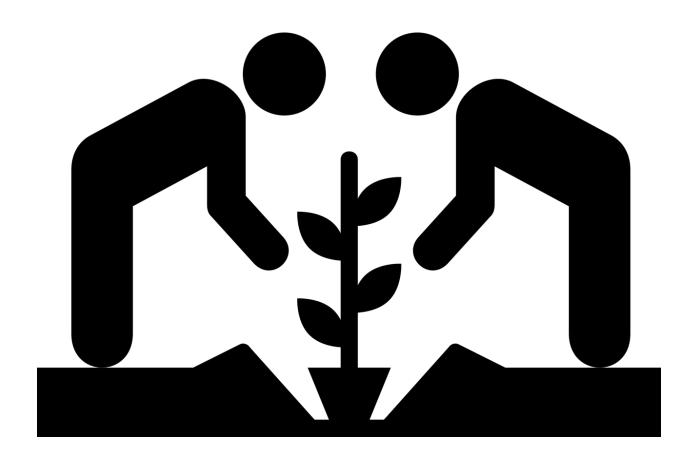
Community Garden Expansion in the City of Bozeman

Recommendations Based on Case Studies



A Project of the Montana State University
Sustainable Food and Bioenergy Systems Program Capstone Class

Acknowledgements

The Sustainable Food and Bioenergy Systems Capstone class of 2021 would like to thank the following people and organizations for their input, resources and assistance in making this project possible:

- Bozeman Community Gardeners, Barbara, Pam and Luke
- Kelley Jazdzewski, City of Bozeman, Parks Division
- Susan Gallagher, CATS (Community Engaged and Transformational Scholarship Initiative), Western Transportation Institute, MSU
- Garden City Harvest Staff, Missoula, Montana
- P-Patch Program Staff, Seattle, WA
- High Plains Environmental Center Staff, Loveland, CO
- Faculty, administrators and staff of Montana State University SFBS Program

Report Authors

2021 Sustainable Food and Bioenergy Systems Capstone Class:

Gracelyn Abel
Dylan Halverson
Braedon Lineman
Anna McKee
Grace Nichols
Anna Parreira
Gavin Usher

Mary Stein, Course Instructor

We acknowledge and honor, with respect, the Indigenous Nations and Peoples on whose traditional homelands and ancestral territory Montana State University now stands and whose historical and cultural relationships with the land continue to this day, including the Apsáalooke (Crow), Ktunaxa (Kootenai), Niimiipuu (Nez Perce), Očhéthi Šakówin (Lakota), Piikani (Blackfeet), Qlipse (Pend Orielle), Seliš (Salish), Shoshone, and Tsétsêhéstâhese (Northern Cheyenne).

Executive Summary

During the fall semester of 2021, Montana State University undergraduate students in the capstone course for the Sustainable Food and Bioenergy Systems degree program endeavored to provide the City of Bozeman with recommendations for expansion of the community garden program. The City is currently experiencing an increased demand for enrollment in the community garden program. However, the City's capacity to meet this expanding demand is limited, due to lack of both land resources and management availability.

Students performed literature reviews and gathered data on challenges and opportunities that may result in a more expansive, resilient and impactful community garden program. They met with current community gardeners- the experienced and novice alike- and City of Bozeman Parks Division staff to understand the present perceived successes and needs. Finally, the team interviewed program leaders from community gardens in three different cities in order to extrapolate the "keys to success." The common themes of each interview were compiled in an affinity mapping exercise.

Following analysis of these findings, students developed a list of recommendations for the City of Bozeman for the community garden program. These recommendations include:

- 1) Establishment of key partnerships with community organizations to expand both operations and funding capacity for the community garden program.
- Consideration of alternative garden models beyond the individual garden plot model to support different levels of interest and experience for intended target audiences
- 3) Identification of clear target audiences who may greatly benefit from a community garden program.
- 4) Alignment of community garden practices with agroecological principles to conserve and promote the health of soil and water resources.
- 5) Promotion of community awareness of the community garden program through focused messaging and branding
- 6) Expansion of gardener access to a variety of educational resources, including experienced garden mentors.

An expanded community garden program in the City of Bozeman would support many aspects of social, ecological and economic sustainability and is well aligned with overall sustainability and climate change objectives of the City, as delineated in the Bozeman Climate Action Report. A well-functioning community garden program will expand the wellbeing of the Bozeman community.

