

Of Community Gardening

Reducing carbon footprint:

Produce from community gardens does not have to be processed, packaged, or transported long distances, cutting down on the waste and carbon emissions resulting from conventional produce.

- In the United States, 10 calories of fossil-fuel energy are required to produce a single calorie of supermarket food (Pollan, 2008), and “getting food from the farm to our fork eats up 10 percent of the total U.S. energy budget” (Grunders, 2012).
- Produce sold in supermarkets spends up to 7-14 days in transit. During this time, almost 50% of the transported food is lost to spoilage (Community Food Security Coalition, 2003, p. 4).
- 52% of fruits and vegetables in the U.S. are wasted: 20% in production, 12% in distribution and retail, and 28% at the consumer level (Grunders, 2012 p. 5).
- 29% of total annual U.S. food production by weight is wasted at the distribution, retail and consumer level. The production, packaging, distribution, retail, and disposal of this wasted food accounts for 2% of the U.S. annual greenhouse gas emissions. (Venkat, 2011).
- Organic matter in landfills accounts for 16% U.S. emissions of methane, a greenhouse gas (Grunders, 2012).
- Local agriculture conserves resources by shortening the commodity chain, saving on fuel-demanding transportation and packaging, and reducing emissions associated with wasted food (Bremer et al, 2003, p.23; Community Food Security Coalition, 2003, p. 4).
- One study showed that soils in urban gardens have higher soil organic carbon--a measure of carbon storage--than conventional agricultural soils. (Edmondson et al., 2014).
- Community farms on the urban fringe in Sutton, UK had higher carbon sequestration rates than urban parks and forests (Kulak et al., 2013).

Municipal Benefits:

Community Gardens are an economic benefit to local governments in several ways:

- Green space in neighborhoods has been shown to have a significant positive effect on housing prices (Conway et al., 2010).
- Community gardens have a positive effect on property values, especially in low-income neighborhoods in New York city (Voicu & Been, 2008).
- In Milwaukee, properties within 250 feet of gardens experienced an increase of \$24.77 with every foot and the average garden was estimated to add approximately \$9,000 a year to the city tax revenue (Bremer et al, 2003, p. 20; Chicago, 2003, p. 10; Sherer, 2006).
- Been and Voicu estimate that New York’s “gross tax benefit generated by all community gardens over a 20-year period amounts to about \$563 million” (2006, p. 28).

- Community gardens provide a retreat from the noise and commotion of urban environments, and have been shown to attract small businesses (Sherer, 2006).
- Community garden programs provide employment, education, and entrepreneurship opportunities for a wide variety of people, including students, recent immigrants, and homeless people (White, 2011a; Community Food Security Coalition, 2003).
- Gardens reduce soil erosion and runoff, which lessens flooding and saves the city money (Bremer et al, 2003, p. 50, 56; Sherer, 2006; tpl, 2004).

Food Production:

Community gardens allow people without their own land the opportunity to produce food, and provide a place for gardeners to share knowledge and skills.

- Access to land is a significant barrier to residential food production, which can be addressed by community gardens (Kortright & Wakefield, 2011).
- In a participatory study of over 100 community, school and backyard gardens in New York City, the estimated total yield of these gardens in 2012 was 87,000 lbs of produce, valued at \$ 330,000, encompassing 106 crop varieties (Farming Concrete 2012).
- New York city community gardeners produced yields that were higher than the USDA listed average for several common crops--collards and tomatoes-- indicating that community gardens are an efficient way to grow produce (Gittleman et al., 2012).
- Participants of D-Town Farms, a project of the Detroit Black Community Food Security Network, cited intergenerational relationships that pass on gardening knowledge, and access to produce in food desert areas, as benefits of their garden project (White, 2011a).
- Community gardens are places that develop, retain and transmit “knowledge and experience required to grown food...contributing to urban resilience” (Barthel et al., 2014).

Health Benefits:

Physical Health Benefits

- Eating more organic local produce reduces exposure to chemical fertilizers and pesticides. Local food can “be eaten fresh, without the preservatives that are typically added to produce that is shipped long distances” (Bremer et al, 2003,p. 54).
- “Community gardens provide a place that fosters both positive aesthetic experiences (taste, smell, touch, sight) and the satisfaction of growing good food. These experiences shift the relationship that gardeners have with food, supporting processes necessary for healthy eating behaviors” (Hale et al., 2011).
- Community gardening has repeatedly been shown to increase consumption of fruits and vegetables among participants (Barnidge et al., 2013; Blaine et al., 2010; Carney et al. 2011; Litt et al., 2011; Poulsen et al., 2014).
- Community gardeners in one study ate fruits and vegetables 5.7 times a day on average, compared with 3.9 times a day for non-gardeners (Litt et al., 2011).
- In a participatory study of a Hispanic community in Oregon, participants were supported in creating and maintaining



gardens. Over the gardening season, frequency of vegetable intake increased for adults and children, and frequency of worrying about food running out decreased significantly (31.2%-3.1%) during the post-garden period (Carney , 2011).

