Denver Urban Gardens
LiveWell Colorado
Community Health Initiative

Summary Report

March 2011
Kaiser Permanente Community Health Initiative

The LiveWell Colorado Denver Urban Gardens (DUG) Initiative described in this report is one of 25 in Colorado that is part of the national Kaiser Permanente (KP) Community Health Initiatives (CHI). CHI is a program-wide strategy for achieving a significant and measurable impact on the health of communities served by KP. The thematic focus is "Healthy Eating Active Living"—promoting improvements in nutrition and physical activity and reductions in rates of overweight/obesity. Over 30 communities in 5 KP regions have active CHI efforts underway.

LiveWell Colorado

LiveWell Colorado is an initiative that aims to inspire and advance policy, environmental, and lifestyle changes that promote health through the prevention and reduction of obesity in Colorado. LiveWell Colorado works with community initiatives, such as the LiveWell Colorado Denver Urban Gardens (DUG) Initiative, to promote equal opportunities for healthy eating and active living through policies, programs and environmental changes. Funded by The Colorado Health Foundation, Kaiser Permanente, and the Kresge Foundation, LiveWell Colorado coordinates efforts to advance policy strategy, and build leadership and capacity to reduce health disparities related to nutrition, physical activity and obesity. For more information, visit www.livewellcolorado.org.

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Maps

Denver Urban Gardens
La Alma-Lincoln Park, Sun Valley, and Baker neighborhoods
Denver, Colorado
Executive Summary

Community Description

The LiveWell Colorado Denver Urban Gardens (DUG) Initiative was designed to promote healthy eating and active living (HEAL) in three neighborhoods in Denver County: La Alma/Lincoln Park, Sun Valley and Baker. The total population in the three neighborhoods is approximately 12,500. The majority of residents are Latino and many live in poverty.

As of 2010, over 60 partnering organizations were involved in the LiveWell Colorado DUG Initiative, representing residents, health care, government and other sectors. Some key members include: City and County of Denver, Denver Public Schools, Denver Housing Authority, Connecting Generations, Denver Youth Farmers’ Market Coalition, and the Sun Valley Stakeholder Coalition. DUG was the project leader and took responsibility for most decisions. However, the blueprint for the LiveWell Colorado DUG Initiative was developed through an inclusive planning process, with community check-in when strategies were revised.

Community Change Strategies and Accomplishments

The overall strategy pursued by the LiveWell Colorado DUG Initiative was to take a few largely unconnected community gardens, and expand and integrate them with other environmental approaches in order to promote changes in their community food systems. Several new gardens have been created and existing ones expanded. Farmers’ markets run by youth during the growing season were established and now fresh produce can be purchased at these sites using Electronic Benefits Transfer (EBT) machines for the Supplemental Nutrition Assistance Program. Educational programs serving both youth and families have been developed to show people how to do healthy cooking on limited budgets. Infrastructure improvements have been created to make garden produce available to food pantries and other community outlets serving low-income residents. Zoning and ordinances have been changed to support urban agriculture, and garden space has been added to the optional amenities that can be included in future public space development of parks, housing and open space.

The reach of 20% of the population by the higher intensity strategies, many of which are sustainable, could be expected to produce measurable behavior change over time. These strategies include activities such as increasing fresh produce access through community gardens, school food environment changes and multi-session educational programs. This reach could be considered a success given the challenges of working in low-income neighborhoods with
many other pressing problems, as well as initiating relationships with a number of new partners over time.

Conclusions

The LiveWell Colorado DUG Initiative invested in multilevel strategies including 1) changes to regional urban agriculture policies, and 2) installing 11 community/school gardens that were integrated with other environmental and programmatic approaches to promote changes in the food access system in the three Denver neighborhoods of La Alma/Lincoln Park, Sun Valley and Baker. About half of the completed strategies are sustainable and could be expected to produce measurable behavior change over time.

DUG, as an organization, has built the capacity to support the field on best practices for building sustainable gardens while working on regional zoning and ordinances that can create better access to healthy food systems for low income communities. DUG’s policy activity has lead to the creation of a Denver Food Policy Council and their work is now spreading to the broader Denver community.

The lasting success of the LiveWell Colorado DUG Initiative will depend on the ability of resident leadership to maintain the community gardens and organizational partnerships after LiveWell Colorado funding ends. If the gardens and relationships are sustained, potentially more residents of these three communities will have the opportunity to eat healthier food grown in their own neighborhood.
I. Community Description

The LiveWell Colorado Denver Urban Gardens (DUG) Initiative worked to promote healthy eating and active living (HEAL) in three neighborhoods in Denver County, Colorado: La Alma/Lincoln Park, Sun Valley and Baker. The map on page 1 shows the location of the neighborhoods and the location of several of the gardens that are involved in the LiveWell Colorado DUG Initiative. The total population in the three neighborhoods is approximately 12,500. Table 1 shows the breakdown of the population by ethnicity and median household income. In the LiveWell Colorado DUG Initiative neighborhoods, 53% of the residents are Latino compared with 32% in Denver County as a whole. The median household income is substantially lower: $27,000 in the LiveWell Colorado DUG Initiative neighborhoods versus $39,500 in the county as a whole.

Table 1
Community Demographics — Denver Urban Gardens Initiative

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Sun Valley</th>
<th>Baker</th>
<th>LaAlma/Lincoln Park</th>
<th>LiveWell CO DUG Initiative combined</th>
<th>Denver County</th>
</tr>
</thead>
<tbody>
<tr>
<td># of residents</td>
<td>1,500</td>
<td>5,800</td>
<td>5,200</td>
<td>12,500</td>
<td>554,600</td>
</tr>
<tr>
<td>% White</td>
<td>10%</td>
<td>40%</td>
<td>32%</td>
<td>33%</td>
<td>52%</td>
</tr>
<tr>
<td>% Latino</td>
<td>53%</td>
<td>54%</td>
<td>52%</td>
<td>53%</td>
<td>32%</td>
</tr>
<tr>
<td>% African American</td>
<td>17%</td>
<td>3%</td>
<td>7%</td>
<td>7%</td>
<td>11%</td>
</tr>
<tr>
<td>% Asian</td>
<td>13%</td>
<td>1%</td>
<td>4%</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>% Other</td>
<td>7%</td>
<td>3%</td>
<td>4%</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>Median household income</td>
<td>$7,411</td>
<td>$31,719</td>
<td>$26,445</td>
<td>$27,201</td>
<td>$39,500</td>
</tr>
</tbody>
</table>

Source: 2000 Census

“...this is a highly mobile community and crises come up in their lives that keep them away.”
II. Community Collaborative: History, Structure, Process

In the summers of 2007 and 2010, interviews were conducted with five to eight key LiveWell Colorado DUG Initiative partnership members. They spoke about the process of the work of the Initiative and described Denver Urban Gardens (DUG) as an organization that had been active in these communities for many years, building relationships and trust with residents and organizations. Over the course of the Initiative, new gardens were built to serve multiple functions. “The community has needs for gathering together, having a place for physical activity, a safe place to walk, engage in social interaction, mingle with diverse cultures and learn about that and each other.”

