Growing connections: exploring hands-on garden programs as a tool for food education and community outreach

by

Madelynn Swaney

B.S., Missouri State University, 2018

A REPORT

submitted in partial fulfillment of the requirements for the degree

MASTER OF LANDSCAPE ARCHITECTURE

Department of Landscape Architecture and Regional & Community Planning
College of Architecture, Planning and Design

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2025

Approved by:

Major Professor
Lee R. Skabelund

Copyright

© Madelynn Swaney 2025.

Abstract

Many Americans are unaware of where their food comes from due to a significant disconnect between the broader population and their foodshed (Deelstra & Girardet 2017). This disconnect leads to uninformed adults and children not being able to identify the origins of food products (Newsela 2017). The rise of industrialized agriculture and the decline in the number of Americans involved in farming has contributed to a growing gap between people and the food production process. Most people rely on grocery stores for their food, and school curriculums often focus on what food *is* rather than *how* it is produced. Teaching students about food origins is essential, as it impacts eating decisions and habits which are formed in the early stages of development (Lineberger & Zajicek 2000; McAleese & Rankin 2007). Edible school garden programs offer hands-on opportunities to integrate food and nutrition education into schools, providing diverse and engaging learning experiences through gardening.

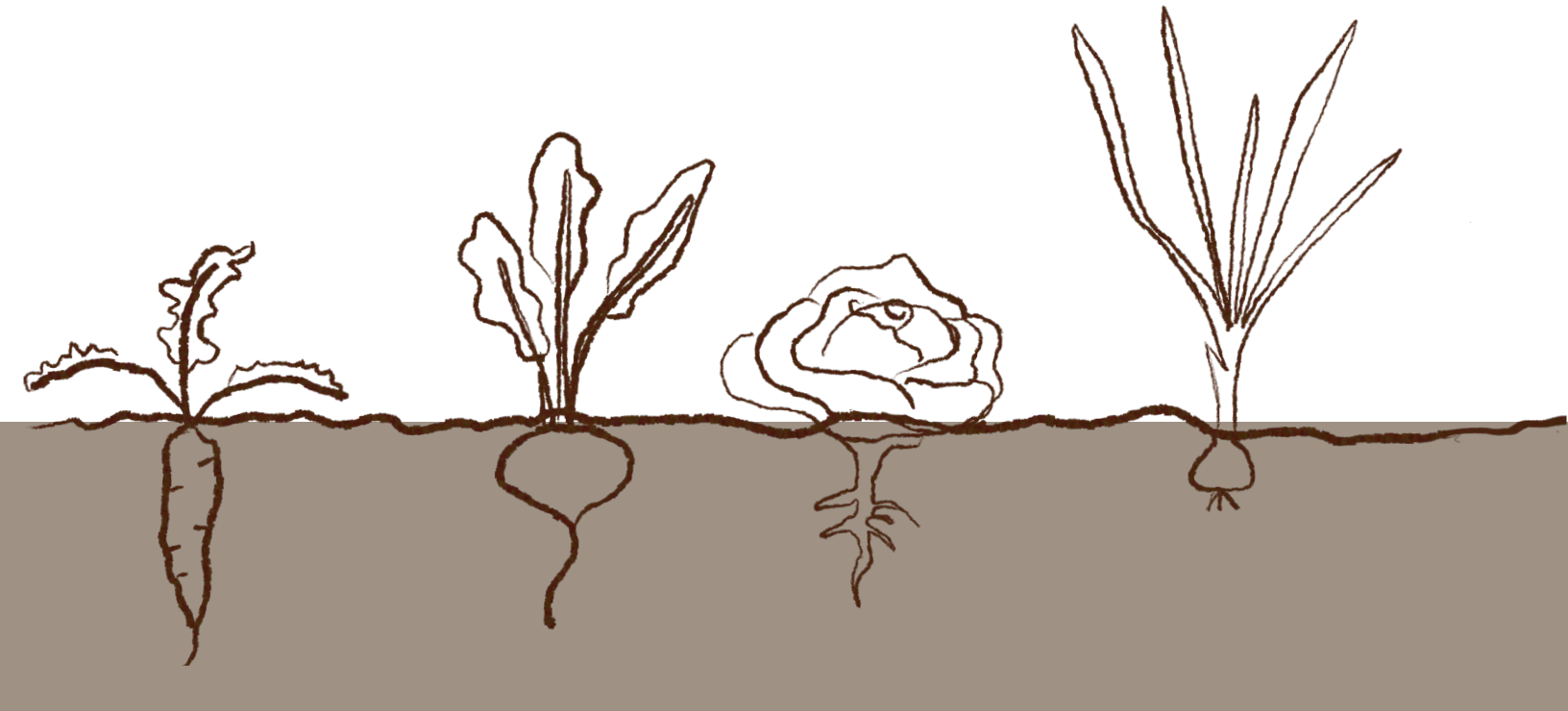
This report examines the benefits of garden programs for students's education, health, environmental stewardship, and academic performance. It reviews the literature on urban agriculture, edible school gardens, and various garden program models, including school gardens, university gardens, non-profit initiatives, and Indigenous food systems. To further understand these models, a selection of case studies will be analyzed. Through discussions with stakeholders, case study interviews, and site analysis, a projective design was developed to create a garden design and program for an Indigenous university. The findings inform both the design and development of a garden program, aiming to ensure that all members of the university can enjoy and benefit from the campus garden and greenhouse.

Growing Connections:

Exploring Hands-On Garden Programs as a Tool for Food Education and Community Outreach.

Madelynn Swaney

MASTERS PROJECT REPORT
LANDSCAPE ARCHITECTURE
SPRING 2025



Growing Connections:
Exploring Hands-On Garden Programs as a Tool for Food Education and Community Outreach.

A report submitted in partial fulfillment of the requirements for the degree: **Master of Landscape Architecture**

Department of Landscape Architecture and Regional & Community Planning

College of Architecture, Planning, and Design

Kansas State University

Major Professor: Lee R. Skabelund
Supervising Committee: Howard Hahn & Dr. Cary Rivard

© Madelynn Swaney 2025
Kansas State University, Manhattan, Kansas
All Rights Reserved

Copyright

© Madelynn Swaney 2025

LAND ACKNOWLEDGMENT

Indigenous Peoples have been the traditional stewards of the lands we live and work on for generations.

Kansas State University, located in Manhattan, Kansas, and Haskell Indian Nations University, located in Lawrence, Kansas, acknowledge that they reside on the ancestral and unceded lands of the Kaw people. Kansas has long been home to many Native Nations, including the Kaw, Osage, and Pawnee. Today, the state is home to four federally recognized tribes: the Prairie Band Potawatomi Nation, the Kickapoo Tribe of Kansas, the Iowa Tribe of Kansas and Nebraska, and the Sac and Fox Nation of Missouri in Kansas and Nebraska.

Many Indigenous Peoples once lived and thrived on the western prairie of Kansas but were forcibly removed through Indian removal policies and settler colonization. Recognizing these historical injustices is essential to fostering reconciliation and understanding.

Haskell Indian Nations University began as an Indian boarding school under the federal Indian Boarding School Policy of 1860, a system designed to strip Indigenous children of their languages and cultures in an effort to assimilate them into white society. Over its 140-year history, Haskell has transformed into a vital institution of higher education for Indigenous students. Now operating under the Bureau of Indian Education, Haskell provides a space for intertribal communities to pursue college degrees while supporting cultural traditions, innovation, career development, and personal growth.

As a non-Native student writing this report, my intention was to listen, learn, and amplify the voices of Indigenous Peoples in the context of land-based education, food education, and outreach. I approached this work with respect and humility, recognizing the deep knowledge and lived experiences of Indigenous communities. My goal has been to highlight their perspectives and efforts while acknowledging my position as a learner in this space.

ACKNOWLEDGMENTS

I would like to express my deepest gratitude to everyone who has supported me throughout this journey and during my time at Kansas State University.

Thank you to my major professor, Lee R. Skabelund, and my committee members, Howard Hahn and Dr. Cary Rivard, for your invaluable guidance and support. I appreciate the time you dedicated to meeting with me, coordinating discussions, and reviewing my work. Your mentorship has been instrumental in shaping this project.

I am also grateful to the K-State's Horticulture, Campus Planning, and Landscape Architecture department faculty for their insightful feedback on design revisions and programming.

A special thank you to the faculty, staff, and students at Haskell Indian Nations University for welcoming me into this project and supporting my efforts, especially during a time of hardship and uncertainty.

To everyone who took the time to answer my emails and share their program initiatives, thank you. Your dedication to increasing food education and addressing food insecurity is truly inspiring. I hope this work helps raise awareness of your incredible efforts.

Thank you to my studio-mates for your unwavering support, encouragement, and laughter. You have made this experience more meaningful in ways that go far beyond project work, and I am excited to see the impact you will make in the world.

Finally, to my loving husband and family—thank you for your unwavering support. You stood by me through every step of this journey, even when it meant uprooting our lives, relocating, and putting things on hold while I pursued a new career path. I am deeply grateful to have such a strong, caring, and supportive family. Your love and encouragement have shaped who I am and made this achievement possible.

LIST OF FIGURES

01 Introduction

Figure 1.1 Methodology Diagram
Figure 1.2 MPR Timeline

02 Background

Figure 2.1 Literature Review Map
Figure 2.2 Phytoremediation Diagram
Figure 2.3 Benefits of Urban Agriculture Diagram
Figure 2.4 Students Engaging in Physical Activity Through Gardening
Figure 2.5 School Garden Collage
Figure 2.6 University Garden Collage
Figure 2.7 Non-Profit Garden Collage
Figure 2.8 Indigenous Food System Collage

03 Methodology

Figure 3.1 Methodology Diagram
Figure 3.2 Shawnee Mission School District Collage
Figure 3.3 Toronto Metro University Rooftop Garden Collage
Figure 3.4 Tucson Village Farm Collage
Figure 3.5 National Farm to School Native Communities Collage
Figure 3.6 Indigenous Farm Hub Collage

04 Analysis

Figure 4.1 Methodology Diagram
Figure 4.2 Interviewee Background Table
Figure 4.3 Garden & Farm Operations Comparative Matrix Chart
Figure 4.4 School Engagement Strategies Comparative Matrix Chart
Figure 4.5 Challenges Faced Comparative Matrix Chart
Figure 4.6 Funding Resources Comparative Matrix Chart
Figure 4.7 Key Takeaways Chart

05 Design

Figure 5.1 Map of Lawrence, KS
Figure 5.2 Floodplain Map
Figure 5.3 Surrounding Land Use Map
Figure 5.4 Haskell University Building Context Map
Figure 5.5 Site Map of Existing Conditions
Figure 5.6 Project Site Visit Map
Figure 5.7 Drain Cover
Figure 5.8 Inside of Drain Cover
Figure 5.9 Drain Outlet
Figure 5.10 Haskell University Sign
Figure 5.11 Project Site South View
Figure 5.12 Project Site East View
Figure 5.13 Constraints Map
Figure 5.14 Opportunities Map
Figure 5.15 Design Iterations
Figure 5.16 Site Plan

Figure 5.17 Drainage Strategy
Figure 5.18 Programming Diagram
Figure 5.19 Site Plan Perspective Key
Figure 5.20 Main Entrance Perspective
Figure 5.21 Outdoor Classroom Perspective
Figure 5.22 Winona Walkway Perspective
Figure 5.23 Site Plan Section Key
Figure 5.24 Section A
Figure 5.25 Birdseye View
Figure 5.26 Section B

06 Recommendations

Figure 6.1 Lawrence Non-Profit Map
Figure 6.2 Kansas City Metro Non-Profit Map
Figure 6.3 Local Farms & Gardens in Lawrence, KS

TABLE OF CONTENTS

01. INTRODUCTION 3

02. BACKGROUND.....15

03. METHODOLOGY 45

04. ANALYSIS 73

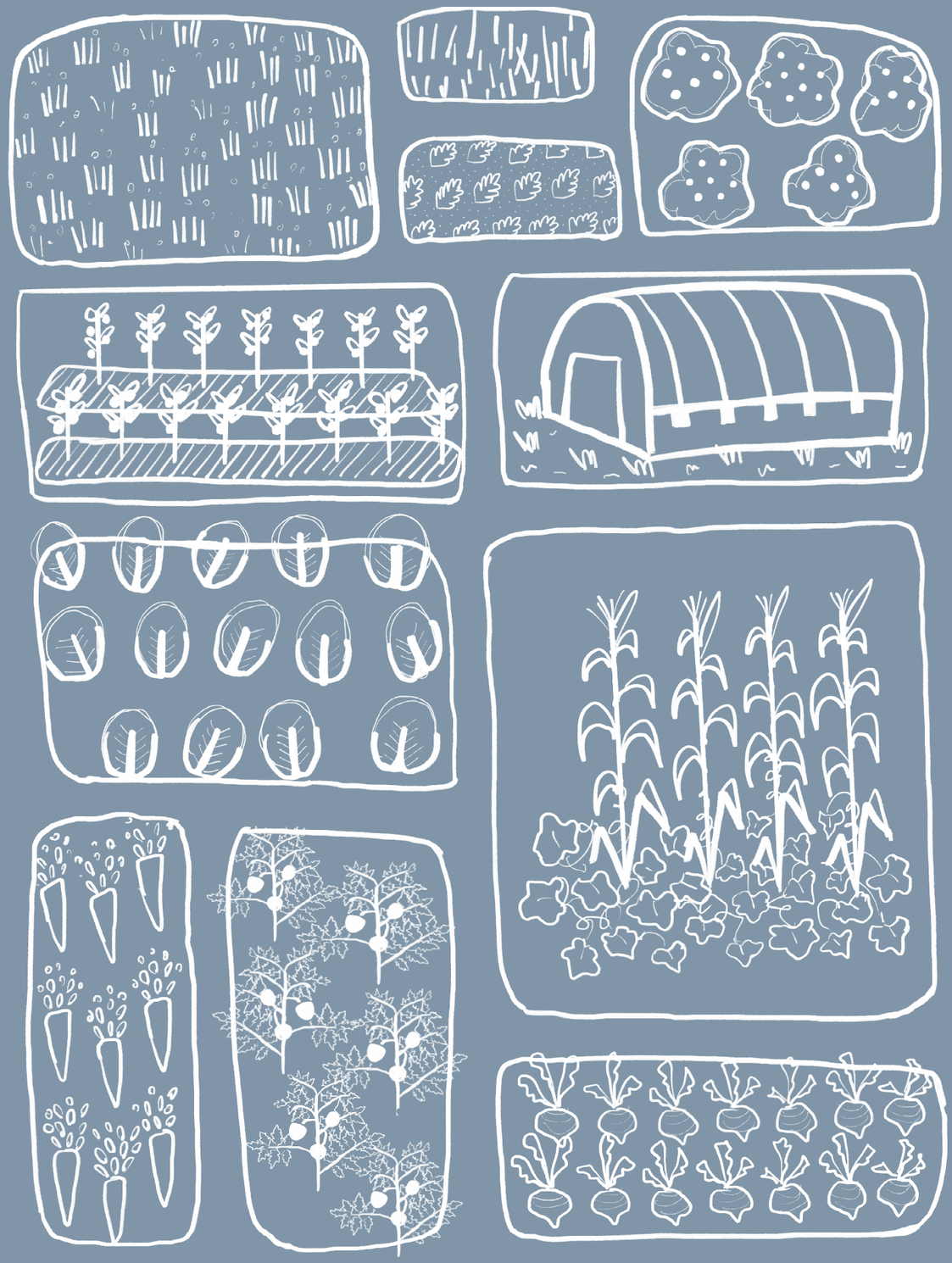
05. PROJECTIVE DESIGN 87

06. RECOMMENDATIONS 105

07. CONCLUSION 137

08. REFERENCES 143

09.APPENDICES.....155



01. INTRODUCTION

ABSTRACT

Many Americans are unaware of where their food comes from due to a significant disconnect between the broader population and their foodshed (Deelstra & Girardet 2017). This disconnect leads to uninformed adults and children not being able to identify the origins of food products (Newsela 2017). The rise of industrialized agriculture and the decline in the number of Americans involved in farming has contributed to a growing gap between people and the food production process. Most people rely on grocery stores for their food, and school curriculums often focus on what food *is* rather than *how* it is produced. Teaching students about food origins is essential, as it impacts eating decisions and habits which are formed in the early stages of development (Lineberger & Zajicek 2000; McAleese & Rankin 2007). Edible school garden programs offer hands-on opportunities to integrate food and nutrition education into schools, providing diverse and engaging learning experiences through gardening.

This report examines the benefits of garden programs for student's education, health, environmental stewardship, and academic performance. It reviews the literature on urban agriculture, edible school gardens, and various garden program models, including school gardens, university gardens, non-profit initiatives, and Indigenous food systems. To further understand these models, a selection of case studies will be analyzed. Through discussions with stakeholders, case study interviews, and site analysis, a projective design was developed to create a garden design and program for an Indigenous university. The findings inform both the design and development of a garden program, aiming to ensure that all members of the university can enjoy and benefit from the campus garden and greenhouse.

CENTRAL DILEMMA

Many Americans don't know where their food comes from or how food is being produced (Newsela 2017; McAleese & Rankin 2007).

IMPORTANCE

Students' education and experience with food have a direct impact on their eating habits and decisions. These eating behaviors are established while they are young and continue into their adulthood (Lineberger & Zajicek 2000; McAleese & Rankin 2007). The food that students consume has a direct impact on their health and wellness, which ultimately impacts their development and academic performance. By providing education on food and nutrition through hands-on gardening activities, they develop a stronger relationship with fruits and vegetables, enhance their learning and academic skills, and build upon their knowledge of the environment.

Hands-on gardening teaches students:

- The food production process, from cultivation to its journey to grocery stores, schools, restaurants, and dinner tables.
- Exposure to various careers in agriculture and horticulture.
- Sustainable farming practices, including Traditional Ecological Knowledge (TEK) and Indigenous land management techniques.
- A deeper connection to nature through outdoor learning.
- Academic achievement, skill development, and enhanced creative thinking through experiential learning.
- Opportunities for community cohesion and education surrounding culturally significant foods, access to food, and resource sharing.

RESEARCH QUESTION

How do selected case study programs engage students in food education through garden-based learning and how can these approaches be adapted to support outreach and learning at an Indigenous university?

RESEARCH SUB-QUESTIONS

- How are existing garden programs engaging with schools to promote food education?
- How are students engaging in gardens? What activities are offered and are these activities integrated into lesson plans?
- How are various subjects and classroom curricula incorporated into garden-based learning programs?
- What outreach opportunities do garden programs create for schools and their surrounding communities?
- What strategies do existing programs have to ensure their program is sustainable and viable?
- What challenges do these garden programs face and how do they overcome them?
- In what ways do Indigenous-led garden programs differ from non-Indigenous garden programs?

PROJECT VISION & GOALS

This report aims to raise awareness about the importance of food education and the incorporation of agriculture and horticulture topics into classrooms. The goal is to provide schools with the tools and strategies to implement garden programs within their district, either through school gardens or partnerships with local farmers and farm-to-school organizations. These connections provide educational opportunities, advocate for sustainable careers, and promote sustainable and accessible food systems.

SIGNIFICANCE TO LANDSCAPE ARCHITECTURE

Landscape architecture is largely concerned with creating sustainable outdoor spaces that provide places for community engagement and education. Landscape architects are dedicated to promoting health and well-being, including access to nutritious food. By collaborating with diverse perspectives, landscape architects can help design and implement edible landscapes that promote sustainability and education.

METHODOLOGY

This research aims to inform a projective design that aligns with its findings. Case studies were selected to analyze various garden program models discussed in the literature review, including school gardens, university gardens, non-profit organizations, and Indigenous food systems. Interviews with case study representatives will provide a deeper insight into the networks, approaches, and strategies used to facilitate educational activities and sustain their programs.

The projective design focuses on developing a conceptual garden design for an Indigenous university in Kansas, promoting hands-on learning initiatives. It also integrates traditional land management techniques and cultural practices to strengthen connections between the garden and the community. Additionally, the final design features garden program recommendations shaped by the insights from the case study interviews and stakeholder discussions.

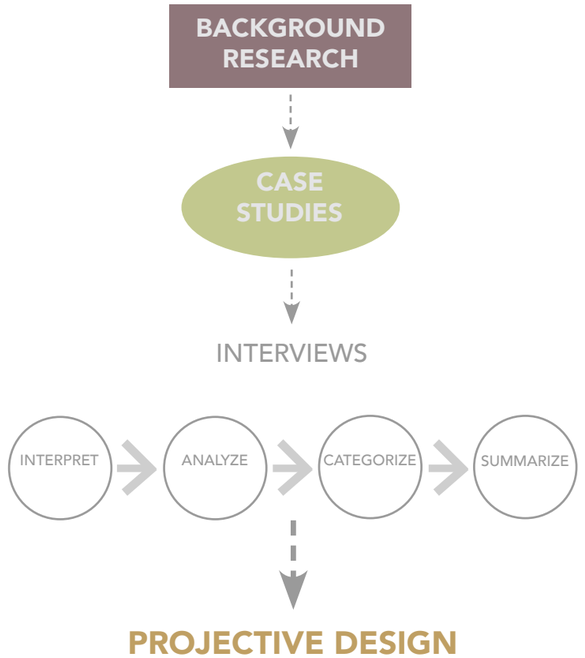


Figure 1.1 Methodology Diagram (Swaney 2025).

INTERVIEWS

Interviews were conducted to gain insights from professionals experienced in managing garden programs. Participants were selected based on their leadership roles within their respective programs, with at least one year of management experience and a comprehensive understanding of program operations. The chosen programs needed to include an educational component focused on engaging students within their community. The interviews provided valuable perspectives on how different program models engage students, carry out operations, establish partnerships, secure resources, and navigate challenges.

Approval from the Kansas State University IRB was obtained prior to conducting interviews. Interviewees were informed of the research objectives and provided with the interview questions in advance. While participants had the option to remain anonymous, none elected to do so. Most interviews were conducted via Microsoft Teams video calls and recorded to ensure accuracy, while one interview was a written response via email, and another was conducted via phone call.

Interview responses were analyzed by identifying reoccurring themes, patterns, and key points discussed amongst the collective group of interviewees. These themes, patterns, and key points were then interpreted and synthesized to answer the research question and to inform the projective garden program recommendations.

PROJECTIVE DESIGN

The projective design serves as a synthesis of the research findings, translating key insights from the literature review and case study interviews to inform the final design.

This project focuses on designing a campus garden for Haskell Indian Nations University, an Indigenous university in Lawrence, Kansas. I had the privilege of collaborating with Haskell's students, staff, and faculty to develop an inclusive and well-informed design for their campus. The garden is designed to create an inviting space for all university members, promote outdoor learning by integrating the garden into various academic programs, and incorporate traditional Indigenous land management practices. These sustainable practices, which Haskell already utilizes, enhance biodiversity, support habitat creation, and improve stormwater management through the use of native plant species.

In addition to the garden design, recommendations have been developed to assist Haskell University and other schools and universities in implementing hands-on garden programs. Informed by case study interviews and discussions with Haskell's community, this resource provides practical guidance for institutions and individuals seeking to establish their own hands-on garden programs.

BOOK ORGANIZATION

This report serves as a guide for educators and school administrators seeking to implement school garden programs at their institutions. It also offers valuable insights for planners, designers, horticulturalists, and individuals interested in food education and sustainable food systems.

The book's organization follows the standard order of chapters:

- Introduction: an overview of the book's content, research questions, and the importance of this research.
- Background: an in-depth review of relevant literature related to urban agriculture, edible gardens, and garden program typologies.
- Methodology: outlines the research methods used to address the research question, including:
    - Case Studies - examines selected garden programs for insights and best practices.
- Analysis: a synthesis of the research findings that guide the projective design.
- Projective Design: a conceptual garden and greenhouse design and garden program recommendations informed by the methods.
- Conclusion: a discussion of the overall research process and whether or not the findings answer the research question and the potential for future research.

KEY CONSIDERATIONS

A key consideration for this project is the capacity of schools to establish and maintain garden programs, as well as the level of interest and commitment from those who will lead these initiatives. School gardens require ongoing maintenance, whether managed by teachers, students, parents, volunteers, or through organization partnerships. These responsibilities can sometimes feel overwhelming, and garden upkeep may decline if a key leader leaves or relocates. However, opportunities exist to collaborate with external partners, such as community organizations or local farmers, to support maintenance efforts or provide off-site learning experiences that still offer the benefits of an on-campus garden program.

Another key consideration is securing funding for garden program implementation and long-term sustainability. Funding sources vary by case, and while this report provides recommendations for obtaining financial support, availability may fluctuate. While some programs can be designed to be self-sustaining, this is not always feasible. Garden program initiatives often begin as grassroots efforts, requiring creativity and problem-solving to maintain momentum and ensure long-term success.

PROJECT DEVELOPMENT

Throughout the proposal process in the fall semester, this project underwent several changes. Initially, it was developed in collaboration with K-State's Center for Childhood Development (CCD) to design a playground. However, due to the focus on food education through hands-on gardening, the project faced limitations related to the age groups involved. As a result, the scope shifted toward developing a digital resource hub intended to compile diverse online materials that support garden-based food education programs. This version of the project aimed to assist students, schools, and organizations pursuing similar goals.

