

Advancing a Healing Garden Program and Partnership Cape Town Project Center 2020



For more information:

<https://wp.wpi.edu/southafrica/projects/2020-projects/hgi/>

Abstract

To support the Healing Garden Institute (HGI), this project created an overarching strategic plan for healing garden programming and development and advanced a partnership with an organization serving a vulnerable population. We conducted interviews, visited local healing gardens, read peer-reviewed literature, and examined award-winning gardens to gather expertise about healing garden design elements, therapeutic horticulture activities, and design process to structure our strategic plan. The HGI Design and Partner Guidebook and supplementary design tools, meant for both internal and collaborative use, detail this plan. We researched and evaluated organizations in Worcester that already work with HGI's target population to find potential partners. After initially identifying four organizations, we prioritized Seven Hills as our first potential partner and created a presentation to further engage and inform the leaders of this organization about HGI's plan to implement a healing garden.

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Executive Summary

Healing Gardens

Healing gardens have existed as early as the Middle Ages, where these spaces of rest and repose were placed next to monastery hospitals to provide the sick with a peaceful escape from the world (Jiang, 2013). Today, healing gardens continue to promote wellbeing and can be found near hospitals, community centers, assisted living centers, and other communities (Marcus and Sachs, 2013). Starting in the 1980s, growing evidence of qualitative and quantitative types that natural landscapes are beneficial for health demonstrated that the choice of physical environment mattered (Ulrich, 1984; Simons et al., 1999; Mooney and Milstein, 1994; Wells, 2000; Kaplan and Kaplan, 1995; Harris, 2017; Rugletic et al., 2000). Researchers and other professionals recognized that they could utilize this knowledge of the benefits of nature to their advantage by designing settings that have a proven impact on enhancing cognition, positive mood, sense of purpose, self-esteem and overall health (Ulrich et al., 1999; Kaplan and Kaplan, 1989; Marcus and Sachs, 2013).

Architects and psychologists collaborated to find certain design elements that would qualify these gardens as “healing” (Momatz, 2017; National Garden Bureau, 2020; Eckler, 2016; Stigsdotter and Grahn, 2002). They found that the design must reduce stress by offering visitors a sense of control, the chance for social interaction, positive distractions in nature from their daily struggles, and the opportunity for physical exercise (Ulrich et al., 1999). The

choice of plants and hardscape must meet these demands for the garden to be considered “healing” (Momatz, 2017; Stigsdotter and Grahn, 2002).

Client Populations

Successful healing gardens are tailored to meet the needs of the community that it serves (Ecklerling, 1996). All people can benefit from the healing properties of the garden, but there are certain communities that can significantly benefit from such an offering due to their life circumstances: Homeless individuals, elderly, developmentally disabled, prisoners, and individuals with psychological trauma or mental illness. Many existing healing gardens were created for these populations due to the serious health struggles and extreme stress affecting these individuals (Marcus and Sachs, 2013).

Mentally ill individuals benefit from the stress-reducing atmosphere at Nacadia Healing Garden in Copenhagen (Stigsdotter et al., 2018). Homeless individuals experience social inclusion and a sense of purpose at the Homeless Garden Project in Santa Cruz, CA (Homeless Garden Project, 2020). Elderly individuals with dementia feel reduced agitation and can have a place to safely wander at Abe’s Garden in Nashville, Tennessee (Detweiler et al., 2012; Abe’s Garden, 2020). Young adults with developmental challenges learn gardening skills and connect with their community at Knockout Farms (Opportunity Knocks, 2020). At the Memorial Healing Garden at Oregon State Penitentiary, prisoners can find peace and tranquility in nature’s beauty (Kurisu, 2020). Each group has their own struggles but can experience the benefits of a healing garden in their own way.

Sponsor – Healing Garden Institute



Figure 1: HGI logo.

The Healing Garden Institute (HGI), an organization based in Worcester, Massachusetts, aims to bring this concept to their own city. The HGI (Figure 1) is a small, non-profit organization with three members:

Founder and leader Dr. Thidi Tshiguvho, administrative lead

Bernadine Mayhungu, and landscape architect Robert Cabral. The HGI strives to serve communities in Worcester that are disproportionately affected by chronic disease and help them overcome some of these challenges through gardening and the consumption of healthy and medicinal plants (Healing Garden Institute [HGI], 2018). HGI consists of three main components – the Research Institute, the Medicinal Community Garden, and the Healing Garden.

Our project addresses HGI's newest service offering: The Healing Garden. Because they are at a developmental stage with limited resources, HGI has identified a new organizational development model based on strategic partnerships. For the Healing Garden service, HGI will work with a partner organization in Worcester to design and build therapeutic gardens at partner locations, complete with tailored design elements and horticultural activities that serve the social, psychological, and functional needs of their clients. Due to the significant impact of healing gardens on vulnerable populations, HGI aims to serve groups such as the elderly, those with special needs, the ex-incarcerated, individuals with psychological trauma or mental illness, and those with substance abuse disorders. At the start of our IQP, this program was in an early stage

with successful and knowledgeable leaders but lacking a fully developed service and a strategy for building strategic partnerships with other organizations.

Goals and Objectives

The goal of this project was to develop a new healing garden program and partnership strategy for the Healing Garden Institute that will benefit vulnerable populations in Worcester. To accomplish this goal, we worked closely with HGI staff on the following objectives:

1. Map an overarching strategic plan for HGI's development
2. Advance a strategic partnership with HGI

Deliverables

HGI Design and Partnership Guidebook



Figure 2: Excerpt from the HGI Design and Partner Guidebook.

To address HGI's need for a developmental plan and programming for their healing garden service, the team mapped an overarching strategic plan for HGI's development and programming in the HGI Design and Partnership Guidebook (Figure 2), with associated design tools. This 30-page guidebook is a compilation of all the research and analysis on design elements, therapeutic horticultural activities, and garden design processes that we believe will be

beneficial to HGI in the construction of their next therapeutic garden. HGI can use this guide as their own guiding internal organizational structure document for their therapeutic garden model and can also present to partner organizations for in-depth explanation of their services and collaborative design process. The guidebook also acts as a step-by-step plan for bringing the therapeutic garden offering from start to finish, through four phases of development (Figure 1).

Supplementary Design Tools

Supplementary design tools are included with the guidebook to help facilitate the design process and tailor the options to fit the partner's need. The three tools are as follows:

1. **Plant Planning Workbook:** The Plant Planning Workbook matches plant options with their corresponding benefits, maintenance level, type, hydroponic ability, and more to allow the partner organization to find which plants best match their goals and resources.
2. **Garden Activity Planning Workbook:** The purpose of the Garden Activity Planning Workbook is to help the partner decide on a list of possible horticultural activities that HGI would help offer. With this workbook, the partner can easily choose which activities they wish to have in their program by matching their community demographic and desired benefits with corresponding activities.