DUG is the lead agency for the LiveWell Colorado DUG Initiative, the convener of the collaborative and the organization primarily responsible for implementing Initiative activities. DUG was created in 1985 to create a thriving and sustainable network of community gardens that are conceived of, cultivated, and supported by local citizens and institutions throughout the urban neighborhoods of Metro Denver. Together with residents, they "grow community, one urban garden at a time."

A leading organization in urban agriculture and community development, DUG is now in its twenty-fifth year as a community garden organization in Denver. DUG assists with the creation and management of over 90 metro-area gardens in neighborhoods and small parks. Primarily serving low to moderate-income populations in urban settings, DUG provides opportunities for participants to supplement their diet with produce grown in nearby public gardens. Through the gardens, participants assume responsibility to improve their community, initiate a sense of pride in their surroundings, and improve their nutritional status through healthy, fresh food.

The three neighborhoods—La Alma/Lincoln Park, Sun Valley and Baker—had just a few community gardens when the project began. At the beginning of LiveWell Colorado, DUG met with other community-based agencies working in these neighborhoods to develop a three-year grant proposal and project. A planning grant was submitted in 2005 and the project began in February 2006. The project was extended to five-years and concluded in December 2010.

As of 2010, over 60 partnering organizations were involved in the LiveWell Colorado DUG Initiative, representing residents, health care, government and other sectors. Some key members include: City and County of Denver, Denver Public Schools, Denver Housing Authority, Connecting Generations, Denver Youth Farmers’ Market Coalition, and the Sun Valley Stakeholder Coalition.
LiveWell Colorado (formerly Kaiser Permanente/Thriving Communities) provided $17,000 in funding for the planning year (2005), $165,000 in the first year for implementation (2006), $190,000 in the second year (2007), $250,000 in the third year (2008), $140,000 in the fourth year (2009), and $75,000 in the fifth year (2010)—all totaling $837,000. Other funding partners included: ColRoMorA Foundation, Anschutz Foundation, Office of Economic Development, Business & Housing Services, Denver Foundation, and the Denver Scientific and Cultural Facilities District.

DUG was the project leader and took responsibility for most decisions. However, the blueprint for the Initiative was developed through an inclusive planning process, with community check-in when strategies were revised. DUG engaged a wide variety of stakeholders and collaborated with partners and residents to make decisions. As for resolving conflicts, DUG has a reputation for transparency and competency. DUG staff defines roles upfront and invests in the time and effort to maintain a participatory approach. Few disagreements have arisen, but when they did, they sat down as a group, face-to-face, and talked about it.

“DUG is careful of mission creep. They are willing to walk away rather than have it fail.”
III. Creating Sustainable Community Change: Goals, Process and Strategies

Goals and Vision

The LiveWell Colorado DUG Initiative overall goal was to empower the community voices to define the healthy living vision they have for themselves in the La Alma/Lincoln Park, Sun Valley, and Baker neighborhoods, largely through garden-based strategies. The specific goals of the strategies were to:

1. Inform and design local and regional policies that support sustainable food systems;
2. Develop policy and environmental changes in schools and the community to promote healthy living; and
3. Connect residents to HEAL resources and opportunities within their community.

Partnership members in interviews described the LiveWell Colorado DUG Initiative vision in their own words. “Gardens are viewed as an asset, not just a hobby,” as one person put it. They described school and community gardens as places that build community and encourage relationships along with providing access to fresh, healthy fruits and vegetables. One overarching objective was to design a model and test ways to create a local and informal food system. “They go to the core of what community needs in areas of high crime and vandalism—gardens provide food security and give kids something to do.”

Process

The LiveWell Colorado DUG Initiative began with a planning process that combined DUG staff expertise with an assessment of community needs that emerged from meetings with residents and community-based organizations. The starting point for the Initiative was the gardens in each of the three communities. DUG then sought community input about how to expand and build on the gardens. The existing relationships between DUG and community groups were key to this needs assessment process.

Initially, close to 20 individual strategies were planned. The first two years of implementation were spent carrying out strategy projects. Over time, the LiveWell
Colorado DUG Initiative created greater alignment among the projects and focused on finding ways to sustain them. For instance, they expanded and linked education to the gardens. Some strategies were dropped or changed. The process evolved organically, with DUG and its partner organizations being opportunistic and leveraging existing relationships. The challenge was creating sustainable projects through the building of community capacity in the low-income target neighborhoods where little capacity existed previously.

To achieve the LiveWell Colorado DUG Initiative goals, DUG and its partners built new community gardens, supported school wellness activities, and developed youth gardening activities. They served as a resource to program leaders and others in the community on urban agriculture, nutrition and gardening education, food access and policy. In the last years of the Initiative, DUG turned over many strategies to adopting organizations and put infrastructures and relationships in place to develop stronger community ownership and sustain the new gardens.

Respondents to the interviews noted several lessons learned over the course of the LiveWell Colorado DUG Initiative about how to do this work:

- DUG’s organizational culture was an asset: they defined roles upfront and valued hiring staff that are willing to address things that aren’t going well.

- More engaged discourse—through community forums and other means—helped work out implementation details until everyone was satisfied with the direction being taken.

- Leveraging the broader assets in the community (schools, farmers, assisted living communities, youth in farmer’s markets) and engaging them in policy change work were major successes.

- Systematic testing and measuring the effect of a cluster of strategies (such as connecting gardens to food banks and farmer’s markets) might help inform how to link gardens to the health of the community, although it was acknowledged that there may be logistical challenges to putting this kind of feedback in place.
Community Change Strategies

The LiveWell Colorado DUG Initiative worked to make significant, sustainable changes in communities—changes that promote HEAL-related lifestyles changes and create environments supportive of positive lifestyle choices. These community changes included new programs and greater availability of healthier foods that promote healthy eating as part of everyday life.