- Multiple studies have demonstrated that school garden programs, when combined with other components such as cooking and nutrition lessons and taste testing, have a positive impact on children’s vegetable and fruit consumption, taste preference for fresh produce, and willingness to try produce (Brown 2014; Castro et al., 2013; Evans et al., 2013; Gibs et al., 2013; Morgan et al., 2010; Ratcliffe et al., 2011; Somerville et al., 2012).
- School gardening programs can improve recognition of vegetables, and increase the variety of vegetables eaten by children (Ratcliffe et al., 2011).
- A 12-week after school cooking, nutrition and gardening program with primarily Latin@ 4th and 5th-graders led to increased dietary fiber intake and decreased diastolic blood pressure among participants. Among overweight participants, the program also led to reductions in BMI and reduced weight gain (Davis et al., 2011).
- A study out of the University of Utah showed that gardeners have lower odds of being overweight or obese than their neighbors (Zick et al, 2013).
- Participants in a community-based farming intervention program for HIV patients reported “less distress symptoms, improved overall general health, and reduced frequency of illicit drug use.” (Sacham et al., 2012).
- One study found that “For every additional year spent in the [community gardening] program, respondents spend 0.205 hours (roughly 12 minutes) more per week working on their plots—or alternatively 2 hours more per week for every 10 years spent in the program. This implies increasing commitment to gardening over time as opposed to “burnout” and thus provides evidence of life-long behavioral change among respondents” (Blaine et al., 2010).

Mental Health Benefits

- Living near urban green space has been shown to increase life satisfaction (Bertram & Rehdanz, 2014).
- Time spent on allotment gardens in the summer was a significant predictor of increased well-being in one study. Participants reported improvements in mental and physical health associated with time spent at their gardens (Webber, 2013).
- Community gardening cultivates psychological well-being through social and sensory experiences. Gardening promotes a sense of pride and accomplishment, and can allow people to form deep spiritual connections with the earth (Poulsen et al., 2014).
- In a participatory study of a Hispanic community in Oregon, participants in a community gardening program reported mental health benefits from working in their gardens together with their families (Carney et al., 2011).
- Gardening is particularly beneficial to older adults. Studies have shown that gardening can contribute to overall life satisfaction, strengthen social networks, decrease feelings of loneliness, and provide other psychological benefits to the elderly (Cheng et al., 2011; Tse, 2010; Sommerfeld et al., 2010). These benefits are derived from both “doing” gardening activities as well as “being” at the garden site (Hawkins et al., 2013).
- A study of guests at a daytime shelter for homeless women who planted, tended, prepared, and ate from their gardens found that gardening contributed to “stress relief, social inclusion, personal change, [and] self-actualization” (Grabbe et al., 2013).

Exercise:

- Community gardens can provide a safe space for recreation and exercise (White, 2011a).
- “As gardeners engage with the process of growing their own fruits and vegetables, they also develop positive emotional and aesthetic experiences with physical activity” (Hale et al., 2011).
- Gardening tasks are moderate-high physical activity for children (Park et al., 2013).
- In a study of mostly low-income elementary schools, children at schools that received gardens were more active, with more moderate-to-vigorous physical activity and less sedentary activity than children at control schools (Wells et al., 2014).
- Gardening is exercise that can be done at one’s own pace, which is particularly important for older people (Poulsen et al., 2014).
- Gardeners over 65 reported statistically higher levels of physical activity and perceptions of personal health than non-gardeners in one study (Sommerfeld et al., 2010).
- In a study of adults between 50 and 88, gardeners reported “significantly less perceived stress than participants of indoor exercise classes” (Hawkins et al., 2011).
- Increased frequency and length of gardening tasks predicted better mobility in the elderly (Leng and Wang, 2013).

Crime Prevention:

Community gardens offer a solution to vacant lots, a focal point for community organizing, and can lead to community-based efforts to deal with other social concerns such as crime.