3. **Landscape Portfolio:** The Landscape Portfolio offers suggestions and inspiration for the garden design, with 10 different design elements based on a combination of award-winning and local gardens.

Partnership Development

To promote partnerships, we created a list of suitable partners, identified the first partner to reach out to, and created a presentation to inform and raise interest in the partner organization.

1. **Identify Potential Partners:** The team identified four possible partners (Abby's House, Seven Hills, Friendly House, and Elder Services of Worcester Area), evaluating their suitability based on the partner's similarity to HGI's objectives, values, and target population of the partner, the space available at the partner location, and the partner's available funding.
2. **Select First Partner:** Out of the four above organizations, the team selected Seven Hills, an organization serving individuals with developmental disabilities, based on their space availability and organizational stability.
3. **Reach Out and Informal Presentation:** After HGI successfully contacted Seven Hills, the team created an informal presentation and process flow diagram to introduce the therapeutic garden service to Seven Hills and raise their interest.

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Healing Gardens and Their Communities

To give a broader understanding of the therapeutic garden model offering and its significance, the following sections discuss the concept of a healing garden and the communities in Worcester that it could best serve.

What Are Healing Gardens?

According to the American Horticultural Therapy Association (AHTA) (AHTA), a healing garden is a “plant dominated environment... designed as a retreat and a place of respite” (American Horticultural Therapy Association, 2007). Modern healing gardens frequently accompany healthcare facilities but can also be found at memorial sites, community centers, and parks (Marcus and Sachs, 2013). While all healing gardens share the same overall goal of reducing stress and enhancing well-being, the means for achieving this goal varies. Some visitors derive benefits purely from the design elements of a garden, passively enjoying its atmosphere (Severtsen, 2006). Other gardens offer healing through both their design and the interactive gardening activities possible within them (Marcus and Sachs, 2013), such as DeWitt Healing Garden (Figure 3). The design of the garden reflects the needs of the clients (Söderback et al., 2004).

The heart of the healing garden concept lies in the evidence-based healthcare design field. This field began recognizing the role of nature in promoting wellbeing in the 1980s with Roger Ulrich’s landmark study on the positive correlation between recovery time and a natural landscape window view (Ulrich, 1984). Later



Figure 3: Healing Garden in DeWitt, Michigan.

studies identified more health benefits brought by a natural landscape and related horticultural activities, including reducing stress (Simons et al., 1999) and anxiety (Mooney and Milstein, 1994), increasing attention (Wells, 2000), improving cognitive functioning (Kaplan and Kaplan, 1989), building self-esteem (Harris, 2017; Diamant and Waterhouse, 2010) and offering the chance for social interaction (Rugletic et al., 2000; Kam and Siu, 2010). As more research demonstrated the positive impact of nature on health, architects incorporated these findings in the form of healing gardens (Marcus and Sachs, 2013).

The design of a garden reflects the theory behind why healing gardens improve health. According to Roger Ulrich, the healing properties of a garden originate from its stress-reducing mechanisms (Ulrich et al., 1991). He points to a natural space's ability to instill a sense of control, facilitate social support, offer the opportunity for physical movement, and positively distract with nature as key to reducing stress. Kaplan and Kaplan (1995) promote the Attention Restoration Theory, the idea that nature restores a person's ability to direct attention. They argue that nature helps lead this process of mental recovery by incorporating the following four themes: "Being away" from stressful life incidents, "extent" (immersion in a spacious physical area), "fascination" with stimulating distractions, and "compatibility" with activities that match our natural instincts (Kaplan and Kaplan, 1995).

Architects utilize specific design elements to meet the above criteria of "healing" (Momatz, 2017). For example, stone walls, hedges, and trees all frequently enclose the outside of healing gardens, and living plants line the walls to promote a sense of safety and privacy from the outside world (Stigsdotter and Grahn, 2002). Living plants, rather than stones or gravel, must fill the garden to promote positive distractions as visitors observe the cycle of life and the majesty of natural beauty (Ecklerling, 1996; Stigsdotter and Grahn, 2002). Plant and layout colors should be strategically selected to provide a relaxing atmosphere (Figure 4). The relaxing effect will assist in the mental healing process, as the garden becomes a place of escape and solace. Furthermore, different plants will assist with different

goals. If the focus of the garden is more on aromatherapy (improving health through smelling plants) and nutrition, one should choose herbs such as lavender or basil (National Garden Bureau, 2020). To uplift and invigorate, one could include brighter flowers (e.g. petunias and sunflowers). The National Garden Bureau (2020) suggests attracting butterflies, birds, and other forms of wildlife, such as coneflowers and salvias, that will produce food and nectar for wildlife.



Figure 4: Variety of plants colors fill this English garden.

Types of Healing Gardens

There are many varieties of healing gardens, so it is difficult to organize them into discrete categories. The AHTA (2004) differentiates between therapeutic and restorative gardens. Therapeutic gardens, such as the Healing Forest Garden Nacadia in Copenhagen (Stigsdotter et al., 2018), are often designed with guided treatment plans in for garden (Ecklerling, 1996). Often, therapists utilize horticultural therapy, a licensed profession (Ecklerling, 1996), as part of a client's plan within the garden. In horticultural therapy, patients

improve motor control, coordination, social interaction, mood, and other areas of health through hands-on planting of vegetables or flowers similar activities (Scott, 2014). Restorative gardens refer to healing gardens built with the purpose of restoring well-being but not necessarily within a treatment plan (AHTA, 2016), such as the AIDS Memorial Garden in San Francisco's Golden Gate



Figure 6: AIDS Memorial Garden.

Park (Figure 5). While visitors can apply gardening activities, restorative gardens focus on improving the health of its visitors through its sights, scents, and general atmosphere. Many gardens incorporate principles of both the therapeutic and restorative gardens, depending on the needs of the target population.

Herbal Medicine

Another aspect frequently found in healing gardens is herbal medicine because it contains a wide array of healing properties that can be tailored to fit the needs of the target population. The World Health Organization defines herbal medicine as “naturally occurring, plant-derived substances with minimal or no industrial processing that have been used to treat illness...” (Tilburt and Kaptchuk, 2008). Herbal medicine is utilized

by 80% of the world's population, primarily in developing countries for its affordability and availability (Kamboj, 2000). In Africa, 90% of individuals rely on herbal/traditional medicine, and likewise 70% in India. Some cultures incorporate herbal medicine with their healthcare system, such as China where herbal medicine accounts for 40% of all healthcare. Even in the United States, herbal medicine is utilized by about 38% of adults, and herbal supplements are taken by 13% (Benzie & Wachtel-Galor, 2011).

