

Lasting Impacts in a Rural Community through Horticultural Activities

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Abstract

Community garden projects have incredible potential to positively impact local communities socially, economically, and environmentally. However, community gardens often face challenges that limit a project's capacity to be sustained, and consequently prevent long-term positive impacts. We believe that four main features of garden projects contribute to their positive potential: (i) accessibility to all individuals, (ii) opportunities for development of new relationships and personal skills, (iii) the acquisition of new knowledge and skills both about gardening and through gardening, and (iv) positive impact on the environment. Together these factors facilitate participation, communication, and commitment among individuals, which ultimately leads to a strong sense of community. We will present an overview of these concepts in the context of our community-organizing garden project based in northern Wisconsin, the Flambeau River Community Growing Center (FRCGC).

Keywords: Community gardening; Participatory gardening; Community horticulture; Greenhouse project

Introduction

In a recent community-organizing garden project, based in northern Wisconsin, called the Flambeau River Community Growing Center (FRCGC), we found that engaging the community in the design and implementation of horticultural activities assisted in overcoming many challenges; thus leading to long-term sustainability. The project was initially designed in fall 2012 as collaboration amongst university educators, a paper mill, health care workers, engineers, and local schools. Four main features of the FRCGC activities have contributed to the overall success of this community organizing project: (i) access for all individuals, (ii) potential development of new relationships and personal skills, (iii) the acquisition of new horticultural skills and knowledge, and (iv) tangible contributions to the local environment. Together these factors enhance participation, communication, and commitment among individuals; and ultimately promoted a strong sense of community. Today the FRCGC continues to function in the community as a non-profit community center with a mission to connect people of ages to the garden, the environment, and each other.

FRCGC operates in Park Falls, WI, a small town in north-central Wisconsin, through grassroots organizing that began as a dream among a small group of northern Wisconsin citizens from Price County with experience in different lines of work (nursing, engineering, teaching, business management, and gardening) and plant scientists at the University of Wisconsin, Madison (UW, Madison). All shared values for the community's relationships, health, the environment, and gardening. Through these shared values, the idea grew into a funded proposal to create garden-based educational opportunities that integrated community development and promoted individual and environmental health. Initial funding was provided by the Ira & Ineva Reilly Baldwin Wisconsin Idea Endowment (<http://provost.wisc.edu/baldwin>) whose mission is that education should influence people's lives beyond the boundaries of the classroom. This support was essential to successfully launch FRCGC and provided funding for the training of a graduate student, design and construction of the greenhouse, and materials and tools for greenhouse benches, raised beds, soil and seed supplies (Figure 1).

Materials and Methods

Site of FRCGC

The FRCGC is located on a plot donated by the Flambeau River Paper Mill that had been maintained as a grassy area with minimal usage (Figure 1A). The plot included several concrete pads, rocky sandy loam soil, and a surrounding border of pines, spruce, and box elders to the north and west, with the Flambeau River and low shrubs to the east.

Greenhouse and display garden

A vail-style 24-foot by 48-foot twin wall polycarbonate greenhouse (Madison Greenhouse Co. Madison, WI) was installed on the site in fall 2013. The site was prepared by installing a 25.5-foot by 51.5-foot concrete pad resting on 2 feet of fine gravel and surrounded by 4 feet of 2-inch foam capped with aluminum. A circuit of ½-inch cross-linked polyethylene (PEX) tubing was embedded in the concrete foundation to ultimately provide radiant heat through the greenhouse floor utilizing waste heat generated by the mill (Figure 1B). The greenhouse was designed to withstand 40-pound snow loads and up to 90 mph winds with excellent light transmission and longevity (Figure 1C and 1D). The display garden and raised beds were installed on the south-west side of the site so that they would be visible from the street. This garden is intended to demonstrate gardening techniques and unique horticultural crops to provide a horticultural and community gathering space.

Greenhouse benches and raised beds

Greenhouse benches and raised beds were constructed from local white cedar selected for its resistance to rotting in moist environments. The bench design included a ladder-like surface on legs that were supported by angled and parallel braces with a collar around the

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Figure 1: FRCGC site, greenhouse, and display gardens. A. Original site before construction. B. Polyethylene (PEX) tubing embedded in the concrete foundation. C. Interior of greenhouse with benches constructed by community. D. Greenhouse and outdoor growing beds.