A significant shift occurred when Dr. Cary Rivard connected me with Haskell Indian Nations University, who were in the early stages of planning a campus garden. Upon learning of my background in landscape architecture, Haskell University invited me to support the development of design concepts for the project. This opportunity allowed me to grow as a designer and provided valuable insight into Haskell's history and culture and an opportunity to explore Indigenous food systems and land management practices. While I contributed design plans and perspectives, I recognize that Haskell University maintains full authority over all design elements and programming decisions to best reflect the needs and values of their community.

The overarching goal of this project became twofold: to support the garden design process at Haskell and to gather feedback through community engagement and selected case study interviews. These efforts aimed to provide informed recommendations to guide the implementation of a culturally responsive and educational garden program at the university.

TIMELINE

The following page presents a visual timeline outlining the process and key events involved in completing the Master's Project Report.

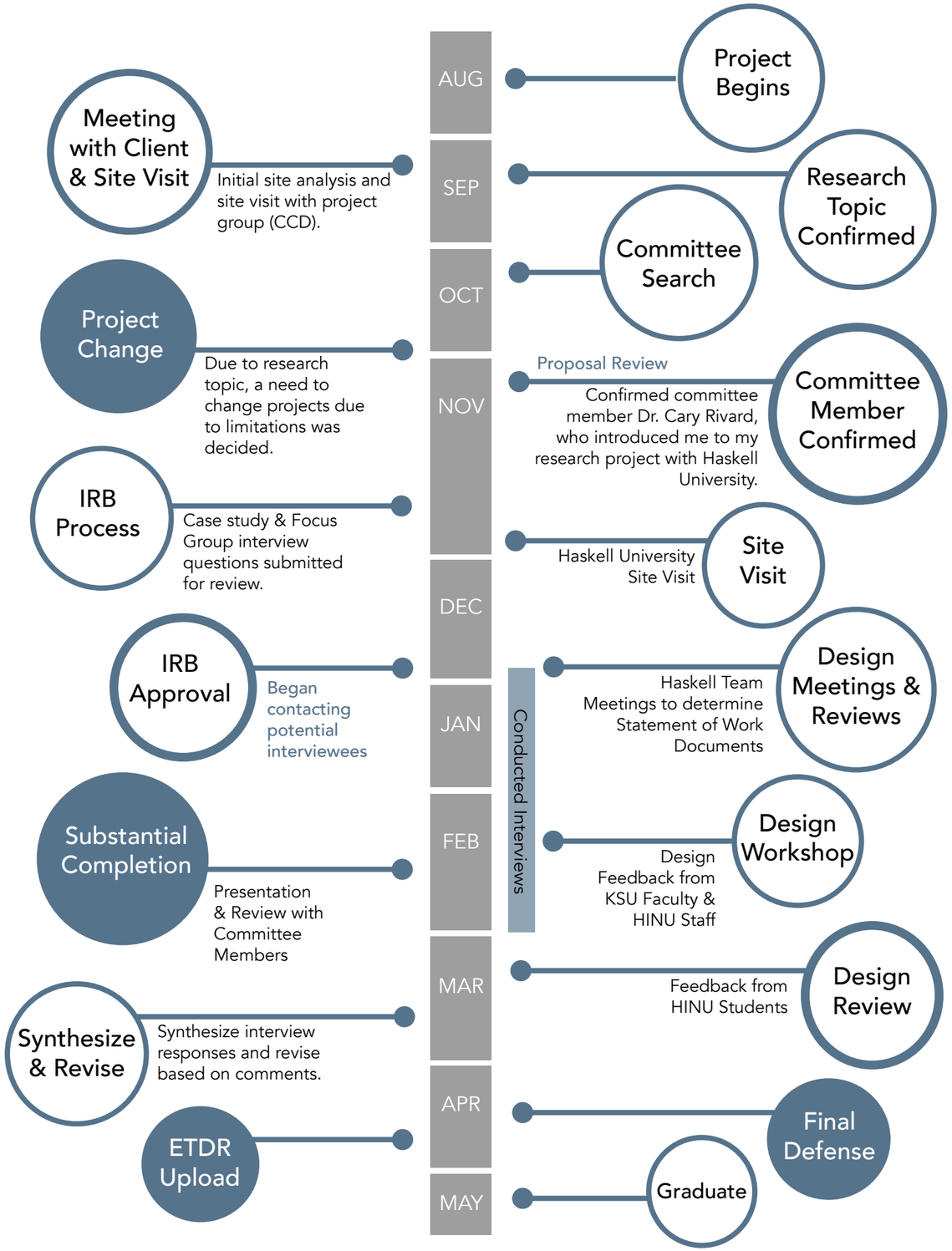
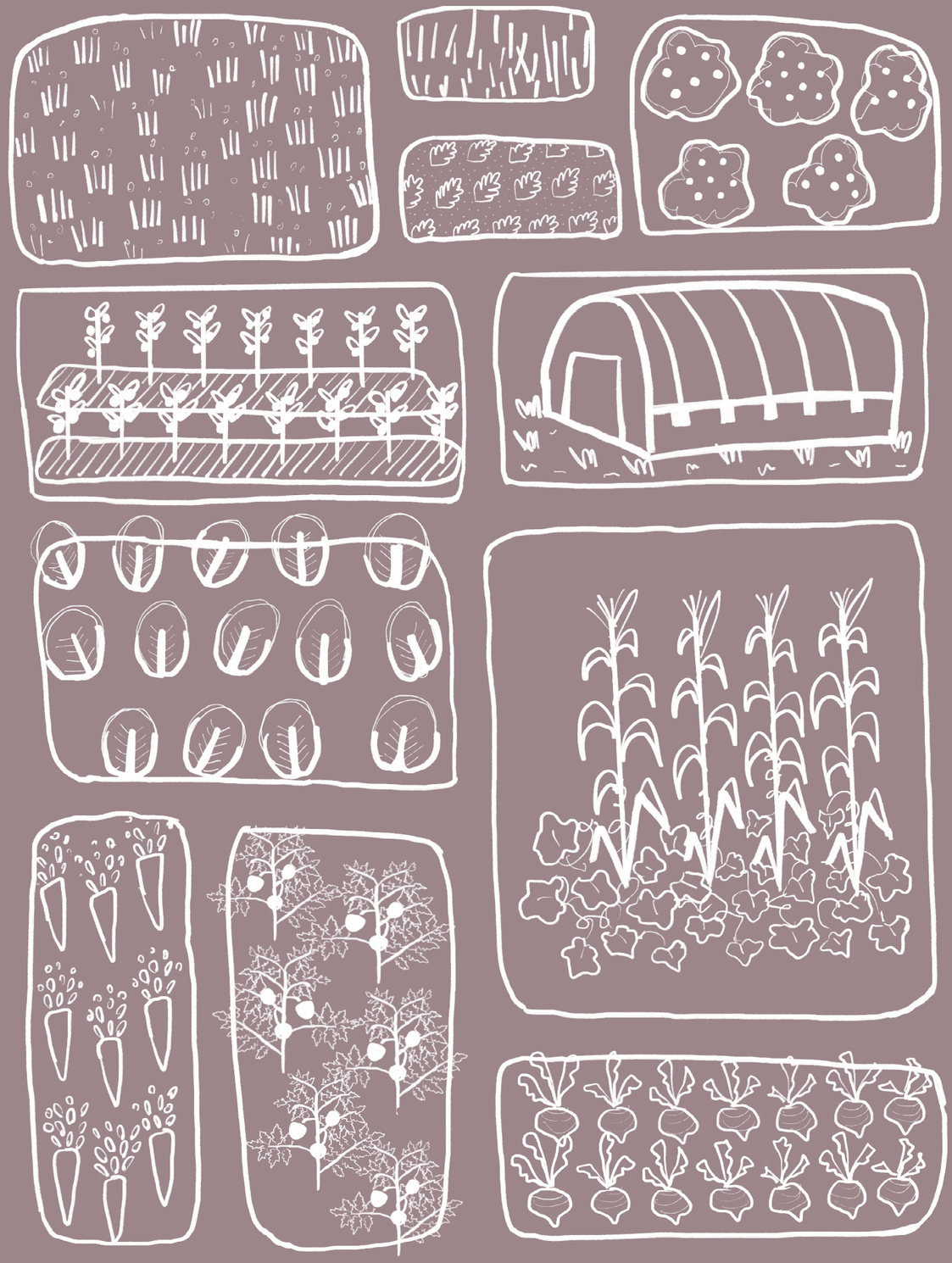


Figure 1.2 MPR Timeline (Swaney 2025).



02. BACKGROUND

This section comprises a literature review that explores the topics of urban agriculture and edible school gardens, focusing on their role in food education. It begins with an overview of urban agriculture, defining the concept and establishing its relevance to this report. The review then discusses edible school gardens, a form of urban agriculture that integrates hands-on learning experiences for students to build upon their food education. Research highlights many benefits of edible gardens, including improved food education and knowledge, enhanced health and wellness, stronger connections to nature, and positive impacts on academic performance. Lastly, this section examines various program model typologies of edible school gardens, providing essential background information that will guide the methodology of this project.

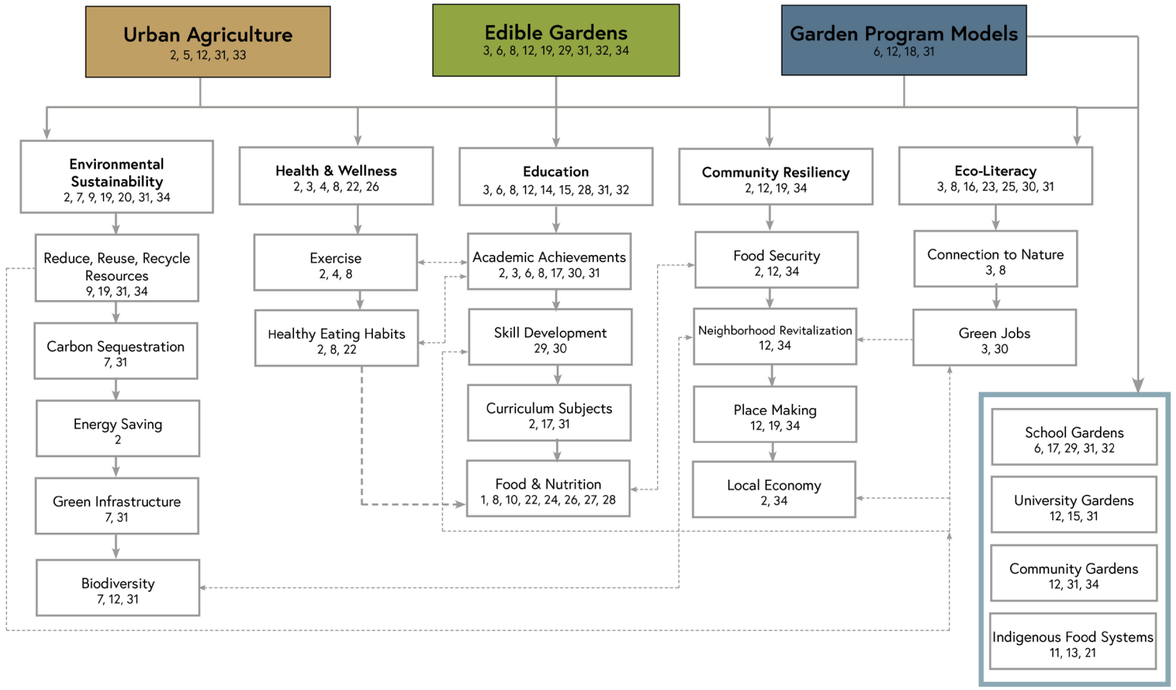


Figure 2.1 Literature Review Map (Swaney 2025)
The literature review map highlights the major topics explored in the review while also showing the important connections within sub-topics.

1. Berezowitz, Yoder, & Schoeller 2015
2. Brown & Carter 2003
3. Center for Ecoliteracy 2024
4. Centers for Disease Control and Prevention 2024
5. Danks 2010
6. Deelstra & Girardet 2017
7. DiClaudio, Hughes & Savoca 2013
8. Ecological Society of America 2000
9. Hahn, Gillogly & Bradford 2021
10. Havrelock & Kay 2023
11. Hodgson, Campbell & Bailkey 2011
12. Hoover & Mihesuah 2019
13. Kansas State Department of Education 2024
14. K-State Research and Extension 2024
15. Kimminau & Murphy 2006
16. Klemmer, Waliczek & Zajicek 2005
17. Kuhnlein, Erasmus & Spigelski 2009
18. Langemeyer et al. 2021
19. Lanza et al. 2021
20. Leach, Sabreena 2024
21. Lineberger & Zajicek 2000
22. Louv 2005
23. McAleese & Rankin 2007
24. McBride et al. 2013
25. Morgan et al. 2010
26. Morris & Zidenberg-Cherr 2002
27. Newsela 2017
28. Paul 2020
29. Pevec 2016
30. Philips 2013
31. Skelly & Bradley 2000
32. Slow Food Foundation 2024
33. Slow Living LDN 2023
34. Wise 2014

GLOSSARY

Community Gardens: "Derive from when a diverse group of people in a neighborhood comes together to raise food. Each person or family has a designated plot" (Philips 2013, 126).

Community Health: "The social and economic capacity of a community to create an environment that sustains the visions, goals, and needs of its residents" (Brown & Carter 2003, 7).

Community-Supported Agriculture (CSA): "A production and marketing model whereby consumers buy shares of a farm's harvest in advance. Consumers become CSA members by paying an agreed amount at the beginning of the growing season, either in one lump sum or installments" for the exchange of local, fresh produce often delivered weekly (NC State Extension n.d.)

Ecoliteracy: Ecological literacy and awareness means understanding the principles of ecosystems and how to apply those to build sustainable communities (McBride et al. 2013).

Edible School Gardens: "A variation of community gardens that are focused on combining education, stewardship, and nutrition. Different approaches include farm-to-table gardens, which offer a culinary twist, and a school lunch program, rooftops, and vertical walls offer schools more real estate to provide these urban Ag landscapes" (Philips 2013, 127).

Environmental Stewardship: "The responsibility for environmental quality shared by all those whose actions affect the environment" (EPA 2005, 2).

Foodshed: "An area that supplies a population center with food. Includes the land it is grown from, the routes traveled, the markets it is delivered through, and the table it ends up on. It can also be used to describe the global flow of food" (Philips 2013, 164).

Indigenous Food Sovereignty: "A re-connection to land-based food and political systems" in ways that uphold "sacred responsibilities to nurture relationships with our land, culture, spirituality and future generations" (Mihesuah & Hoover 2019, 11). Kinship is deemed to be important (Wildcat 2023). **Also defined as a framework that:** "Connects the health of food with the health of the land and identifies a history of social injustice as having radically reduced Indigenous food sovereignty in colonized nations" (Mihesuah & Hoover 2019, 11-12).

Nature Deficit Disorder: "The idea that human beings, especially youth, are spending less time outdoors than they have in the past, and the belief that this change results in a wide range of behavioral problems" (Louv 2005).

Traditional Ecological Practices (TEP): "The application of traditional ecological knowledge to maintain or enhance the abundance, diversity, and availability of natural resources or ecosystems" (Fowler & Lepofsky 2011, 286; referenced in Leach 2024).

Indigenous Food Systems: Indigenous food production processes and relationships that utilize Indigenous knowledge of the land and food resources (Kuhnlein, Erasmus & Spigelski 2009).

Urban Agriculture: "The growing, processing, and distribution of food and other products through intensive plant cultivation and animal husbandry in and around cities" (Brown & Carter 2003, 1).

INTRODUCTION

The Need for Food Education in Kansas Schools

The Kansas State Department of Education requires students to learn about food and nutrition through standardized lesson plans and curricula from preschool to 12th grade. However, these educational programs focus on *what* to eat rather than *how* food is grown and produced (Hahn, Gillogly, & Bradford 2021). Currently, schools in Kansas are not required to teach students about agriculture or horticulture—fields central to food production, processing, and distribution. Programs such as the School-Based Agricultural Education (SBAE) educate over 13,000 students about agricultural careers, food, fiber, and natural resource systems throughout Kansas (Kansas State Department of Education 2024). However, SBAE primarily targets older students, typically starting in sixth grade, leaving elementary students with minimal exposure. Coupled with a decrease in the number of Americans directly engaged in farming due to industrialization, this lack of agricultural education increasingly distances people from an understanding of their local foodshed, or the region where food is grown, produced, and consumed (Danks 2010; Hahn, Gillogly & Bradford 2021; Philips 2013).

The Problem

Studies indicate that many Americans lack awareness of food origins. According to a 2017 Innovation Center of US Dairy survey, 7% of American adults believed chocolate milk comes from brown cows (Newsela 2017). A separate study involving fourth to sixth graders in California found that 40% were unaware of the origins of hamburgers and couldn't recognize common vegetables like onions and lettuce as plants (Newsela 2017). The students could recall the names of vegetables and knew they were grown in gardens or farms, but they could not identify the origins of processed or packaged foods. A study done by Hahn, Gillogly & Bradford (2021) in the Southeastern region of the U.S. found similar results, with more than 40% of participants aged four to seven not being able to identify the origins of processed foods. While there is research that focuses on students' food preferences and nutrition education, there is little research on their education regarding food origin.

The Significance

This knowledge gap influences food choices and health-related decisions, ultimately affecting physical development, overall wellness, and long-term health outcomes (Lineberger & Zajicek 2000; McAleese & Rankin 2007). Research indicates that eating habits are formed during early childhood and continue to shape eating behaviors into adulthood (Morgan et al. 2010).

To address this gap, organizations such as the National Agriculture in the Classroom and the American Farm Bureau Foundation integrate agricultural education into schools (Newsela 2017). Urban agricultural practices, including school and community gardening programs, also serve as effective tools for enhancing food and nutrition education among both students and adults. Urban agriculture, which encompasses food production within urban and peri-urban settings (Philips 2013), provides hands-on learning opportunities that foster a deeper understanding of food systems. Additionally, incorporating Traditional Ecological Knowledge (TEK) reconnects communities with pre-colonial food practices, preserving cultural heritage while promoting sustainable food production and education.

URBAN AGRICULTURE

What is Urban Agriculture

Urban agriculture is the practice of growing, processing, and distributing food in or around urban and peri-urban cities (Brown & Carter 2003; Philips 2013). According to the Center for Sustainable Systems (2024), "83% of the U.S. population lives in urban areas. By 2050, 89% of the U.S. population and 68% of the world population is projected to live in urban areas." Despite this urban shift, most food consumed in cities is sourced from rural agricultural lands, with some imported internationally. Historically, however, this was not always the case. In colonial times, agriculture was crucial to urban economic growth (Hodgson, Campbell, & Bailkey 2011). As industrial-scale farming expanded during the 19th century, cities became less reliant on growing their own food, and zoning laws began excluding agriculture from urban land use, deeming it unnecessary. Today, the majority of people depend on grocery stores for their food, distancing them from the food production process. This disconnection contributes to a loss of knowledge about food systems and production.

Benefits of Urban Agriculture

Urban agriculture has gained traction, often through grassroots efforts to combat food insecurity during crises or to gain more control over food accessibility, affordability, and production practices. By utilizing urban spaces for food production, urban agriculture offers sustainable approaches that provide fresh food while also helping to mitigate climate change impacts. Moreover, it promotes community cohesion through revitalization, engagement, networking, and job creation. Urban agriculture also serves as a platform for education and outreach, with training and mentoring programs, school initiatives, and other resources that support agricultural knowledge and practices.

Environmental Sustainability

Urban agriculture does not inherently ensure sustainable food production. However, when combined with ecological approaches, it can contribute to sustainable practices (Philips 2013). By preserving green space, reducing resource consumption, implementing native and climate-adaptive species, and connecting to all cultural groups, urban agriculture offers environmental benefits to cities.

Soil Health

Urban agriculture can help revitalize soil health and reduce erosion through various techniques, including using cover crops and supplementing nutrients with composted materials (e.g. leaves, grass clippings, food scraps, and yard trimmings) (Langemeyer et al. 2021). Erosion prevention and soil health are improved through biological processes performed by plant roots. Roots help hold the soil in place during rain events and help make nutrients available for plants to absorb and grow. Soil can also store approximately twice as much carbon as the atmosphere (Philips 2013) through photosynthesis, which then gets broken down and stored as organic matter (Ecological Society of America 2000). Composting food waste is one strategy that enriches the soil composition while reducing landfill waste and greenhouse gas emissions (Langemeyer et al. 2021; Philips 2013; Wise 2014).

Water Quality

Healthy soil and diverse plant species with stabilizing roots can help reduce stormwater runoff and filter sediments and pollutants, improving the water quality of the local watershed (Deelstra & Girardet 2017; Philips 2013). As shown in Figure 2.2, phytoremediation is a biological process in which plants help remove contaminants from soil, water, and air. Urban agriculture relies on water for irrigation and food production. Water conservation is rooted in Traditional Ecological Practices (TEP), where Indigenous peoples have long employed sustainable techniques to preserve water resources (Ward's World n.d.).

Water can be conserved using native and climate-adaptive plant varieties. These species provide habitat and food resources for beneficial insects and pollinators necessary for productive edible landscapes (Deelstra & Girardet 2017; Philips 2013). Incorporating native plant species helps improve species preservation (Hodgson, Campbell & Bailkey 2011) while promoting transit corridors for a larger habitat network (Philips 2013). Other sustainable water management techniques include rainwater harvesting and drip irrigation, which further reduces irrigation demands (Langemeyer et al. 2021).

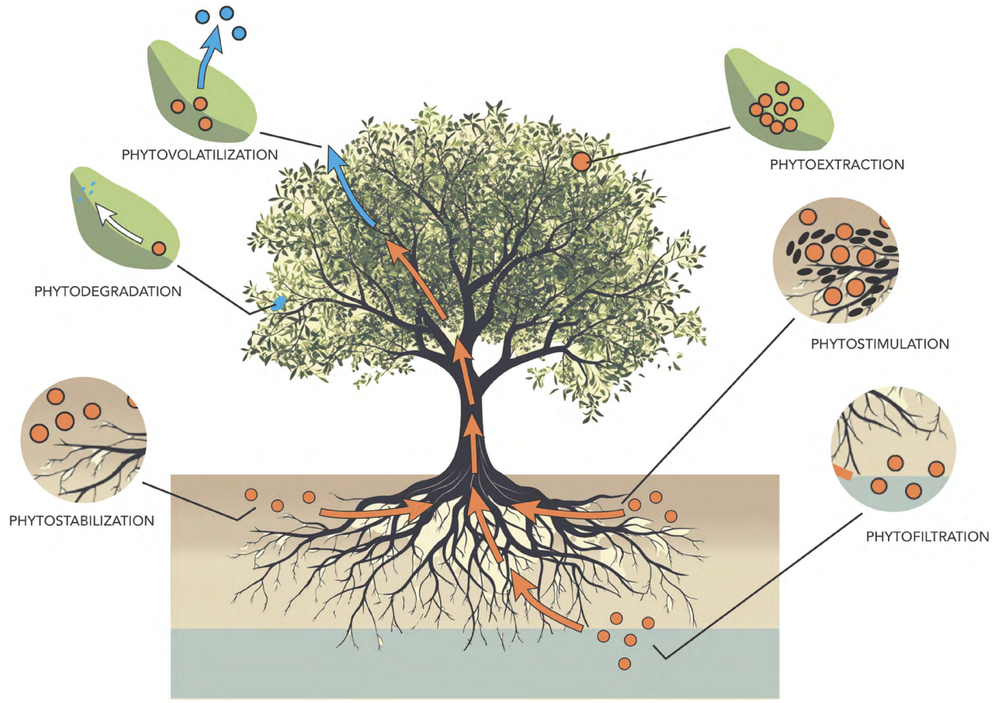


Figure 2.2 Phytoremediation Diagram (Swaney 2025)

This diagram shows the different plant biological processes that occur during phytoremediation which is a process that plants do to clean contaminants from the soil, water and air (Philips 2013).

Air Quality & Heat Island Effect

Urban agriculture also has the ability to lower air temperatures and increase air humidity to create a buffer against urban heat island effect (Langemeyer et al. 2021). Through the process of plant evapotranspiration, plants can create micro-climates and reduce air temperatures in cities (Lanza et al. 2021). Trees and more extensive vegetation contribute further by sequestering carbon and filtering pollutants from the air (Deelstra & Girardet 2017; Philips 2013). By reducing the need for long-distance transportation and refrigeration, local food production also lowers energy consumption and related costs (Brown & Carter 2003). Through ecological practices, urban agriculture integrates sustainable methods that help create healthier, safer, and more resilient cities.

Community Resiliency

Urban agriculture plays a critical role in strengthening communities by facilitating economic development, community revitalization, and social networks. Neighborhoods that take pride in community gardens enhance their surroundings and gain the capacity to grow and sell their own produce. This creates entrepreneurial opportunities for inner-city farmers markets for both small-scale commercial farmers and residents (Brown & Carter 2003). Community health— "a community's social and economic capacity to meet its residents' goals and needs" (Brown & Carter 2003, 7), improves with greater food security and better physical and mental health among residents. These factors, in turn, reduce crime rates, healthcare costs, and demand for city services.

In economically distressed neighborhoods experiencing decline, urban agriculture has emerged as a resilient and restorative strategy, often seen as a symbol of community recovery and renewal (Hodgson, Campbell, & Bailkey 2011). In cities facing disinvestment, urban agriculture transforms vacant lots into productive green spaces while addressing food insecurity (Brown & Carter 2003).