Figure 1 briefly lists the key LiveWell Colorado DUG Initiative strategies according to the levels of the ecological model for health promotion, where the most immediate, proximal influences on individual behavior (e.g., programs, organizational environment) are shown on the inner rings and the more distal (e.g. public policy, community environment) are shown in the outer rings. While it is important to intervene at all levels of the model, focusing on the outer rings of policy and environmental changes, which was the goal of the Initiative, and has the potential for greater impact and sustainability using potentially fewer resources.

Figure 1. LiveWell Colorado DUG Initiative Key Strategies

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Policy Strategies

The LiveWell Colorado DUG Initiative policy strategies centered on developing wellness teams in schools and initiating a food policy council. These two efforts helped establish a process for creating community gardens on school grounds with the Denver School Garden Collaboration, and successfully advocated for changes in zoning and ordinances for urban agriculture and beekeeping. The LiveWell Colorado DUG Initiative focused on policies to designate garden space in public spaces—parks, housing, open space—because community gardens can become secure and sustainable assets in the neighborhood. The following is a brief description of the two policy-oriented strategies:

- **Wellness teams.** Established wellness teams in two schools and agreement on school garden land use. Successfully advocated for a salad bar, garden-cafeteria program, and removed soda vending and candy fundraisers from one elementary school.

- **Food policy council.** Established a food policy council. Changed zoning and ordinances for urban agriculture and designating garden space in public spaces—parks, housing, open space.

Environmental Change Strategies

The LiveWell Colorado DUG Initiative environment strategies focused on gardens, including creating and maintaining them, building education programs around them, and providing garden-grown produce to farmers markets, food banks, and other institutions. A few strategies encouraged physical activity. The following is a complete list of the environmental change strategies:

- **Community and school gardens.** Installed eight community gardens (reached 450 residents and students). Garden installed at one elementary school. Ten students participated in a summer garden program.

- **Specialty gardens.** Installed three gardens at sites for people with special needs (reached approximately 280 clients at these special centers).

- **Container gardens.** Established four sites for the distribution of container gardens (reached 1325). Created the Free Seeds & Transplants Program to support container and backyard gardening. More information is available at http://dug.org/free-seeds-transplants.

- **School farmer’s markets.** Created youth-run farmers' markets at two elementary schools (reached 1315).
- **Youth mobile produce markets.** Created youth-run markets using carts and bicycles that were held at two worksites (reached approximately 60 residents working at these worksites).

- **Bike racks.** Installed bike racks at one elementary school. (one student used regularly).

- **Central refrigeration.** Installed a large refrigeration unit to improve fresh produce distribution. This asset is now used regionally during the growing season, not just in the target community. (The number reached is captured in other strategies reporting on produce distribution specific to the neighborhood.)

- **Grow-A-Row program.** Donated fresh produce grown in gardens to Denver Public Schools and other outlets (reached 4700).

Table 1 contains more details about the gardens installed in the LiveWell Colorado DUG Initiative neighborhoods. A total of over 700 people were reached by participation in the 11 gardens.
Table 1. Description of the LiveWell Colorado DUG Initiative Gardens

<table>
<thead>
<tr>
<th>Neighborhood gardens</th>
<th>Plots</th>
<th>Plot size</th>
<th>Estimated number people reached per year&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Total people reached over 5 project years&lt;sup&gt;2&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baker neighborhood</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Casa Verde</td>
<td>10</td>
<td>20’x7’</td>
<td>25</td>
<td>48</td>
</tr>
<tr>
<td>Fairmont Elementary&lt;sup&gt;3&lt;/sup&gt;</td>
<td>22</td>
<td>10’x15’</td>
<td>55</td>
<td>78</td>
</tr>
<tr>
<td>St. Peter and St. Mary</td>
<td>6</td>
<td>9’x5’</td>
<td>15</td>
<td>38</td>
</tr>
<tr>
<td>Baker</td>
<td>21</td>
<td>16’x16’</td>
<td>52</td>
<td>75</td>
</tr>
<tr>
<td>Atlantis (garden for people with disabilities)&lt;sup&gt;4&lt;/sup&gt;</td>
<td>12</td>
<td>10’x10’</td>
<td>30</td>
<td>120</td>
</tr>
<tr>
<td><strong>Lincoln Park neighborhood</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Court House Square (garden for seniors)&lt;sup&gt;4&lt;/sup&gt;</td>
<td>15</td>
<td>10’x10’</td>
<td>38</td>
<td>152</td>
</tr>
<tr>
<td>Elati&lt;sup&gt;3&lt;/sup&gt;</td>
<td>18</td>
<td>10’x10’</td>
<td>45</td>
<td>68</td>
</tr>
<tr>
<td>South Lincoln&lt;sup&gt;3&lt;/sup&gt;</td>
<td>8</td>
<td>10’x7’</td>
<td>20</td>
<td>43</td>
</tr>
<tr>
<td>Greenlee</td>
<td>6</td>
<td>10’x12’</td>
<td>15</td>
<td>38</td>
</tr>
<tr>
<td><strong>Sun Valley neighborhood</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fairview Elementary&lt;sup&gt;3&lt;/sup&gt;</td>
<td>16</td>
<td>12’x7’</td>
<td>40</td>
<td>63</td>
</tr>
<tr>
<td>Family Crisis Center&lt;sup&gt;4&lt;/sup&gt;</td>
<td>1</td>
<td>17’x16’</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td><strong>TOTAL - 11 gardens</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>135</td>
<td>--</td>
<td>337</td>
<td>731</td>
</tr>
</tbody>
</table>

<sup>1</sup> Approximately 2.5 people/household/plot.
<sup>2</sup> Approximately 3 new households added in each garden/year. Specialty gardens turned over each year.
<sup>3</sup> Gardens contain active youth and community plots.
<sup>4</sup> Specialty garden.