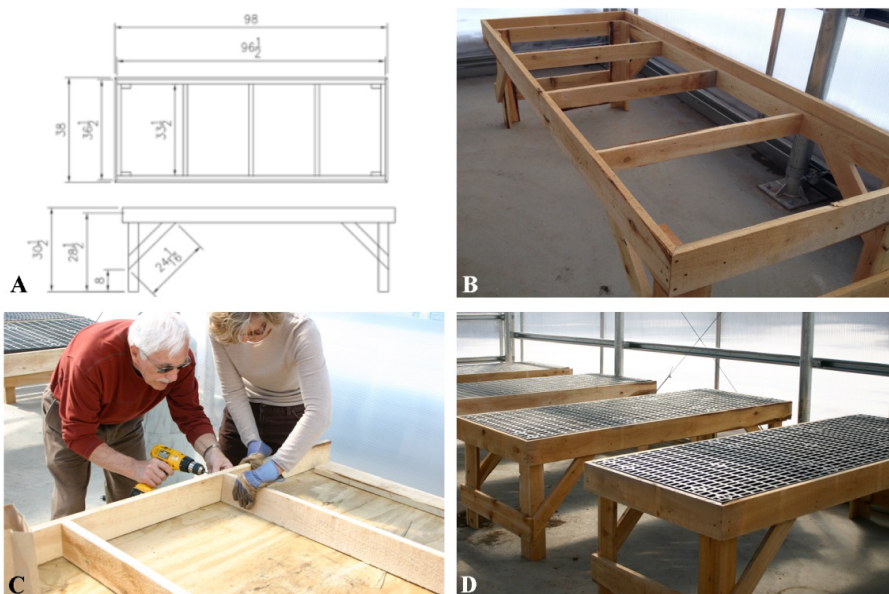


Figure 2: Greenhouse benches. A. Design illustrating top view and side view. B. Completed frame of greenhouse benches. C. Community members building initial benches. D. Completed benches.

ladder-like surface to secure the 8-foot by 4-foot bench tops (Structural Plastics, Holly, MI) (Figure 2). This design combined strength with versatility so that the benches could withstand heavy loads but also be taken apart easily for cleaning. In addition, the community built smaller benches to use as stools for classes or as benches for younger individuals. One-foot deep 4-foot by 8-foot raised beds were assembled and filled with leaf compost and top soil mix (Hsu Growing Supply, Wausau, WI). Additional raised beds (including new designs) were assembled by community members in subsequent years.

Plant cultivation

Seed requests for vegetables and ornamentals appropriate for northern Wisconsin were submitted to more than 25 seed companies, and seed was generously provided by the following: Burpee Seed (Warminster, PA), Harris Seed (Rochester, NY) Johnny's Seed (Winslow, Maine), Seedway (Elizabethtown, PA), Pinetree Gardens (New Gloucester, Maine), Park Seed (Greenwood, South Carolina), Stokes Seeds (Buffalo, NY), Dutch Gardens (Bloomington, Illinois), Thompson and Morgan (Jackson, NJ) and Territorial Seed (Cottage

Grove, Oregon), and the Open Source Seed Initiative (Madison, WI). In general, seed was planted in the greenhouse in 3" plastic pots or peat pots in Sungro Professional Growing Mix or Fafard 3B (Carlin Horticultural Supplies, Milwaukee, WI). Vegetable crops included lettuce, tomatoes, peppers, onions, zucchini, cucumber, tomatillo, kale, broccoli, cauliflower, and Brussels sprouts. Flowers included salvia, marigolds, verbena, strawflowers, gomphrena, and zinnia. In addition, multiple herbs were grown and placed throughout garden beds to serve as pollinator attractants and pest deterrents. Herbs that attract bees and other beneficial insects included thyme, oregano, and borage. Fennel, parsley, and cilantro were planted as insect deterrents. In an environment such as Park Falls, the season is severely limited by climate as there are only 120-135 frost-free days and generally less than 2000 Growing Degree Days. The limited growing season contributed to a significant need for and interest in starter plants as well as container gardening.

Seedlings were grown for transplant into gardens around Park Falls, including: FRCGC's display garden, Chequamegon Area School District's school garden, and St. Anthony of Padua's school garden. All of the greenhouse operations (e.g. planting, transplanting, watering, etc.) were accomplished through volunteer efforts. Volunteers gathered weekly from mid-April - mid-June to discuss needs and plans for the summer gardens. Weekend work sessions of 2-4 hours were established for 4-6 weeks at the beginning of each season to start seedlings and transplant as seedlings grew. An additional two workdays in early June when core volunteers were joined by additional members of the local community preceded the annual summer open houses. Core volunteers also shared daily watering tasks in the greenhouse throughout the growing season. Although the composition of this group has varied from year to year, it has typically consisted of two mill workers, the mill health associate, two local school representatives, two representatives from extension, and two community members. UW, Madison participants volunteered for workdays and workshops, and also joined in monthly to the morning meetings through teleconferencing. As community garden plots were established watering, trimming and fertilization was shared by the larger community and managed by a sign-in system. Vegetables and flowers were grown to maturity in both the display garden and the greenhouse.