Generally, herbal medicine is less mainstream in western culture as a form of healthcare and perceived as an unadvanced and outdated concept, although there are numerous scientific studies to enforce its efficacy. For instance, a double-blind, randomized study on ginger, a historical headache remedy, compares it to a billion-dollar headache medication – Imitrex. It was found that just a pinch of ginger is just as effective as the drug and costs less than a cent (Greger & Stone, 2018). Similarly, the spice curcumin has been proven to treat multiple diseases. Specifically, a double-blind, placebo-controlled study demonstrated that over 50% of patients with ulcerative colitis went into remission within a month of being treated with curcumin, versus none of the patients who received the placebo (Greger and Stone, 2018). With little to no side effects and a low price tag, herbs like curcumin provide alternatives or supplements to mainstream pharmaceuticals.

Who Could Healing Gardens Serve?

Healing gardens can benefit many populations (Stigsdotter et al., 2018), but there are certain populations

in Worcester who will benefit the most from a healing garden: Homeless individuals, elderly, individuals with psychological trauma or mental illness, developmentally disabled, and prisoners.

In 2019, there were 18,471 homeless people living in Massachusetts with 2370 individuals experiencing chronic homelessness (Massachusetts Homelessness Statistics, 2019). Because of their transitive living situation, homeless people are often more likely to be affected by certain issues, such as death by suicide (Patten, 2017), contagious diseases (State of Homelessness, 2020), alcoholism, pregnancy, and malnutrition (Wiecha, 1991), at disproportionately higher rates than their non-homeless peers. A healing garden can help the homeless to help combat disease and malnutrition, provide an enjoyable and rewarding activity to their lives, and even help them transition into homes (Grabbe et al., 2013).

Both the Homeless Garden Project in Santa Cruz, California and Streetscape in South Africa use a healing garden model to aid homeless individuals by recruiting this population to work in their garden (Homeless Garden Project, 2020; Streetscapes, 2020). In the Streetscapes program, the homelessness rate fell to 13% from 91%, with 84% in the group of 40 individuals finishing the program (Streetscapes, 2020). Both programs focus on creating a sense of community, instilling hope, and aiding recovery for their homeless workers, while giving them practical life skills through their vocational gardening method (Homeless Garden Project, 2020; Streetscape, 2020).

As one of the main demographics of any society, the elderly account for almost 15% of the population of

Worcester. The elderly population could benefit from a healing garden because they are highly subject to chronic illnesses (Smith, 2018). The elderly also face a physical decline and mental decline (health and cognition): Over 15% of adults over the age of 60 suffer from a mental disorder, while 47.5 million elderly people around the world suffer from dementia caused by cognitive decline (Smith, 2018). Dementia care places, such as Abe's Garden in Nashville, Tennessee, have adopted the healing garden as part of their evidence-based treatment plan (Abe's Garden, 2020), as studies show that these gardens reduce agitation and provide elderly individuals with a safe place to wander (Detweiler et al., 2020). Healing gardens offer a holistic approach to these mental and physical issues by providing a chance for socialization, physical activity, cognitive improvement, stress reduction, and healthy fruits and herbs (Pardue-Spears, 2020) (Figure 6).



Figure 6: Seniors examining plants in an indoor garden.

Nearly one in five Americans are living with a mental illness (U.S. Department of Health and Human Services, 2020). Healing gardens and gardening in general have shown to improve mental health by improving mood and relieving stress. The healing properties of gardening have

been adopted by hospitals and addiction treatment centers as a part of the healing process (Williams, 2020). Both the Healing Forest Nacadia in Copenhagen and the Cluj-Napoca Hospital in Romania utilize healing gardens to treat their patients with mental illness, through observation of nature and gardening activities.

According to the Massachusetts rehabilitation commission, there were 804,000 people—almost 12% of the state’s population—living in Massachusetts with disabilities (Massachusetts Rehabilitation Commission, 2018). There are several secondary health issues that people with disabilities suffer from, such as obesity, depression, stress and anxiety, and fatigue (Disability and Health Related Conditions, 2020). They also frequently face social exclusion as society may not adapt to their special needs, so a healing garden with accommodations can promote a sense of community and social inclusion among these individuals (Diamant and Waterhouse, 2010).

A healing garden with a vegetable and herb production component can also improve physical health by introducing more healthy foods. Exploring the garden and participating in planned activities can promote further physical health and reduce obesity as this space provides those with disabilities an opportunity to get out and move around in whatever way they are capable of (Rise, 2019) (Figure 7). Knockout Farms incorporates all these components in their healing garden program as young adults with developmental challenges learn gardening skills and connect with their community (Opportunity Knocks, 2020).



Figure 7: A specially abled woman and her companion enjoy the RHS Garden Wisley in Surrey, UK.

In 2018, the Massachusetts prison system held over 8,000 people. Formerly incarcerated people have a 27% unemployment rate, and face similar issues homeless population previously discussed (Fraser, 2019). A prison in Canada has a garden program that brings in some of their incarcerated men to grow and donate produce. The study done on this garden found that the men had “access to fresh vegetables, experienced pride and tranquility in their work, experienced positive socio-emotional benefit through donating vegetables, and were able to imagine meaningful futures shaped by their experience in the garden” (Timler, 2019). This idea of giving people a job and teaching them valuable skills is something that can help them transition back to society when their sentence is fulfilled.

Goal, Objectives & Methodology

The goal of this project was to develop a new healing garden program and partnership strategy for the Healing Garden Institute that will benefit vulnerable populations in Worcester. To accomplish this goal, we worked closely with HGI staff on the following objectives:

1. Map an overarching strategic plan for healing garden programming and development.
2. Advance a partnership for HGI.

Objective 1: Map an overarching strategic plan for HGI's development

To achieve objective 1, the team followed three main steps (Figure 8). See Appendix A for a more detailed methodology.

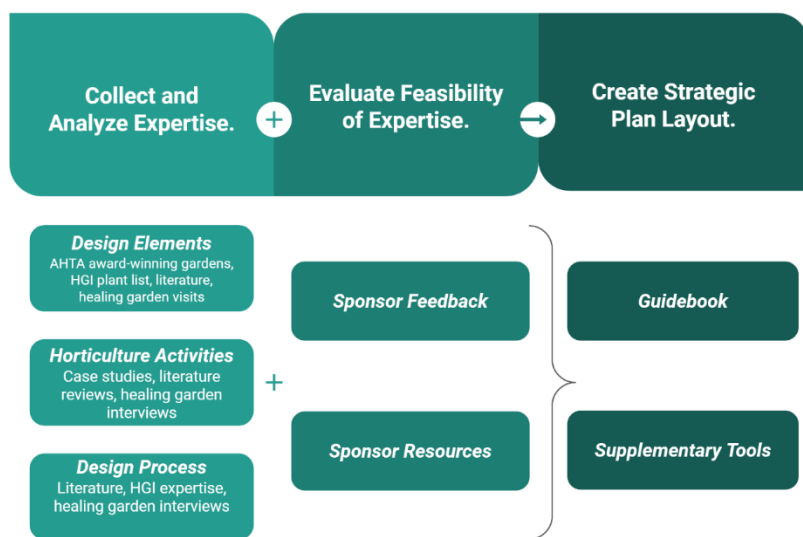


Figure 8: Flowchart for Objective 1.