The LiveWell Colorado DUG Initiative programmatic strategies were predominately nutrition education classes and trainings and recipe demos held in various settings. Promotional activities included marketing the farmers’ market and distributing a guide to residents about HEAL opportunities in their neighborhood. Physical activity classes were attempted, but found to be unsustainable. The following is a complete list of the programmatic strategies:

- **Harvest Festival.** Held annual with chef and resident recipe demos (reached 200).
• **Nutrition classes.** Conducted six week cooking and nutrition courses in different venues (reached 122)

• **Garden curriculum.** Established cooking demos and curriculum at two schools and one family crisis center. Produced recipes, held teacher trainings and produced garden curriculum for science teachers (reached 757). The curriculum is available at [http://dug.org/school-garden-curriculum](http://dug.org/school-garden-curriculum).

• **Promotion.** Printed and distributed HEAL Resource Guide and conducted a promotional drawing (reached 1500). Marketed farmers’ markets via door-to-door flyers and wheelbarrow produce display.

• **Exercise classes.** Offered yoga classes (reached 10).

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**Capacity Building Strategies**

The LiveWell Colorado DUG Initiative initially organized community needs assessment activities to engage residents and learn about their interests and priorities. They also provided garden management and coalitions to advance and promote garden and food access activities, and then slowly transferred leadership to the residents. What follows is a complete list of the capacity building strategies:

• **Resident engagement.** Held walkability & safety forums.

• **Garden technical assistance.** Expanded the reach of community gardens to neighboring communities during the growing season. In addition, DUG has become a resource supporting community garden strategies for other LiveWell Colorado communities and throughout Colorado and the U.S.

• **Neighborhood coalition support.** Provided leadership to a neighborhood coalition that promotes linking community health and nutrition resources and holding HEAL events.

• **Youth market coalition.** Developed a coalition of Youth Farmers’ Markets across the city to advance sustainability and increase collaboration throughout the year.
Figures 2 - 6 represent information about the types of strategies that were pursued by The LiveWell Colorado DUG Initiative. Figure 2 shows the breakdown of strategies by the health target area focus. The target area could be primarily nutrition, physical activity or both. Half of the strategies focus on nutrition, mostly because of the emphasis on community and school gardens. A third focused on both nutrition and physical activity. Figure 2 also shows the breakdown of strategies by sector. The majority of strategies (76%) occurred in the neighborhood. About one quarter of the strategies occurred in the school (19%) and worksite (5%) sectors.

Figure 2. Distribution of the LiveWell Colorado DUG Initiative strategies, by sector and health target

- Health target:
  - Nutrition 53%
  - Physical activity 10%
  - Both nutrition & physical activity 37%

- Sector:
  - Neighborhood 76%
  - School 19%
  - Worksite 5%

N=21 strategies
N=19 strategies. Does not include 2 capacity building strategies that are not sector specific.
Figure 3 shows the breakdown of strategies by objective. The majority of strategies (43%) were focused on environmental change, particularly increasing the availability of produce for residents. Almost one-third (29%) are programmatic. The policy change strategies (10%) were focused on environmental change to increase the availability of healthy food.

**Figure 3. Distribution of the LiveWell Colorado DUG Initiative Strategies, by objective (n=21)**

![Pie chart showing 43% Environmental change, 29% Programs, 19% Capacity building, 9% Policy change]

Figure 4 shows the breakdown of 21 strategies in place at the end of the Initiative. A total of 27 strategies were planned and developed. Six of these were dropped over the course of the Initiative. Seventeen of the strategies were implemented successfully at the end of the Initiative, and out of these, about one-half are likely to be sustained. These sustainable strategies included:

- Developing a variety of gardens, including eight community/school gardens, three specialty gardens, 1325 container gardens.
- Installing a refrigeration unit to improve fresh produce distribution.
- Establishing a Youth Farmers’ Market coalition to advance sustainability and increase collaboration.
- Setting up the Grow-A-Row food donation program and Farm to School Program (14,000 apples were donated to all Denver Public Schools in 2007).
- Implementing a nutrition and garden education program at two schools, a summer youth garden program at two sites, and cooking and nutrition courses.
Figure 4. Distribution of all the LiveWell Colorado DUG Initiative Strategies, by status

*CAP= Community Action Plan (does not include 6 dropped strategies)

Figure 5 shows the reach penetration of strategies by sector. The programmatic strategy, offering garden and nutrition education, reached a majority of students (65%) in the school sector, while nutrition education and other promotional strategies reached slightly less than 20% of the residents in the neighborhood sector. Conversely, 65% of the residents were reached by numerous environmental changes focused on healthy food access (e.g., youth farmers’ markets, community and container gardens, produce donation programs) compared to about 25% in the school sector where one of the schools installed a school garden and made changes to the school food and other food-related policies.

The highest reach strategies were:

- Food donations of fresh grown produce, Youth Farmers Markets, container gardens, neighborhood distribution of a HEAL resource guide.

- School garden and nutrition education curriculum and Wellness Team activities in one school e.g., salad bars and other school food improvements.
Figure 5. Percent reached$^1$ by the LiveWell Colorado DUG Initiative strategies,$^2$
by objective and sector

![](chart.png)

$^1$The number reached is an estimate. Some duplication is possible.

$^2$Does not include four implemented capacity strategies.
Examining the number of people reached by the LiveWell Colorado DUG Initiative strategies helps inform the extent to which the target population is touched in some way. It’s also important to look at the strength of the strategies to affect behavior change. Figure 6 breaks down 17 of the implemented strategies by their “population dose”—a combination of the number reached and the strength, i.e., likely behavioral impact on each person reached. Because of limited information from the literature on the effect of HEAL environmental and policy strategies, the strength ratings are very rough approximations based on the intensity of the strategies (e.g., media campaigns are rated low strength; environmental interventions in schools where the students encounter the changed environment every day are higher strength). Reach and strength were estimated and put into three categories – high, medium, and low shown in the figure below.

Approximately six of the LiveWell Colorado DUG Initiative strategies are relatively high reach and four are high strength—and seven (see green box in figure 6) or about 40% are both medium-high, i.e., high dose.

The two highest dose (high reach/high strength) strategies were school-based—gardens with companion curriculum and school food changes. Other strategies that were relatively high reach/high strength included youth farmers’ markets and summer gardening programs, container gardens, fresh produce donations, and policy advocacy for urban agriculture zoning and ordinance changes.