What are community gardens?

Community gardens, as defined by the American Community Garden Association, can be urban, suburban, or rural and can be centered on growing flowers, vegetables, or simply focused on making community connections. Community gardens can take many forms, including one large collective gardening plot or many individual plots. They can be located in parks, schools, hospitals, or neighborhoods (American Community Garden Association, 2021). There is no single framework for community gardens, thus there is flexibility for the adoption of different models to fit the unique needs of a community.

Community gardens have existed in one form or another around the word for thousands of years, but the first official community gardens began in the United States in the 1890s (Smithsonian Gardens, 2021). Detroit created gardens out of vacant plots around the city during the economic recession in 1893, in the hopes of employing and feeding Eastern European immigrants (Smithsonian Gardens, 2021). The project was so successful that other cities across the nation began to implement their own community garden programs. Today, community gardens continue to be a popular tool used by cities and other organizations to increase food access and wellbeing in neighborhoods.

The three most common models of community gardens are school, communal, and individual plot gardens (Denver Urban Gardens, 2012). Community gardens may be administered by local government agencies, non-profit organizations, neighborhood associations, or partnerships made up of a combination of the three. Gardens and plots may be maintained by individuals, groups of gardeners, or communally. Harvested produce can be consumed by individual gardeners, sold at markets to help fund the gardening program, or donated to local food banks.

Benefits of Community Gardens

The value of community gardens are many. People who volunteer at least once a week in gardens are shown to consume more fruits and vegetables than their counterparts (Barnidge et. al, 2013). Higher consumption of fruits and vegetables is associated with lower risk of many chronic diseases, including obesity, type II diabetes and heart disease. Diet related disease accounts for 22% of deaths among adults (Institute for Health Metrics and Evaluation, 2019). Overall food access increases when a community garden is located in a neighborhood. One of the main reasons why people choose to participate in shared gardens is the access to fresh and healthy foods, often expensive and inaccessible to people with less disposable income.

Other positive changes associated with gardening include an increase in self-confidence, reduction of risky behaviors in youth, and reduction in neighborhood crime (Ober et. al, 2008). Not only are community gardens positive for gardeners' personal physical health, they are also beneficial to mental and community health. Gardening and green spaces also increase neighborhood aesthetic appeal. Finally, a recent study found higher levels of resilience and optimism among community gardeners, even when compared to home gardening peers (Inn Koay and Dillion, 2020). The community aspect of shared gardens increases individual's community involvement and strengthens neighborhood bonds.

Bozeman's Challenges

The City of Bozeman Community Garden Program has approximately 87 individual community garden plots available. In recent years, the interest in community gardening has expanded, currently outweighing the availability of garden plots. This has resulted in a substantial waiting list and a lottery entry for any new gardeners. Due to Bozeman's rapid growth rate, the need for more gardening and green spaces is becoming crucial. The community is challenged with preserving greenspace and productive agricultural land in the face of rapid growth and development. New developments are subject to green space requirements, albeit minimal, as per city planning regulations.

The current funding and staffing allocated for the City of Bozeman Community Garden Program is minimal. One staff person within the Parks Division is tasked with managing the program, and Parks Division maintenance staff address irrigation repairs throughout the season and plot maintenance at the end of each season. There is currently no shared tool bank, nor is there any formal gardener education or mentorship program for beginning gardeners, resulting in barriers to success for new gardeners.

The awareness and engagement of the community with the city's green spaces is crucial to the success and evolution of the community garden program in Bozeman. Community gardens positively impact communities' health, wellbeing, and food access, along with providing educational resources for all ages. Although a formal community wide survey was not conducted here, this research team observed that there is minimal outreach associated with the community garden program and relatively low community awareness of the community garden program.

Current community garden plots in Bozeman are not catering to people of different abilities. For example, wheelchair accessible paths and garden beds of different heights could increase engagement in the community garden program for people with different needs.

The City of Bozeman is committed to sustainability initiatives centered on reducing greenhouse gas emissions throughout the community. The recently formed Sustainability Office has been tasked with collaborating with residents, businesses, and organizations ``...to inspire action and reduce the community's carbon footprint now and for future generations." (City of Bozeman Website). Additionally, the City adopted a Climate Action Plan in 2019 that is centered on solutions for reducing greenhouse gas emissions throughout the community and creating "...a more equitable, resilient, and sustainable community while maintaining the wonderful quality of life here in Bozeman." (Bozeman Climate Action Plan, 2019). An expanded community garden program centered on sound agroecological principles will contribute to the city assets in support of the Climate Action Plan.