However, these efforts can also unintentionally contribute to racial inequality in historically marginalized Black and Brown communities (Hawes, Gounaridis, & Newell 2022). Urban gardening, while often well-intentioned, has been linked to gentrification and cultural appropriation. Research shows that even in areas without direct housing displacement, gardens can lead to white intrusion into BIPOC spaces and the co-opting of Black and Brown agricultural labor and traditions (Hawes, Gounaridis, & Newell 2022).

Despite these challenges, urban agriculture can also foster trust and cross-cultural connection through shared experience. By promoting social cohesion, it brings diverse groups together around common goals. Educational programs and mentorship in traditional ecological knowledge further bridge generational gaps and help preserve cultural heritage. In reinforcing these cultural and social ties, urban agriculture offers meaningful opportunities for community engagement, inviting people of different ages, backgrounds, and ethnicities to participate in environmental stewardship and build a stronger sense of place and identity (Langemeyer et al. 2021; Wise 2014).

Educational Pathways

Urban agriculture provides a strong framework for education on sustainability, health, food education, and ecology. Urban agriculture initiatives, such as edible school gardens, can help integrate food and garden-based education into school curricula and build strong networks within the community.

Outdoor classrooms and schoolyard gardens are ideal settings to teach a wide range of subjects and offer active, experiential learning opportunities that enhance students' academic performance (DiClaudio, Hughes, & Savoca 2013; Philips 2013). Academic subjects such as math, science, and language arts paired with real-world applications through garden activities make learning a more meaningful and memorable experience for students (Danks 2010; Philips 2013; Skelly & Bradley 2000).

Garden programs also connect schools with diverse professionals in their community. These range from chefs, farmers, horticulturalists, ecologists, artists, etc. These interactions support environmental education and stewardship through exposure to various careers, skill sets, learning styles, and perspectives (Center for Ecoliteracy 2024).

Ultimately, these programs cultivate more than just plants; they help students develop essential life skills like responsibility, teamwork, and empathy for nature and one another (Danks 2010; Skelly & Bradley 2000). By linking academic learning with practical skills and environmental stewardship, urban agriculture helps build healthier, more resilient communities.



Figure 2.3 Benefits of Urban Agriculture Diagram (Swaney 2025)

EDIBLE SCHOOL GARDENS

What are Edible School Gardens

Edible school gardens are a form of urban agriculture that combines components of education, environmental stewardship, and nutrition (Philips 2013). Programs like edible schoolyards or green schools promote the implementation of gardens at school sites to provide hands-on gardening activities for students to learn about food production (Center for Ecoliteracy 2024). Other programs such as farm-to-table and farm-to-school connect schools with local farmers to expose students to various agricultural practices and provide fresh, local, and culturally significant produce for cafeteria programs.

The Bureau of Indian Education (BIE) works with Indigenous communities to help implement school gardens and embrace Indigenous cultural teachings and practices while supporting hands-on learning experiences (Bureau of Indian Education 2024). The BIE helps schools integrate edible gardens into curricula to support interactive learning experiences and provide exposure to agriculture and food production industries.

These initiatives support nutritional education, provide hands-on learning, enhance cultural learning, and build partnerships with schools and community members. Community engagement is integral, involving families through events and classes, which fosters a deeper connection to food and agriculture (Wise 2014). School gardens can be cost-effective, interactive spaces that provide opportunities for students to connect classroom

subjects, such as math, science, art, and language, with garden activities for real-world applications. Edible gardens lend themselves to encourage students to explore nature, enhance developmental skills, and nurture environmental stewardship, preparing them for life after school (Danks 2010; Philips 2013; Skelly & Bradley 2000).

Food & Nutrition

The implementation of nutrition-based public health programs in U.S. schools is closely tied to developing school meal programs (Berezowitz, Yoder & Schoeller 2015). The National School Lunch Program (NSLP) was created in 1946 to combat nutritional deficiencies and encourage healthier eating habits among students. In 1975, the School Breakfast Program (SBP) was introduced with similar goals, focusing on providing nutritious meals to students, particularly those from low-income families. Since students spend a significant portion of their day in school, consuming one to two meals, schools offer an ideal environment for promoting healthy eating habits (Morgan et al. 2010). Additional programs, such as farm-to-school initiatives, have further contributed to this effort by increasing the availability of local fruits and vegetables in cafeterias and classrooms (Berezowitz, Yoder & Schoeller 2015).

Food Sovereignty

Indigenous communities have numerous motivations for pursuing food sovereignty and improved health, rooted in a complex interplay of social, political, cultural, economic, and environmental factors (Mihesuah & Hoover 2019). A key motivation is the desire to address the health disparities that stem from colonization, which disrupted access to traditional food systems such as hunting, fishing, and farming. Mihesuah and Hoover (2019) describe food sovereignty as "a necessary tool to solve existing health problems, as well as to promote better health in the future" (p. 62).

Due to historical land dispossession and forced assimilation, many Indigenous communities lost access to culturally significant and nutritious foods, resulting in reliance on government-issued commodities and processed foods high in fat and sugar (Mihesuah & Hoover 2019). This shift has contributed to widespread health challenges, including diabetes, heart disease, and other diet-related illnesses. In response, many Indigenous communities are initiating garden and food sovereignty projects to reclaim control over their food systems and improve community health outcomes.

Kenny Perkins (Mohawk) of Kanenhi:io, emphasizes that food sovereignty allows communities to take control of their nutrition, ensuring they know what goes into their bodies, make healthier choices, and pass on these values to future generations to promote long-term well-being (Mihesuah & Hoover 2019). Valerie Segrest (Muckleshoot) mentioned in an interview in 2014 that "the reason why we have a lot of diabetes and heart disease in our community is because we've been taken away from our traditional food system and have experienced the effects of a superimposed diet on people. When I talk to my leaders, they know, and they preach about how if we ate our traditional foods, we wouldn't be sick" (Mihesuah & Hoover 2019, 64). For these reasons, Segrest and others are working on projects to shift diets to culturally important health foods.

Food Education

Similarly, hands-on gardening initiatives that implement edible gardens into school programs enhance food and nutrition education, helping to improve student's knowledge and understanding of where their food comes from. Research suggests that participation in school garden programs increases students' likelihood of consuming fresh produce (DiClaudio, Hughes & Savoca 2013). Studies by Morris and Zidenberg-Cherr (2002) and McAleese and Rankin (2007), analyzed the impact of adding garden-based activities to food and nutrition classes. Both studies revealed that incorporating hands-on gardening activities alongside classroom lessons enhanced students' nutrition knowledge and increased their preference for fruits and vegetables.

Eating Behaviors

Research has shown that eating patterns developed during childhood can persist into adulthood, shaping long-term eating behaviors (Lineberger & Zajicek 2000; McAleese & Rankin 2007). This further stresses the need to integrate food education into school curricula and encourage parental involvement in after-school gardening and cooking programs to create a more comprehensive approach. Since parental vegetable consumption strongly predicts students' vegetable intake (Morgan et al. 2010), involving parents in these initiatives could further reinforce healthy eating habits. Ultimately, educating students about nutrition and healthy foods can have far-reaching effects on their overall health, development, and academic performance.

Health & Wellness

Gardening provides hands-on learning experiences that take students out of the traditional classroom and immerse them in the practical process of growing plants outdoors. This approach increases students' physical activity during the school day and encourages healthier eating habits, as discussed in the previous section. According to the Centers for Disease Control and Prevention (2024), approximately 14.7 million youth in the U.S. aged 2 to 19 are classified as obese. Various factors, including genetics, diet, and physical activity, influence obesity.

As mentioned in the previous section, many Indigenous communities experience disproportionately high rates of diabetes and other diet-related illnesses, which are rooted in historical injustices that have disrupted access to land and traditional food systems. Colonization not only restricted the ability to hunt, fish, and farm but also imposed reliance on government-issued and processed foods high in fats and sugars—contributing to poor health and disease (Mihesuah & Hoover 2019).

Efforts to increase access to traditional foods—such as blue corn, pumpkins, squash, and beans—are central to initiatives promoting Indigenous food sovereignty. These initiatives restore autonomy over food choices and support cultural revitalization. Programs that incorporate traditional gardening practices or establish networks to provide locally grown foods in school or community meal programs serve as practical strategies for improving health, addressing food insecurity, and reclaiming Indigenous food systems.

Physical Activity

Due to increased demand for standardized testing in public schools, students spend more time in the classroom and less time outside (Paul 2020). Physical activity is often limited to organized sports, which, while beneficial, are not the only means of encouraging movement and engagement. Integrating activities like gardening into the academic curriculum offers a compelling alternative. These hands-on experiences combine physical exercise with learning, supporting both cognitive development and overall well-being, while also strengthening students' connection to the natural world. Tasks such as weeding, planting, digging, and harvesting can burn approximately 135 calories in just 30 minutes for someone weighing around 125 pounds (DiClaudio, Hughes & Savoca 2013). Figure 2.4 shows an example of students at the University of Michigan engaging in physical activity by planting young crops and implementing a drip irrigation system.

Nutrition

Beyond physical activity, proper nutrition is essential to students' overall well-being. Research indicates that participation in farm-to-school programs is associated with a reduced risk of childhood obesity and diet-related illnesses such as diabetes and heart disease (Brown & Carter 2003; Center for Ecoliteracy 2024; Morgan et al. 2010). As noted previously, students engaged in hands-on garden programs integrated with academic curricula are more likely to develop a preference for and increase their consumption of fruits and vegetables (DiClaudio, Hughes, & Savoca 2013; McAleese & Rankin 2007; Morris & Zidenberg-Cherr 2002). These experiences allow students to see the direct results of their efforts, fostering a sense of pride, confidence, and motivation through the tangible outcomes of growing their own food.

Conversely, poor nutrition is linked to fatigue, weakened immune response, and difficulty focusing—factors that hinder students' academic performance and overall health (Brown & Carter 2003). Therefore, promoting student health through initiatives such as edible school gardens is vital not only to physical wellness but also to cognitive development and learning capacity (Brown & Carter 2003; Lineberger & Zajicek 2000).



Figure 2.4 Students Engaging In Physical Activity Through Gardening (Skabelund 2022).

Ecoliteracy

There is a growing concern that students are not spending enough time outdoors, leading to a disconnect from nature (DiClaudio, Hughes & Savoca 2013). Richard Louv (2005) coined the term 'nature deficit disorder' to describe the theory that young people spend less time outdoors than in the past, which is believed to affect growth development and cause behavioral problems. Research has shown that students spend less time outdoors, which means that they are losing opportunities for creative play and exploration of the natural world (DiClaudio, Hughes & Savoca 2013). Although edible gardens are not considered entirely "natural systems," they offer valuable opportunities for students to engage with ecological processes firsthand. Through gardening, students can observe plant life cycles, investigate the role of beneficial insects in pollination, and explore the various plant and soil components that support and sustain life.

Time Spent Outdoors

According to the Kansas Health Institute, "approximately one-quarter of responding public elementary schools have reduced recess time within the past three years to devote more time to preparing students for required state tests" (Kimminau & Murphy 2006). Edible school gardens can allow students to get out of the classroom and engage with nature to play while they learn. These connections with nature build upon their eco-literacy. Ecoliteracy, or ecological literacy, means understanding the principles of ecosystems and how to apply those to build sustainable communities (McBride et al. 2013).

Connection to Nature

Edible school gardens and farm-to-school programs provide opportunities for students to connect with nature and reinforce educational concepts learned in the classroom. These programs create tangible ways for students to experience nature that engage their senses. These range from the smell of herbs and flowers attracting pollinators, the touch of the cool soil, the sound of insects that inhabit the garden, the range of colors of different plant species, and the taste of fresh fruits and vegetables. These connections bridge the gap between life that supports humans and the ecosystem cycles that support all living things (DiClaudio, Hughes & Savoca 2013). Concepts such as ecology, plant systems, and conservation through project-based learning within garden settings help students learn the importance of environmental stewardship.

Academic Performance

Edible school gardens have been shown to enhance student learning and test scores, with significant improvements in subjects like math and science due to hands-on, nature-based learning (Center for Ecoliteracy 2024; DiClaudio, Hughes & Savoca 2013; Klemmer, Waliczek & Zajicek 2005). Gardening develops skills like curiosity, critical thinking, and creativity by engaging in different learning styles. A California State Education and Environment Round Table study analyzed schools that used the 'Environment as an Integrating Context' (EIC) in their curriculum (Danks 2010). The study found that students who participated in the EIC program, which integrates garden-based lesson plans, performed better in reading, writing, and math, gained critical thinking and problem-solving skills, and became self-motivated learners (Danks 2010).

Environmental Stewardship

Studies also highlight that gardening particularly enhances science achievements. One study found that third to fifth graders in gardening programs scored notably higher in science compared to peers without this experience (Klemmer, Waliczek & Zajicek 2005). Garden programs reinforce academic subjects and can also provide job-related skills in areas like agriculture, business, and environmental science, often in partnership with local universities (Brown & Carter 2003; Philips 2013). These experiences prepare students for future careers and encourage environmental stewardship.

Skill Development

Edible garden programs offer a wide range of benefits, including job-training opportunities in farming, marketing, business development, ecological restoration, environmental science, and cultural studies through collaborations with local organizations and institutions (Philips 2013). Youth garden programs further support workforce development by teaching leadership and job skills through producing and selling fresh produce, providing students with hands-on experience in entrepreneurship and food production (Brown & Carter 2003).

Beyond career preparation, garden-based education fosters meaningful learning by moving students beyond rote memorization to higher-level thinking skills such as interpretation and analysis (Paul 2020). These environments actively engage students in the learning process—an essential skill often overlooked due to the emphasis on standardized testing in public schools. Gardening also encourages students to take risks, develop problem-solving skills, and expand their abilities through experiential learning (DiClaudio, Hughes & Savoca 2013).

Moreover, these programs build confidence by immersing students in real-world situations where they can take action and see tangible results. This reinforces Albert Bandura's social learning theory that self-produced actions and environmental feedback are key to developing a sense of competence (Pevec 2016). Ultimately, garden learning spaces serve as long-term investments in education and health, with benefits that extend far beyond the classroom.

EDIBLE GARDEN PROGRAMS

What are Edible Garden Programs

Through the framework of urban agriculture, edible garden programs promote environmental sustainability, community engagement, and education. This report discusses various program models offering multifaceted benefits for educating students on food production, including school gardens, university gardens, non-profit garden programs, and Indigenous food systems. School gardens involve on-site gardening activities or off-site farm visits, immersing students in food systems to deepen their understanding of food production and nutrition (Danks 2010; Philips 2013). University gardens range from small plots to large-scale farms or orchards on campus grounds, often partnering with local schools and organizations to advance agricultural and horticultural education (Hodgson, Campbell & Bailkey 2011). Non-profit garden programs are typically community gardens operated by a non-profit organization with a set of board members with support from staff and volunteer members. These programs usually focus on outreach, food security, and food education (Philips 2013). Lastly, Indigenous food systems is a term that describes Indigenous food production practices that utilize Indigenous knowledge of the land (Kuhnlein, Erasmus & Spigelski 2009). While Indigenous food systems are practiced within Indigenous Peoples' land, these provide intertribal connections and educational opportunities to share traditional knowledge and culture around food and land stewardship. Each model in this report is supported by practical, real-world site applications.

School Garden Programs

Starting a school garden offers students and school communities a hands-on way to reconnect with local agriculture and ecology while creating engaging, flexible learning spaces (Danks 2010; Philips 2013). School gardens vary widely in size, structure, and purpose. They may include raised beds, in-ground plots, container planters, vertical structures, or green roofs. Figure 2.5 provides a visual representation of a school garden. Some schools integrate culinary programs or farm-to-cafeteria initiatives, allowing students to contribute fresh produce to school meals (Danks 2010). This culinary component teaches valuable food preparation skills and introduces students to diverse cultures and cuisines through food.

School gardens serve as dynamic educational tools, supporting math, science, art, and language lessons through engaging, hands-on activities (Danks 2010; Klemmer, Waliczek & Zajicek 2005; Philips 2013). Schools can further expand educational opportunities by partnering with local farmers and community gardens to participate in off-site gardens or taking field trips to explore varied agricultural practices. These garden experiences enrich students' understanding of food and nutrition, connecting them to local food systems and enhancing essential life skills (Paul 2020; Skelly & Bradley 2000).



Figure 2.5 School Garden Collage (Swaney 2025)

University Garden Programs

Many universities operate small to large-scale farms that produce fruits and vegetables for education, research, and community service purposes, supporting initiatives in nutrition, environmental stewardship, and community engagement (Hodgson, Campbell & Bailkey 2011). The harvested produce may be donated, used in campus dining halls, or sold, depending on the program. Through programs such as farm-to-cafeteria, edible gardens can help to reduce food costs, offer locally grown organic options, and provide fresh produce to students and faculty on campus or local food pantries (Philips 2013). These programs teach students food production techniques and entrepreneurial skills relevant to the food industry.

Typically managed by agricultural, horticultural, or natural resource departments, university gardens allow students to apply classroom knowledge through hands-on experiences in food production and sustainable land management (Hodgson, Campbell & Bailkey 2011). Additionally, universities often collaborate with local organizations and school districts to extend food production and environmental education to youth and adults. Most universities with garden programs will also include helpful resources like training courses, lesson plans, and garden implementation guides (K-State Research & Extension 2024). University gardens are a great way to promote food and ecological education, connecting students across age groups and inspiring interest in green careers. Figure 2.6 provides a visual representation of university gardens.



Figure 2.6 University Garden Collage (Swaney 2025)

Non-Profit Garden Programs

Non-profit gardens are typically community gardens and operate on a range of scales from local, state, regional, and even international. These programs focus mainly on fruit and vegetable cultivation (Hodgson, Campbell & Bailkey 2011) and strive to help their community by establishing garden programs, educating students and adults on food education, providing training courses, and mitigating food insecurity. The gardens provide fresh produce and create vibrant green spaces within communities, promoting local engagement and supporting biodiversity. Community gardens play a vital role in economic development and community revitalization by contributing to neighborhood pride, empowering residents to grow and sell their own produce, and creating opportunities for entrepreneurs and commercial farmers through inner-city farmers markets (Brown & Carter 2003). Figure 2.7 shows what a non-profit garden may look like, as well as a local farmers market. Research highlights multiple community benefits that come from community gardens, such as strengthening social bonds, promoting active citizenship, and reinforcing community identity (Wise 2014).

Community gardens serve as spaces for social interaction, education, and mentoring. Often collaborating with local organizations, community members, schools, and volunteers, they engage multiple generations and contribute to healthier environments through access to fresh produce, environmental stewardship, and social equity (Phillips 2013). Therefore, these gardens support human and ecological well-being, enhance neighborhoods, and implement sustainable practices.



Figure 2.7 Non-Profit Garden Collage (Swaney 2025)

Indigenous Food System Programs

Including Indigenous food systems in this report on urban agriculture underscores the significance of their contributions and shared goals with other garden-based programs, such as promoting food and nutrition education, improving health outcomes, and increasing access to healthy foods. However, a key distinction lies in the emphasis Indigenous food systems place on cultural preservation—through traditional land management practices, culturally significant foods, language revitalization, and ancestral connections (Mihesuah & Hoover 2019). These systems have not only informed aspects of Western agriculture (Havrelock & Kay 2023) but also offer valuable insights into sustainable practices that seek to maintain balance within natural ecosystems, supporting the well-being of both human and non-human life.

Traditional Ecological Practices (TEP), also referred to as Traditional Resource and Environmental Management (TREM) or Traditional Cultural Practices (TCP), are defined as "the application of traditional ecological knowledge to maintain or enhance the abundance, diversity, and availability of natural resources or ecosystems" (Fowler & Leposfsky 2011, 286). These practices support traditional food systems and initiatives that promote food sovereignty. Food sovereignty in reference to Indigenous food systems "refer to specific collective capacities of particular Indigenous peoples to cultivate and tend, produce, distribute, and consume their own foods, recirculate refuse, and acquire trusted foods and ingredients from other populations" (Mihesuah & Hoover 2019, 11). A movement toward Indigenous food sovereignty is growing within Indigenous communities, emphasizing the rights to land and food production and responsibilities toward culturally, ecologically, and spiritually appropriate relationships within these systems (Mihesuah & Hoover 2019).

In many Indigenous communities, the availability of traditional foods has declined, while processed foods have become more prevalent, contributing to poor health (Mihesuah & Hoover 2019). Beyond their nutritional benefits, traditional foods connect people to cultural identity and heritage. Many Indigenous community programs view food as a critical vehicle for cultural education. Cassius Spears Sr. of the Narragansett tribe expressed that food "identifies your culture, your traditions, basically who you are" (Mihesuah & Hoover 2019, 66), noting that many youth lack awareness of where their food comes from.

Traditional food systems reintroduce opportunities for young people to engage in farming and learn ancestral practices, preserving knowledge for future generations. For example, the Mvskoke Food Sovereignty Initiative (MFSI) in Oklahoma partners with the Euchee language immersion program (Mihesuah & Hoover 2019), where students plant a garden each summer, combining language learning with hands-on agricultural education. As the director explains, this approach naturally reinforces language through physical activity while yielding food for the community. "Because you're physically doing what's being said and that helps you to remember and learn and associate the meaning with the activity and that has all that repetition built in. So we can view the language in a natural way, and addition have food to show for it" (Mihesuah & Hoover 2019, 66).

Indigenous food sovereignty embodies a collective commitment to sustain and share knowledge of sustainable food practices, promoting self-determination through daily engagement with land and food. This commitment to food sovereignty strengthens cultural restoration and intergenerational resilience as communities work toward food independence, ecological stewardship, and cultural preservation within a globalized food system. Figure 2.8 provides a visual representation of what a traditional food system may look like.



Figure 2.8 Indigenous Food System Collage (Swaney 2025)

CONCLUSION

Research indicates that many students and adults lack awareness of where their food comes from or how it is produced (McAleese & Rankin 2007; Morris & Zidenberg-Cherr 2002; Newsela 2017). Hands-on gardening activities have been shown to address these educational gaps effectively. These activities not only enhance understanding of food production but also positively contribute to health and wellness, strengthen connections with nature, and improve academic achievement across various subjects (Brown & Carter 2003; DiClaudio, Hughes & Savoca 2013; Lineberger & Zajicek 2000; Philips 2013). Garden programs provide opportunities for students to learn about food production practices while creating connections with the broader community through partnerships with nonprofits, local farmers, extension agencies, and other organizations. Such partnerships strengthen community resilience, foster local identity, and contribute to neighborhood vibrancy (Brown & Carter 2003; Hodgson, Campbell & Bailkey 2011; Philips 2013).

Garden programs discussed in this report support sustainable food system practices and serve as a platform for food education for both students and the public. By participating in hands-on gardening programs, students gain valuable knowledge about food origins and nutrition while actively moving their bodies, learning in outdoor environments, and engaging with diverse community members. These program models offer adaptable frameworks for other settings, supporting a holistic approach to building healthier, more sustainable communities.



03. METHODOLOGY

The methodology for this research was designed to address the research question and inform the projective design. A series of interviews were conducted with representatives from various garden program case studies, each aligning with the garden program models discussed in the literature review. These case studies share a common goal of educating students and the local community about food. The interview responses were analyzed to identify themes and patterns, which serve as the foundation for the projective design of garden program recommendations and provide insights for the campus garden design.

Research Question:

How do selected case study programs engage students in food education through garden-based learning and how can these approaches be adapted to support outreach and learning at an Indigenous university?

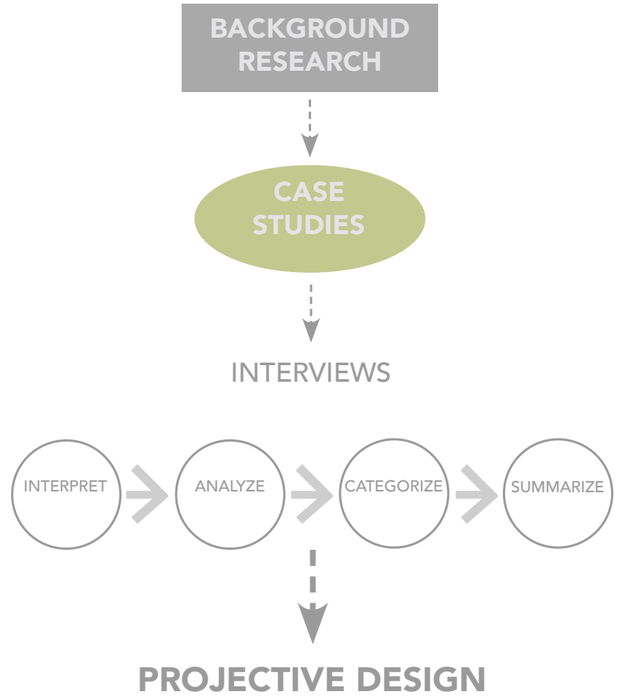


Figure 3.1 Methodology Diagram (Swaney 2025)

CASE STUDIES

The case studies selected for this report fall under the four garden-based program model typologies discussed in the literature review. While there are other garden program models outside of this report, I focused on these four because they directly engage with students in food education and/or provide knowledge regarding Indigenous food systems. The four program model typologies include edible school gardens, university gardens, non-profit garden programs, and Indigenous food system programs.