Collect and Analyze Expertise

The strategic plan consists of three major parts—design elements, therapeutic horticulture elements, and design process—that all varied in their methods of collection and analysis.

Design Elements: Given a list of 47 types of healing plants previously used by our sponsor, we researched the benefits of each plant to illustrate how plant customization could occur with partner organizations. We organized our findings into an Excel document. The second design area focused on non-living design elements of the garden (hardscape). To research and gain inspiration about these features, we visited two healing gardens— the Virginia Thurston Healing Garden in Harvard, MA and the Tower Hill Botanic Garden in Boylston, MA—and analyzed features from 19 different gardens that have won the American Horticultural Therapy Association (AHTA) Therapeutic Garden Design Awards by looking for commonalities and striking features. Finally, we examined literature to determine the overarching guiding principles recommended by experts.

Therapeutic Horticulture Activities: To develop a curriculum of therapeutic horticulture activities, the team primarily examined peer-reviewed case studies but also interviewed other successful healing garden programs— City Seeds Urban Farm, in St. Louis, MO and the Homeless Garden Project in Santa Cruz, CA (Appendix B)—and read through published literature reviews on therapeutic horticulture programming. We organized the data based on programming logistics, activities, and corresponding benefits to identify common themes among all programs and differences between programs aimed at different

populations in a supplementary Excel file labeled “Activity Studies.”

Design Process: As noted above, the team conducted interviews and gained information on the outreach, budget plans, partnership formation, community collaboration, struggles and other elements relevant for early phases of development that could be incorporated into HGI’s own development plan and design process. Next, the team spoke with Robert Cabral, the landscape architect with HGI to gain his expertise on designing architecture with community organizations. Lastly, the team drew from peer-reviewed literature to add depth to our understanding of the best design practices.

Evaluate Feasibility of Expertise

Because HGI is a small organization based in a New England climate, some of the steps recommended by experts were not possible due to the difference in climate and funding. The team continuously evaluated the feasibility of the expert recommendations based on sponsor feedback and available resources and revised early deliverable material to reflect these suggestions.

Create Strategic Plant Layout

We compiled all the research and analysis on design elements, therapeutic horticultural activities, and garden design processes in a guidebook and supplementary tools.

HGI Design and Partner Guidebook: Our team created a guidebook meant for both HGI internal use and for collaboration with a partner organization. The purpose of this book was to facilitate the design process and help partner organizations understand HGI programming. We analyzed the previously gathered

information to find common themes among successful programs and garden designs to construct the easily readable and evidence-based strategic plan outlined in this guidebook.

Supplementary Design Tools: To aid with the design process, we created Garden Activity Planning Workbook that contains a list of activities and their corresponding benefits and populations, a Plant Planning Workbook that illustrates plant possibilities and their benefits, growing season, maintenance, and more, and a Landscape Portfolio showing different hardscape elements with AHTA-award winning garden examples.

Objective 2: Develop a strategic partnership for HGI

As a small, developing organization, HGI needs a partner to provide the physical location of the garden and a client population. We followed the first three of the following five steps to advance a partnership for HGI (Figure 9):

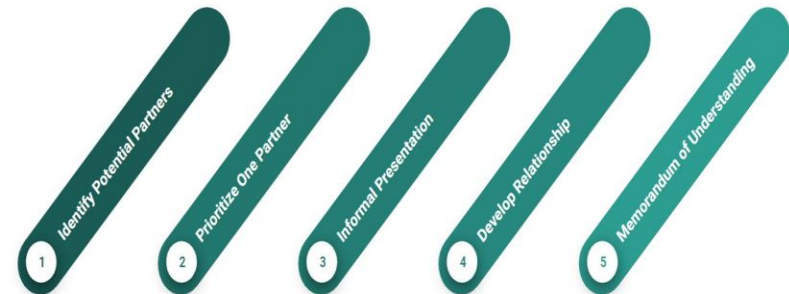


Figure 9: List of steps to create partnership for HGI.

Step 1—Identify Potential Partners: To create a list of potential partners, we researched possible partner organizations in Worcester with content analysis

techniques and evaluated their suitability based on the following criteria:

- Objectives and values of the organization: Do their goals and fundamental values align with HGI?
- Target population they are assisting: Do they work with a vulnerable population such as the elderly, homeless, specially abled, or substance abusers?
- Space available: Is there a garden already present? How much space is available?
- Funding: Do they have previous funding? Are they financially stable as an organization?
- Willingness for partnership: Are they willing and excited to bring a healing garden to their community?

Step 2—Prioritize One Partner: To select the first organization to reach out to, we compared the suitability of each partner organization on our list. We prioritized partners based on similarity of goals, staff availability, space for a garden, budget, and client base.

Step 3—Informal Presentation: After our sponsor successfully contacted the chosen organization, the team created an informal presentation to summarize the therapeutic garden model offered by HGI. The information in the presentation was informed by the research conducted in objective 1.

Findings and Recommendations

Objective 1

The following findings and recommendations were based on the healing garden case studies, literature reviews, interviews, and AHTA garden analyses and informed the construction of the project deliverables.

Design Process

1. *A Participatory Design Process gives voice to beneficiaries and encourages participation.* Stakeholders and clients will be more invested in the garden's success and therefore more likely to participate in the therapeutic horticultural activities or even volunteer to assist with the garden construction. Robert Cabral, HGI landscape architect, recommends this strategy in urban landscaping to building a sense of community and pride.
2. *Being involved in the design process will inform the users about the benefits of the garden* and how every feature is selected to achieve some therapeutic goal. Not only will this be a valuable learning opportunity, but this knowledge will make users more likely to relax by the garden and mindfully enjoy the benefits.

Additionally, participatory design could be considered healing in a similar way to the garden itself. This design process exudes these benefits:

1. *Social Interaction:* Creates a sense of community within the users, as they are working together towards a common goal.

2. *Enrich Lives:* Generates excitement, which in turn improves mood and reduces stress.
3. *Develop Skills:* Become knowledgeable about the design process and healing gardens, and gain experience collaborating with others.
4. *Health:* Collaborative sessions can help improve concentration and make users more active/stimulated.
5. *Self-Confidence:* Decision-making and input given for the design creates a sense of control. Seeing ideas come to life creates a sense of accomplishment for the beneficiaries.