- Reclaiming vacant lots makes neighborhoods feel safer (Poulsen et al., 2014).
- A study of residents’ perceptions of vacant land in a Philadelphia neighborhood found that vacant land caused feelings of decreased community wellbeing, control over neighborhood, neighbor ties, and property values, and an increase in fear of crime and physical danger for children, and in feelings of sadness, depression, powerlessness, anger, and negative stigma by outsiders. Community-generated solutions including gardens were seen as a positive response to these concerns (Garvin et al., 2013a).
- Residences near produce gardens are better maintained than ones near vacant or undeveloped lots (Krusky et al., 2014).
- A community-based farming intervention for patients with HIV led to reduced frequency of illicit drug use (Sacham et al., 2012).
- A randomized, controlled study in which selected vacant lots were cleaned, planted with trees and grass, and surrounded with a low wooden fence, showed “...a decrease in the number of total crimes and gun assaults around greened vacant lots compared with control. People around the intervention vacant lots reported feeling significantly safer after greening compared with those living around control vacant lots” (Garvin et al., 2013b).
- Community gardens give youth a safe place to interact with peers and can involve them in beneficial activities (Sherer, 2006).

- Social networks fostered through youth-centered gardening programs can provide an alternative to gangs (Fulford & Thompson, 2013).

The Urban Ecosystem:

- Garden plants and micro-organisms have many ecological benefits, including:
 - Filtering rainwater and helping to keep lakes, rivers, and groundwater clean (Bremer et al, 2003, p. 50).
 - Reducing soil erosion and runoff, helping mitigate flooding (Bremer et al, 2003, p. 50, 56; Sherer, 2006; tpl, 2004).
 - Restoring oxygen to the air and helping reduce air pollution through the gas exchange systems of leaves and soils (Chicago, 2003 p. 14; Sherer, 2006).
- A study comparing the soil quality of urban allotment gardens and conventional agricultural fields found that allotment soils had 32% more soil organic carbon (SOC), and a 36% higher carbon: nitrogen (C:N) ratio, than conventionally farmed soils. SOC and C:N ratio are important for healthy soil functioning and for carbon storage. This indicates that “small-scale urban food production can occur without the penalty of soil degradation seen in conventional agriculture” (Edmondson et al., 2014).
- Community gardens are places where ecological management practices and knowledge are cultivated, shared between gardeners and passed on through time. This process takes place through oral communication and by observing the techniques of fellow gardeners, and is strengthened by community guidelines and the wider social networks that community gardens are often a part of (Barthel et al., 2010).
- “The ebb and flow of the seasonal garden cycles help gardeners gain a more embodied understanding of the natural processes that food production is dependent on...as well as fostering a sense of reciprocity among people and the landscape” (Hale et al., 2011).
- Community gardens add beauty to the community and heighten people’s awareness and appreciation for living things. In a Chicago survey, this was the #1 reason given for the importance of community gardens, mentioned by 14.3% of respondents, while 83% of respondents felt that the garden has enhanced the beauty of the community (Chicago, 2003, p. 34).

Youth Education:

Community gardens can serve as outdoor classrooms where youth learn valuable skills, like practical math, communication, responsibility and cooperation. They also provide the opportunity to learn about the importance of community, stewardship and environmental responsibility.

- When combined with science education, gardening can be a form of experiential learning that is more effective than traditional classroom learning. In a study of Hispanic and African American middle school students in Los Angeles, students who participated in a science class with a school garden project showed dramatically improved science-processing skills when compared to those in a traditional science class (Blair, 2009 p. 19).
- Several studies of the REAL School Garden program, which provides school gardens, garden-based learning, and teacher training in low-income Texas schools, found that “84% of students experiencing hands-on academic lessons in [school gardens] report high levels of engagement, specifically in math in science.” Schools with gardens also surpassed other schools on standardized science test scores (McCartney, 2013).
- A two-year garden-based learning program for disruptive and low-performing students in Spain was shown to de-



crease school failure, dropout rate, and classroom disruption, and improve the skills, self-esteem, and self-confidence of students (Ruiz-Gallardo et al., 2013).

- A youth gardening intern program in Winnepeg for “at-risk” youth reported gains in “skills, improved self-esteem, increased environmental awareness, enhanced food security” among youth interns. Through the garden program, youth “fostered their own social networks to help counter the attraction to gangs” (Fulford & Thompson, 2013).
- A study in Minneapolis and Saint Paul found that youth in garden programs were more willing to eat nutritious and unfamiliar foods than youth not in garden programs, and were more likely to cook and garden outside the program (Lautenschlager & Smith 2007).
- Children in an Ontario school garden program demonstrated enhanced environmental stewardship behaviors as a result of the program (Upitis et al., 2013).
- A study of elementary school students in Texas found that children that had any type of experience with gardening had more positive attitudes toward the environment than students who had not gardened. The study showed that hands-on gardening activities are important to the development of environmentally concerned citizens, and that children's involvement in informal gardening experiences has as much impact on their environmental outlook as involvement in formal school-based programs (Aguilar et al, 2008).
- Elementary-aged children who had lessons in a school garden could better estimate species richness and identify more plants than children who learned similar lessons in a classroom. Additionally, children who learned in the garden saw species richness as a positive aesthetic quality. These findings have implications for cultivating citizens who are concerned for the importance and protection of biodiversity (Benkowitz & Kohler, 2010).