When selecting case studies for each category, I evaluated each case based on their involvement with students and schools, curriculum integration, and mission statements focusing on advancing food education within their communities.

SCHOOL GARDEN PROGRAM

SHAWNEE MISSION SCHOOL DISTRICT

Overland Park, Kansas

UNIVERSITY GARDEN PROGRAM

TORONTO METROPOLITAN UNIVERSITY

Toronto, Canada

NON-PROFIT GARDEN PROGRAM

TUCSON VILLAGE FARM

Tucson, Arizona

INDIGENOUS FOOD SYSTEM PROGRAM

NFSN - NATIVE COMMUNITIES

Nationwide

INDIGENOUS FARM HUB

Corrales, New Mexico

INTERVIEWS

For each case study, a representative was selected based on their role within the program and their comprehension of its operations and management. Each representative participated in an interview using a standardized set of questions, which were approved by K-State's IRB prior to the interviews. Interviewees received the questions in advance, and their responses were recorded to ensure accuracy. The interviews were conducted via video conference, phone call, or written responses via email. Each interviewee agreed that their name could be used in this report.

The interview questions explored how each program was established, its organizational structure, engagement strategies, activities, management methods, funding sources, partnerships, and challenges. The final question specifically asked representatives for advice on establishing a garden program at an Indigenous university. This was intended to inform the projective design and provide diverse professional perspectives on creating garden programs emphasizing Indigenous cultural practices.

INTERVIEWEES

- **Arlene Throness** | Urban Farm Manager, Toronto Metropolitan University – Arlene manages two campus rooftop farms at TMU. She holds a Bachelor's degree in Political Science and a certificate in Ecological Garden Design (Living Architecture Monitor n.d.). With over ten years of experience in food cultivation and an additional eight years in landscaping, horticulture, and silviculture, Arlene brings extensive expertise to her work.

- **Samantha Williams Barrantes** | Indigenous-Led Programs Coordinator at Urban Farm, Toronto Metropolitan University – Sam is the founder of the Indigenous Foodways Program and Medicine Garden at TMU (Barrantes 2025). Since 2020, she has led the design of culturally significant programs and growing spaces.

- **Dr. Leigh Anne Neal** | Chief of Early Childhood Education and Sustainability, Shawnee Mission School District (SMSD) – Dr. Leigh Anne has a Doctorate in Education and over 20 years of experience teaching, directing, and leading the Shawnee Mission School District (Leigh Anne Neal n.d.), the third largest school district in Kansas. She has won many awards for her work in communications and education. In 2020, she took over as the Chief Director for SMSD's Sustainability Program (Neal 2025), which oversees various school gardens and native landscapes for more than 40 schools within the district.

- **Doug Moles** | Plant & Soil Science Instructor at Shawnee Mission School District (SMSD) – Doug teaches plant and soil science classes at the Center for Academic Achievement for SMSD, integrating hands-on learning experiences at Broadmoor Urban Farm with science-based coursework (Moles 2025). Prior to this, he spent 25 years teaching chemistry at Shawnee Mission West High School.

- **Bob Brassard** | Chef & Educator at Broadmoor Bistro and Founder of Broadmoor Urban Farm – Chef Bob was responsible for starting the Broadmoor Urban Farm program at Shawnee Mission School District (Brassard 2025; Moles 2025). Bob was also in charge of the baking program at Broadmoor Bistro (Swan n.d.), which is a culinary program through SMSD that partners with the farm for a farm-to-table experience. Bob grew and expanded the program for over 23 years before retiring in 2023.

- **Jess Luse** | Community Engagement and Development Coordinator at Tucson Village Farm, AZ – Jess has been involved with TVF for over a decade, beginning as an intern and now overseeing events, marketing, newsletters, social media, and more (Luse 2025). She also leads the annual Culinary Medicine camp for teens, educating them on nutritional and medicinal foods.

- **Tomas Delgado** | Program Manager at National Farm to School Network – Tomas oversees the National Farm-to-School Network's Native Communities program, working with farmers and producers to provide resources and build partnerships (NFSN 2021). The program focuses on integrating traditional foods and education to strengthen and expand the Indigenous network.

- **Alan Brauer** | Senior Director, Indigenous Farm Hub (IFH) – Alan co-founded IFH with Kara Bobroff. Alan manages the daily operations of the farm, as well as procures funding resources, supports efforts in farm-to-school, and oversees customer relations (Brauer 2025).

CASE STUDY INTERVIEW QUESTIONS

Below is the list of interview questions approved by K-State's IRB and conducted for the case study interviews. These questions cover general background information of the program and the representative's experience, engagement strategies with schools, garden maintenance, program management, resources, and challenges faced.

BACKGROUND INFORMATION

1. Can you describe your role and responsibilities in the program, and how long have you been in the position?
2. How did your program get started, and what motivated its development?

SCHOOL ENGAGEMENT

3. How is the program structured? (e.g., curriculum integration, extracurricular activity, community involvement)
4. In what ways do schools typically find or connect with your program? What is the onboarding process like for schools that want to participate?
5. Approximately how many schools are currently involved in the program?

GARDEN MAINTENANCE

6. How do the gardens get maintained and who is responsible for garden maintenance?

MANAGEMENT STRATEGIES

7. How do you plan and organize activities for the garden program?
8. Who are the key stakeholders involved in managing the program, and what are their roles?
9. What strategies do you use to ensure continuity in program leadership and management, especially during staff turnover or school breaks?
10. How do you document and track progress or changes in the garden program over time?

RESOURCES

11. How is funding typically acquired to support your program's efforts?
12. What resources (e.g., funding, volunteers, partnerships) are critical to the program's success?

CLOSING THOUGHTS

13. What are the most significant challenges the program faces?
14. What suggestions do you have for those initiating food garden education programs on an Indigenous peoples' campus?



01 CASE STUDY:

EDIBLE SCHOOL GARDENS

SHAWNEE MISSION SCHOOL DISTRICT

Overland Park, Kansas

MISSION STATEMENT:

Sustainability is a priority at Shawnee Mission School District and this is shown through efforts such as the school gardens and natural areas program to provide outdoor learning laboratories supported by curriculum and community partners (SMSD 'Sustainability' n.d.).

SCHOOL GARDENS & NATURAL AREAS

Shawnee Mission School District is the third-largest school district in Kansas, totaling approximately 47 schools. In 2008, a Cafeteria Composting Program was initiated through grassroots efforts and has since expanded into a district-wide initiative (SMSD 'Efficiency/Composting and Recycling' n.d.). This program, along with the district's 2016 strategic plan, led to the creation of the Shawnee Mission Sustainability Program, which supports all schools in establishing and maintaining school gardens and native landscaped areas. The district's school gardens vary in purpose, including vegetable, herb, flower, pollinator, and rain gardens (SMSD 'School Gardens and Natural Areas' n.d.). While not all gardens focus on food production, students and teachers have opportunities to start their own or visit other garden sites within the district through the program.

Shawnee Mission partners with non-profit organizations to advance its sustainability initiatives. These partnerships provide maintenance training, resources such as seeds and tree saplings, and educational opportunities, including field trips that integrate food, science, and math education.

Figure 3.2 Shawnee Mission School District Collage (Left)

Through these efforts, the program promotes connections between students and the natural world.

Key Partnerships include:

- Kansas City Community Gardens
- Cultivate Kansas City
- The Giving Grove
- Missouri Organic Recycling
- Bridging the Gap
- Deep Roots KC
- Kansas Wildlife, Parks & Tourism (OWLS)
- Monarch Watch
- Kansas State University

BROADMOOR URBAN FARM

Broadmoor Urban Farm is a 1.3-acre vegetable farm located at Shawnee Mission School District's Center for Academic Achievement (CAA) (SMSD 2020). The farm began as a grassroots effort to compliment the student-run, farm-to-table restaurant, Broadmoor Bistro in 2000. Chef Bob Brassard spearheaded the farm and partnered with non-profit organizations, local restaurants, and Kansas State University and expanded from its original 120' by 120' plot growing micro greens into a thriving urban farm (Brassard 2025). Over the years, soil quality was improved with compost from the district's Cafeteria Composting Program, and the farm diversified its produce selection to meet the restaurant's needs. At its peak, the farm produced 22,000 pounds of food annually (Brassard 2025). Due to its success, the district integrated the farm into its curriculum as a capstone project, making it part of the CAA relocation project in 2015.

Today, Broadmoor Urban Farm supplies fresh, locally grown produce to Broadmoor Bistro, local restaurants, farmers markets, school cafeterias, and food pantries (Brassard 2025). Beyond its role as a food source, the farm serves as an invaluable educational resource for both students and the local community.

"YOU CREATE FOOD MEMORIES WITH A FARM"

Bob Brassard, Chef & Educator

(Brassard 2025)

"I NOTICED A DEFINITE LACK OF AWARENESS ABOUT WHERE FOOD COMES FROM"

Bob Brassard, Chef & Educator

(Brassard 2025)

A Working Classroom

The farm functions as a hands-on classroom where high school students take culinary and plant science courses to learn about food production and agriculture. Chef Bob Brassard (2025) highlighted that students gain skills in seed saving, plant propagation, and food preservation methods like canning and pickling. They also develop entrepreneurial experience by growing and selling produce to local restaurants and at farmers markets. The farm integrates diverse agricultural techniques, including greenhouse operations, vertical growing, hydroponics, and holistic pest management with companion planting. Managed primarily by students, faculty, and volunteers, the farm continues operations in the summer with student summer employment opportunities to support farm maintenance and produce market sales (Moles 2025).

Education for All Ages

The farm's impact extends beyond high school students. Elementary and middle school classes take field trips to the farm, where they learn about food production and participate in hands-on activities, such as pumpkin picking and birdhouse decorating (Brassard 2025; Moles 2025). Additionally, high school students visit younger students to assist with their school gardens and provide mentorship.

A Lasting Impact

Broadmoor Urban Farm is more than just a farm, it is a hub for experiential learning and skill development. Students gain exposure to career pathways in agriculture, culinary arts, and sustainability while developing professional and entrepreneurial skills. By providing hands-on learning outside the classroom, the farm offers an alternative, engaging educational experience that prepares students for life beyond school.



Figure 3.3 Toronto Metro University Rooftop Garden Collage (Left)

02 CASE STUDY:

UNIVERSITY GARDENS

TORONTO METROPOLITAN UNIVERSITY

Toronto, Canada

MISSION STATEMENT:

The Urban Farm is a student-led initiative dedicated to growing food on campus and providing hands-on learning opportunities in sustainable agriculture (Toronto Metro University n.d.)

URBAN FARM

Urban Farm operates two rooftop farms on the Toronto Metropolitan University campus in downtown Toronto. The primary production site is a quarter-acre rooftop farm atop the George Vari Engineering and Computing Centre (TMU n.d.). This green roof was built in 2004, but a decade later was converted into a rooftop farm by student-led initiatives (Living Architecture 2023). The secondary location opened in 2022 and sits on top of the Daphne Cockwell Health Sciences Complex (TMU n.d.). The latter was established as a result of Toronto's Green Roof Bylaw, passed in 2009. "More than a decade later, we have 700 green roofs in this city, but this is the first to be built as part of that legislation as a farm" (Exploring Alternatives 2019, [0:52]). These rooftop farms not only educate the public about food production and food sovereignty but also serve as research sites to inform the expansion and replication of similar projects.

The campus farm produces and distributes food, facilitates research, and engages the community through a range of ecological rooftop farming and associated outreach activities (TMU n.d.).

Urban Farm hosts several programs, including:

- **Indigenous Foodways Program** – Incorporates traditional Indigenous ecological knowledge (TEK) to grow culturally significant crops and medicines.
- **Harvest Collective & Learning Circle** – Engages Black communities in education and advocacy for Black Food Sovereignty.
- **Living Lab & Rooftop Tours** – Provides research opportunities and educational tours to share knowledge about rooftop farming.

Farm Operations

Each year, the farm produces 10,000 pounds of food, which is distributed through the university's farmers market, CSA (Community-Supported Agriculture) program, and the "Food Room," a campus food pantry offering free food to students (Exploring Alternatives 2019; Throness 2024). The farm operates on six inches of engineered soil, with row crops mounded an additional six inches, creating a total growing depth of one foot. While capable of growing various crops, the farm prioritizes high-yield, succession crops to maximize production in limited space. Due to the high organic matter content in the soil, irrigation is required only once a week. The farm utilizes drip irrigation methods to minimize water loss and enhance efficiency.

The farm gets many students from different disciplines interested in learning about the farm and getting involved (Exploring Alternatives 2019; Throness 2024). Students range from nutrition studies, architecture, engineering, environmental studies, urban planning, and business. With many different program initiatives that are offered at the farm, there are opportunities for anyone to join and learn about rooftop urban farming.

"When we started the farm, we weren't sure what we could grow on a roof. So we started by growing a little bit of everything and we found that there wasn't anything we couldn't grow."

Arlene Throness, Urban Farm Manager

(Exploring Alternatives 2019, [0:31])

INDIGENOUS FOODWAYS PROGRAM

The secondary rooftop garden on the Daphne Cockwell Health Sciences Complex is a 5,000-square-foot green roof supporting the Indigenous Foodways and Black Food Sovereignty programs (Living Architecture 2023). The Indigenous Foodways garden began as a student-led initiative by Samantha Williams during her time at Indigenous Student Services on campus (Barrantes 2025). She now serves as the Urban Farm's Indigenous-Led Programs Coordinator for the past five years.

This program provides the campus's Indigenous community with access to traditional and culturally significant crops, along with educational opportunities (Barrantes 2025). The program offers events and activities that teach traditional growing methods, seed saving, food sovereignty, as well as the medicinal uses of native plants. Additionally, the program offers interactive tours of the Indigenous Foodways and Medicine Garden, highlighting the identification of medicinal plants and the history of their cultural and ceremonial uses.

"That course [ecological market garden program] **involves a field session for hands-on experiential learning, which we think is really KEY to learning about farming."**

Jayne Miles, Programs Coordinator

(Exploring Alternatives 2019, [3:06])



Figure 3.4 Tucson Village Farm Collage (Left)

03 CASE STUDY:

NON–PROFIT GARDENS

TUCSON VILLAGE FARM

Tucson, Arizona

MISSION STATEMENT:

"TVF is a seed-to-table program designed to reconnect young people to a healthy food system, teach them how to grow and prepare fresh food, and empower them to make healthy life choices. TVF is a working urban farm and healthy living center that fosters life and leadership skills in young people through agriculture, culinary education, outdoor adventure opportunities, and community engagement" (TVF 'Mission and Vision' n.d.).

TUCSON VILLAGE FARM

Tucson Village Farm (TVF) is a registered 501(c)(3) non-profit organization affiliated with the University of Arizona (Tucson Village Farm n.d.). This connection makes TVF a unique case study, as it operates both as a non-profit garden program and an educational extension of the university. Located at the University of Arizona's Campus Agricultural Center, TVF is a seed-to-table program dedicated to engaging students in healthy food systems, teaching them about food production and agriculture, and encouraging them to make informed nutritional choices.

TVF offers a range of hands-on educational programs, including:

- **Field Trips –** Schools are invited to bring students of all ages to the farm for interactive lessons on food production, soil science, composting, and nutrition.
- **Cooking Classes –** Youth and adult classes teach participants how to incorporate farm-grown vegetables and herbs into meals, explore fermentation techniques like kombucha and sourdough bread making, and conduct culinary science experiments.
- **Little Sprouts –** Designed for children ages 2-5, these sessions introduce young learners to gardening, new foods, and nature-based activities that support cognitive and emotional development.

Note: The curriculum that gets integrated into farm activities has been backed by research and peer-reviewed by the University of Arizona (Luse 2025).

Additional programs offered at TVF that aren't listed include summer camps, a ropes course, teen military adventure camps, outdoor leadership training, and the 4-H Healthy Living Ambassadors program.

"Our vision is to cultivate healthy lifestyles, wellness, resilience, and sustainability in young people, empowering them to be contributing members of their communities."

(Tucson Village Farm n.d.)

Farm Operations

Tucson Village Farm operates on two different sites.

- **The 'Little Farm'** - Is the original farm location of TVF, which was established in 2010 (TVF 'Our Learning Spaces' n.d.). This site is one-acre and located at the Pima County Cooperative Extension Office. It features vegetable crops, a chicken coop, an orchard, compost and vermicompost facilities, and a mechanical milking cow. More than 5,000 students visit this site annually.
- **The 'Big Farm'** - Approximately an eight-acre expansion launched in 2020, offering large-scale agricultural production, a 4-H high ropes course, a culinary education center where cooking classes are hosted, and an outdoor patio for workshops and open-air cooking demonstrations (TVF 'Our Learning Spaces' n.d.). Future plans for this site include integrating livestock to enhance educational opportunities.

Tucson Village Farm provides year-round, hands-on learning experiences for students of all ages and regularly hosts community events. Its ongoing expansion continues to enrich educational opportunities while strengthening its role as a model for university-supported urban agriculture.

"Tucson Village Farm is not just growing vegetables but we are growing people."

David Gilmore, Marketing and Media Specialist

(Tucson Village Farm 2022, [0:35])



Figure 3.5 National Farm to School Native Communities Collage (Left)

04 CASE STUDY:

INDIGENOUS FOOD SYSTEM PROGRAMS

NATIONAL FARM TO SCHOOL NETWORK - NATIVE COMMUNITIES

Nationwide

MISSION STATEMENT:

"National Farm to School Network increases access to local food and nutrition education to improve children's health, strengthen family farms, and cultivate vibrant communities" (NFSN 'About' n.d.).

NATIONAL FARM TO SCHOOL NETWORK

National Farm to School Network (NFSN) is a 501(c)(3) non-profit organization dedicated to increasing students' access to locally grown food and nutrition education (NFSN 'About' n.d.). NFSN collaborates with nonprofit organizations, state agencies, universities, and other entities to provide schools across the U.S. with resources and support for establishing farm-to-school programs. According to the USDA Farm to School Census data from the 2022-2023 school year, NFSN has engaged 45.6 million students and reached 74.1% of U.S. schools, with over 74,433 schools participating in its programs (NFSN 'About' n.d.).

In 2020, NFSN launched a 'Call to Action' to address racial injustice in the food system and reduce inequities that limit the power of those involved in food production, distribution, supply, and consumption (NFSN 'Our Call to Action' n.d.). As part of this initiative, NFSN (n.d.) states: "We believe that what we eat should be an affirmation of our culture and our communities. We believe that if we work together to dismantle structural racism and shift power to communities that have been marginalized, exploited, and excluded, a racially just food system is possible for every community."

NFSN offers different programs including:

- **School Meals Campaign** – an initiative that works with schools and local farmers to increase the amount of local food used in cafeteria programs.
- **Early Care & Education** – an initiative to advance racial and social equity; access to healthy, affordable, and culturally relevant local foods; gardening; and food, nutrition, and agricultural education.
- **Native Communities** – working with Native partners to develop school menus to include traditional foods, support Native producers, and connect classrooms to Indigenous-based education.
- **Producer Support** – provide support to agricultural producers, including farmers, fishers, ranchers, food processors, and other local food businesses to support farm-to-school initiatives.
- **Training & Cohorts** – NFSN offers learning, relationship-building, and professional development for those interested in deeper engagement with farm-to-school movements.

NATIVE COMMUNITIES

The Native Communities program within the National Farm to School Network (NFSN) partners with Indigenous producers, farmers, distributors, and other Indigenous-led entities to integrate traditional foods into school meals (NFSN 'Farm to School in Native Communities' n.d.). Examples of these foods include blue corn, bison, and heirloom varieties of squash and pumpkin. In addition to food integration, the program collaborates with Native partners to provide educational opportunities for schools, teaching traditional farming practices, plant identification, seed-saving techniques, and connections to tribal seed banks (NFSN 'Farm to School in Native Communities' n.d.).

"[School cafeterias] are often overlooked and are crucial experiential resources for kids."

Tomas Delgado, Program Manager at NFSN

(Delgado 2025)

"Schools aren't just for the kids, they're for the entire community. Especially when you introduce things like gardens, they become community hubs."

Tomas Delgado, Program Manager at NFSN

(Delgado 2025)

Achievements

This initiative has played a key role in expanding Indigenous food sovereignty across Native communities in the U.S. Key initiatives include the 2017 Seed Change Cohort for traditional seed sharing, the 2018 Native Communities Leadership Council, and the 2019 designation of the Intertribal Agriculture Council as National Partner of the Year (NFSN 'Farm to School in Native Communities' n.d.). Most recently, in 2019-2020, NFSN introduced the Native Communities Practitioner Working Groups, designed to facilitate peer-to-peer learning on core topics (NFSN 'Farm to School in Native Communities' n.d.).

Indigenous Farm to School Movement

The Native Communities program at NFSN supports Indigenous-led initiatives in farm-to-school movements, promoting the revitalization and expansion of traditional foods to ensure culturally reflective meals within communities (Delgado 2025; NFSN 'Farm to School in Native Communities' n.d.). This representation strengthens community identity and pride, offering students opportunities to learn about their culture and history through hands-on experiences. By engaging in traditional food practices, students deepen their connections with family, heritage, and ancestral knowledge. Students also have the opportunity to tour farms in collaboration with Native partners, learning firsthand how traditional foods are grown, harvested, and processed. Additionally, meet-your-farmer events at schools introduce students to local Native farmers, further reinforcing these connections (NFSN 'Farm to School in Native Communities' n.d.).

Programs like this are vital in supporting healthy, locally grown food systems within Indigenous communities. By strengthening community connections and providing essential resources, this initiative contributes to healing and empowerment through food sovereignty.



05 CASE STUDY:

INDIGENOUS FOOD SYSTEM PROGRAMS

INDIGENOUS FARM HUB

Corrales, New Mexico

MISSION STATEMENT:

"The Indigenous Farm Hub engages Indigenous communities in creating a network of farmers and families that will strengthen local and sustainable food systems by providing access to healthy foods, build prosperity for farmers and local communities through land reclamation, and reconnect the bond between language and culture to Indigenous practices of agriculture" (IFH 'Mission and Vision' n.d.).

INDIGENOUS FARM HUB

Indigenous Farm Hub (IFH) is a part of NACA (Native American Community Academy) Inspired Schools Network (NISN), a non-profit organization that supports Indigenous leaders in integrating land-based learning into school curricula and promoting Indigenous culture, identity, and community investment (Brauer 2025; NISN 'What We Do' n.d.). Founded in 2020 by Kara Bobroff *(Navajo/Lakota)* and Alan Brauer, the IFH was established to address community needs and improve access to fresh food (Brauer 2025). Following the success of its first CSA (community-supported agriculture) program that supported 25 families on just one third of an acre of land, Kara and Alan partnered with NISN to expand the initiative, collaborating with local schools to promote Indigenous land-based learning, culturally significant foods, and cultural education. Land-based learning utilizes sustainable agricultural practices with traditional Indigenous knowledge (TEK), Indigenous culture, language, and customs. This approach to education facilitates hands-on experiences that engage the body, mind, and spiritual connection to the land which is inherent in Indigenous cultures (VELA 2021).

Figure 3.6 Indigenous Farm Hub Collage (Left)

Program Opportunities

The Indigenous Farm Hub (IFH) partners with local schools to engage Indigenous students in land-based learning, fostering an understanding of Indigenous practices while improving access to healthy foods. Its curriculum covers traditional food systems, sustainable agriculture, and hands-on activities that support preparing produce for school meals and CSA orders (Brauer 2025; VELA 2021).

Beyond the classroom, IFH offers apprenticeships and internships for students to gain farm experience. It also provides fellowships for Native and non-Native farmers, offering up to two years of training in Indigenous food systems and sustainable agriculture to help them establish farms in their home communities (Brauer 2025; IFH 'Who We Are' n.d.).

Farm Operations

The Indigenous Farm Hub owns 12.5 acres of land, six of which are dedicated to daily farming operations that support CSA programs, school meals and educational initiatives (Brauer 2025). The remaining land is available for farm fellowships to perform farming operations and to learn farming techniques.

The CSA program is farmed on six acres of land (Brauer 2025). The farm produces both Indigenous and non-Indigenous crops to provide the community with fresh, nutritious food. For example, they grow blue corn, Anasazi beans, okra, potatoes, and root vegetables. Harvested produce not only supports CSA customers but is also distributed to schools, senior centers, early child care centers, and food pantries, expanding access to fresh, healthy food in communities facing food insecurity.

"[Early policies that have separated Native children from their families] have left huge gaps in knowledge of Indigenous ways of living. The knowledge that we can pass on through Indigenous perspectives and learning is really powerful."

Kara Bobroff, Board Member and Founder of NACA & NISN

(VELA 2021, [0:01])

"The more students can be outside and in a natural learning environment, the more successful that they're going to be overall."

Kara Bobroff, Board Member and Founder of NACA & NISN

(VELA 2021, [0:24])

School Engagement

The Indigenous Farm Hub partners with 8-10 schools on average, engaging approximately 600 students (Brauer 2025). Working on a sliding scale, IFH tailors its curriculum and programming to meet each school's specific needs. Schools participate at different levels, from single-season visits to hands-on activities like planting, irrigation setup, and harvesting events.

Additionally, IFH hosts "Meet Your Farmers" events, where farmers visit schools to share their knowledge of traditional Indigenous farming practices and culture (Brauer 2025).