Therapeutic Horticultural Activities

The following findings are all from the analysis of the case studies, interviews, and literature reviews.

1. *Identify Needs:* Successful horticultural programs first identify the needs and interests of their target population.
2. *Plant Interaction:* Therapeutic horticulture must involve interaction with living plants (Figure 10).
3. *End Goals:* Structuring each activity with an end goal in sight leads to increased satisfaction as participants feel more confidence as they take part in a project from start to finish.
4. *Structure:* The length of activity duration and program length varied among case studies, but most were within 0.5-2 hours per day one time per week.
5. *Credibility:* Non-certified horticultural programs like HGI's should present activities as "therapeutic horticulture" to avoid credibility issues, as "horticultural therapy" programs are licensed through AHTA.



Figure 10: Participants cultivate vegetables in a raised bed at Vallejo People's Garden.

Design Elements

We found the following elements to be the leading themes in healing garden designs based on our analysis of the AHTA award winning healing gardens, local healing gardens, and peer-reviewed literature.

1. *Accessibility:* As there are many different groups of people with varying abilities who may be using your healing garden, accessibility is crucial. Pathways and seating must accommodate those with special needs.
2. *Variety of Spaces:* Offering a variety of spaces will provide beneficiaries with a sense of control as they have the freedom to choose where they spend their time in the garden. The garden should provide some places for horticulture activities, quiet seating areas for observation of plants, and other more open

spaces to enjoy the sun and gather in small groups to socialize.

3. *Living Plants:* Living plants must be the primary component in a garden. A key element of healing gardens is its ability to reduce stress through nature, so sand, gravel, and stone structures alone are not sufficient alone to fill a garden.
4. *Sense Stimulation:* The garden must stimulate all five senses of the visitor. This can be done through careful selection of plants, water features, and focal points. The sound caused by flowing water can promote introspection and thoughtfulness. Wind chimes and string lights calm and comfort visitors (Hubbard, 2020).

Objective 2

Researching Potential Partners

Because HGI is a younger organization with limited resources, they would benefit from a new organizational development model based on strategic partnerships. These partnerships will help them increase their funding and resources and provide a physical space and client population for their garden. We found that having a partner that already works with one of HGI’s target populations be crucial, as they will have trained staff that are experienced with the population’s needs. With a partner, HGI can streamline the creation and benefits of the garden and allow for a more tailored garden. Although there are many possible organizations in Worcester that serve HGI’s target population, we found these four organizations to be the best potential matches for partners based on the evaluation criteria listed in the methodology (Table 1):

Table 1: List of organizations and target populations

Organization	Target Population
Seven Hills ASPIRE!	Adults and children with disabilities or significant life changes such as brain injury
Abby’s House	Low-income or homeless women with or without children
Friendly House	Under- resourced members of the Worcester community
Elder Services of Worcester Area	Elderly and younger individuals with disabilities

Engaging with Seven Hills

Ultimately, our team chose Seven Hills ASPIRE! to be the first organization that we approach with HGI’s therapeutic garden service. There were many factors that make Seven Hills the ideal first partner and set them apart from the other three organizations that we were looking at:

Complementing Goals: Primarily, their goal— “to provide opportunities for people with intellectual and developmental disabilities, autism, and brain injury to develop skills necessary to pursue interests in employment, recreation, and social interaction” (Seven Hills, 2020) matches HGI’s therapeutic garden goals. Table 2 relates each goal set by Seven Hills to the benefits of HGI’s healing garden.

Table 2: Comparison of the goals of Seven Hills to benefits of a healing garden

Social Interaction	Enrich Lives	Develop Skills	Health	Self Confidence
<ul style="list-style-type: none"> Make friends with others in Seven Hills Make friends with volunteers from HGI Engage community in gardening activity to produce own food 	<ul style="list-style-type: none"> Reduce stress Improve mood Decrease anxiety and depression Path to recovery from mental distress or emotional trauma 	<ul style="list-style-type: none"> Improve hand-eye coordination Weekly reflection sessions with accompanying activities 	<ul style="list-style-type: none"> Improve concentration Improve memory Decrease heart rate Use garden design and exposure to nature to help restore physical health 	<ul style="list-style-type: none"> Increase sense of control Increase sense of purpose Tools and support provided to take action towards self healing

Highly Trained Staff: Seven Hills has highly trained staff that can assist HGI in working with the target population. As HGI lacks the credentials necessary to work directly with people who have developmental disabilities, having trained staff nearby is beneficial for smooth operation during healing activities.

Indoor and Outdoor Space: One location of Seven Hills ASPiRE! in Worcester has a horticulture studio with plants inside as well as outdoor space behind the facility.

Multiple Locations: Having multiple locations in Worcester and many more within an hour drive of Worcester is a great advantage as it would allow HGI to expand into other locations without having to develop a new partnership.

Large Budget: Since Seven Hills has multiple locations, a new building and access to large amounts of funding, it is reasonable to assume they would be more receptive to a partnership than a smaller organization. COVID-19 has had a large monetary effect on many organizations around Worcester so having one that is more stable at the current moment is very important to consider.

Contact with Seven Hills

Our project liaison, Dr. Thidi Tshiguvho, contacted the head of Seven Hills to make an initial connection and engage their interest. From there, she met with Vice Presidents of two Seven Hills ASPiRE! locations – Godard Memorial Drive (Figure 11) and Hope Ave. Both locations were extremely excited about the idea of working with HGI in the future and the prospect of evaluating healing impacts of their existing gardens. The Vice Presidents requested our presentation slides (outlined in the deliverables section) with the intention of presenting HGI’s goals and therapeutic garden service to the rest of their team, allowing Seven Hills to move forward with a future partnership with HGI.



Figure 11: Seven Hills, Goddard Memorial Drive location.

However, COVID-19 safety restrictions could cause delays in the physical construction of the garden as Seven

Hills will not allow additional people in their facilities until further notice. However, these initial meetings put HGI in an excellent position to build this relationship and plan for a working partnership.

Deliverables

Objective 1 – HGI Design & Partner Guidebook

This guidebook (Figure 12) contains the strategic plan for HGI’s development and is the compilation of all the research and analysis on design elements, therapeutic horticultural activities, and garden design processes. The audience of the guidebook is primarily the organizations partnering with HGI, but this guidebook will also help HGI to visualize their therapeutic garden model programming and design process.



Figure 12: Excerpt from the HGI Design and Partnership Guidebook.