Community gardens will aid in the community's goals of creating a resilient low-carbon community through its sustainable production of food and soil building practices. Garden management must align with agroecological principles in order to sustain the natural resources necessary for the gardening program (soil and water). This begins with smart soil and water management. At present, the city requires gardeners to clear soil of all debris and leave it uncovered over winter, which is not aligned with sound soil building and water conservation practices. With drought becoming a frequent environmental challenge to the City, there needs to be innovation in how watering resources are managed in the Bozeman community gardens, including optimizing soil health for maximum water holding capacity.

Project Methods

During the fall semester of 2021, the Sustainable Food and Bioenergy Systems (SFBS) Capstone class endeavored to explore solutions for expanding the City of Bozeman community garden program. This required a dynamic approach over the span of one semester and involved interviews with stakeholders, research into the literature related to community garden programs, and case studies examining community garden programs in other cities.

Students visited Langhor Gardens (one of the current City of Bozeman community garden sites) to conduct interviews with two long term gardeners and one beginning gardener on their experiences with the community garden program. The students then participated in an in-class dialogue with a staff member from the City of Bozeman (Parks Division) who oversees the community garden program. The class conducted a limited literature search to explore the relationship of participation in community gardens and their multiple functions. This outlined different limitations along with implications of how community gardens can be used as a promising tool to meet a range of needs for

residents living in disadvantaged neighborhoods. They explored different pedagogical frameworks and governance structures for operating community gardens.

Students were then split into three groups to perform case studies on three community garden programs in other cities. Each group researched two cities and later narrowed it down to one each. These final selected cities were explored in depth. Key members of each community garden organization were interviewed. A list of interview questions was approved by the MSU Institutional Review Board. Information from each interview was recorded in writing, summarized and presented to the class. Next, the class participated in an affinity mapping exercise to coalesce information gathered from the three case studies. This exercise led to the identification of categories of most importance, from which top line recommendations emerged. This information was then summarized into a report that outlines a set of recommendations for community gardens in Bozeman moving forward.

Project Findings

Interviews with current gardeners (both experienced and new) identified both benefits and challenges for gardeners engaged in the current program. Among the benefits identified are the opportunity for producing fresh, healthy produce, physical activity, and connection to other gardeners in the community. Gardeners identified some challenges including strict rules for clearing garden plots at the end of the season that were not aligned with healthy soil building practices, occasional breakdown of irrigation systems, weediness of plots, lack of clarity of where to seek mentorship (beginning gardener), concerns about different fencing approaches and their impacts on birds, and lack of gardening education resources. All gardeners acknowledged their good fortune in having access to one of the individual gardening plots in light of the limited number of plots in the community.

Following completion of the dialogue with current gardeners, the SFBS Capstone team met with the current City of Bozeman staff member overseeing the Community Garden program. The current program operations were outlined, including the number of current plots and the process for new gardeners to sign up for a plot, which involves a lottery system that is open to applicants for 3.5 weeks. Challenges faced by the program, in addition to the finite number of plots relative to community interest, include poor soil conditions and weediness in many locations, irrigation system maintenance challenges, and minimal staff capacity. Opportunities for the program in the future include alignment with city goals related to sustainability, community engagement, climate action and updating landscaping standards for new neighborhoods.

Next, SFBS Capstone students divided into three teams to explore community garden programs in three other cities, with the goal of bringing new ideas and strategies to the City of Bozeman. The case study cities were chosen based upon several factors, including a) strong programming and leadership, b) integrated community garden systems that have proven to be successful over multiple years and c) recent rapid community growth. Additionally, two of the case study cities (Loveland, CO and Missoula, MT) were of comparable size to Bozeman, while the third city (Seattle, WA) was included to provide an example of community gardening strategies in a larger, urbanized environment.