*Figure 6. Number of the LiveWell Colorado DUG Initiative strategies and potential impact*
Story of success

Growing a healthy community, one garden at a time

Spotlight on Denver Urban Gardens

Denver Urban Gardens (DUG) has launched dozens of community gardens throughout Denver’s neighborhoods in the past 20 years. Between 2006 and 2010, eleven of these were created in a cluster of three neighborhoods—Sun Valley, La Alma/Lincoln Park, Baker—for the LiveWell Colorado DUG Initiative.

The gardens are designed to attract residents and create safe places to gather, socialize, become more physically active and increase the consumption of fresh, healthy food. Showcasing all kinds of plants, produce and flowers, they draw in residents of all ages who enjoy getting their hands dirty while seeing—and tasting the results of their labors. These gardens create and strengthen communities like the LiveWell DUG neighborhoods, where bonds between neighbors had been frayed by economic hardship, unsafe streets, and bleak, uninviting public spaces.

How did the LiveWell Colorado DUG Initiative sustain its community gardens and create more cohesive, health-promoting neighborhoods?

Resident Ownership — Before, During and After

Michael Buchenau, DUG’s Executive Director, and DUG’s Community Initiatives Coordinator, Shannon Spurlock, agree that the first key step to creating gardens that last season after season, year after year, is to make sure that community members really want a garden. In these and other neighborhoods, DUG helped with a garden’s design and organization, but the passion to start a community garden happened among local residents—within walking distance of the new garden site.

Usually, a small group of residents (often, as small as just one person) got things started by walking a neighborhood with flyers and going door-to-door to talk about the possibilities. A group meeting soon followed, with DUG staff sharing some ideas and offering access to various types of training available to community gardeners. From the beginning, though, the garden belonged to the residents—and it is this initial group that eventually formed itself into committees to organize workdays for volunteers, promote the garden, tackle problems and disputes, and arrange events.

The Staying Power of Public Lands

Finding and choosing an appropriate setting for a community garden is another key decision. DUG learned the hard way that placing gardens on private land makes them too vulnerable to the whims of landowners. When a vacant lot is unused, owners are happy to have local residents transform it into a more appealing space. But when a more profitable or urgent use comes along—a condo sale, an expansion, a parking lot for overflow crowds—the garden is the first thing to go. Taking away a garden that was once a visible, tangible asset demonstrating positive community change creates a greater sense of loss than if the garden had never been there in the first place.

One key learning is that gardens must be placed strategically on public lands—whether it is a school, a park, or a public housing development. The setting must fully absorb and incorporate the garden as part and parcel of its other activities, its mission, and its culture. If the garden is relegated to an obscure corner, Buchenau notes, “That’s a recipe for neglect.” The community-building benefits of gardens—neighbors striking up conversations, seniors sharing a greeting and a story, teachers watering plants alongside their students—all require a central, visible garden spot that is naturally on the way from Point A to Point B as people go about their daily lives.

How Gardens Grow Healthy Communities

Several successful, mature community gardens were created in the DUG LiveWell Colorado Initiative. Success means the gardens were fully woven into the neighborhood’s daily life and rhythms. Gardeners may have launched it, but all kinds of people—whether or not they ever touch a seed or a watering can—are part of it and see it as theirs. The gardens became settings for an early-morning yoga class, for art and music, for story time with local children, for weddings and memorial services.

Natural beauty and an interest in obtaining fresh produce and getting exercise through gardening may provide an initial lure, but the formation of a face-to-face social network (the kind that doesn’t require a computer) keeps people coming back and protecting the garden they come to see as their own. This ownership takes place over time. For instance, parents may start volunteering their time in their children’s school garden, or children may pair up with adult volunteers to go door-to-door with a cart of sample produce and flyers about your youth farmer’s markets. Some gardens became so successful that there was extra bounty to donate to food banks and shelters.

Once the LiveWell Colorado DUG Initiative gardens became established, systematic rotations in leadership were set up so that no one person or point of view became entrenched. Like any group or organization, gardens experience their share of conflicts, from rules about pets to personal grudges to infractions of watering and composting rules. Most garden groups find ways to resolve their problems and conflicts on their own. This, too, is part of the benefit—building experience with collective decision-making and problem-solving that can be (and is) applied to many neighborhood situations.

Residents from 8 or 88 in Denver’s Sun Valley, La Alma/Lincoln Park, Baker community gardens now have ways to contribute year-round to safe, convenient places to congregate, get a little exercise, and access fresh, seasonal produce. These neighborhood assets “touch the community in as many ways as possible,” ensuring that the gardens will be a fixed, not fleeting, feature stemming from the LiveWell Colorado DUG Initiative.
Photovoice

Background on Photovoice

Photovoice is a community-based approach to documentary photography that provides people with training on photography, ethics, critical discussion and policy advocacy. Once people are trained on the method, they are given cameras to take pictures that represent their ideas, thoughts or feelings about particular issues in their communities. Participants write captions for their photographs using the mnemonic SHOWeD: What do you See here? What is really Happening? How does this relate to Our lives? Why does this problem or strength exist? What can we Do about it? The pictures and related captions about community issues can then be shared with key stakeholders or policy makers in the community in order to advocate for change.

Photovoice in the LiveWell Colorado DUG Initiative

Two Photovoice projects were conducted. The first (time 1) was intended to capture barriers to healthy eating and active living. The second (time 2) was adapted to capture the changes in the community from the perspective of the participant as a result of the LiveWell Colorado DUG Initiative efforts.

Time 1: A total of fifteen youth, seven students from Fairmont Elementary and eight students from Fairview Elementary, participated in the original Photovoice project (summer 2006). The photos were displayed during three community events and had on-going exhibitions at two locations. The pictures and related captions highlighting barriers to health were also used in several CHI communities to successfully advocate for change.²

The photo at right was used by the youth to successfully advocate for renovation of their neighborhood park.

In winter 2008, Groundwork Denver partnered with The Denver Housing Authority (DHA) to engage nine Youth Employment Academy participants who used Photovoice to represent aspects of their community that impacted their health and environment. The DHA photos have been exhibited at the North Lincoln Opportunity Center and the youth are exploring other exhibit opportunities, including the Denver Public Library exhibit space.

Groundwork Denver also worked with nine clients and four staff from Atlantis, a nonprofit that supports people with disabilities in independent living, on a project to document issues with mobility and transportation. Atlantis presented the photos to the Urban Planner and Senior Landscape Architect in charge of transit oriented development for the Alameda light rail station, and advocated for light rail planning decisions to consider accessibility beyond ADA requirements. Both decision makers have agreed to include people with disabilities on advisory committees and other input forums and the city planner is assisting with setting up an exhibit. Atlantis has been trying to present to the Mayor's Office and is considering other venues as well.