Chapter 1 guides the reader through the philosophy and scientific evidence surrounding the use of healing gardens in promoting wellbeing. Chapters 2-3 lay out HGI’s mission and workflow with partner organizations. Chapters 4-5 introduce the programming brought by HGI. These chapters illustrate how the activities and design elements work in traditional healing garden programs and some of the ways HGI incorporates

these elements into their offerings. Chapter 6 outlines how the actual partnership design process will work. This final chapter is intended as a step-by-step plan to guide the participatory design process. Tools instrumental for use in the design process—the Landscape Portfolio, the Garden Activities Planning Workbook, and the Plant Planning Workbook—are referenced and explained throughout Chapter 6.

Landscape Portfolio

Since the partnership will not be officially established until our project has ceased, it is uncertain what land/indoor space HGI will use or what target population HGI will be working with. Therefore, it is impractical to create a tailored garden design at this time. However, to leave HGI and the partner organization well-prepared to design a garden, we composed our research in a Landscape Portfolio (Figure 13).

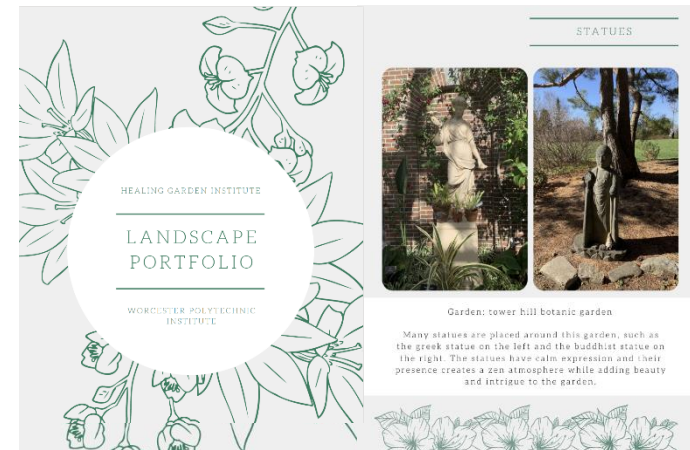


Figure 13: On the left is the cover of the Landscape Portfolio. The right image showcases an excerpt from the book.

This is a spiral-bound physical book that provides ideas for the following design aspects of the healing garden: Raised beds, accessibility, focal points, water, pathways/hardscape, foliage, seating, wildlife, and overall layout. The images and research for this book are detailed in the background and methodology. Each section has a general description about how different adaptations of this feature can have healing properties but also notes how different accommodations are best for certain populations. Similar features within each category are also grouped together and explained as needed for the viewer's ease.

Plant Planning Workbook

The Plant Planning Workbook (Figure 14) is an Excel document consisting of 47 plants previously used by HGI that identify the benefits, use, growing season, ease of maintenance, hydroponic potential, and other logistical information for each plant that would be beneficial for the partner's knowledge.

Plant name	Benefits									
	Improve mental health	Improve cognition	Immune booster	Promotes external wound healing	Antimicrobial / Antibacterial	Decongestant	Pain reliever	Improves Digestion	Regulates Cholesterol Level	Muscle Relaxer
Aloe Vera				■	■			■		
Angelica										
Ashwagandha	■	■	■							
Asparagus	■							■		■
Astragalus	■		■					■		
Bacopa Monnieri/Brahmi										
Basil	■	■			■					
Beans		■						■		
Bell Peppers			■							

Figure 14: Section of the Plant Planning Workbook

This document is intended for a partner organization to be able easily find which plants best match their goals, hence why the sections about benefits and applications are color-coded and organized by category. They can use the workbook as a guide in the planting and planning process.

Garden Activities Planning Workbook

This Excel document (Figure 15) contains a list of possible activities on the left with the top rows detailing corresponding benefits, target populations, and designation as a passive or active activity.

Activities	LOGISTICS		TARGET POPULATION						TARGETED BENEFITS																
	Use in Activity Session?	HGI Staff Needed?	Passive (Yes/Active (A)?	Elderly	Homeless	Developmentally Disabled	Psychological Trauma/Mental Illness	Substance Abusers	Reduce stress	Reduce Depression	Reduce Anxiety	Feel respected	Improve social skills or offers chance for social self-confidence	community/social inclusion	Attention restoration	Reduced loneliness	Reduce agitation level	Cognitive functioning	Mood/attention level	bring positive affect	increase in attentive engagement/attention	Agency/self-determination/choice	Giving purpose/feel worth achieving/pride	Sense of achievement/pride	
Selecting plants/materials			A																						
Potting plants			A																						
Plant cultivation			A																						
Watering plants			A																						
Fill watering cans			A																						
Sweeping garden			A																						
Cleaning tools			A																						
Weeding			A																						

Figure 15: Section of the Garden Activities Planning Workbook.

The purpose of this tool is to aid in the participatory design process so that the horticultural activities' plan can be easily assembled. The sheet is organized in a user-friendly manner to match activities based on the partner's community demographic (i.e. elderly, developmentally disabled) and on the benefits requested by the partner. The column labeled "Use in Activity Session?" and "HGI Staff Needed?" are left blank and will be filled in during the design phase with the partner organization. The "HGI Staff Needed?" will be marked as a yes, depending on the needs

of the community at the discretion of the partner organization. “Use in Activity Session” will be marked as a yes if the partner wishes to add this activity to their assembled list.

Objective 2 - Potential Partnership Introductory Presentation

This presentation is a simple, fast, and effective way to explain to a partner organization, such as Seven Hills, what HGI is and how they will work with the partner organization to offer the therapeutic garden service. Busy partner organizations may not have the time to meet, but HGI can still engage their interest with this tool. The aesthetically pleasing but informative presentation allows partner organizations to understand the goals, programming, and design process of HGI’s therapeutic garden offering without a member of HGI or our WPI team present.

While all future presentations will follow the same general format—background of a healing garden, goals of HGI, how a healing garden matches the partner’s goals, HGI’s contribution, expected contribution from the partner, programming summary, phases of development—each presentation can be personalized for the specific partner organization to make the therapeutic garden more appealing to them. This presentation is currently customized for Seven Hills. With Seven Hills, we matched their goals, found on their website mission statement, to the benefits offered by the therapeutic garden to demonstrate how HGI’s service could directly support their needs. This presentation acts as a tool to educate and

explain how a partnership with HGI would work and how it would be beneficial for the partner organizations.

Conclusion

Our team leaves HGI with several concrete deliverables to support their development as an organization. We recommend that HGI uses the HGI Design and Partner Guidebook and supplementary design tools to facilitate the therapeutic garden design process and conversations with partner organizations. To advance future partnerships, we recommend that HGI engages the potential partner’s interest with our customizable, aesthetically pleasing, and informative presentation. The Healing Garden Service offered by HGI will promote physical and mental wellbeing, and we look forward to seeing HGI continue to grow as an organization.

Figure 16: A Japanese healing garden.