Students made contact with representatives from each city. In Seattle, Washington (Pop. 724,305, Elev. 174), students interviewed the Community Outreach and Programs Manager. In Loveland, Colorado (Pop. 81,127, Elev. 4,984), students interviewed the Community Outreach and Programs Manager, and in Missoula, Montana (Pop. 73,710, Elev. 3,209), students interviewed the Community Gardens Director. All interview subjects gave consent to be interviewed before being asked the series of approved questions. The following is a summary of case study findings:

Seattle, WA

The Seattle community garden system, known as the P-Patch Community Gardens, is a collection of over 90 community gardens in the municipality. Students conducted a phone interview with the Community Garden Coordinator for the P-Patch program. Types of gardens include collective gardening spaces, individual plots and shared group plots. The P-Patch gardens are primarily located on public lands, with some gardens located on land in trusts and others on privately owned land made accessible to community gardeners. Each community garden is assigned a staff member with six community garden coordinators from the Seattle neighborhood association. Master Gardeners are trained and give back hours in community gardens as teachers and mentors. The Seattle community gardens have an emphasis on supporting the BIPOC community, low income communities, and individuals with different abilities and needs. Food harvested from the gardens is shared when possible and is donated to food banks or mutual aid programs. A garden tool bank is available for lower income and beginner gardens to utilize. Plot fees are charged on an annual basis and financial assistance is available when needed. The primary challenges faced by the P-Patch Community Garden program include managing conflict between neighboring gardeners, providing support to gardeners of all levels to improve their gardening skills, and having space to add more gardens in an already well-established city.

Loveland, CO

The High Plains Environmental Center (HPEC) in Loveland, CO houses a community garden center for the public. The gardens are operated through a collaboration that includes a gardener committee, HPEC volunteers, and HPEC staff. Through this model, there is a higher level of oversight in addressing issues and creating innovation at a lower cost to any one group. Volunteers are incentivized with the allocation of their own plots or boxes at no cost, which are then used as demonstration and teaching boxes for the community and HPEC visitors. All gardeners are required to participate in volunteer work for the community gardens, which helps maintain upkeep as well as promotes community connection and engagement. Funds and fundraising are managed through a partner non-profit which allows for fast mobilization of fundraising efforts and financial allocation.

Missoula, MT

Students interviewed the Community Gardens Director at Garden City Harvest in Missoula, MT. Garden City Harvest (GCH) is a well established nonprofit that runs Missoula's community garden program, matching gardeners to plots. The organization works with the City of Missoula, churches, local businesses, and other organizations to turn land, donated or loaned, into gardens. The partnerships between other organizations and GCH are vital, having allowed the gardens to thrive for decades. The present community gardens in Missoula are rented plots, school gardens, PEAS farm (a small farm on City owned land which also serves as an experiential classroom for University of Montana students), and three local farms. In total there are eleven gardens throughout Missoula. The Garden City Harvest program has four paid positions: a full time director, a seasonal full time assistant, a part time intern, and an apprentice. About 30% of the gardeners are of low or intermediate income levels. The community gardens provide grounds, tools, water, compost systems, manure in spring, straw in fall and irrigation and education on gardening. The organization collaborates with the local agriculture extension office to have Master Gardeners serve required volunteer hours at Missoula community gardens.

Case Study Analysis

Each case study city offers a unique approach to community gardens in their respective cities, and in turn, unique benefits to the community. There are several important themes that emerged through the case studies:

- Various organizational structures exist between entities to facilitate community gardens.
- Specific target audiences are prioritized, such as those with limited access to resources.

- Variety of community garden models are employed, ranging from communal models, demonstration gardens, and individual plots.
- Strong partnerships exist among volunteers, nonprofits, developers, and the cities.
- Education is embedded in the form of mentors, Master Gardener volunteers, written materials, workshops, signage, and more.
- Resources are provided to gardeners including newsletters, social media pages, and email lists where gardeners could not only learn, but also engage with each other.
- Community engagement strategies lead to collaboration and connection among gardeners.

Community garden organizational structures within the three case study cities were a collaboration of effort, largely between the City and nonprofits. Responsibilities were divided among the two entities according to their best and most effective functions. In the case of Missoula and Loveland, nonprofits serve as the primary garden managers with the City offering support. The role of the City was less about direct oversight and management and more directed towards funding and resource provisions. In the case of Seattle, their gardens are managed through the City's Department of Neighborhoods, but even so, they do not manage the gardens alone. Volunteers fill in many gaps, acting as both boots on the ground for the City and nonprofits, as well as serving as a liaison between the garden community and higher management. Commonly, volunteers are provided plots themselves, giving them a hands-on perspective of the garden's day-to-day happenings.