Educational workshops

Educational opportunities at FRCGC primarily encompassed workshops and school events. Workshop topics included starting your garden, square foot gardening, container gardening, herb and salad garden pots, dividing houseplants, designing and building a hydroponic salad table, season extension, seed saving, veggies on the grill, straw bale gardening, perennial gardening, starting an asparagus bed, propagation techniques, fruit crops for home gardeners, and salsa making. Workshops were advertised locally in newspapers, radio announcements, bulletins published by the local extension office, at schools, and at the Flambeau River Paper Mill. Workshops were led by UW personnel, mill workers, school associates, retired community members, and local extension agents. While fees were not charged for any of the workshops, donations were accepted, and these helped defray material costs for FRCGC. Local schools and UW-Extension also hosted youth programming events at FRCGC with themes related to greenhouses and starting a backyard/school garden.

Results and Discussion

Through its development, FRCGC expanded the University of Wisconsin's presence in a rural area that had been underserved by

the UW system, collaborated with a Wisconsin private industry, and promoted the development of a community through new educational opportunities with local schools and the surrounding areas. FRCGC achieved all of this while maintaining horticultural activities as the central theme within its operations. Since then, FRCGC earned support from the Center for Integrated Agricultural Systems (CIAS), UW-Extension Community Food Systems, the Ann Marie Foundation, and local businesses from the Park Falls community.

Accessibility and newly formed community

In general, horticultural activities are universally accessible, and studies have shown demographically that gardeners include people from all regions of the world, all ages, all education levels, and all income levels [1-4]. There are few, if any, cultural barriers that prevent a person from being able to perform horticultural activities; and consequently, community gardening projects have the potential to attract persons of diverse backgrounds. Even for individuals who face challenges such as economic, physical or emotional disabilities, there are generally solutions for overcoming these barriers whether open-spaces, raised beds or containers that provides access to a greater variety of people. In addition, there are often alternative activities for these individuals that can access other skills whether they be garden planning, seed organization, or record keeping. Overall, community gardens can provide adequate space for limited or no cost, community, increased variety and quality of foods and low cost for fresh vegetables and flowers.

The FRCGC fostered the formation of a new community: a newly organized group of people from different backgrounds with shared interests. Several principles within the development of FRCGC ensured this successful, positive, and sustainable community organizing. First, FRCGC developed organically (i.e. through grassroots means) and in doing was based on homegrown values and locally identified needs. Examples include access to starter plants for school gardens and community, access to fresh vegetables, and local workshops on gardening activities. This positioned the group to effectively reach out to local residents and surrounding communities. Next, FRCGC's stakeholders maintained special attention to inclusivity so that creative ideas and unexpected opportunities were harnessed for their full potential as participants shared unique skills. For example, the expertise of mill employees with woodworking skills and access to quality lumber resulted in significant cost savings and construction of all the greenhouse benches and raised beds (Figure 2). Overall, FRCGC has been maintained by a sense of shared ownership through the project's visioning, conceptualizing, and implementing; thus establishing a commitment to protect and maintain the community facility and gardens. Specific incentives included the mill's commitment to promoting health through the garden plots by providing land, electrical power, personnel and a health advisor.

Development of new relationships and personal skills

While the nature of many horticultural activities could be described as repetitive, systematic, methodical, or habitual, these activities also provide numerous socializing opportunities; and thus, horticultural activities can foster stronger relationships among people and the development of new personal skills [5-7]. Activities can often be performed settings and venues that are relaxing and tranquilizing, as well as equitable, and people of all ages and diverse backgrounds can come together to accomplish these tasks [4]. In addition, many garden spaces require coordination of planting and selection of certain species; thus, fostering teamwork and cooperation, empowerment, and relationships

among participants [4,8]. In addition, there are multiple studies on the role of gardening in healing and prevention for individuals with high anxiety, vulnerability to substance abuse or addictions; and gardening can provide a valuable outlet for many individuals [2,6,7,9-12]. Alternative studies also report that gardening and outside activities with others promotes improved health and well-being [13-15]. Again, the harmonious, leisurely and slow processes associated with gardening provide therapy. Last, many gardeners in general love to share their experiences, plants and harvest; consequently, promoting further relationships.