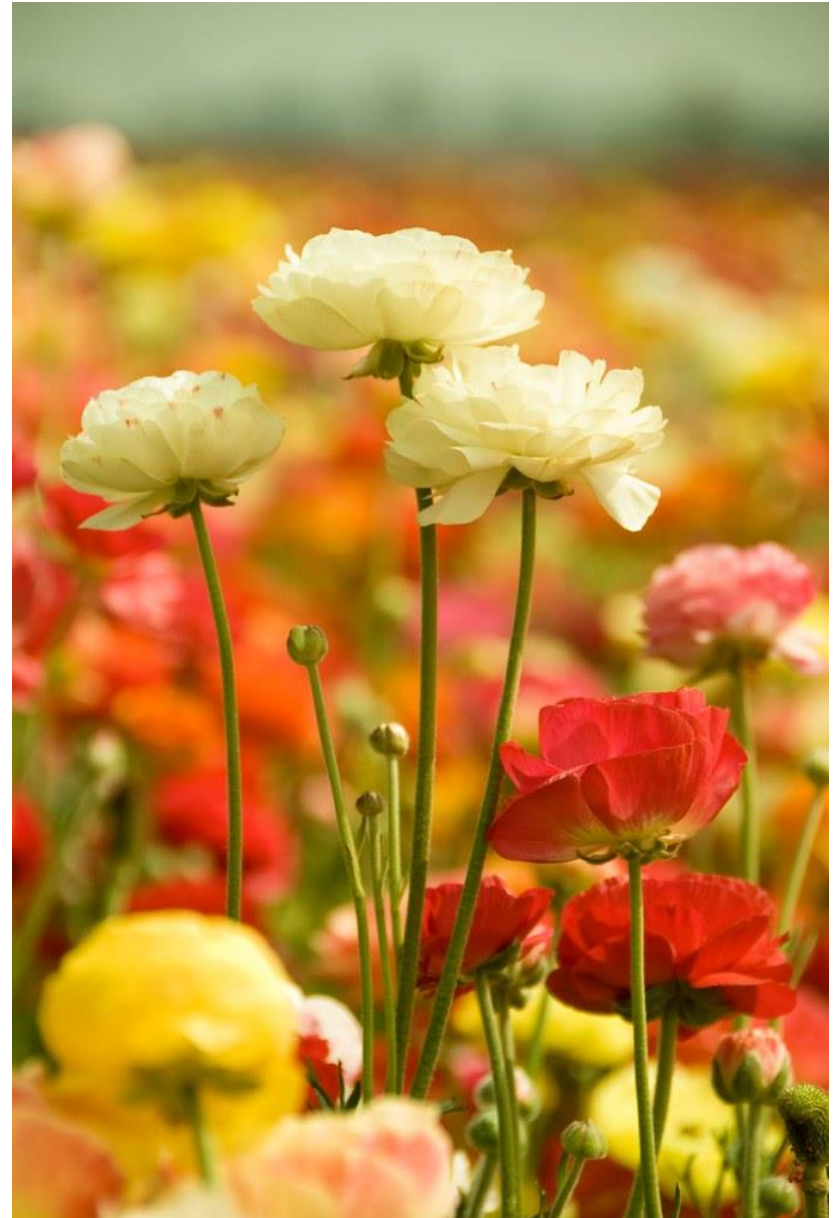


Acknowledgements

To our sponsors at the Healing Garden Institute, Thidi Tshiguvho, Robert Cabral, and Bernadine Mayhungu, thank you for giving us the opportunity to work on this impactful project. All the work that you have done and continue to do is very inspiring. We are very excited to see what HGI will accomplish in the future. Thidi, your energy and enthusiasm was always infectious. It was a great pleasure working with you this term!

To our advisors, Scott Jiusto and Gbeton Somasse, thank you for all your guidance through this semester. We are very grateful for your constant enthusiasm and your willingness to answer our questions and provide feedback at any hour of the day.

Interactive Qualifying Project Report submitted to the faculty of WORCESTER POLYTECHNIC INSTITUTE in partial fulfillment of the requirements for the Degree of Bachelor of Science



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Appendices

Appendix A—Detailed Methodology for Objective 1

Collect and Analyze Expertise

The strategic plan consists of three major parts—design elements, therapeutic horticulture elements, and design process—varying in their methods of collection and analysis.

Design Elements

Given a list of 47 types of healing plants previously used by our sponsor, we researched the benefits of each plant to illustrate how plant customization could occur with partner organizations and organized our findings into an Excel document.

The second design area focused on non-living design elements of the garden (hardscape). For analysis, we split this section into the categories of pathways, seating, lighting, wildlife, focal points, and accessibility (Pamela Hubbard, 2020) based on healing garden design aspects outlined by Pennsylvania State University. To research and gain inspiration about these features, we visited two gardens with healing properties – the Virginia Thurston Healing Garden in Harvard, MA and the Tower Hill Botanic Garden in Boylston, MA. Additionally, we analyzed features from 19 different gardens that have won the American Horticultural Therapy Association (AHTA) Therapeutic Garden Design Awards over the past 22 years by looking for commonalities and striking features. Finally, we

examined literature to determine the overarching guiding principles recommended by experts. From this analysis, we compiled a look book to guide HGI and the partner organization in the garden design process.

Therapeutic Horticulture Activities

To develop a curriculum of therapeutic horticulture activities, the team primarily examined peer-reviewed case studies, but also interviewed other successful healing garden programs and read through published literature reviews on therapeutic horticulture programming. The team interviewed with City Seeds Urban Farm in St. Louis, Missouri (Appendix B) and The Homeless Garden Project in Santa Cruz, California (Appendix C) to learn more about their horticultural activities, benefits, and session structure.

We analyzed many literature sources, selected based on program success level, journal reputability, and similarity to HGI’s target populations (elderly, developmentally disabled or intellectually disabled, individuals with psychological trauma/mental health, homeless individuals, and substance abuse disorders), to develop our ideas and gain expertise. These sources were selected based on program success level, journal reputability, and similarity to HGI’s target populations: Elderly, developmentally disabled or intellectually disabled, individuals with psychological trauma/mental health, homeless individuals, and substance abuse disorders. We organized the data based on programming (activity duration, program duration, location, age), offered activities, and corresponding benefits to identify common themes among all programs and differences between programs aimed at

different populations. See appendix C for the full analysis of source material.

Design Process

To guide the actual design process, the team collected information on the best development practices in designing a healing garden and working with partner organizations. As noted previously, the team conducted interviews and gained information on the outreach, budget plans, partnership formation, community collaboration, struggles and other elements relevant for early phases of development that could be incorporated into HGI's own development plan and design process. Next, the team interviewed Robert Cabral, the landscape architect with HGI. Through his professional expertise, he added input on the best method of landscape architecture design when working with community organizations. Lastly, the team drew from peer-reviewed literature to add depth to our understanding of the best design practices. A notable source was a dissertation by a Texas A&M PhD student that provides tools for assessing the garden and allowing for continuous improvements to the garden even after the initial design phase is over (Sachs, 2017).