Every case study exemplifies community leadership with a mixture of employees and volunteers taking care of garden management responsibilities and working with garden members. In many cases, management was less about gardening and more about uniting the community with the land. Missoula's Garden City Harvest director stated, "We are not managing gardens, we are mainly managing people." The organizational structure can be summed up as the City providing resources and support for the community in partnership with a non-profit organization that serves to prioritize community management and resource disbursement.

Targeted gardeners served within each city varied. Examples include those who had limited land access, food insecurity, children, younger generations, and the BIPOC community. While both Missoula and Seattle wished to prioritize marginalized communities, they often found their gardener demographics to be biased towards older generations, white people, and those with more financial resources. In Missoula, this lack of alignment between targeted demographics and actual demographics could be

attributed to a change in affordability of housing. In the case of Seattle, causes could be attributed to historic, systemic barriers for low-income and BIPOC community members. Seattle has been working to foster gardening communities that are rich in culture and diversity and with time, hope to have this reflected in their gardener demographics. The High Plains Environmental Center (Loveland, CO) targets high-density dwellers, people seeking horticultural therapy, families, nature enthusiasts, and individuals needing accessible garden spaces (aligned with ADA accessibility guidelines).

The case studies prove that no single community garden model fits every need, but a diverse portfolio of models is beneficial. HPEC has smaller raised bed plots with a dozen or more set aside for specific uses such as kid-friendly gardens, sensory garden boxes, and demonstration boxes used by volunteers as educational tools. Some boxes are used as dedicated spaces for growing food bank donations. The HPEC's volunteer community garden committee members provide monitoring of garden plots and outreach to gardeners who may need more assistance to flourish. They help with organizing community work days and donations, and they lead members in group decision making. The City of Seattle supports collective gardens, individual garden plots, shared group plots, youth specific plots all operating on a mix of public and private land. Garden City Harvest also has mixed ownership land sourced from the City's parks and private land from apartment buildings, churches, and single family homes with large lots. Privately owned land leaves garden spaces the most vulnerable to change, but can be mitigated with appropriate contracts or memorandums of understanding. Many of these garden models facilitate community growth through the use of shared fencing, which encourages gardener interaction instead of isolation.

Partnerships are the glue that keep the case study community gardens together. These partnerships come in two categories: funding and operations. Funding partnerships exist as non-profits conducting fundraising events, individual donations to the garden programs, municipal funding, and grant funding led by City or non-profit staff. They can exist as partnerships with developers to ensure land is set aside for the purpose of community gardens with developer permit fees being used for community garden development. In the case of Loveland, a developer donated land to the HPEC to establish a nature preserve and community space including the gardens. In Missoula, the hospital has a partnership with Garden City Harvest to manage and grow food on the hospital campus. The hospital-funded gardens are used as a therapeutic space for patients and the food grown is donated to the food bank. Seattle partners with many organizations, such as the Black Farmers Collective and Yes Farm, both organizations with knowledge and educational resources to support a strong community gardening base.

Operational partnerships are exemplified by Missoula's Garden City Harvest as they work with Parks and Rec and Missoula Redevelopment Agency to source underutilized land for garden space. New garden locations are developed and set up by Garden City Harvest, including communal tool sheds, water infrastructure, and fencing. Garden City Harvest's role extends beyond land coordination. The organization matches gardeners to land based on location, placing people in plots in one of their several garden locations around the city. In addition, Garden City Harvest offers several gardening information resources on their website and onsite in gardens; the program also shares written materials with gardeners, such as Montana State University Extension Services *MontGuides*.

Paramount to community garden success in the case study cities is education and resources for gardeners, and these educational opportunities and resources come in many forms. Gardening mentorship was mentioned as important in all case study cities. Additionally, both the Loveland and Seattle community gardens have regular workshops, demonstrations, and classes for gardeners to learn about and practice basic gardening knowledge and skills, and to direct members to further information sources. Master Gardeners also donate their time to helping fledgling gardeners thrive throughout the season.

Hubs of communication and information dispersal like newsletters, social media groups, and email chains are other strategies for education outreach done by all three city gardens. These hubs not only facilitate community building, but act as a place for rich information exchange between beginning and seasoned gardeners. Lastly, a diversity of garden plot sizes from smaller raised beds to larger plots of land, facilitate gardeners at different skill levels. Small plot options were used by gardeners just getting their toes wet. Beginner gardeners could start small, preventing mid-season panic when large plot management could be difficult for those still learning. The HPEC (Loveland) small plots accompanied by mentors and demonstration gardens were shown to be just the right formula to bring new gardeners success.