Social and Community Benefits:

Community gardens provide spaces to interact with neighbors, to create and strengthen community and cultural traditions, to take agency and act collectively, and to resist oppression.

- Community gardens offer unique opportunities to establish relationships within and across physical and social barriers. (Bremer et al, 2003; Tranel & Handlin, 2004).
- By creating safe spaces where community members can interact and share knowledge, tools, and gardening tasks, community gardens build social bonds and trust between neighbors, and create a sense of belonging to the larger community (Poulsen et al., 2014).
- Perceived benefits of community gardens include positive social experiences such as the sharing of work, produce, and gardening knowledge, and the creation of interpersonal bonds between diverse members (Northrop et al., 2013).
- Surveys of community gardeners in Cleveland found that community gardens “increase feelings of community, [and] create ties to place by creating neighborhood satisfaction, and increasing feelings of safety” (Luke, 2013).
- Community gardening and neighborhood beautification projects correlate with increased perceptions of neighborhood social capital (Alaimo et al., 2010; Firth et al., 2011).
- In a Denver neighborhood, “Community and home gardening were positively associated with higher levels of neighborhood attachment when compared to people who did not garden.” (Comstock et al., 2010). Neighborhood attachment “promotes stability, involvement, and investment in the physical and social characteristics of the neighborhood” (Galster and Hesser, 1982, Mesch and Manor, 1998 and Twigger-Ross and Uzzell, 1996; cited in Comstock et al., 2010).



- While working with and studying a group of black women activists in Detroit who were transforming vacant lots into gardens, Monica White found that their efforts improved access to healthy food, created safe spaces for community gatherings and fostered inter-generational relationships. The project modeled self-reliance, self determination, empowerment, and agency, and set an example for collective work, activism, and taking agency in other aspects of community life (2011b).
- Milwaukee community gardens are places of citizenship practice, allowing people who have “struggled to be incorporated politically and to meet material needs” to “transform space according to their own interests, claim rights to space, engage in leadership and decision-making activities, contest material deprivation, and articulate collective identities” in the face of systematic oppression (Ghose & Pettygrove, 2014).
- Community gardens can provide a space for people to “affirm cultural gardening practices and therefore express an important part of their heritage” (Hale et al., 2011).
- A participatory study of a kitchen garden project in Vancouver, BC showed how gardening can be a force of decolonization. The project focused on traditional aboriginal foods and medicines, cooking and preservation techniques, and cultural celebrations and feasts. One participant said that the project “‘is decolonization because part of the colonization that we [Native people] live in is dependency’ and that the garden program decreases dependency on western health care and supports traditional health-promotion practices” (Mundel & Chapman, 2010).
- One study found that “[Gardeners] who donate produce to hunger shelters, food banks, and other charitable organizations average spending about 4 hours and 20 minutes more in the garden per week than those who do not donate. This result is important because it shows that gardeners who are more active with their plots tend to use their participation not only as a way to improve their own diets, but also to make a contribution to the community by donating produce” (Blaine et al., 2010).

Horticultural Therapy:

- “A ten percent increase in nearby green space was found to decrease a person’s health complaints in an amount equivalent to a five year reduction in that person’s age” (Sherer, 2006, p. 16).
- In a Scottish study, perception of the quantity and quality of local green space influenced mental well-being. Additionally, social contact while visiting green space was associated with lower stress levels (Thompson et al., 2014).
- Gardening can relieve acute stress and restore positive mood (Van Den Berg & Custers, 2011), provides relaxation and a sense of pride and accomplishment (Northrop et al., 2013).
- A multi-study analysis of 1252 people found that exercise in the presence of nature such as gardens significantly improved self-esteem and mood, with particularly strong positive effects on the self-esteem of the young and the mentally ill (Barton & Pretty, 2010).
- A qualitative study of Swedish stress patients in garden therapy found that time in nature and “garden rooms” reinforced their recovery process, through positive sensory experiences and social interactions (Adevi & Martensson, 2013).
- According to Hale et al., “When the gardeners perceive the garden landscape as providing an aesthetically pleasant experience, it results in feelings of joy, pride, purpose, peace and awe... [and helps] gardeners to process emotions, provide a sense of purpose, and foster stability through the regular cycles of the garden” (Hale et al., 2011).

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