**Time 2:** Creative methods are needed to document the environmental changes brought about by these interventions and to communicate the results to a range of audiences. An innovative way to apply Photovoice as a qualitative evaluation method was created and piloted. This includes asking members of community collaboratives to participate in a second round of photographs and captions to document changes to their community environment and then to reflect on the potential impact of those changes and plan for future advocacy efforts.

We recruited participants from the original Photovoice project plus those most familiar with the accomplishments of the LiveWell Colorado DUG Initiative in an attempt to capture the changes that were created as a result of the funding. Once people were trained on the adapted method, they were again given cameras to take pictures that represent, this time, the community transformation. Participants wrote captions for their photographs using a revised set of questions: What has changed in your community as a result of the CHI? Why are these changes important to your community? What do we still need to do to create a HEAL community?

**Findings**

A total of 16, 4 youth and 12 adults, participated in the Photovoice project (summer 2010). Participants were asked to select the top five greatest accomplishments. These were:

- Increased access to healthy food, including neighborhood and school gardens and farmers’ markets
- Nutrition education
Leadership development
Zoning changes for urban agriculture
Community building including diversity and neighborhood safety

These photos are examples from the community’s perspective of the greatest impact of the Initiative.

DUG worked with the city and county of Denver to change zoning codes. Community gardens are now a “use by right” for their
strengthen local food systems and increasing access to healthy, fresh foods.

Shannon Spurlock- DUG Community Initiatives Coordinator

Live Well Sponsored Fairview Youth Farmer’s Market In Action
The Fairview Youth Farmer’s Market in action! Youth are selling fresh produce harvested from the garden to their
community. They have colorful signs to appeal to passing potential customers, wanting the community to know that not
only are they selling fruits and vegetables, but that they are cheap and they accept food stamps creating the best access
to affordable healthy foods that the community has ever had.

Maureen Hearty-DUG Education Facilitator
Community Impact and Sustainability

For the LiveWell Colorado DUG Initiative to produce measurable community-level change in outcomes such as healthier eating and increased physical activity, the strategies must reach a substantial fraction of community residents in a strong enough way to achieve changes in behavior. New gardens created as part of the Initiative involved over 700 youth and adult gardeners on a regular basis. Over 800 people attended multi-session nutrition education programs and over 1,300 purchased fresh produce from farmers’ markets. It is uncertain how many people participated in more than one activity, but these numbers imply that approximately 20% of the population (2,800 out of 12,500) in the target neighborhoods are being reached by higher intensity programs that might be expected to produce measurable behavior change. In addition, close to 1,300 residents (10% of the population) have expanded access to fresh produce through container gardening and about 4,700 people (35% of the population) received donated fresh produce through the Grow-A-Row program and from other surplus sources of fresh produce through the Denver Public Schools and other outlets. HEAL guides were distributed to 1,500 people (10% of the population).

The substantial investment made in the LiveWell Colorado DUG Initiative will be repaid over time if a majority of the activities are sustained and an expanding number of residents participate in the gardens and the educational programs. Using sustainable strategies was a conscious part of the LiveWell Colorado DUG Initiative since the outset. Sustainability is being achieved in four ways: 1) through DUG building its own organizational capacity to do regional-level policy change around sustainable agriculture and food systems; 2) building expertise to provide technical assistance to similar initiatives across the nation; 3) by investing in permanent community infrastructure like gardens on public property; and 4) by creating coalitions with other community-based organizations and residents to manage community gardens and offer programs over time.

IV. Results — Strategy and Population Level Change

The ultimate goal of the LiveWell Colorado DUG Initiative is to produce "population-level change." That is, a "representative" (randomly sampled) community resident could be expected to be eating more fresh produce and becoming more physically active as a result of the Initiative. Population-level
change is being tracked for adults using an automated telephone survey and, for youth, using a school-based survey. Strategy-level change is also being tracked using various evaluation methods to capture results from key strategies to complement and inform the population-level measures.

**Strategy-Level Results**

Strategy-level evaluations help us understand the impacts of promising high dose strategies in more detail. DUG partnered with Jill Litt, School of Public Health at the University of Colorado Denver. A series of surveys and tracking of the LiveWell Colorado DUG Initiative garden production and market sales were conducted. Here are some highlights of their findings:

In 2009, 201 customers attended the Fairview Youth Market and purchased over 1400 pounds of food. About 500 pounds of this food came from the garden itself. The market offered Electronic Benefit Transfer (EBT) and 24 transactions took place over the summer. Most (69%) of the market customers reported growing food elsewhere in the community, and of those who did not, 75% were interested in growing food at home or in the community.

In 2010, the Fairview garden harvested 170 lbs to sell at the market. Another 55 lbs was harvested and sold to the school cafeteria salad bar. The market sold a total of 1124 lbs fresh produce. In the 11th week, the market profit was $351.30 ($117.75 from food stamps). Profits were comparable to the previous year.

In the spring and fall of 2010, a web-based survey of about 100 gardeners throughout Denver, not just in the LiveWell Colorado DUG Initiative, did find that new gardeners increased their average intake of fruits and vegetables by a little over half a serving a day by the end of the growing season.³

**Population-Level Results**

Population-level surveys of youth and adults were conducted to see if there were broad-based improvements in food and physical activity behavior outcomes. Given the LiveWell Colorado DUG Initiative focus on gardens and the limited reach of their more intensive activities, however, we did not expect to see widespread changes in population measures. Detailed results are shown below, and did not show many significant changes to date.

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Surveying Adults — Interactive Voice Response

Interactive Voice Response or IVR is an automated approach to phone surveying. In IVR surveys, a recorded voice programmed by computer asks the questions rather than a live person. Names and phone numbers are obtained from a commercial list company for everyone with a listed phone number and address. Unlisted numbers and cell phones are not called. Community members whose numbers have been selected are notified in advance via postcard that they have been selected and that they may opt out by calling a number on the postcard. As an incentive to complete the survey, they are also eligible to be entered into a drawing for a prize.