Conclusion and Recommendations

Organizational Structure and Operations

Through case study research, we have found that the designation of a community garden administration and staff along with adequate staffing capacity, are critical to maintaining the operations of the program. Given the growing interest in the City of Bozeman community garden program, we conclude that two full time staff members, in addition to part-time or seasonal support from paid interns, would be the minimum staffing needed to accommodate program expansion.

As it currently exists, the City of Bozeman community garden program is managed by a single individual within the Parks Division. In addition to standard Parks Division responsibilities, this is a great undertaking for one person. The City of Bozeman may consider the time, knowledge, and willingness that such a position requires and choose to expand staffing to cover the needs of this expanding program. Alternatively, the City may consider the ultimate scope of its administrative capacity for a community garden program and choose to delegate to or partner with an external group, such as a local non-profit or private entity to operate and expand the community garden program.

Partnerships

A commonality noted among case study cities was reliance on partnerships to both fund and operate community garden programs. In no case did the municipality alone run the program. In fact, partnerships were often credited with the program's success. Our team has distinguished two necessary categories for partnerships, defined in figure 1:

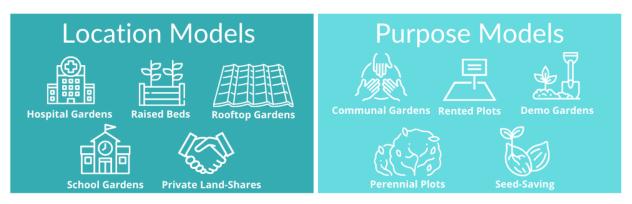


(Figure 1)

A wide variety of entities exist in Bozeman whose missions are to support the wellness of the community and may be an appropriate fit for community garden partnership. These include Gallatin Valley Food Bank (HRDC), Gallatin Valley Farm to School, Montana State University, Bozeman K-12 schools, private schools, local Master Gardeners, Bozeman Health and more. Great synergy in community garden interest and capacity may be found through partnership with these entities, as well as others. It is recommended that a planning workshop be conducted to explore the feasibility of a partnered approach to expanding community gardens in the City of Bozeman. This diversity of partnerships can guide the city to robust and dynamic solutions, possibly leading to greater flexibility from the City of Bozeman when facing challenges from the community garden program.

Models and Approaches

Currently, the City of Bozeman engages in only one model for the community garden program - individual rented plots. In order to address the growing need for physical garden space, we suggest the creative solution of "reimagining" the community garden structure. In addition to sectioned plots available for rent, many successful programs have implemented alternative approaches in order to meet a multiplicity of needs:



(Figure 2)

In the City of Bozeman there are a variety of existing public garden spaces that are disconnected from a central community garden program. For example, Bozeman School District elementary schools each have raised garden beds, and in some cases greenhouses, which are largely cared for by parent volunteers and Gallatin Valley Farm to School staff. Montana State University Family and Grad Housing also has a garden space; however, it is not regularly maintained, nor do families have the resources- tools, seeds, knowledge- in order to maintain these spaces themselves. These sites offer an opportunity for a city-wide community garden to solve two problems: 1) The need for gardening support in existing gardens. 2) The need for additional land area for a community garden program. In addition, Story Mill Community Park, Bozeman Health Hillcrest Senior Living Center, and others are examples of successfully operating gardens in Bozeman presently. These gardens are well-established potential partners that could benefit a city-wide garden network or serve as templates for future and current gardens in various stages of development.

Looking forward, the community garden program may choose to introduce new models, such as therapy gardens for health facilities, seed-saving plots, perennial gardens, and spaces for medicinal herbs. Demonstration gardens can also fill an educational role in the community, closing knowledge gaps experienced by beginner gardeners. Further, to

incorporate the feedback regarding education and resources, the City may consider the use of demonstration gardens, expertise of Master Gardeners, shared tool sheds, and provision of print or online links to *MontGuides*.

Messaging and Branding

Our research found that the most successful community garden programs have invested in outreach and branding of the program, which has resulted in expanded community recognition and support in both donations and volunteerism. Beyond name recognition, these programs have made clear their purposes and visions. This is the first step toward achieving community support.