A core aspect of IFH's mission is engaging students through outdoor, hands-on learning experiences. Many schools face challenges in maintaining year-round school gardens due to scheduling conflicts and upkeep demands (Brauer 2025). By addressing challenges in maintaining school gardens, IFH offers students a structured, hands-on experience of the full growing cycle. As Alan Brauer (2025) explains in his interview, "The work ethic and the connection to doing something of meaning, that you can see with your eyes, is pretty profound for kids… They play a big role in this."

The Impact

Beyond farming skills, IFH strives to connect students with traditional Indigenous knowledge of food systems and food sovereignty. Food plays a central role in Indigenous culture and language, encompassing how it is grown, prepared, and the nutrients it provides (VELA 2021). By learning in outdoor environments through hands-on activities, students gain an understanding of both the practical and cultural significance of Indigenous food systems.

04. ANALYSIS

The analysis examines the case study interview responses and identifies patterns, themes, and relationships to determine whether the research question has been answered. Additionally, the findings inform the projective design of an Indigenous campus garden and its associated garden program recommendations.

Research Question:

How do selected case study programs engage students in food education through garden-based learning and how can these approaches be adapted to support outreach and learning at an Indigenous university?

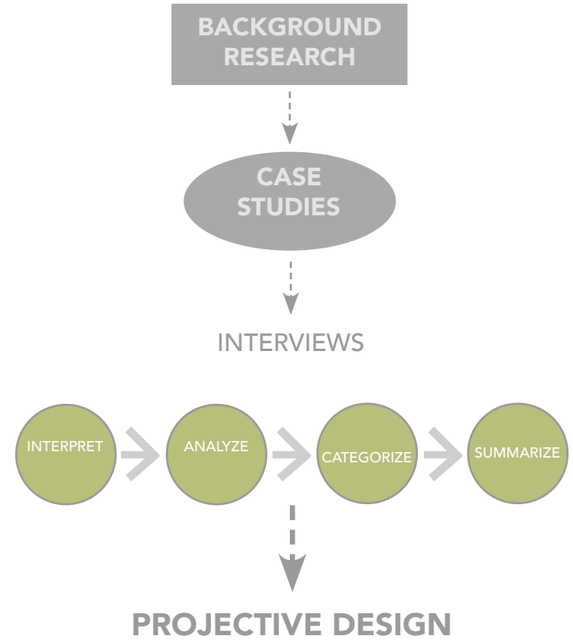


Figure 4.1 Methodology Diagram (Swaney 2025)

Case Study Interviewees

School Garden Program

Shawnee Mission School District - Broadmoor Urban Farm	1. Dr. Leigh Anne Neal
	Chief of Early Childhood Education and Sustainability. Dr. Neal has over 20 years of teaching and leadership experience at SMSD.
	2. Doug Moles
	Plant Science Instructor and manages the Broadmoor Urban Farm. Doug has been a teacher at the district for over 25 years and has been managing the farm since 2023.
	3. Bob Brassard
	Chef and Culinary/Food Science Instructor at the Broadmoor Bistro and Founder of Broadmoor Urban Farm for 23 years. Recently retired.

University Garden Program

Toronto Metro University	4. Arlene Throness
	Urban Farm Manager at TMU for more than ten years.
	5. Samantha Williams Barrantes
	Indigenous Foodways Founder and Coordinator for five years.

Non-Profit Garden Program

Tucson Village Farm	6. Jess Luse
	Community Engagement and Development Coordinator and has been apart of TVF's team for ten years.

Indigenous Food System Program

NFSN - Native Communities	7. Tomas Delgado
	Program Manager for four years.

Indigenous Food System Program

Indigenous Farm Hub	8. Alan Brauer
	Co-Founder and Senior Director of IFH for five years.

Interviewee Background & Perspective

The table below outlines the diverse backgrounds and perspectives of the interviewees regarding their involvement in garden-based programs. These identifications highlight their knowledge of food production and agricultural skills, teaching experience, and the distinctions between administrative, management, and coordination roles. Notably, most interviewees are not Indigenous, with the exception of Samantha Williams. This is an important distinction, as it impacts the research findings. In the Indigenous food systems case studies, I spoke with non-Indigenous representatives who acknowledged their non-Indigenous background but emphasized their collaboration with Indigenous communities. They work alongside these communities, following their lead to achieve shared goals and to help spread awareness of Indigenous knowledge and culture. Additionally, as not all interviewees disclosed their backgrounds, this table may not fully capture their experiences and expertise.

Case Study	Horticulture/Agronomy	Educator	Administrator/ Director	Manager	Coordinator
Shawnee Mission School District		Dr. Neal	Dr. Neal		
	Doug Moles	Doug Moles		Doug Moles	
	Bob Brassard	Bob Brassard		Bob Brassard	
Toronto Metro University	Arlene Throness			Arlene Throness	
					Sam Williams
Tucson Village Farm					Jess Luse
NFSN - Native Communities				Tomas Delgado	
Indigenous Farm Hub	Alan Brauer	Alan Brauer	Alan Brauer		

Figure 4.2 Interviewee Background Table (Swaney 2025)

Key Themes

Below is a list of key themes that emerged in the majority of interview responses. These themes are categorized into two groups: the first focuses on the motivations behind establishing the program and its broader impact, while the second highlights the strategies and advice interviewees identified as essential to their success.

IMPACT:

• Increase Food Access

All five case studies highlighted that a key reason for establishing their respective programs was to address challenges their communities faced in accessing fresh, local food. Additionally, they aimed to ensure that schools had access to these vital resources through farm-to-table or school lunch programs.

• Enhance Education

All five case studies prioritized enhancing education, with varying emphases on food production, outdoor learning, cultural education, and interdisciplinary connections across subjects such as math, science, art, and language.

• Improve Cultural Representation

Three out of five case studies, specifically those involved in Indigenous food systems, noticed a gap in cultural representation within their meals and communities. To address this, they established programs that increase Indigenous networks to educate others on Indigenous foods and medicine and make these resources more accessible and represented in meal programs.

STRATEGIES:

• Start Small

Three out of eight interviewees advised those starting their own garden programs to begin on a small scale. For example, Arlene Throness, the Urban Farm Manager at TMU said "It's okay for these things to happen slowly, like trying to build it all from the beginning, I think can be overwhelming" (Throness 2024). A few interviewees noted that program development is inherently a gradual process, with growth occurring over time through dedication and effort. Many of the programs started as pilot projects, and when they saw how successful and how much impact they were making, they evolved into permanent programs.

- For example, Alan Brauer from IFH shared that they started as a CSA program with the goal of providing NACA families with fresh produce during COVID-19 (Brauer 2025). They were surprised by their success in supporting 25 families on just a third of an acre of land for twenty weeks. This accomplishment motivated Alan and Kara to launch their own program with NACA, eventually leading to the creation of the Indigenous Farm Hub.

• Establish Garden Champions

The concept of Garden Champions was introduced by three interviewees, with others also emphasizing the importance of their staff to the success of garden programs. Rooted in school garden initiatives, Garden Champions are typically teachers, administrators, staff members, or parents who take on the responsibility of managing and maintaining the garden, often without a designated full-time garden manager. Garden Champions help ensure that the gardens are being maintained, and that the responsibility will be passed along to the next champions that take the project on.

- Dr. Leigh Anne Neal, Chief of the Sustainability Program at Shawnee Mission School District, who helps schools in the district establish and maintain gardens, discussed the importance of having a dedicated team. She shared in her interview that when a school in the district expresses interest in starting a garden, she requests that they identify three people to serve as their initial *Garden Champions*. She emphasized, "If there isn't a pipeline of leaders, then the gardens may languish" (Neal 2025). And when starting a garden, it is important to ask:

    - What type of garden will it be?
    - What level of maintenance is needed?
    - What's the garden's purpose?

• Develop Key Partnerships

All interviewees emphasized the importance of building partnerships with others who share similar values and goals. Arlene Throness stated, "Partnerships are key; they exponentially increase the potential for impact" (Throness 2024). Collaborating with non-profit organizations, schools, local farmers, and community leaders can provide vital support and mutual benefits for a program. These relationships often support efforts in garden maintenance, expanding networks, school engagement, grant writing, curriculum integration, and career development.

- Bob Brassard, founder of Broadmoor Urban Farm, highlighted in his interview that forming partnerships with non-profits is essential, as these organizations often think differently and find creative ways to solve problems (Brassard 2025).

COMPARATIVE MATRIX CHARTS

The case study analysis and interview responses were synthesized using comparative matrix charts, highlighting similarities and differences among garden program models. Additional matrices captured complexities, including school engagement strategies, challenges, and funding resources.

GARDEN/FARM OPERATIONS

Case Study	Broadmoor Urban Farm (SMSD)	TMU Urban Farm	TMU Indigenous Foodways	Tucson Village Farm	NFSN Native Communities	Indigenous Farm Hub
Location	Overland Park, Kansas	Downtown Toronto, Canada	Downtown Toronto, Canada	Tucson, Arizona	Nation Wide	Corrales, New Mexico
Program Model Type	School Farm	University Urban Rooftop Farm	University Urban Rooftop Farm	University & Non-Profit Farm	Non-Profit Indigenous Food System	Non-Profit Indigenous Food System
Garden Size	1.3 Acres	0.25 Acres	0.15 Acres	Little Farm: 1 Acre Big Farm: 8 Acres	N/A	6 Acres
Anual Production Quantity (lbs)	At peak: 22,000 but tracking isn't consistent	10,000	Unknown	3,000	N/A	35,000
Number of Schools Involved	5 High Schools (47 total schools)	Unknown	Unknown	104 Schools	4 Schools & 1 School District	8-10 Schools
Number of Students Involved	4-5 Students per Class 12 Summer Students	Unknown	Unknown	11,000 Students	Over 120 Students	600 Students
Who is responsible for Maintenance	Garden Manager (1) Students (5-12) Volunteers	5 Full Time Staff Volunteers	5 Full Time Staff Volunteers	Americorps Team, University Interns, Students, Volunteers	N/A	3 Full Time Staff 4 Farmers Volunteers

Figure 4.3 Garden & Farm Operations Comparative Matrix Chart (Swaney 2025)

This chart illustrates the type, size, and operations of each garden program, allowing for a comparative analysis.

SCHOOL ENGAGEMENT STRATEGIES

Case Study	Broadmoor Urban Farm (SMSD)	TMU Urban Farm	TMU Indigenous Foodways	Tucson Village Farm	NFSN Native Communities	Indigenous Farm Hub
Returning Schools				X		X
Word of Mouth	X		X	X		X
Social Media		X		X		
Website				X		
Tours	X	X	X	X		
Relationships / Partnerships	X	X	X	X	X	X
School Counselor	X					
Fundraising Events				X	X	X
Events	X	X	X	X	X	

Figure 4.4 School Engagement Strategies Comparative Matrix Chart (Swaney 2025)

This chart shows the various methods the programs used to engage with schools and to connect them with their initiative. Most programs develop long-term relationships with schools, with many returning year after year.

CHALLENGES FACED

Case Study	Broadmoor Urban Farm (SMSD)	TMU Urban Farm	TMU Indigenous Foodways	Tucson Village Farm	NFSN Native Communities	Indigenous Farm Hub
School Schedule Conflicts with Planting Schedule	X					
Funding / Securing Funds	X	X	X	X	X	X
Wildlife	X					
Pests & Insects	X					
Grants (Restrictive Funds)				X		X
Maintenance	X					
Bureaucracy	X			X	X	X
Critism About Using Modern Tech.						X

Figure 4.5 Challenges Faced Comparative Matrix Chart (Swaney 2025)

This chart summarizes the challenges garden programs face, including maintenance issues like wildlife and pests, as well as management difficulties such as securing funding.

FUNDING RESOURCES

Case Study	Broadmoor Urban Farm (SMSD)	TMU Urban Farm	TMU Indigenous Foodways	Tucson Village Farm	NFSN Native Communities	Indigenous Farm Hub
Grants	X	X	X	X	X	X
Donations	X	X		X	X	X
Profits from Food Sales	X	X				X
Profits from Event Sales				X		
School Budget	X	X	X	X		
Fundraisers	X			X	X	X

Figure 4.6 Funding Resources Comparative Matrix Chart (Swaney 2025)

This chart illustrates the various funding sources for these programs. While all relied on grants, school-affiliated programs also benefited from additional support through school budgets.

KEY TAKEAWAYS

Analysis of the interview responses uncovered key insights that will inform the projective design. These include notable observations, effective strategies for overcoming challenges, and valuable advice for developing successful garden programs.

- **Start Small and Be Patient:** Gardening takes a lot of resources and can become overwhelming. By starting small, there is room to grow into the success that is built.
- **Be Creative:** Every great project encounters obstacles. Use creative problem-solving skills to work within budgets and advocate for support.
- **Establish a Team:** Whether it is a team of Garden Champions, full-time staff, or volunteers, having a designated team dedicated to managing and maintaining the garden is essential. Providing paid positions can support long-term sustainability and reduce turnover, ensuring consistent care and leadership.
- **Develop Partnerships:** Garden programs are strengthened by building relationships with individuals and organizations that share similar values and goals. These partnerships create opportunities for resource sharing, collaboration, and expanded networks for community engagement, ultimately enhancing the program's viability and impact.
- **Address Seasonal Limitations:** The peak season for food production occurs during the summer months when schools are out, creating logistical challenges. Partnering with local farmers and selecting crops with multiple yields can help extend the growing season while students are still in school.
- **Integrate Curriculum:** Connecting garden-based activities to academic subjects enhances learning and makes real-world connections. This approach fosters curiosity, critical thinking, and hands-on engagement.
- **Cultivate Awareness and Career Exposure:** Through garden experiences, students gain a deeper appreciation for food production, recognizing the effort involved in growing and packaging the food they consume. This awareness fosters empathy and introduces potential career paths in agriculture, sustainability, and environmental stewardship.
- **Celebrate Cultural Representation:** Incorporating culturally significant foods into garden programs helps build community identity and pride. These programs provide opportunities to grow traditional crops and educate others about cultural practices and food traditions passed down through generations.



- **TEAMWORK**

  Develop a team with diverse expertise and passion to support the garden and programs. Establish partnerships with non-profits and other organizations with similar goals and missions to increase impact.



- **PLANNING:**

  Planning and farm practices are impacted by the climate and seasonal conditions which are major factors of garden programs and activities.



- **EDUCATION:**

  Garden programs promote educational opportunities through hands-on learning experiences.



- **CULTURE REPRESENTATION:**

  Representation of diverse cultures through food can enhance community cohesion, pride, and identity.

Figure 4.7 Key Takeaways Chart (Swaney 2025)

SUMMARY & REFLECTION

While the case studies varied in structure, some being school-based garden programs, others operating on farms that connect with schools, and some serving as networks linking schools and farmers, they all provided valuable insights into managing and operating garden programs focused on promoting food education for students and the local community.

Analysis of the interview responses revealed that each program prioritized increasing awareness of food and food production, expanding access to fresh and local foods, and fostering community cohesion. Integrating youth food education was a central goal across all programs, achieved through various approaches, including food production and processing education, culinary education, traditional Indigenous food production, and land-based agricultural practices.

To enhance access to fresh and local food, programs implemented initiatives such as school meal programs, food pantry donations, community-supported agriculture (CSA), and farmers markets. Community cohesion was also a shared priority, reinforced through strong partnerships with non-profit organizations, institutions, farmers, and restaurants. These collaborations supported educational initiatives and community events that promoted food education, career development, and resource-sharing. Additionally, the programs contributed to cultural revitalization by incorporating culturally significant foods into meals, celebrating important food traditions, and strengthening the community's sense of identity and pride.

While not all garden program case studies emphasized an Indigenous component, they share a common goal of increasing access to food education. The primary distinction between Indigenous and non-Indigenous garden programs lies in cultural representation. Non-Indigenous programs focus on food education and outdoor activities, whereas Indigenous programs integrate culturally significant food varieties, traditional ecological knowledge and practices, and cultural revitalization. This includes language learning, medicinal crops, traditional foods, and the intergenerational sharing of knowledge, enriching the learning experience with deep cultural connections.

Figure 4.7 illustrates the many facets of garden programs and the diverse benefits they offer to communities, students, and local organizations. These programs play a vital role in promoting food education, cultural awareness, and healthy lifestyles for future generations.

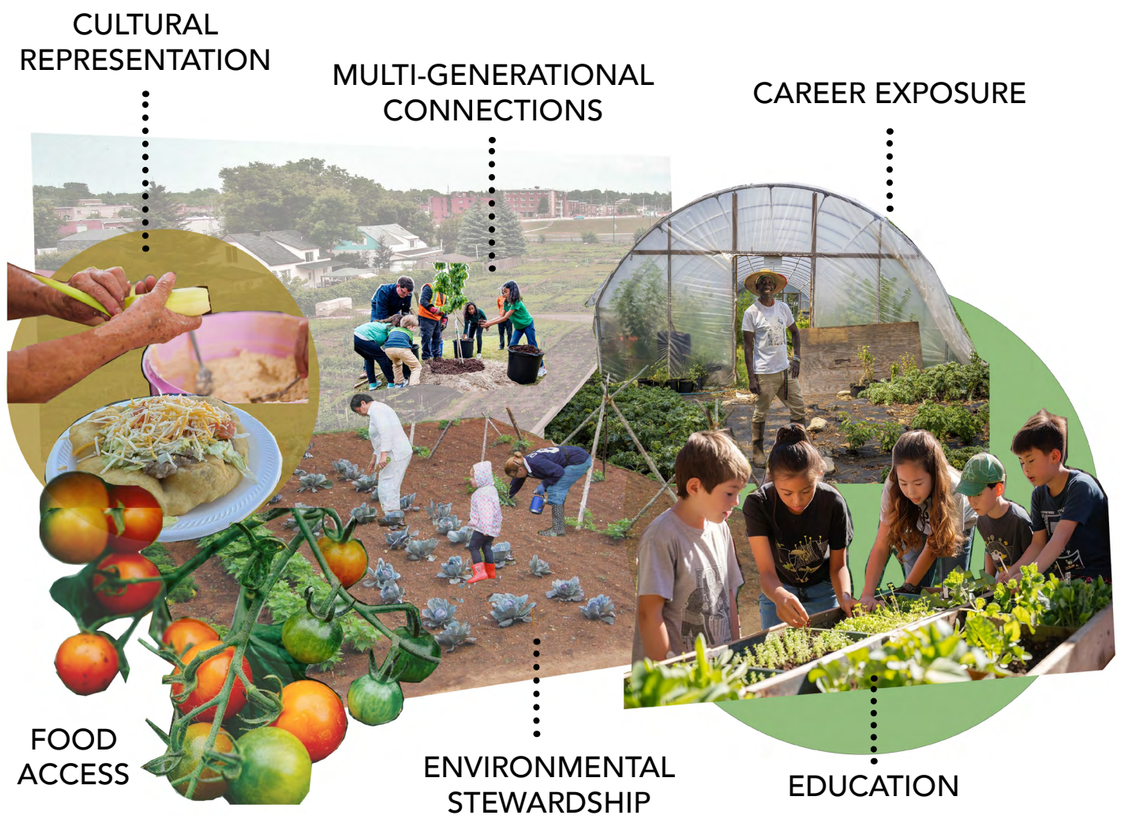
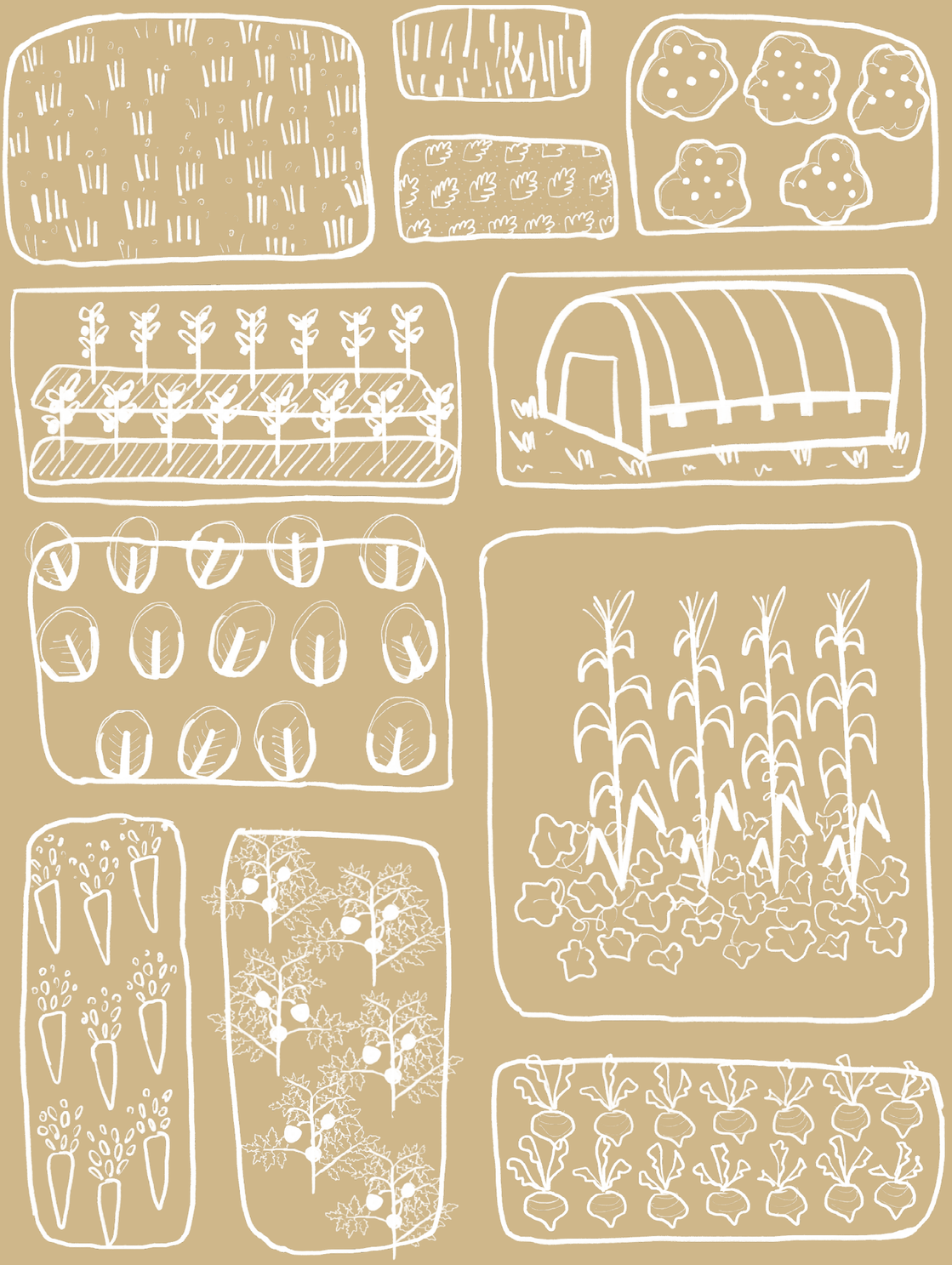


Figure 4.8 Garden Program Collage (Swaney 2025)



05. PROJECTIVE DESIGN

The projective design presented in this chapter builds upon the research and analysis conducted in the previous sections, including background research, case study analysis, interview responses, and design review feedback. These collective findings provide a foundation for developing a conceptual garden design and program recommendations. By integrating insights from case study interviews and stakeholder input, this design aims to create a space that supports food education, food sovereignty, community engagement, academic integration, and Indigenous knowledge and culture.

PROJECT BACKGROUND

I was invited by Haskell Indian Nations University to collaborate on the design of a new campus garden and greenhouse. This project originated a few years ago when Haskell received a federal grant to fund a new greenhouse, along with a learning center featuring laboratories and a classroom to complement the greenhouse and garden spaces. Located at one of the university's main entrances, the new garden and greenhouse will serve as a prominent feature, welcoming visitors while showcasing Haskell's commitment to integrating academic and cultural learning.

As a non-Native designer working on an Indigenous campus, I recognize that my role in this project was one of learning and collaboration. Haskell has generously allowed me to contribute my skills as a landscape architecture student. Still, the foundation of this project, land stewardship, and food sovereignty belong to Indigenous culture and identity, practices that have long preceded my involvement.

PROJECT GOALS:

- Create a welcoming and prominent landmark at one of Haskell's main entrances.
- Educate visitors and the campus community on the ecological, cultural, and medicinal benefits of Indigenous plant species.
- Apply Indigenous land management techniques to reinforce cultural education.
- Support hands-on learning and research efforts.
- Enhance campus biodiversity by creating habitats for native pollinators and wildlife.
- Provide space for students, faculty, and community members to engage in shared learning experiences and promote collaboration between disciplines.

PROJECT OVERVIEW

- **LOCATION** – Haskell Indian Nations University, Lawrence, Kansas.
- **PROJECT TYPE** – Campus Garden and Greenhouse design.
- **CLIMATE ZONE** – Continental climate. Hot summers, cold winters, and partly cloudy skies.
- **CLIMATE BIOME** – Temperate grassland biome.
- **PROJECT SITE SIZE** – Approximately 1.5 acres.