Evaluate Feasibility of Steps Recommended by Expertise

The team continuously evaluated the feasibility of the proposed recommendations based on sponsor feedback, available resources, and climate. Some of the literature and example programs took place over shorter periods of time and in areas outside of New England. The list of activities drafted from the expertise was adapted to fit HGI's

experience with gardening, adding and removing items as necessary. The team revised the activity duration and timing to reflect the availability of the sponsor while balancing the recommendations of the literature. The sponsor recommended plant suggestions for the healing garden based on their place in her previous garden and the New England climate.

Creating Strategic Plant Layout

Our team created a guidebook to serve as reference material for the Healing Garden Institute and its partner organization. This guidebook educates and aids in the use of the resources that we have developed to build plans for the garden. The guidebook compiled all the research and analysis on design elements, therapeutic horticultural activities, and garden design processes in a readable format to use in guiding the design process and presenting HGI programming to partner organizations. We analyzed the previously gathered information to find common themes among successful programs and garden designs to construct the evidence-based strategic plan outlined in this guidebook. As part of the guidebook, we created tools that would be used in the design process: A list of activities and their corresponding benefits and populations, a list of plants that HGI uses with each of their benefits, growing season, and plant use, and a look-book containing showing different hardscape elements with AHTA-award winning garden examples.

Appendix B: Homeless Garden Project Interview

Interviewee: Darrie Ganzhorn, Executive Director of the Homeless Garden Project

What is the mission behind the Homeless Garden Project?

In urban garden, people find a sense of belonging through the natural cycles and community. But, it goes wider than this. We connect them to our active volunteers, bringing diverse groups together on a level playing field. All are equal. We ask of everyone simply "Can you do the weeding, harvest this crop?" In our vision statement, we state that we have a thriving and inclusive community. This is a hub of community building, including our local workforce community.

What is your impact on the local food system? What does your CSA program look like?

Our impact on local food system is still little. We have a currently sold-out CSA program, consisting of 64 programs. There are two options: 1) We harvest shares for members, and they pick it up or 2) You pick the share and they come and pick it up. We feed two birds at one time, as the CSA shares supports our training program, and our training program can support local programs such as the AIDS project, River, and a nearby transitional youth program. Agencies apply to be a part of our shares program, and trainees choose them. They are paired up and get to learn about the agencies. Then, they vote on agencies, with each trainee voting for their top 5. They mainly chose agencies

that worked with children and seniors, as they felt worried about these communities.

How are volunteers involved with your organization?

We have open volunteer hours from 10-2, with a few designated workdays that we call "make a difference day," such as those in honor of Cesar Chavez and MLK. The job of the people is to share the love. We try to welcome all kinds of volunteers and ask, "What kinds of activities could that do? How do you make accommodations for them?" We worked with one developmentally disabled group from Friend Street which offers daytime activities for those experiencing homelessness. They came 3-4 days per week and were there to watch and enjoy the fresh air, be in community, and be in a place that they are accepted and don't have to behave differently. They came with their own staff who work with them. In our permaculture action network, we have 200 people on the farm. At normal times, we have our shift manager and 2-3 volunteers staffing the store. The store is open on 10-8, 7 days a week, with 3 shifts a day, offering three opportunities for our employees in the transitional employment program. WE have >100 volunteers in the store year-round. At our Farm to Table Dinners, part of our transitional employment program, we serve our employees a large meal and have speakers. We have keynote speaker and a trainee speaker. The trainee will talk about what it is like to be on the farm, eat on the farm. We have around 100 volunteers for chef and servers.

How do you recruit volunteers?

We recruit volunteers through word of mouth, regular newsletter, Facebook page, Instagram and flyers, as well as

by partnering with local volunteer agencies and presenting to local organizations. We have many volunteer groups from churches, businesses (e.g., Amazon, Whole Foods), etc., some of whom are yearly. Our holistic values attract them. The farm can be both team building and a good way to learn about our organization.

How do you fund your organization?

68% came from donations from a combination of grants from foundations, individuals, and business donors. In our capital campaign, we've raised 3.5 million dollars. We also have government grants. A lot of these are about housing first, as they give a dollar for 1000 dollars of impact. We also use food stamp grant as the government wants to support people to make sure they have enough food and become more self-sufficient. 2% comes from city government. 26% of our income from store with 6% from farm, CSA program, farm stand. We wholesale with local restaurants. Previously, we had to lay people off in the winter which how the store got started. In our project, we are always trying new things and adapting. We aren't afraid to try things and then scratch them. This is where the year-round store came in, where our people tried making candles and skillet during the winter months to keep the store open.

What are your future goals for your organization?

Studies show that the 1st 6 months after homeless people leave project like this is the time that they are most likely to lose another job. We want to bring people together during these 1st 6 months to create lasting impact. We also have a goal to double our organization and work with the

city to build a permanent farm, as we are currently farming on a temporary farm on a lease.

How did you program originally recruit homeless individuals to take part?

Our original program leads had been a restaurant manager and donated coffee and sandwiches to a nearby shelter. She would go down to the shelter and ask if anyone wanted to work on the farm. For the first 5 years or so, there was a lack of clarity on the whole project.

What does your transitional employment program look like?

We are working to end homelessness in collaboration with 22 other agencies to make a lasting impact on the homeless community. Our transitional employment program went from 3 year in well-being to an organization that was 1 year to support into jobs and well-being. We now outreach with homeless agencies. We are trying to counteract the idea that we are training them to become farmers. We use the farm to practice employment skills. We also want to dispel this myth of hard work. Our program is about being surrounded by beauty and be out in fresh air, having tangible meaningful work

Darrie: Would you like to hear about the social work assistance program that we offer with our employment program?

We offer a social work program that helps our homeless individuals address barriers: transportation, legal issues, debt, mental health issues, addiction issues. We want to help them best in our employment program. Our social

workers come from local universities. We have 4 interns who work with our licensed social worker. Each worker meets with trainees personally. All trainees have milestones, as our program is all about giving people a second chance.

- *Milestones:*
 - *2 months: check strong attendance, interview about well-being—every aspect. Address barriers, set a goal for check in at 4-month milestone.*
 - *4-month milestone: address digital literacy, need computer to apply for jobs, a lot of people are afraid about going into world*
 - *6-month milestone- Meet with them as an employee with a resume.*
 - *Could supervisor give employee a good reference?*
 - *Can a trainee resolve the issues if good reference not possible?*
 - *11 months: Apply for two jobs per week*