Our team recommends that the mission and vision of the City of Bozeman community garden program be discussed and defined so that greater clarity is embedded throughout all programming outreach and messaging. In addition to promoting awareness and confidence among the community, this will serve to guide the decisions made by the program. Clear program messaging should be embedded on a program website and all communications platforms linked to the community garden program (other social media, written communications, branded attire, and any other marketing materials).

Education and Resources

Dialogue with current participants of the City of Bozeman community garden program revealed a need for education, an opportunity for peer-to-peer learning, and a desire for access to resources for all involved in the program, including the operations staff. For example, access to basic crop and soil science information must be available to gardeners and staff, as well as those involved in the decision making regarding the program. One example of necessary improvement for the health of the community gardens is redefining what a "clean" plot looks like going into winter. The total removal of all mulch, including leaves and other organic residue, results in poorer soil quality and structure for the following year, whereas mulching or cover-cropping could enhance soil fertility and water holding capacity. Other forms of education may include an on-site informational binder or bulletin board, social media materials, on-site gardening mentors, demo garden plots, and workshops.

Many educational resources exist in the City of Bozeman. After all, the City has a long history serving as the home of Montana's land grant university. It would be most fitting for the community garden program to facilitate a reciprocal relationship among students sharing knowledge and support with the garden community, while gaining hands-on experience outside the classroom. Outside of the university, Master Gardeners often seek out volunteer opportunities, sharing knowledge and experience to the community.

As previously outlined, establishing strong partnerships among external entities in the City can go beyond organizational structure to fill other needs like educational resources.

Target Demographics

Through research of other community garden programs, it was found that the identification of and commitment to serving a target group was a primary driving force for decision-making and selection of community garden program models. In alignment with the City of Bozeman Climate Plan's (City of Bozeman Climate Plan, 2021) emphasis on equity and human health and well-being, we have found the following steps to be critical in reaching the community garden program's target demographic(s).

Step 1: Research

Collect quantitative data, including current population size, median age, median income, and other factors. Collect qualitative data through community interviews with a diverse sample of Bozeman residents to better understand their unique needs, as well as to determine any gaps that may exist in existing services.

Step 2: Identify

Based on the gathered data, identify one or more target groups- whose characteristics and needs may overlap- toward which the program will primarily direct its services. A tangible goal, such as aiming to reach 30% of gardener enrollment under the age of 30, will aid in measuring success and reinforcing the program's purpose to the greater community.

Step 3: Implement

Create short and long term goals in order to meet the specific needs of the identified target group. Implement strategies that promote equity and adjust as needed. For example, in order to serve the Latinx target group, the city may choose to partner with organizations who offer translating and transportation services, as these are both sources of inequity within the Latinx community. Further, culturally regarding services may be offered, such as cultivation of traditional food crops.

Step 4: Adapt

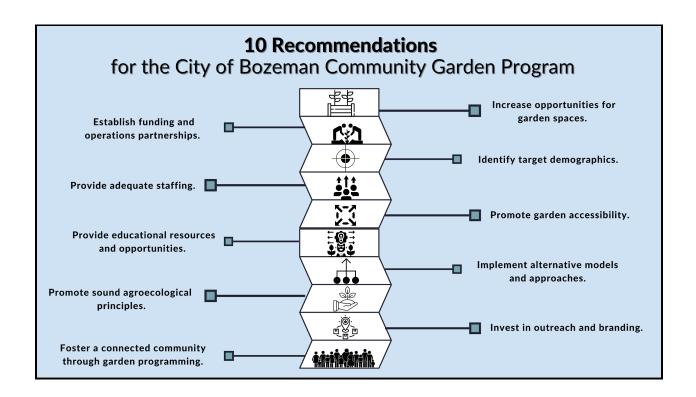
Acknowledge that the target group may change and that this process will need to be repeated to adapt to the growing, changing population- and thereby changing needswithin Bozeman.

Conclusion

In order to make progress toward the goal of this community garden project, the City of Bozeman and its partners will need to strategize according to the above guidelines. Through the establishment and fostering of partnerships, the present management will be alleviated of financial, social, and scheduling pressures. From there, the overseeing body- whether or not it exists as a department of the city- must promote awareness among the community through branding and messaging methods that align with the city's goals of social sustainability. Through implementation of creative garden models and educational services, this program has the potential to promote the overall wellness within the Bozeman community.

