

IMPACT STATEMENT

Until recently, young children and teens almost never got type 2 diabetes, which is why it used to be called adult-onset diabetes. Now, with over 193,000 children and adolescents diagnosed with type 2 diabetes, the increasing frequency of this disease in young people is a growing clinical and public health concern, a problem closely tied to inadequate fruit and vegetable consumption among children.¹ School gardens can help.

School gardens are a multi-faceted educational and experiential tool that show promise in reducing risk factors for type 2 diabetes. As children spend the majority of their day in a school setting, it is important to capitalize on the opportunity to build healthy habits from an early age. These effects have been recorded in several research papers; however, many studies present a similar long-term challenge: sustainability. Sage Garden Project aims to address sustainability issues by awarding schools funds to be used directly to pay educators to teach in the garden during the school day.

THE EVIDENCE SO FAR: IMPACTS OF SCHOOL GARDENS AND COOKING SKILLS ON STUDENT ACADEMIC, SOCIAL AND HEALTH OUTCOMES

Research has shown positive effects of school gardens on the knowledge, attitudes, and behaviors of students with respect to academic, social and health outcomes. For example, a literature review of 48 studies found positive impacts on academic outcomes with the highest positive impact for science followed



by math and language arts.² Other outcomes of school garden exposure were also observed such as increased social development by building student self-esteem and providing safe and peaceful spaces for students.² These results were con-

sistent across programs, student samples, and school types, and despite the different research methodologies used.

The health effects of school garden programming are diverse and include increased knowledge related to fruits and vegetables (F&V), increased food preferences for and willingness to try F&V, increased F&V consumption, increased dietary fiber intake and increased physical activity.^{3,4,5,6,7}

Researchers have also documented the evidence surrounding the relationship between cooking skills and a healthier dietary intake in both adults and children.^{8,9,10} Cooking behaviors in adolescents are associated with greater likelihood of meeting Healthy People 2010 dietary objectives and lower intake of fat, and higher intake of fruits, vegetables, fiber, folate, and vitamin A.^{8,11} Children's dietary habits are also particularly important because dietary patterns set in childhood often develop into lifelong eating habits.¹² In school aged children, participation in food preparation is related to greater self-efficacy for selecting healthy foods, stronger preferences for fruits and vegetables, and better overall diet quality.¹³



SAGE GARDEN PROJECT MODEL AND VISION

Sage Garden Project (SGP) programming is based on an ecological mindset, which explains individual behavior as the result of many levels of influence. (Fig 1) Sage Garden Project understands that in order to decrease the risk of type two diabetes and obesity in children, it is necessary to widen the focus of our efforts. Meaningful changes occur when sustainable school garden and cooking programs become part of the school's identity, when lessons and skills are brought back to families, when districts financially support these programs, and when the community comes together to enact policies that support SGP's vision.

Beginning at the individual level, SGP directly influences students' knowledge, attitudes, skills and behavior by providing **school day learning about and exposure to fruits and vegetables**. SGP educators often have classroom teachers with

them during garden and cooking lessons, thereby bringing concepts from the garden back to the classroom, strengthening and reinforcing knowledge and behavior. As student experiences in the garden increase, so does their exposure to new fruits and vegetables. Skills in cooking and growing are brought home to influence families, from what types of foods are bought to recipes made and meals eaten.

SGP supports school garden programs taught during the day, providing every student in the school an opportunity to learn in and from the garden. This enables a school-wide transformation which influences lunchtime behavior, school wellness policies and staff.

SGP provides up to three years of award money, with the opportunity to receive a period of subsequent sustaining funds. Schools with SGP support prove the value and concept of the

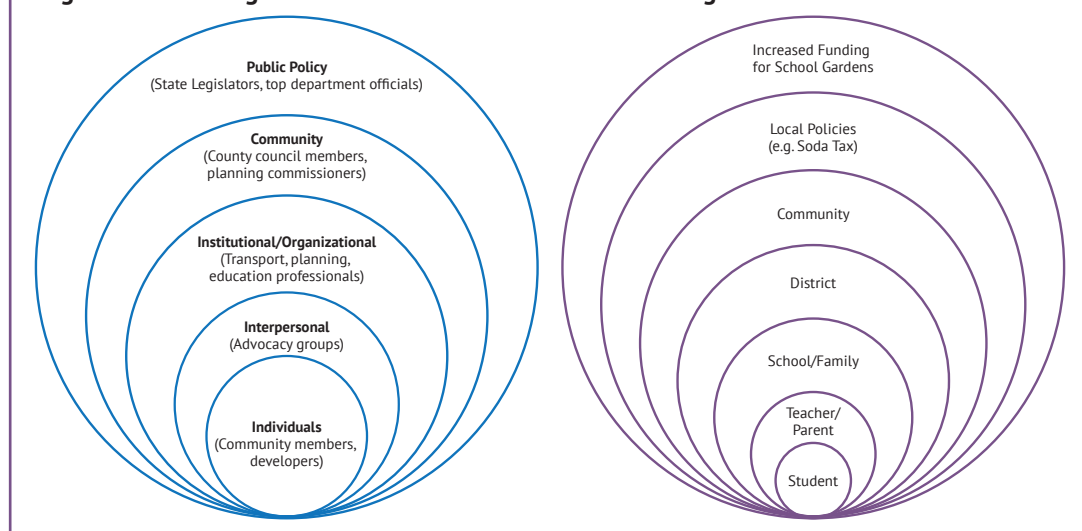
program and ask the district for financial sustainability. District support for school garden programming at all schools immensely increases the potential impact for behavior change.

Community members understand the value of these programs to their school aged children and support extends to activate communities to push for policies that will benefit the health of their people and environment. These policies include city taxes, whose funds directly support school garden education funding and have proved successful in the past (e.g. Berkeley's Soda Tax).

Research shows the positive impacts school gardens have on student health behaviors. When every child has

access to programs like those provided by Sage Garden Project, we take meaningful steps towards decreasing the incidence of type two diabetes.

Fig 1. Social Ecological Framework and SGP Model of Change



2019-2020 SAGE GARDEN ASSESSMENT

Sage Garden Project currently assesses each school we work with to measure the impact of our program on student health outcomes, such as willingness to try new fruits and vegetables. As previous research has observed, children who are more willing to try new fruits and vegetables learn to accept these foods and increase their intake of them over time.¹⁴ Increased fruit and vegetable intake is associated with numerous health benefits in children and adults, including lower risk for type 2 diabetes, and

the earlier these habits are formed, the more likely they are to remain into adulthood.¹⁵ Therefore, SGP uses willingness to try new fruits and vegetables as an appropriate and realistic indicator of future fruit and vegetable consumption.

The Sage Garden Project is currently coordinating with an impressive group of School Garden Support Organizations to create and implement a standardized evaluation tool to measure the impact of school gardens on various outcomes.

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