MAP OF LAWRENCE, KANSAS

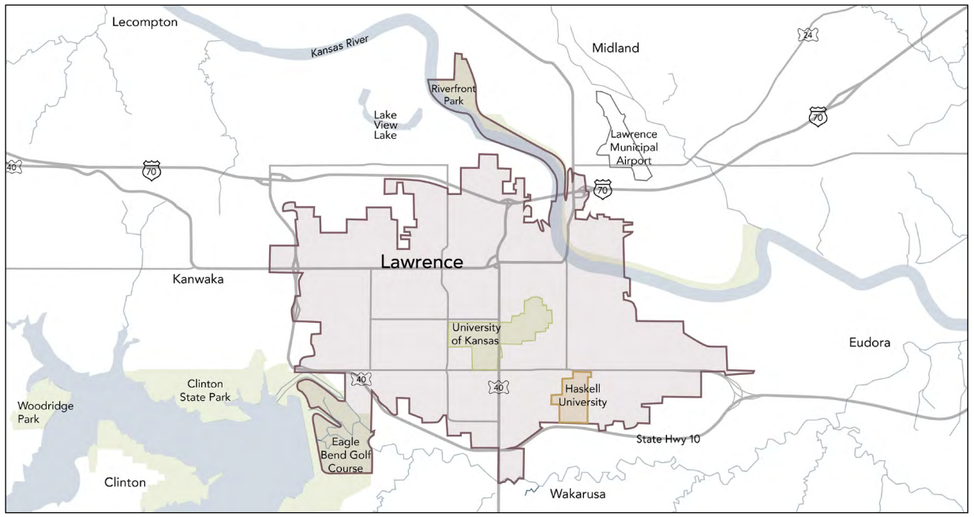
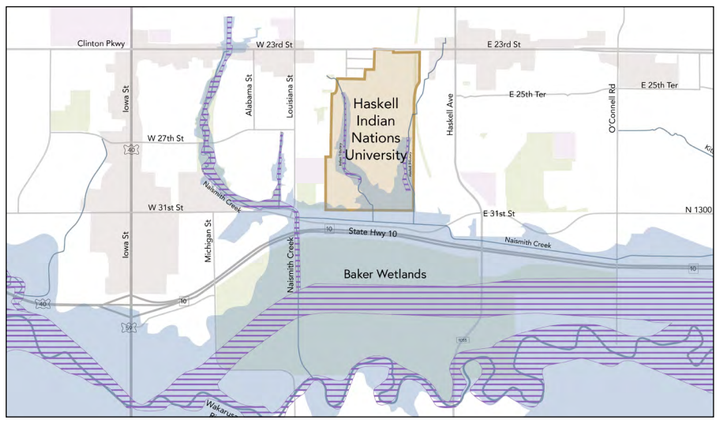


Figure 5.1 Map of Lawrence, Kansas (Swaney 2025)

SITE INVENTORY

FLOODPLAIN MAP



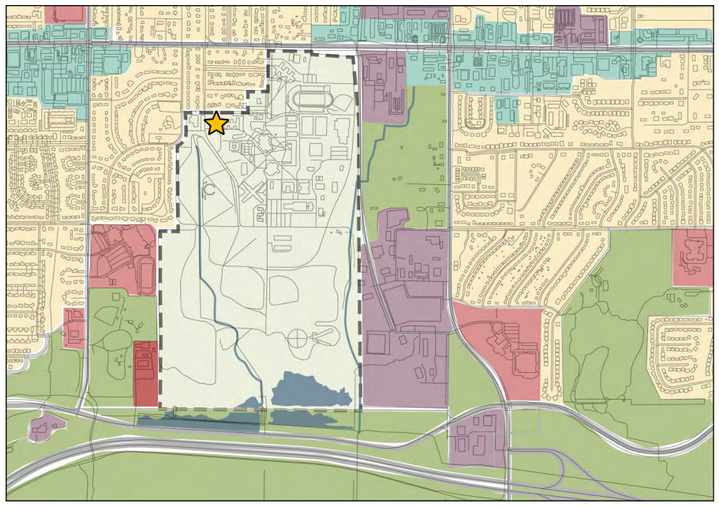
LEGEND

- Haskell University
- AH Zone - 100 Year Floodplain High Risk Flood Areas
- AE Floodway Zone - High Risk Flood Zone
- Green Space
- Schools
- Business District

0 mi .25 mi .50 mi

Figure 5.2 Floodplain Map (Swaney 2025)

SURROUNDING LAND USE



LEGEND

- Project Site Location
- Haskell University Campus Boundary
- Agricultural Land, Parks, and Green Space
- Residential Neighborhood
- Schools, Institutions, and Churches
- Fire Department
- Industrial Area
- Business District
- Water Body

0 mi .125 mi .25 mi

Figure 5.3 Surrounding Land Use Map (Swaney 2025)

HASKELL UNIVERSITY BUILDING CONTEXT



LEGEND

- Project Site Location
- University Entrance
- Haskell University Campus Boundary
- Athletic Fields
- Administrative, Facilities, Museum & Student Services
- Academic Building
- Residential Hall
- Student Parking

0' 300' 600'

Figure 5.4 Haskell University Building Context Map (Swaney 2025)

SITE MAP OF EXISTING CONDITIONS



LEGEND

- Project Site Boundary
- Winona Hall (Residence hall)
- Haskell Health Care Center
- Drains
- Drain Outlet
- University Entrance
- Haskell University Sign
- Light Poles
- Existing Trees on Site

0' 40' 80'

Figure 5.5 Site Map of Existing Conditions (Swaney 2025)

SITE VISIT

In November 2024, a site visit was conducted to gather site inventory and meet the Haskell team in person to discuss the project's progress and goals.

SITE MAP

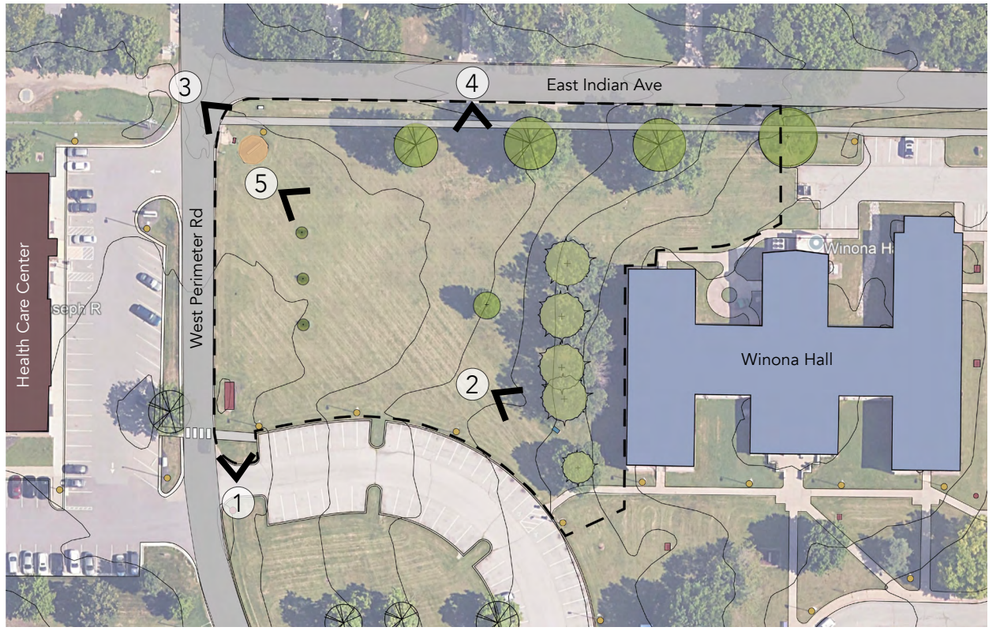


Figure 5.6 Project Site Visit Map (Swaney 2025)

1. Large Drain Cover



Figure 5.7 Drain Cover (Swaney 2024)

1. Inside Large Drain Cover



Figure 5.8 Inside of Drain Cover (Swaney 2024)

2. Drain Outlet



Figure 5.9 Drain Outlet (Swaney 2024)

SITE PHOTOS



Figure 5.10 Haskell University Sign (Swaney 2024)

3. View of the Haskell University Sign.

The image shows the University Sign located on the Northwest corner of the site. This sign marks one of the main entrances to the University's campus.



Figure 5.11 Project Site South View (Swaney 2024)

4. View of the Site Looking South.

The image shows the slope of the land of the site with the crest of the hill being along the side of Winona Hall (east). The land slopes toward West Perimeter Road and Haskell Health Care Center.



Figure 5.12 Project Site East View (Swaney 2024)

5. View of the Site Looking East.

The image shows the site looking towards Winona Hall (east) and the parking lot along the southern edge.

SITE CONSTRAINTS

The site's primary constraints include water flow patterns and existing utilities, such as drainage basins, sewers, and electrical boxes. Additional limitations include its separation from academic buildings on campus and limited space for gardening and programming elements.

CONSTRAINTS

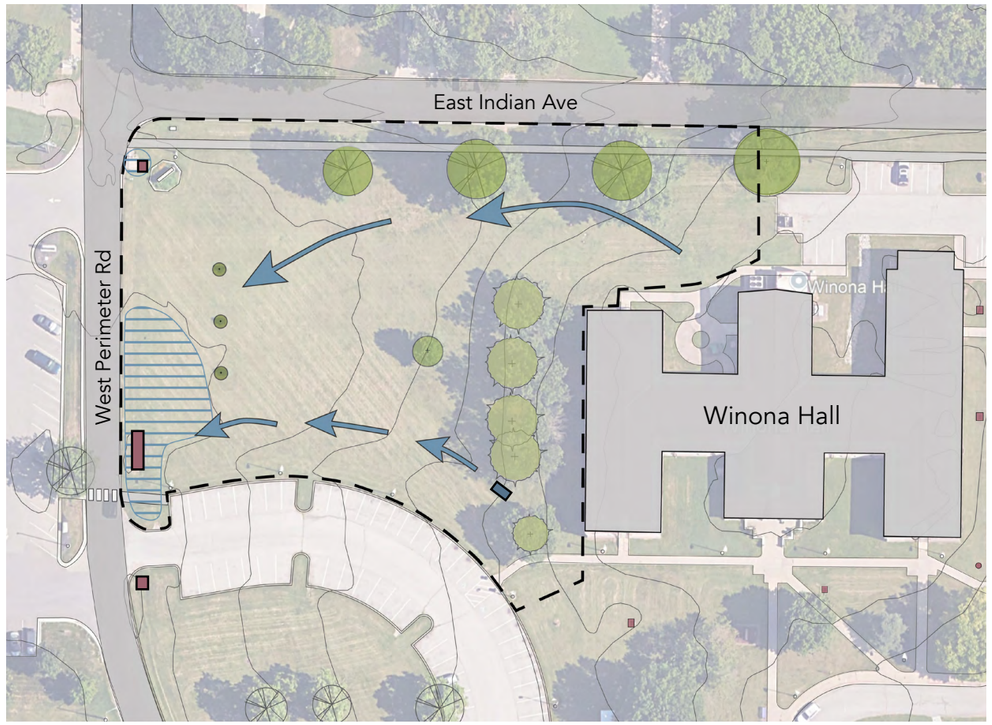


Figure 5.13 Constraints Map (Swaney 2025)

LEGEND

- Project Site Boundary
- Drains
- Drain Outlet
- Drainage Areas
- Flow Line

SITE OPPORTUNITIES

The site presents several opportunities, including potential connections to the Health Care Center, Winona Hall, the surrounding neighborhood, and the broader campus. Its prominent location at a key entrance enhances visibility, offering opportunities for landmarks and community engagement.

Additionally, the site has the potential for future expansion into other areas of campus. Existing large shade trees provide natural comfort during warmer months while incorporating native plant species in the landscape design can reduce maintenance costs, improve water infiltration, and serve as an educational opportunity.

OPPORTUNITIES

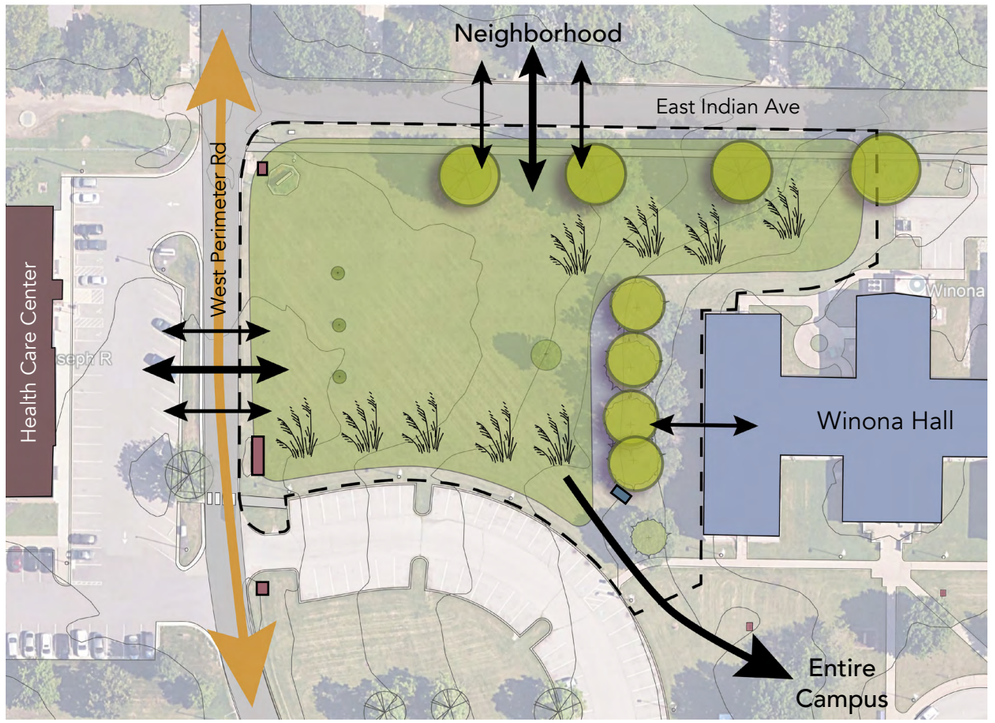


Figure 5.14 Opportunities Map (Swaney 2025)

LEGEND

- Project Site Boundary
- Drains
- Drain Outlet
- Connections
- Major Road and High Visibility
- Native Plant Species can be added to create prairie/ meadow like conditions.
- Shade Trees

DESIGN WORKSHOP

The design has undergone multiple iterations and reviews, incorporating feedback from Haskell's Team and K-State faculty. In late February, a design workshop was held to gather insights from K-State's Horticulture and Natural Resources faculty, including Dr. Jeremy Cowan, Dr. Cynthia Domenghini, and Dr. Cary Rivard, who have extensive experience and research in sustainable food production systems. Leslie Wren, Project Manager and licensed Landscape Architect from K-State's Department of Campus Planning was present, as well as Courtney King, Haskell's Field and Lab Research Assistant and Greenhouse Manager.

These professionals brought valuable expertise in sustainable design and practices, horticulture and food production systems, and land management techniques. The feedback from the workshop was instrumental in shaping the design to better accommodate diverse user needs, enhance mobility and accessibility, incorporate informative signage, and support daily operations.

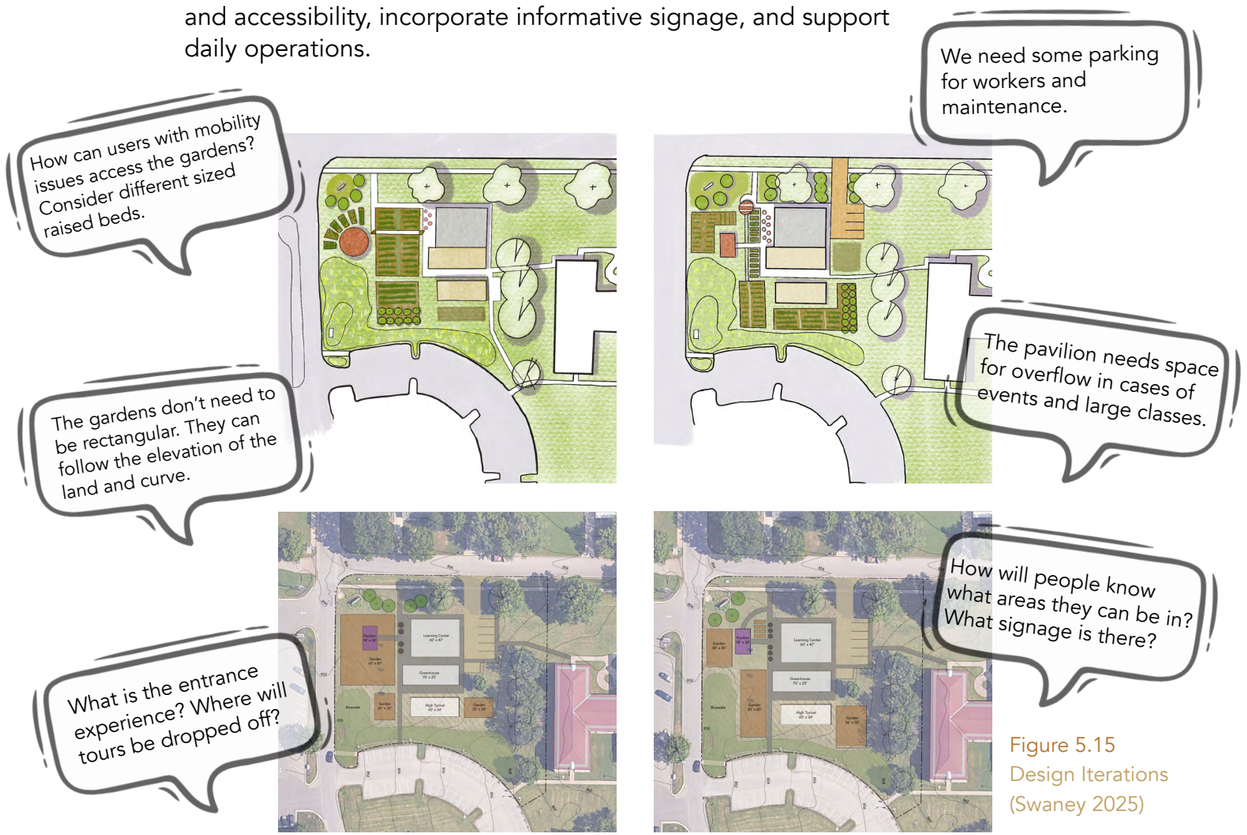


Figure 5.15
Design Iterations
(Swaney 2025)

DESIGN REVIEW

A design review was held in March to gather insights from Haskell University students. The review aimed to gather their feedback regarding design features and elements, future programming and activities, cultural representation, curriculum integration, and other possible connections that can be made. These students range in disciplinary programs from Health and Exercise Science to American Indian Studies and Environmental Science.

Feedback from this review included:

Programming Needs:

- Access to a commercial kitchen for food preparation and processing, cooking classes, and increasing cultural food representation in meal programs.
- They need more seed storage space for the greenhouse and a location where seeds can easily be dropped off or exchanged.

Cultural Representation:

- Incorporating Indigenous Art into the design such as murals, wood and metal art for interpretative signage or site furnishings.
- Diverse Tribal Nations having culturally significant meals represented at the school and at events.

Curriculum Integration:

- Integrating more classes with the greenhouse and garden spaces will help students become aware of these available resources. Most students are not aware that there is a greenhouse on campus.
- American Indian Studies can use the greenhouse and garden to learn about traditional medicines and food varieties.

Engagement Opportunities:

- Community events to invite others to learn about deer and bison processing, creating medicinal bundles, seed collecting, and prairie restoration events.
- Harvest events paired with shared meals.

CONCEPTUAL DESIGN

SITE PLAN



Figure 5.16 Site Plan (Swaney 2025)

PROGRAMMING ELEMENTS

1. Main Entrance
2. Outdoor Classroom
3. Public Garden
4. Learning Center
5. Greenhouse
6. High Tunnel
7. Native Prairie
8. Parking Lot Entrance
9. Prairie Swale
10. Private Garden
11. Compost/Materials
12. Garden Parking Lot
13. Winona Seating Area
14. Winona Walkway

DESIGN COMPONENTS

DRAINAGE STRATEGY

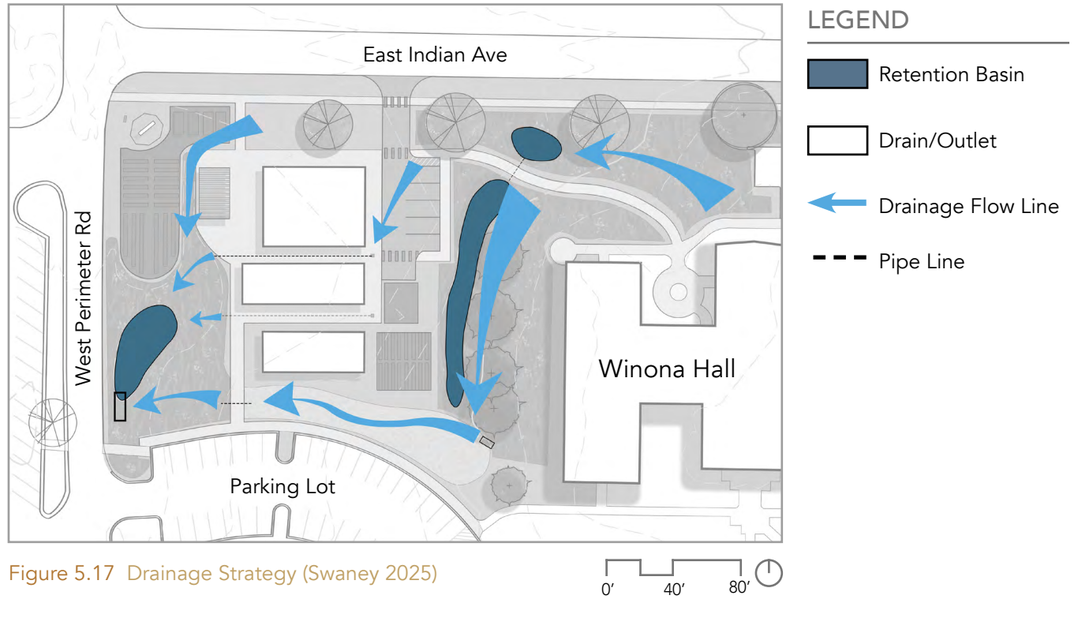


Figure 5.17 Drainage Strategy (Swaney 2025)

PROGRAMMING DIAGRAM

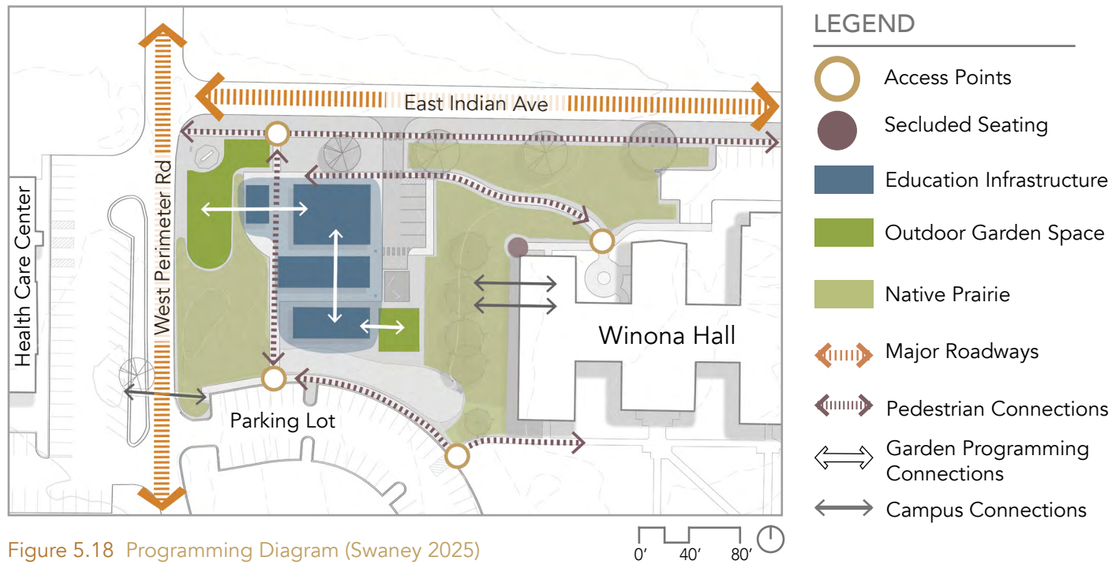


Figure 5.18 Programming Diagram (Swaney 2025)

SITE PLAN PERSPECTIVE KEY

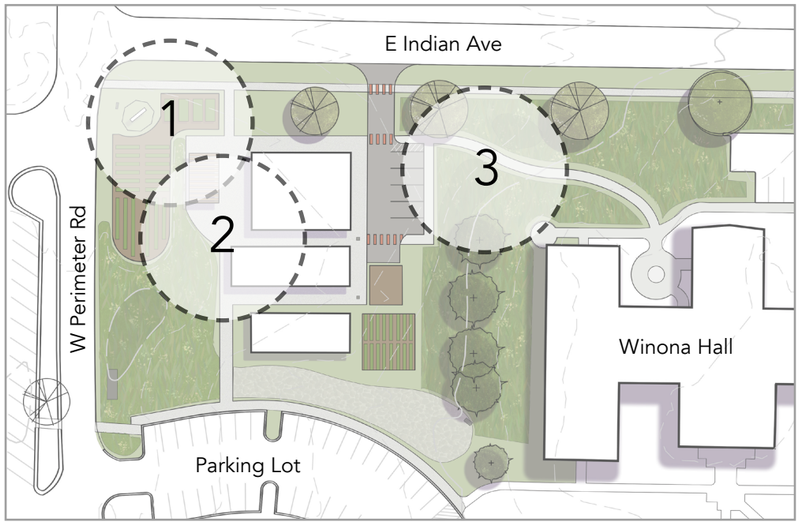


Figure 5.19 Site Plan Perspective Key (Swaney 2025)

1. MAIN ENTRANCE PERSPECTIVE



Figure 5.20 Main Entrance Perspective (Swaney 2025)

This image illustrates the entrance experience when approaching campus from East Indian Ave or West Perimeter Road. The sign is prominently positioned at the corner, enhancing visibility, while the public garden along the road edge further highlights Haskell's innovation and research. See Appendix A (figure A-1) for enlarged design graphics and further detail.