As is the case for community gardens throughout the state and nation, the impact of a holistic-approach community garden model influences those who participate, as well as those who simply observe. Gardens offer spaces for community members to commune with the natural world, elevating mental wellbeing, and grounding people to the land. Fostering this connection to place has been shown to increase community involvement outside the sphere of the gardens themselves. This may look like increased investment in local government and greater responsibility for the community at large. This is often attributed to the acquired perspective of land stewardship and a sense of ownership among community garden members (Kapucu, 2021). In conclusion, the City has the exciting opportunity to cultivate an enriching experience for community members by implementing key strategies outlined in this report, building a better Bozeman.

The following graphic summarizes the recommendations for expanding the City of Bozeman's community garden program:



References

American Community Garden Association. (2021). *Homepage*. ACGA. Retrieved November 18, 2021, from https://www.communitygarden.org/.

Barnidge, E.K., Hipp, P.R., Estlund, A. *et al.* Association between community garden participation and fruit and vegetable consumption in rural Missouri. *Int J Behav Nutr Phys Act* 10, 128 (2013). https://doi.org/10.1186/1479-5868-10-128

Blanco-Canqui, H., Lal, R., Blanco-Canqui, H., & Lal, R. (2010). Soil and Water Conservation. Principles of Soil Conservation and Management, 1–19. https://doi.org/10.1007/978-1-4020-8709-7 1

Burns, H., & Miller, W. (2012). The Learning Gardens Laboratory: Teaching sustainability and developing sustainable food systems through Unique Partnerships. *Journal of Agriculture, Food Systems, and Community Development*, 69–78. https://doi.org/10.5304/jafscd.2012.023.003

City of Bozeman Climate Plans and Policies. (2020) Climate Plans & Policies | City Of Bozeman. (n.d.). Retrieved December 3, 2021, from https://www.bozeman.net/government/sustainability/climate-plans-policies.

City of Bozeman, Sustainability Office. (2021) Retrieved December 3, 2021 from https://www.bozeman.net/government/sustainability

Denver Urban Gardens. (2012). Growing Community Gardens. Denver, Colorado; *Denver Urban Gardens*.

Elrashidi, M. A. (2011). Soil and Water Conservation Advances in the United States: A review. Journal of Soil and Water Conservation. https://doi.org/10.2489/jswc.66.1.5a

Institute for Health Metrics and Evaluation. (2019). New Study finds poor diet kills more people globally than tobacco and high blood pressure. *Institute for Health Metrics and Evaluation*. Retrieved December 3, 2021, from

http://www.healthdata.org/news-release/new-study-finds-poor-diet-kills-more-people-globally-tobacco-and-high-blood-pressure.

Koay, W. I., & Dillon, D. (2020). Community gardening: Stress, well-being, and resilience potentials. *International Journal of Environmental Research and Public Health*, *17*(18), 6740. https://doi.org/10.3390/ijerph17186740

Lehmann, J., & Kleber, M. (2015). The contentious nature of soil organic matter. Nature, 528(7580), 60–68. https://doi.org/10.1038/nature16069

Naim Kapucu, Sean Beaudet, *et al.* (2021) Partnerships and Network Governance for Urban Food-Energy-Water (FEW) Nexus. *International Journal of Public Administration*. DOI: 10.1080/01900692.2021.1967981

Ober Allen, J., Alaimo, K., Elam, D., & Perry, E. (2008). Growing vegetables and values: Benefits of neighborhood-based community gardens for youth development and nutrition. *Journal of Hunger & Environmental Nutrition*, *3*(4), 418–439. https://doi.org/10.1080/19320240802529169

Smithsonian Gardens. (2021). *Vacant lot gardens : Grown from the past: A short history of community gardening in the United States. Community of Gardens.* Retrieved November 18, 2021, from

https://communityofgardens.si.edu/exhibits/show/historycommunitygardens/vacantlot

Tanaka, D. L., Lyon, D. J., Miller, P. R., Merrill, S. D., & McConkey, B. G. (2010). Soil and Water Conservation Advances in the Semiarid Northern Great Plains. https://doi.org/10.2136/sssaspecpub60.c3

Unger, P. W., & Vigil, M. F. (1998). Cover crop effects on soil water relationships. Journal of Soil and Water Conservation.