FRCGC's stakeholders demonstrated appreciation for local knowledge and skills (i.e. woodworking, gardening, electrical and mechanical maintenance, health and education); and consequently have engaged many people in participating with FRCGC. This has also resulted in significant savings, as new participants have shared skills and resources.

Acquisition of new knowledge and skills

From a third perspective, horticultural activities are often associated with multiple learning objectives, which can be garden-oriented or garden-situated. In other words, while engaging in horticultural activities a person can learn about gardening (e.g. plant development, photosynthesis, etc.) and a person can learn through gardening (e.g. math, literacy, etc.). As a discipline, horticulture includes the art and science of intensive cultivation of edible and ornamental plants. Basic plant development, soil chemistry, environmental concerns, and design are only a few of the possible topics that learners can encounter within horticulture activities. Especially exciting is an increased interest in fresh foods and culturally different foods [2]. The potential for learning is limitless.

FRCGC's implementation has formed many new and accessible learning opportunities primarily in form of workshops. These workshops have facilitated experiential learning for people of all ages. While initial workshops were determined by the organizers, additional themes for workshops were chosen after surveying visitors during FRCGC's spring open house events. This strategy promoted further community engagement and established the development of workshops that would align with locally determined needs and interests. The activities incorporated into workshops were interactive and hands-on so that learners would engage with ideas and information actively.

In addition, FRCGC organized an educational program to boost its volunteer community by sponsoring Master Gardener trainees. UW-Extension's Community Resource Development Educator and the 4-H Youth Development Educator worked with participants on understanding the role of a volunteer and helped them master specific gardening skills. Participants participated in multiple ways including answering calls, planning lessons, teaching, assessing risk management and record keeping. Projects emphasized the value of garden education and utilization of community garden facilities by diverse audiences including intergenerational and special needs audiences, the increased availability of fresh foods to the community, and sustainability of the FRCGC.

Positive impact on the built environment

FRCGC has positively influenced the built environment in Park Falls. The built environment includes the physical components of where one lives and works (e.g. homes, building, streets, open spaces, and infrastructure) and is known to indirectly influence health outcomes such as obesity, cardiovascular disease, diabetes, and some types of

cancer [13-15]. So much so, that the Center for Disease Control has established several initiatives to encourage health community design [16]. Two guidelines for healthy community designs within these initiatives include: (1) opportunities for people to be physically active and socially engaged as part of their daily routine, improving the physical and mental health of its citizens; and (2) access to affordable and healthy food, especially fruits and vegetables. FRCGC has successfully implemented activities that address both of these guidelines.

The gardening activities hosted at FRCGC have been accessible to all local residents and were designed to be both physically and socially engaging. Moreover, the nature of gardening supports a schedule that engages people in activities regularly so that it can become part of their lifestyle and not just a once-in-awhile pastime. Seedling production, workshops, and demonstration gardening are only a few of the many opportunities for local residents to participate in meaningful exercise and socializing. Additional activities have included bench and bed building, invasive weed management, construction of a fence for deer control, and trimming and pruning fruit trees. The FRCGC board members also manage taxes, grant writing and overall workshop planning.

FRCGC's gardening activities have positively impacted the local food system because they lead to the production of fresh food. In some cases, such as the greenhouse and display garden demonstrations, FRCGC's activities have had an obvious impact on the local food system. The vegetables and herbs produced through these activities have been made accessible to all FRCGC volunteers. In addition, FRCGC has begun collaborating with a local food pantry and plans to provide regular donations of fresh produce in the coming seasons. In other cases, such as the seedlings grown for transplant, FRCGC's activities have had a less obvious impact on the local food system. These seedlings are critical for gardeners' cultivation of long-growing-season plants because of regional climate challenges. While the extent of fresh foods produced by seedlings shared with individuals is unknown, FRCGC hopes the seedlings lead to more gardeners successfully producing foods at home. FRCGC's production of both fresh foods on-site and seedlings have made a positive impact on the local food system.

Conclusion

It has been hypothesized that garden community-organizing projects may most effectively be sustained when developed by the entire community rather than only NGOs or independent project leaders [17,18]. In addition to contributing to a sustainable environment, community gardens such as FRCGC have the potential to play a valuable role in society through the horticultural activities that are accessible to everyone, the creation of opportunities for individuals to develop relationships, and the numerous learning outcomes [2,3,17-20]. The goals initially proposed for the FRCGC were to foster a community that would engage in the selection and site design for a community growing center, participate in construction of greenhouse benches and outdoor garden beds, practice general plant care, and support design and implementation of learning opportunities. While these goals were certainly achieved, it is the community's engagement that has been vital and inspirational.

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