The main advantage of IVR surveys is that they are much less expensive than other evaluation strategies—once the programming is done a whole list of people can be called at virtually no cost. The method also provides an opportunity to get community-specific, micro-level data and track it over time, and to customize the survey to include the community’s own questions. The main disadvantage is that people are much less likely to respond to these types of recorded surveys than to a live person. The lower response rates (approximately 15% of those eligible to be interviewed) mean that the people surveyed may be less representative of the entire community.

Table 2 shows results collected each year between 2006 and 2008 in the LiveWell Colorado DUG Initiative neighborhoods. The survey was not conducted in 2009 and 2010 because the number of responses from previous years was small. About half of the respondents reported eating five fruits and vegetables per day and exercising the recommended amount in 2006 and these percentages declined somewhat in the next two years. However, none of the changes over time shown in the table exceeded the statistical margin of error (i.e., they should be interpreted as not changing).
Table 2. IVR survey responses: diet, physical activity, overweight

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total N (any responses)</strong></td>
<td>165</td>
<td>113</td>
<td>165</td>
</tr>
<tr>
<td><strong>Diet/Nutrition</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eat 5+ fruits and vegetables/day</td>
<td>50%</td>
<td>44%</td>
<td>39%</td>
</tr>
<tr>
<td>Mean number of F&amp;V</td>
<td>4.4</td>
<td>4.4</td>
<td>4.3</td>
</tr>
<tr>
<td><strong>Physical Activity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommended level *</td>
<td>50%</td>
<td>54%</td>
<td>47%</td>
</tr>
<tr>
<td>Some activity</td>
<td>38%</td>
<td>37%</td>
<td>42%</td>
</tr>
<tr>
<td>No activity</td>
<td>12%</td>
<td>9%</td>
<td>11%</td>
</tr>
<tr>
<td><strong>Body Mass Index (BMI)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal weight (&lt;25)</td>
<td>49%</td>
<td>45%</td>
<td>49%</td>
</tr>
<tr>
<td>Overweight (25-30)</td>
<td>24%</td>
<td>35%</td>
<td>27%</td>
</tr>
<tr>
<td>Obese (30+)</td>
<td>27%</td>
<td>20%</td>
<td>24%</td>
</tr>
</tbody>
</table>

Notes: ** Recommended level is moderate exercise 5/week, 30 minutes/occasion OR vigorous exercise 3 days/week, 20 minutes/occasion.
Surveying Youth — School Surveys

Youth HEAL behaviors were measured using a self-administered survey conducted in the 7th and 9th grades at middle and high schools. Surveys for these ages were used because older students are better able to complete questionnaires about eating and physical activity behaviors than younger children.

Baseline surveys were conducted in January and February, 2008, early in the implementation of the LiveWell Colorado DUG Initiative strategies. Follow-up surveys were conducted in April, 2010. However, by the end of the LiveWell Colorado DUG Initiative, most of the school strategies were successfully implemented in elementary schools, not middle and high school settings. Therefore, the survey results shown in Table 3 are trends in HEAL behaviors among youth attending schools in the neighborhood, but do not reflect exposure to specific school strategies carried out by the LiveWell Colorado DUG Initiative. Results do illustrate some positive trends among youth in the neighborhood and can be used to target future strategies in areas needing improvement.

Table 3 gives examples of questions asked on the survey along with baseline and follow-up results from two schools (one middle school and one high school). Less than half of the students reported exercising vigorously for 20 minutes or more (44% of 7th graders and 47% of 9th graders), and very few students (28% of 7th graders and 23% of 9th graders) reported walking or biking to school. These responses were consistent at baseline and follow-up. However, a positive trend is that 79% of 9th graders reported at follow-up that there are safe places to walk or ride a bike in their neighborhood, compared to 67% of 9th graders surveyed at baseline.

Less than a third of students reporting eating five or more servings of fruits and vegetables (29% of 7th graders and 27% of 9th graders), which remained consistent from baseline to follow-up. There was a large drop in both salad and baked chip consumption from baseline to follow-up (for example, those reporting salad consumption dropped from 91% to 18% among 7th graders, and 89% to 15% among 9th graders). Perceptions about the health and taste of school lunch remained consistently low (less than half of the students thought they were healthy or taste good), although more 9th graders thought the school vending/store foods were healthy (22% at baseline versus 44% at follow-up). These eating behavior trends may be reflective of middle and high school or school district-wide practices or policy changes that took place between 2008 and 2010, separate from the work LiveWell Colorado DUG Initiative.
Table 3. School survey baseline and follow-up: diet & physical activity