2. OUTDOOR CLASSROOM PERSPECTIVE

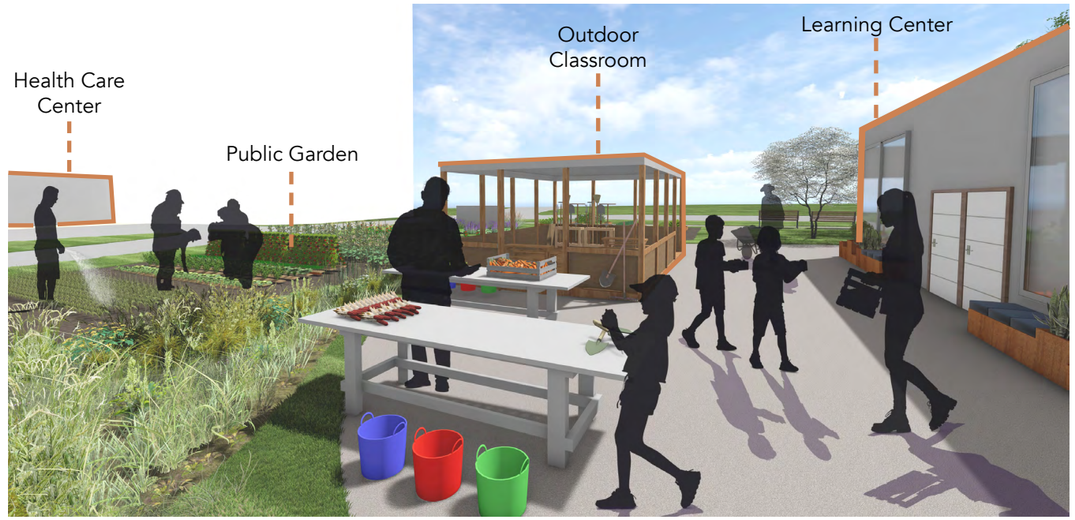


Figure 5.21 Outdoor Classroom Perspective (Swaney 2025)

This image illustrates how classes can use the pavilion or set up flexible work tables for harvesting, planting, seed collection, and other programming activities. See Appendix A (figure A-3) for enlarged design graphics and further detail.

3. WINONA WALKWAY PERSPECTIVE

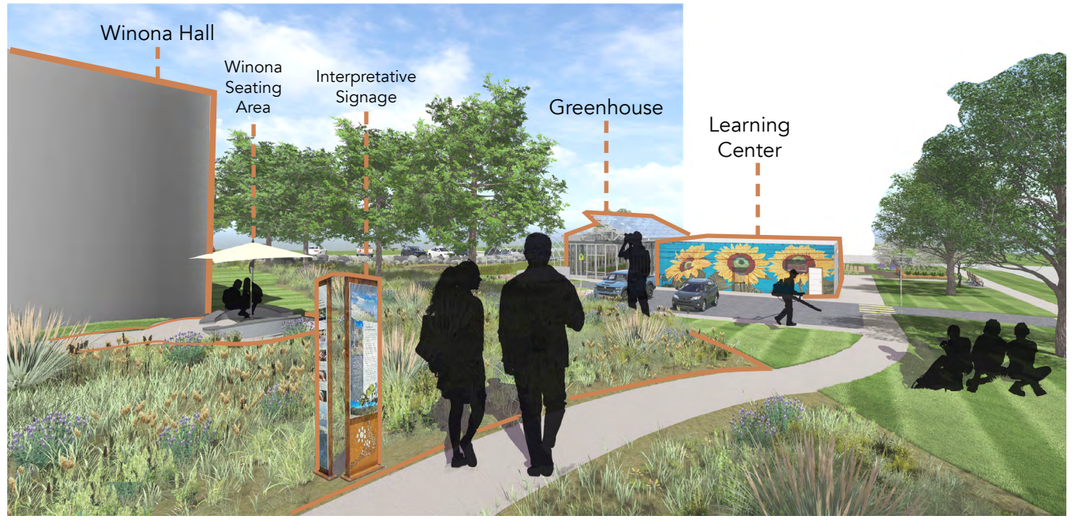


Figure 5.22 Winona Walkway Perspective (Swaney 2025)

Residents at Winona Hall can walk through the native prairie landscape as they enter the garden space, immersing themselves in the natural setting. A view of a mural along the Learning Center highlights how Indigenous artwork can be thoughtfully integrated into the space. See Appendix A (figure A-4) for enlarged design graphics and further detail.

SITE PLAN SECTION KEY

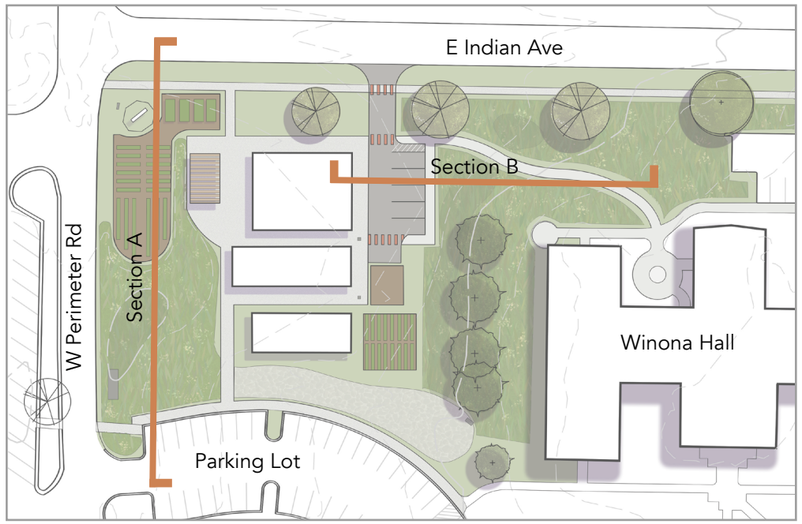


Figure 5.23 Site Plan Section Key (Swaney 2025)

SECTION A: GARDEN ELEMENTS

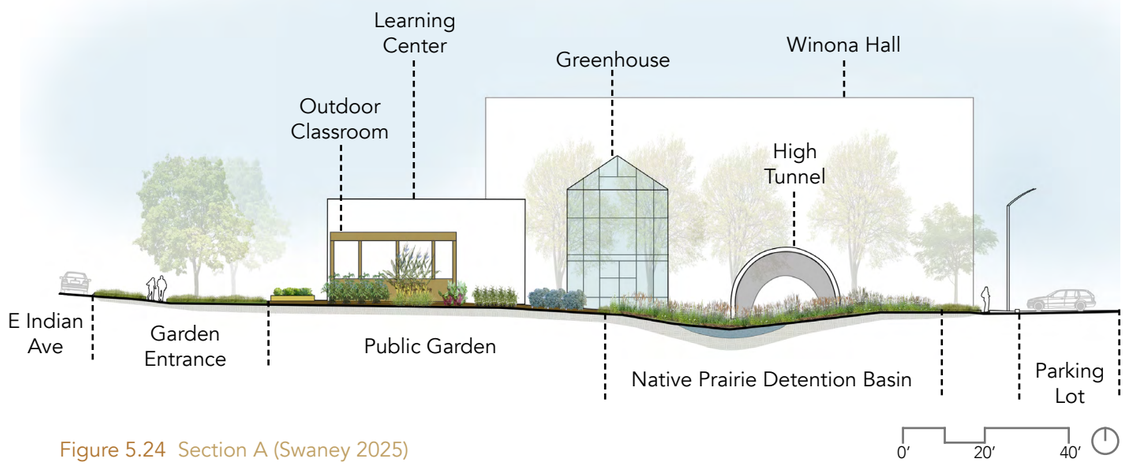


Figure 5.24 Section A (Swaney 2025)

See Appendix A (figure A-7) for enlarged design graphics and further detail.

BIRDSEYE VIEW

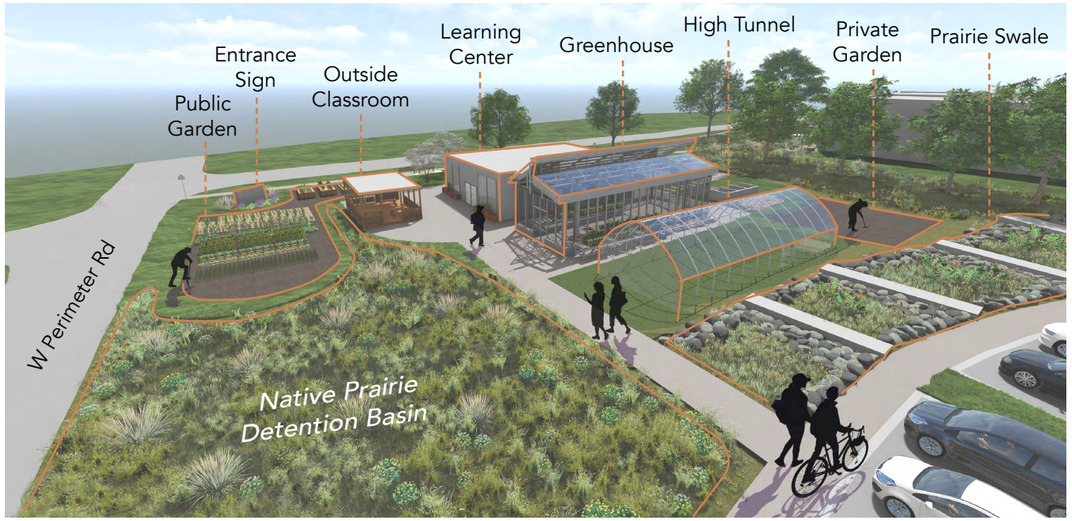


Figure 5.25 Birdseye View (Swaney 2025)

This perspective shows a birdseye view from the southwest corner of the site looking north. This view highlights the relationship between the public garden and the surrounding infrastructure. A sidewalk connection from the parking lot creates a central axis, guiding visitors toward key activity areas. The view also captures the prairie swale and a series of check dams designed to manage and slow water flow during rain events. See Appendix A (figure A-5) for enlarged design graphics and further detail.

SECTION B: WINONA WALKWAY CONNECTION

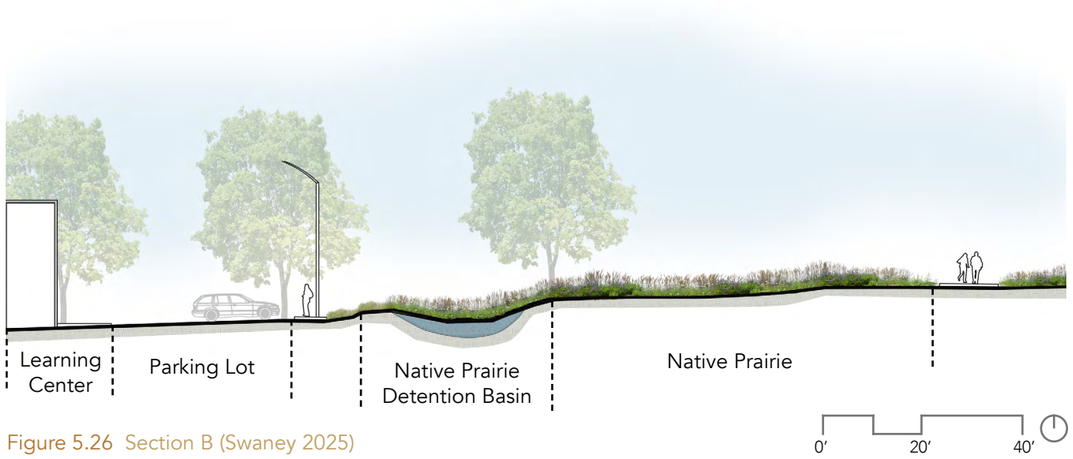
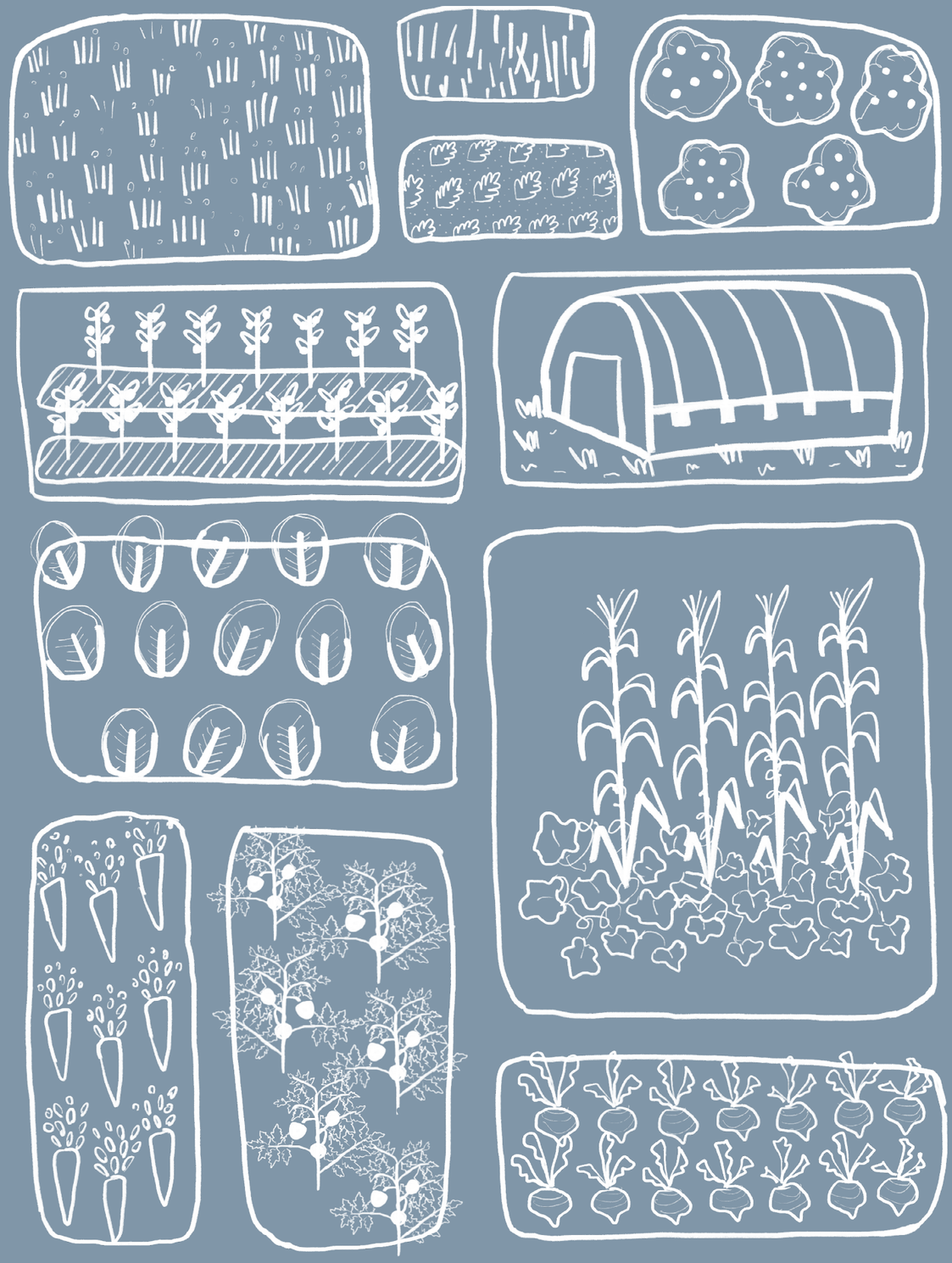


Figure 5.26 Section B (Swaney 2025)

See Appendix A (figure A-9) for enlarged design graphics and further detail.



06. RECOMMENDATIONS

Based on case study interview responses and discussions with Haskell faculty, staff, and students, a set of recommendations has been developed for a hands-on garden program at Haskell Indian Nations University. These recommendations emphasize Indigenous garden and food systems, integrating cultural practices and traditional land stewardship methods that have been utilized by Indigenous Peoples for generations.

These recommendations can be applied to various garden program models, including school, university, and non-profit gardens, while incorporating cultural representation to highlight Indigenous practices and traditional food varieties. Rather than introducing new concepts, they build upon the long-standing knowledge Indigenous communities have practiced, drawing insights from Indigenous-led garden initiatives. Rooted in sustainability, these recommendations serve as a guide for developing garden programs, integrating educational curricula, engaging the community, enhancing cultural representation, and identifying resources to strengthen program networks and support systems.

Recommendations Overview

The recommendations will cover the following topics:

- Establishing a Garden Program
- Garden Management & Maintenance
- Cultural Integration
- Curriculum & Education
- Community Engagement
- Partnerships
- Funding

ESTABLISHING A GARDEN PROGRAM

When thinking about starting a garden program, it is important to consider what kind of garden it will be, the overarching goals and vision, the level of maintenance needed, and the available resources to support these efforts.

Build Upon Established Activities

Most garden programs featured in the case study interviews began as pilot projects or grassroots initiatives. Many of these efforts originated by expanding upon existing activities and gradually evolving into full-scale garden programs. For example, Broadmoor Bistro, a student-led culinary initiative within the Shawnee Mission School District, was established when Bob Brassard introduced an urban farm component. He began with a small experimental garden plot that grew only micro-greens to supplement the Bistro's culinary dishes (Brassard 2025). Over time, this initiative expanded to include additional crops, raised beds, and a greenhouse to support the program's growing needs. Similarly, the Indigenous Foodways Program at Toronto Metropolitan University was initiated by a program founder who recognized a need for Indigenous medicine and food within the campus community. By integrating existing programming from the Indigenous Student Services into the garden, the initiative gradually grew, attracting more participation and developing a broader range of activities (Barrantes 2025).

What Kind of Garden?

This will depend on what experience and interests are present amongst staff and students. There is a wide range of garden varieties, including containers, raised beds, in-ground, greenhouse, hydroponics, vertical, and green roof gardens. Whichever type it may be, remember to start small and slow. Starting a program can become overwhelming. After some time passes, resources are secured, and partnerships are established, there is room to grow and expand programming. Haskell currently operates a greenhouse that supports research, academic initiatives, and cultural education—resources that can directly support and enhance a garden program.

Goals & Vision

It is important to consider what the overall goal and vision is for the garden program. This will help determine what resources and grants are available. It will also help to find programs and organizations with similar goals to build partnerships and support networks.

Level of Maintenance

This is a crucial consideration for garden programs, as they require significant resources and ongoing maintenance to remain sustainable. Key factors to evaluate include soil conditions and necessary amendments, water availability, pest and weed management, seed starting, harvesting, and plans for maintaining the garden during the summer months.

Garden & Greenhouse Facilities Maintenance

In addition to general garden maintenance, it's essential that there are facility staff members dedicated to facilitating water distribution and infrastructure needs for the garden and greenhouse. Having trained personnel on staff who understand the operational requirements of these systems is critical, along with someone designated to respond to emergencies or system failures. Key maintenance tasks include managing climate control systems, ensuring sanitation,

performing structural inspections, and servicing irrigation, fertilization, and monitoring equipment. Developing a monthly, quarterly, and annual maintenance checklist will help track system conditions and anticipate repair or replacement needs.

GARDEN MANAGEMENT & MAINTENANCE

Managing and maintaining a garden program will require a dedicated team of diverse expertise, planning planting schedules, land management techniques, and coordination.

Assemble a Team

A dedicated team will be essential for managing, maintaining, and sustaining the garden and its programs. It is recommended that team members have training and experience in food production, greenhouse management, and agricultural practices. A team with diverse backgrounds and expertise will enhance programming, support a wide range of activities, and expand opportunities for education and training. To minimize turnover, it is highly recommended that garden champion roles be paid positions. This includes offering paid opportunities for students, either through monetary compensation or academic credits.

Full-Time Staff vs. Volunteers

Maintaining a garden benefits from many hands, as collective efforts can create a greater impact in less time. However, according to some of the interview responses, relying on volunteers presents challenges, as they require training and supervision, which can lead to inconsistencies.

A full-time staff dedicated to managing and maintaining the garden is preferred, ensuring continuity in techniques and the ability to adapt based on past experiences. While volunteers play a crucial role in major events like plantings and harvests, their higher turnover rate can make long-term consistency more difficult.

Planting Schedules

One perspective from the case study interview responses emphasized that the plants should come first before programming. This approach ensures that activities align with planting schedules, making programming more effective and meaningful. For example, events like seed collection or harvesting must be timed according to the plant's growth stages to successfully carry out these tasks. A common challenge highlighted by many interviewees is the mismatch between planting schedules and the academic calendar, as the peak growing season occurs when school is out for summer. To address this issue, several recommendations were suggested:

- Plant varieties with high yields and succession planting to extend their growing season.
- Utilize seasonal extension methods such as cold frames, high tunnels, and greenhouse production in the winter months.
- Offer summer employment and activities such as internships, apprenticeships, and volunteer programs.
- Partner with local farmers to increase education and exposure to different growing methods, crop varieties, processing techniques, etc.

Land Management Practices

Effective land management is a key component of garden maintenance, directly influencing the garden's sustainability. Traditional Ecological Practices (TEP) are sustainable land management practices used by Indigenous people. TEP applies Traditional Ecological Knowledge (TEK) to sustain the abundance, diversity, and availability of natural resources (Fowler & Lepofsky 2011). TEK is the ongoing accumulation of knowledge, practices, and beliefs about relationships within ecosystems, developed by Indigenous peoples and passed down through generations. This knowledge serves as a foundation for life-sustaining practices (NPS n.d.) and can support management and programming at the Haskell Indian Nations University garden, greenhouse, and learning center.

Haskell University actively incorporates these practices in managing and restoring its natural landscape. These techniques can also be applied to garden maintenance, offering educational opportunities that raise awareness, promote sustainability, and help students connect with their cultural heritage.

Traditional ecological practices that support garden maintenance include:

- Human-Prescribed Burns: Controlled burns help rejuvenate grasslands and prevent the encroachment of woody species, maintaining the balance of prairie ecosystems (Fowler & Lepofsky 2011).
- Water Conservation: Awareness of seasonal water sources and responsible use ensures water availability for both humans and wildlife (Ward's World n.d.).
- Selective Harvesting and Transplanting: Regulating the timing and size of harvests through selective harvesting and transplanting helps sustain plant populations and optimize yields (Fowler & Lepofsky 2011).
- Mulching and Composting: Using organic materials such as food scraps and plant matter enriches the soil, improves fertility, and helps regulate soil temperature (Fowler & Lepofsky 2011).
- Pruning: Removing dead or excess plant material directs the plant's energy toward productive growth, enhancing yield and health (Fowler & Lepofsky 2011).
- Controlled Grazing: The use of a rotational grazing system that allows pastures to recover after use. The movement of livestock from one area to another prevents overgrazing in specific locations and promotes the health of grasslands (Ward's World n.d.).
- Three Sister Gardening Technique: A system that cultivates corn, beans, and squash on the same plot of land (Ward's World n.d.). Each plant has a role within the ecosystem:
  - Corn: provides a supportive structure for the beans to climb.
  - Beans: due to plant physiological processes, they make nitrogen available in the soil, enhancing soil fertility.
  - Squash: provides a ground cover to suppress weeds and reduce soil moisture evaporation.

CULTURAL INTEGRATION

Integrating cultural components into the garden program can revitalize Indigenous culture by educating Indigenous students about their heritage, traditional practices, and culturally significant foods. This not only supports the revitalization of culture, but also allows for cross-generational and intertribal relationships to share knowledge and practices, and supports Indigenous communities in their efforts toward food sovereignty.

Traditional Ecological Practices (TEP)

As mentioned in the last section, utilizing traditional ecological practices to maintain the garden, not only implements sustainable land management techniques but it also creates opportunities to train and teach Indigenous students about these practices and their historical and cultural origins.

Culturally Significant Foods and Medicine

A garden program has the potential to implement and grow culturally significant foods that can be shared and represented through meal programs and events. Haskell University represents approximately 140 different Tribal Nations and Alaska Native communities (Haskell Indian Nations University n.d.), providing a rich diversity of cultural recipes, food varieties, and medicinal plants that can be grown and shared.

Collaborating with organizations such as the National Farm to School Network and its Native Communities branch can offer valuable resources and support to integrate culturally significant foods into Haskell's dining halls, strengthening connections between traditional food systems and daily student life.

Design Features

After speaking with students at Haskell University, several suggestions emerged to enhance cultural representation in the garden spaces. Students expressed interest in incorporating Indigenous art and interpretive signage to create a more welcoming and meaningful environment for Indigenous students.