<table>
<thead>
<tr>
<th></th>
<th>7th Graders</th>
<th></th>
<th>9th Graders</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2008</td>
<td>2010</td>
<td>2008</td>
<td>2010</td>
</tr>
<tr>
<td><strong>Total N (any responses)</strong></td>
<td>152</td>
<td>120</td>
<td>124</td>
<td>119</td>
</tr>
<tr>
<td><strong>Perceptions about Neighborhood</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It is easy to find a place to buy fruits and vegetables</td>
<td>64%</td>
<td>59%</td>
<td>65%</td>
<td>66%</td>
</tr>
<tr>
<td>It is easy to find a place to buy candy, soda, sweets</td>
<td>84%</td>
<td>84%</td>
<td>89%</td>
<td>83%</td>
</tr>
<tr>
<td>I feel safe outdoors in my neighborhood</td>
<td>71%</td>
<td>76%</td>
<td>61%</td>
<td>72%</td>
</tr>
<tr>
<td>There are safe places to walk or ride a bike</td>
<td>73%</td>
<td>78%</td>
<td>67%</td>
<td>79%*</td>
</tr>
<tr>
<td>I like to go to places in neighborhood to do physical activity</td>
<td>58%</td>
<td>49%*</td>
<td>50%</td>
<td>51%</td>
</tr>
<tr>
<td><strong>Perceptions about School</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School lunch is healthy</td>
<td>47%</td>
<td>43%</td>
<td>41%</td>
<td>51%</td>
</tr>
<tr>
<td>School lunch tastes good</td>
<td>33%</td>
<td>43%</td>
<td>41%</td>
<td>44%</td>
</tr>
<tr>
<td>Foods sold in school vending/stores are healthy</td>
<td>28%</td>
<td>23%</td>
<td>22%</td>
<td>44%*</td>
</tr>
<tr>
<td>I am given candy/sweets few times a year or more</td>
<td>76%</td>
<td>93%*</td>
<td>73%</td>
<td>77%</td>
</tr>
<tr>
<td>I take PE year round</td>
<td>30%</td>
<td>40%</td>
<td>31%</td>
<td>20%</td>
</tr>
<tr>
<td>I learned about healthy food in a class</td>
<td>13%</td>
<td>18%</td>
<td>28%</td>
<td>15%*</td>
</tr>
<tr>
<td><strong>Eating Behaviors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ate 5 servings of fruits and vegetables yesterday</td>
<td>30%</td>
<td>29%</td>
<td>30%</td>
<td>27%</td>
</tr>
<tr>
<td>Ate salad yesterday at home or school</td>
<td>91%</td>
<td>18%*</td>
<td>89%</td>
<td>15%*</td>
</tr>
<tr>
<td>Ate baked chips yesterday at home or school</td>
<td>90%</td>
<td>31%*</td>
<td>89%</td>
<td>35%*</td>
</tr>
<tr>
<td>Ate fast food 2 or more times in last 7 days</td>
<td>42%</td>
<td>45%</td>
<td>52%</td>
<td>38%*</td>
</tr>
<tr>
<td>Ate candy or sweets yesterday any place</td>
<td>100%</td>
<td>83%*</td>
<td>100%</td>
<td>89%*</td>
</tr>
<tr>
<td><strong>Activity Behaviors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I walked or biked to/from school yesterday</td>
<td>37%</td>
<td>28%</td>
<td>20%</td>
<td>23%</td>
</tr>
<tr>
<td>I spent 20 min. or more doing vigorous activity yesterday</td>
<td>46%</td>
<td>44%</td>
<td>49%</td>
<td>47%</td>
</tr>
<tr>
<td>I was physically active at a park or field outside school in the last 7 days</td>
<td>71%</td>
<td>79%</td>
<td>55%</td>
<td>78%*</td>
</tr>
<tr>
<td>I watched programs on a TV or computer for 2 or more hours yesterday</td>
<td>33%</td>
<td>30%</td>
<td>31%</td>
<td>34%</td>
</tr>
</tbody>
</table>

* Difference between baseline and follow-up response = p<.05.
V. Challenges, Lessons Learned

Challenges arose in the process of implementing the LiveWell Colorado DUG Initiative and the lessons learned in responding to these challenges may be useful for other communities undertaking similar initiatives. In some cases, strategies were dropped when the challenges were insurmountable. Information about challenges came both from interviews with partnership members and from DUG staff, who described overall challenges and lessons learned from implemented strategies and from the results of the evaluation.

Youth Mobile Market. The LiveWell Colorado DUG Initiative operated a mobile produce market at two worksites during the farmers’ market season, which also trained young entrepreneurs in business and bicycle skills. The primary challenge was the price point of the produce. They found they had to mark up the price to cover wages for the manager and intern. There were also challenges with a limited capacity based on the number of bicycle trailers and weight capacity, produce sourcing, transportation and storage. This youth strategy proved unsustainable. However, DUG found that Derailer Bicycle Collective was interested in running mobile markets and they took it over in 2009.

Physical Activity. A challenge for the LiveWell Colorado DUG Initiative was implementing the "Active Living" part of HEAL, given their emphasis on gardens and healthy food access and education. The LiveWell Colorado DUG Initiative promoted physical activity in several ways: 1) through the physical activity of gardening itself; 2) by creating a youth mobile market using bikes and installing bike racks at gardens; and 3) by promoting physical activity resources in the community (e.g., yoga and dance classes).

Fresh Produce Storage. A significant barrier to fresh produce distribution was the lack of centrally located storage space for the abundant fresh produce available during the growing season. This barrier was overcome by obtaining a refrigerated storage unit and securing a location to house it. Now multiple organizations are benefitting from the refrigeration unit and surplus produce from the gardens can go to schools, food pantries and senior centers.

Community Engagement. One ongoing challenge was retaining engagement with residents—from gathering resident input to recruiting volunteers and promoting events. Consistent outreach efforts and the development of resident leaders for the gardens helped maintain involvement among residents.

Promotional Venue. Finding a way to promote healthy eating and physical activity opportunities was a challenge. One initial strategy to overcome this barrier was to install permanent, large marquees dedicated to HEAL messages.
throughout the neighborhood. However, this proved to be cost prohibitive and there were significant barriers to overcome with the Historic Commission. As a result, this strategy was dropped.

**Corner Markets.** Several corner markets were approached in an attempt to increase healthy food offerings in these small markets. However, the markets were not willing to invest in the food changes and the partner organization leading the effort went out of business.

**Time and Resources.** Residents faced multiple life challenges and had a hard time consistently coming to meetings and staying involved. Toward the end of the Initiative, interview respondents mentioned other barriers such as the time it takes to develop partnerships, building partnership capacity to sustain the work, and the time and resources it takes to develop a fully functioning community garden.

**Communication Challenges.** Due to the multi-cultural make-up of the neighborhoods, language barriers were often a challenge. This challenge was addressed by using more informal means such as word-of-mouth versus conventional means such as written flyers or other media outlets that are not relied upon as often.

Overall, garden-centric initiatives such as the LiveWell Colorado DUG initiative have limitations. They require significant time and resources to install, manage, and eventually transfer to residents so they can be maintained. This can leave fewer resources to develop robust physical activity strategies that reached a large number of people in a lasting way. And the reach and strength of gardens to change eating behaviors year-round are limited because of the short growing season in a climate such as Denver, Colorado.
VI. Conclusions

The LiveWell Colorado DUG Initiative started with a few, largely unconnected community gardens, expanded to 11 gardens, and integrated them with other environmental and programmatic approaches to promote changes in the community food system. The LiveWell Colorado investment has been used to create new gardens and to provide the staff with resources to partner widely with other community-based organizations to create educational and other programs. The reach of 20% of the population by the higher intensity strategies, many of which are sustainable, could be expected to produce measurable behavior change over time.

One promising area for expanding reach in the future is policy advocacy through the coalitions formed by DUG. The DUG organization itself will be providing technical assistance to other LiveWell communities throughout the state of Colorado to continue this momentum.

The lasting success of the LiveWell Colorado DUG Initiative will depend on the ability of resident leadership to maintain the community gardens and the organizational partnerships after LiveWell Colorado funding ends. If the gardens and relationships are sustained, potentially more residents of these three communities will have the opportunity to eat healthier food grown in their own neighborhood.