The Lawrence area is home to many talented Indigenous artists specializing in mural painting, woodworking, and metalworking. Collaborating with these artists can result in beautifully hand-crafted benches, outdoor pavilions, kiosks, and signage that not only enhance the garden's aesthetic appeal but also celebrate Indigenous culture and storytelling.

Community Engagement

The garden program serves as a platform for community engagement, promoting cultural education and knowledge-sharing among Haskell University and Tribal Nations. It creates opportunities for cross-generational interactions, allowing elders to share traditional wisdom with younger generations through hands-on experiences.

The garden can also host ceremonies and events centered around plantings and harvests, facilitate resource-sharing through seed exchanges, and provide a space for storytelling events that preserve and celebrate Indigenous heritage. As a cultural and educational hub, Haskell University can use the garden to strengthen community connections while honoring and sustaining Indigenous traditions.

CURRICULUM & EDUCATION

Integrating curriculum into the garden and greenhouse will strengthen lesson plans by incorporating hands-on learning experiences that connect classroom topics with real-world scenarios. There are many opportunities for all programs of study at Haskell University to incorporate lessons with the garden and greenhouse. Gardening presents opportunities for students to learn about science, math, art, language, cultural studies, history, etc.

Below are examples of courses offered at Haskell University that could integrate hands-on gardening activities into their curriculum:

Art:

Humanities & Art Credit

- **Drawing**
  Introduction to drawing principles such as freehand, visual expression, and the expression of cultural heritage.
  Example: Outdoor classes where students draw what they see in the garden or greenhouse. They can utilize flowers or other vegetation to create dyes and textures.

Required for Associate and Bachelor Programs

Accounting:

Business Credit

- **Cost Accounting:**
  The study of an accountant's role in an organization and of the manager's decisions based on cost accounting systems.
  Example: Develop a project that evaluates garden budgets and expenses on seeds, soil, and other materials and perform a capital investment analysis.

Required for Business Administration (BS)

Biology:

Laboratory Science Credit

- **General Biology**
  Introduction to biology topics such as cell biology, genetics, evolution, organismal diversity, animal physiology, populations, and ecology.
  Example: Outdoor classes that explore the garden wildlife, plant life cycles, and plant processes.

Required for Associate and Bachelor Programs

Biology Credit

- **Plants of Kansas**
  Introduction to the basic principles and taxonomy, nomenclature, and classification of common and native Kansas plant species.
  Example: Plant identification classes utilizing species grown in the garden.

Elective for Natural and Social Sciences Programs (BS)

Elementary Education:

Elementary Education Credit

- **Physical Activity and Health Methods for K-6 Learners**
  Develop the knowledge and skills needed to promote physical activity and health within their general education classroom.
  Example: Develop hands-on gardening activities within K-6 curriculum to promote outdoor physical activity and healthy eating habits.

Required for Elementary Education (BS)

Environmental Science:

Environmental Science Credit

- **Sustainability**
  Examines carbon and ecological footprints through case study analysis and documentation focusing on energy, waste, water, and transportation related issues.
  Example: The garden and greenhouse can be used as a case study. This will help with the garden program by developing metrics of its impact and evaluating operations.

Elective for Natural and Social Science Programs (BS)

Health, Sports, and Exercise Science:

Physical Activity Course or Health Class Credit

- **Cultural Well-Being: Concepts and Practice to Living Well**
  Provide students with concepts and practice to achieve holistic well-being. A medicine wheel approach will focus on physical, mental, emotional, and spiritual wellness.
  Example: The garden and greenhouse provide environments that can promote these concepts such as eating healthy foods, being active outdoors, restorative benefits, and connecting with cultural practices through the garden.

Required for Associate and Bachelor Programs

Indigenous and American Indian Studies:

Multicultural, World or Comparative Issues Credit

- **Native/Western Views of Nature**
  Consists of a comparative examination of the institution of modern Western Science and what scholars today recognize as Traditional Ecological or Environmental Knowledge (TEK).
  Example: Incorporate outdoor classes with training or lessons on TEK in the garden.

Required for Associate and Bachelor Programs

American Indian Studies Credit

- **Environmental-Community Health and Climate Change**
  Aims to identify environmental risks in order to promote traditional, healthy ways of life for American Indian/Alaskan Native communities.
  Example: Discuss topics of access to local and healthy foods, food security, and food sovereignty.

Elective for Indigenous and American Indian Studies (BS)

There are many other courses offered at Haskell Indian Nations that can intertwine their topics and lesson plans into the garden and greenhouse program. These are just a few examples and initial ideas of how to develop curriculum to support experiential and hands-on learning with diverse academic topics.

COMMUNITY ENGAGEMENT

Garden programs create diverse opportunities for community engagement by enhancing education, improving access to food and resources, expanding cultural networks, and strengthening community identity. By fostering connections across generations, cultures, and backgrounds, these programs cultivate a shared sense of belonging and resilience. Engagement with gardens and greenhouses can take many forms, including community events, educational classes, hands-on training, and guided tours, all of which support learning and outreach.

Events

Hosting garden events throughout the season can connect diverse user groups of the garden program. University-led events can engage student-led organizations by integrating the garden and greenhouse into cultural celebrations, research-related events, and other educational clubs that are part of Haskell's student body. Community-wide events can strengthen intertribal relations by featuring traditional recipes from different Tribal Nations and sharing Indigenous food practices. Additionally, donor events provide opportunities for supporters to share a meal, learn about Haskell's mission and future research, and exchange ideas to further the program's impact.

Examples of events that Haskell already hosts are:

- **Wetland Workday:** Volunteers help remove invasive teasel and bush honeysuckle to help open the prairie for seeding, planting, and local wildlife.
- **Tributary Trash Cleanup:** Volunteers help remove trash from the east tributary on Haskell's campus to help keep the land and campus safe and beautiful.
- **Plant Harvest Events:** Foraging and harvest events throughout campus include wild onion, sunchokes, cattails, maple sap collection, and more.
- **Traditional Native American Food Potlucks:** Special events, such as dances, feature traditional foods and music as part of the celebration.

Classes

The garden program can offer classes to enhance skills and training in land management practices, food production, traditional medicines, food preparation, and other topics that connect to the garden spaces. These classes can be led by Haskell professors and students, with guest lecturers and professionals invited to share their expertise, providing a well-rounded educational experience that integrates academic knowledge with hands-on learning.

Examples of classes Haskell currently implements:

- **STEM Workshops:** Students, staff, and faculty at Haskell University and participants from other institutions present their research projects to the university community.
- **Medicinal Bundles:** Events and classes held at the greenhouse focus on preparing traditional medicines for the local community. These include flat cedar, eastern red cedar, white sage, and tobacco.
- **Native Seed Cleaning:** Educational lessons on how to clean various native seeds and their deep relationships with humans and non-humans.

Tours

Haskell University already conducts tours that engage Tribal Nations, local schools, institutions, and organizations to learn about land management and restoration practices. Integrating the garden and greenhouse into these tours would further enhance awareness of diverse food production methods, ongoing research efforts, cultural connections, and their impact on students and the local community.

For more information regarding Haskell University's Greenhouse events, classes, and tours check out their facebook page: https://www.facebook.com/haskellgreenhouse

PARTNERSHIPS

Forming partnerships with institutions, organizations, local farmers, producers, and Indigenous-led networks will strengthen the garden program's impact by connecting with others who share similar goals and missions. These collaborations foster the exchange of knowledge on management and engagement strategies, as well as resources such as seeds, curricula, and activity planning. Additionally, partnerships can help coordinate initiatives like meal programs, educational summits, conferences, and food production safety and regulation efforts, further expanding the program's reach and effectiveness.

Below is a list of potential partners and their mission statements:

Indigenous Organizations

- **Indigenous Native Chef LLC - Eudora, KS:** Established by Chef Jason Champagne, MPH. "An educational business that promotes outreach culinary education. Provides culinary demonstrations, hands-on cooking events, educational meals, and professionally edited cooking videos" (Indigenous Native Chef n.d.).

  Website: https://www.indigenousnativechef.com/

- **Waldulisi's Indigenous Food - Kansas City Area:** Founded by Melissa Garrett, a Cherokee Nation member and Haskell alum (Winter 2025). Waldulisi's Indigenous Food is committed to educating the public about Indigenous cuisine and increasing access to traditional foods. The organization offers cooking classes and school demonstrations through its educational programs.

  Website: https://www.facebook.com/people/Wadulisis/100088704790124/

- **NFSN Native Communities - Nationwide**: "Increase access to local food and nutrition education to improve children's health, strengthen family farms, and cultivate vibrant communities" (NFSN 'About' n.d.).

  Website: https://www.farmtoschool.org/our-work/native-communities

- **Native American Food Sovereignty Alliance (NAFSA) - Nationwide**: "Restore, Affirm, and Reclaim Indigenous food systems, through education, advocacy, and relationship building" (NAFSA n.d.).

  Website: https://nativefoodalliance.org/

- **North American Traditional Indigenous Food Systems (NATIFS) - Nationwide**: "Works to cultivate the seeds of Indigenous heritage, nourish our people, and honor the land that sustains us" (NATIFS n.d.).

  Website: https://natifs.org/

- **NACA Inspired Schools Network (NISN) - Nationwide:** "Supports leaders in Indigenous communities to develop a network of schools providing rigorous academic curriculum aimed at college preparation while also promoting Indigenous culture, identity, and community investment" (NISN n.d.).

  Website: https://www.nacainspiredschoolsnetwork.org/

- **Feeding America: Traditional Foodways - Nationwide**: "We make healthy (traditional) food easier to access. We help families feel financially secure. We support laws that make food available to everyone" (Feeding America n.d.).

  Website: https://www.feedingamerica.org/hunger-in-america/native-american

- **First Nations Development Institute - Nationwide:** "Our mission is to uplift and sustain the lifeways and economies of Native communities through advocacy, financial support, and knowledge sharing" (First Nations n.d.).

  Website: https://www.firstnations.org/

- **Cultural Survival - Nationwide:** "An Indigenous-led NGO and registered non-profit that advocates for Indigenous Peoples' rights and supports Indigenous communities' self-determination, cultures, and political resilience, since 1972" (Cultural Survival n.d.).

  Website: https://www.culturalsurvival.org/

- **Indigenous Food Systems Network:** "Developed by the WGIFS to allow individuals and groups involved with Indigenous food-related action, research, and policy reform to network and share relevant resources and information" (IFSN n.d.).

  Website: https://www.indigenousfoodsystems.org/

Nonprofit Organizations in Lawrence (Non-Indigenous)

- **Just Food - Lawrence, KS:** "Our mission is to end hunger in our community by increasing access to healthy foods, reducing barriers to health and well-being, and cultivating self-sufficiency" (Just Food n.d.).

  Website: https://www.justfoodks.org/

- **Sunrise Project - Lawrence, KS**: "Serves Douglas County by providing space and opportunities for people of all ages and backgrounds to build an equitable community through education, good food, and social connection" (Sunrise Project n.d.).

  Website: https://www.sunriseprojectks.org/

- **Habitat for Humanity - Lawrence, KS:** "A non-profit housing organization working in local communities across all 50 states and in more than 70 countries around the world. Habitat's vision is of a world where everyone has a decent place to live" (Habitat for Humanity n.d.).

  Website: https://www.habitat.org/ks/lawrence/lawrence-hfh

- **United Way Kaw Valley - Lawrence, KS:** "Works to create and cultivate an unbreakable network of support for a strong, healthy, and equitable community" (United Way Kaw Valley n.d.).

  Website: https://www.uwkawvalley.org/

- **Native Lands Restoration Collaborative (NLRC) - Lawrence, KS:** "A charitable organization that empowers diverse land stewards to protect and restore resilient native ecosystems through community education" (Native Lands Restoration Collaborative n.d.).

  Website: https://www.nativelandsks.org/

Nonprofit Organizations Nation Wide (Non-Indigenous)

- **School Garden Support Organization Network (SGSO) - Nationwide:** "Support the growth and sustainability of an equitable school garden movement" (SGSO Network n.d.).

  Website: https://sgsonetwork.org/

(Non-Indigenous) NON-PROFITS IN LAWRENCE, KS

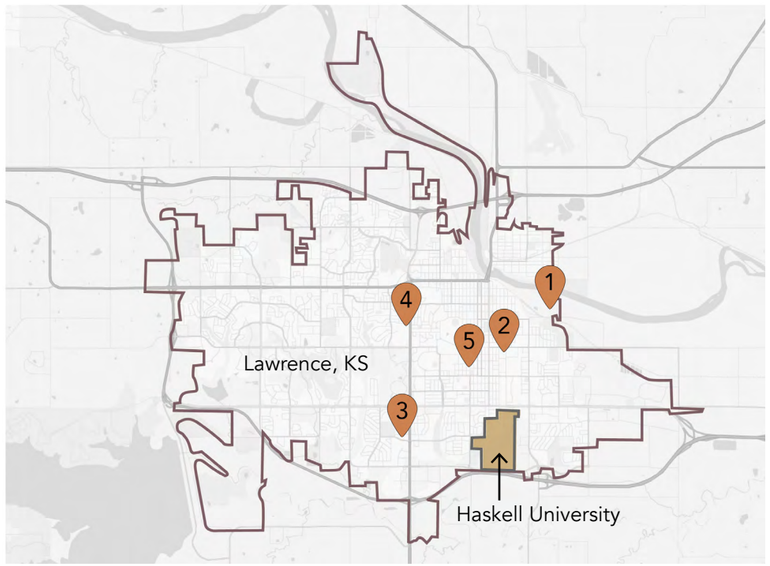


Figure 6.1 Lawrence Non-Profit Map (Swaney 2025).

LEGEND

Haskell University

Non-Profit Organizations

1. Just Food
2. Sunrise Project
3. Lawrence Habitat for Humanity
4. United Way of Kaw Valley
5. Native Lands Restoration Collaborative

Nonprofit Organizations in the Kansas City Metro Area (Non-Indigenous)

- **Cultivate KC - Kansas City, MO**: "A locally-grown nonprofit working to grow food, farms, and community in support of equitable, sustainable, and healthy local food system for all" (Cultivate KC n.d.).

  Website: https://www.cultivatekc.org/

- **The Giving Grove - Nationwide:** "Provide healthy calories, strengthen community, and improve the urban environment through a nationwide network of sustainable little orchards" (The Giving Grove n.d.).

  Website: https://www.givinggrove.org/

- **Kansas City Community Gardens - Kansas City, MO:** "A non-profit membership organization that helps people grow vegetables and fruit from garden plots and orchards located in backyards, schoolyards, vacant lots and community sites" (KCCG n.d.).

  Website: https://kccg.org/

- **Uncover KC - Kansas City, MO**: "Creates positive social impact through civic engagement services and programs that connect people and spark action" (Uncover KC n.d.).

  Website: https://uncoverkc.org/

- **Bridging the Gap - Kansas City, MO**: "Delivers equitable environmental solutions in Kansas City through education, advocacy, volunteerism, and the stewardship of natural resources" (Bridging the Gap n.d.).

  Website: https://bridgingthegap.org/

(Non-Indigenous) NON-PROFITS IN KANSAS CITY METRO AREA

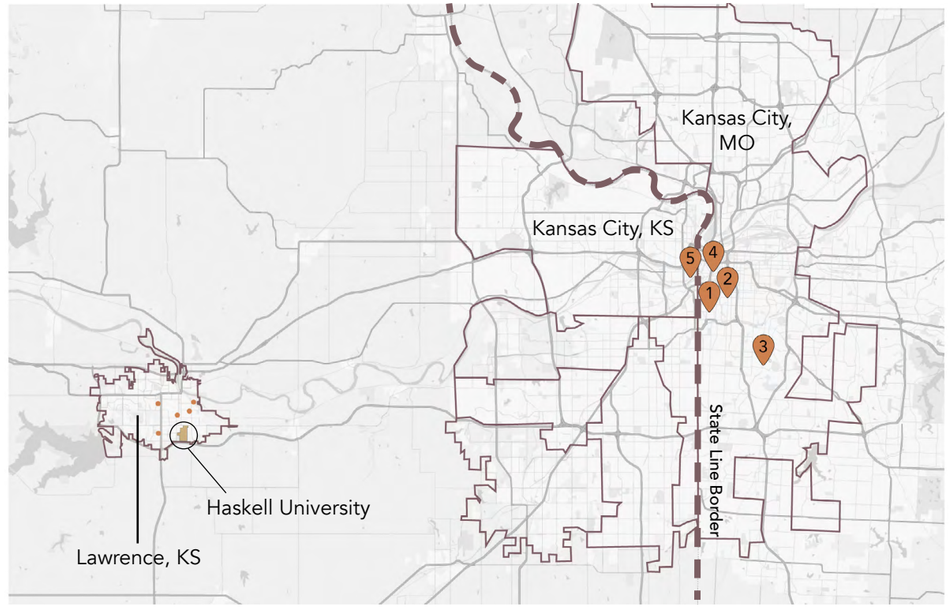


Figure 6.2 Kansas City Metro Non-Profit Map (Swaney 2025).

0 4.6 mi 9.2 mi

LEGEND

Haskell University

State Border of Kansas & Missouri

(Non-Native) Non-Profit Organizations

1. Cultivate KC
2. The Giving Grove
3. Kansas City Community Gardens
4. Uncover KC
5. Bridging The Gap

Institutions

- **Kansas State University**: Provide assistance and guidance for food production, sustainable food systems, food processing, greenhouse production, and research.
    - **K-State Olathe Campus - Olathe Horticulture Research & Extension Center (OHREC):** "342 Acres of land that serves as space for hands-on, plant and produce related research" (K-State Olathe n.d.). Research activities include high tunnel production, vegetable grafting, urban agriculture, and agrivoltaics. The site also hosts educational programs tailored to beginning and resource-limited specialty crop growers.

      Website: https://olathe.k-state.edu/local-resources/olathe-horticulture-center/
    - **K-State Research & Extension - Growing Growers Program (Statewide):** Led by the Olathe Horticulture Research & Extension Center. "Growing Growers is a decentralized program wherein apprentices engage in hands-on farm work at their host farm, receive 12-month access to an extensive online course, and attend a series of in-person workshops and farm tours throughout the growing season" (Growing Growers n.d.).

      Website: http://www.growinggrowers.org/
    - **K-State Olathe Campus - Urban Food Systems Initiative**: "An interdisciplinary collaboration focused on developing sustainable urban food systems that are inclusive, resilient, safe, and diverse" (K-State Olathe Urban Food Systems Initiative n.d.).

      Website: https://olathe.k-state.edu/research/urban-food/
    - **K-State Manhattan Campus - Willow Lake Student Farm**: "Our mission is to be a living laboratory for sustainable agriculture research, education, and outreach, while providing the K-State campus-community with fresh, local produce" (K-State Horticulture & Natural Resources n.d.).

      Website: https://hnr.k-state.edu/about/facilities/willow-lake/
- **K-State Research & Extension Douglas County:** Kaw Valley Farms LLC, Research & resources in agriculture, community development, health and wellness, and natural resources. "Enriching Douglas County residents with research-based information, resources, and opportunities" (K-State Research & Extension Douglas County n.d.).

  Website: https://www.douglas.k-state.edu/
    - **Kaw Valley Farms LLC - Lawrence, KS:** Kaw Valley Farm Tours is an annual event held in the first week of October to tour local farms and wineries, sample and buy products, and engage in fun activities (Douglas County n.d.).

      Website: https://www.douglas.k-state.edu/program-areas/kaw_valley_farm_tour/
- **The University of Kansas - Lawrence, KS**: Provide assistance and guidance on community outreach, ecological research, sustainable food practices, Indigenous studies, and research.
    - **KU Native Faculty Staff Council**: "Promote, support, and advocate for Jayhawks who are citizens of tribal nations at the University of Kansas while working together as one with all Jayhawks" (University of Kansas n.d.).

      Website: https://sovereignpartnerships.ku.edu/nfsc
    - **University of Kansas:** First Nations Student Association, Center for Sustainability, Community Outreach, and Student Farm.

      Website - First Nations Student Association: https://rockchalkcentral.ku.edu/organization/fnsa

      Website - Native Medicinal Garden: https://nativeplants.ku.edu/native-medicinal-plant-garden

      Website - KU Sustainability: https://sustainability.ku.edu/

      Website - Center for Community Outreach: https://cco.ku.edu/

      Website - KU Student Farm: https://kufarming.wordpress.com/about/
    - **KU Biological Survey & Center for Ecological Research - Field Station:** Invites KU community members and other institutions to study its three sites, which cover a variety of native and adapted habitats and indoor and outdoor laboratories (University of Kansas Biological Survey & Center for Ecological Research n.d.).

      Website: https://biosurvey.ku.edu/fieldstation
    - **KU Crops to Campus:** A partnership between KU and the Rolling Prairie Farm Alliance to provide fresh produce to the Lawrence KU community (University of Kansas Employee Wellness n.d.).

      Website: https://wellness.ku.edu/csa

Government Agencies

- **Bureau of Indian Education - Nationwide**: A division of the U.S. Department of the Interior responsible for providing quality education opportunities for American Indian and Alaska Native students (U.S. Department of the Interior n.d.).

  Website: https://www.bie.edu/

- **USDA Indigenous Food Sovereignty Initiative - Nationwide**: "Promotes traditional foodways, Indian Country food and agriculture markets, and Indigenous health through foods tailored to American Indian/Alaska Native dietary needs (USDA n.d.).

  Website: https://www.usda.gov/about-usda/general-information/staff-offices/office-tribal-relations/programs-and-services/usda-indigenous-food-sovereignty-initiative

- **USDA Farm to School Program**: Efforts to connect local producers with schools and other organizations participating in child nutrition, hands-on education, school gardens, class curricula, and field trips (USDA n.d.).

  - Administered by the Kansas Department of Agriculture (KDA) - Manhattan, KS & the Kansas State Department of Education (KSDE) - Topeka, KS

  Website - USDA Farm to School Program: https://www.fns.usda.gov/f2s/farm-to-school#:~:text=Breadcrumb&text=The%20Patrick%20Leahy%20Farm%20to%20School%20Program%20helps%20child%20nutrition,ways%20into%20tribal%20meal%20programs.

Local Farmers & Gardeners

- **Juniper Hill Farms - Lawrence, KS:** "We have a passion for organic and sustainable agricultural production, post-harvest handling, local food systems, and the economics of growing" (Juniper Hill Farms n.d.).

  Website: https://www.jhf-ks.com/

- **Maseualkualli Farms - Lawrence, KS:** The Indigenous Community Center launched this food sovereingty farm in 2022. It focuses on perennial crops, a seed bank, and Indigenous farming practices (Winter 2022).

  Website: https://www.masefarm.org/

- **Chestnut Charlie's - Lawrence, KS:** Host groups and individuals to learn about perennial, organic agriculture and chestnuts (Chestnut Charlie's Tree Crops n.d.).

  Website: https://www.chestnutcharlie.com/

- **Pinwheel Farm - Lawrence, KS:** "Our mission is to help people to live simply, sustainably, and spiritually as part of the Earth's Community of Life by developing, modeling, and teaching innovative alternatives to conventional input-dependent agriculture and consumerist lifestyles and economies" (Pinwheel Farm n.d.).

  Website: https://www.pinwheelfarm.org/

- **Mellowfields Farm - Lawrence, KS:** "Our certified organic farming practices and direct-to-consumer marketing deliver fresh and nutritious vegetables to the eaters in Lawrence, Topeka, and the Kansas City area" (Mellowfields Farm n.d.).

  Website: https://www.mellowfields.com/?utm_source=google&utm_medium=wix_google_business_profile&utm_campaign=229500204550297177

- **Kaw Valley Farms LLC - Lawrence, KS:** Kaw Valley Farm Tours is an annual event held in the first week of October to tour local farms and wineries, sample and buy products, and engage in fun activities (Douglas County n.d.).

  Website: https://www.douglas.k-state.edu/program-areas/kaw_valley_farm_tour/

- **Pendleton's Country Market - Lawrence, KS:** "A diversified family farm, growing vegetables, bedding plants and cut flowers" (Pendleton's Country Market n.d.).

  Website: https://www.pendletons.com/

- **Wohletz Farm Fresh - Lawrence, KS:** A family farm where visitors can pick their own strawberries and blueberries (Wohletz Farm Fresh n.d.).

  Website: https://wohletzfarmfresh.com/

- **The Saltbox Farm - Lawrence, KS:** "Our mission is to bring you closer to the experience of country life, sharing the care we put into raising our animals and nurturing our environment" (The Saltbox Farm n.d.).

  Website: https://www.thesaltboxfarm.com/

- **Wakarusa Valley Farm - Lawrence, KS:** A certified organic farm that grows vegetables, berries, and mushrooms. They participate in the Lawrence Farmers Market and offer two subscription services (Eat Well Guide n.d.).

  Website: https://www.wakarusavalleyfarm.com/

- **Garden Incubator - Lawrence, KS:** This garden is part of the Douglas County Common Ground Initiative. It has plots available for families, adults, kids, and a discovery garden (Garden Incubator n.d.).

  Website: https://www.gardenincubator.org/

- **PermaCommons - Lawrence, KS:** This community garden uses permaculture techniques to grow a diverse range of perennial fruits, nuts, berries, herbs, and aquatic plants (Kansas Permaculture Institute n.d.).

  Website: https://kansaspermaculture.org/projects/permacommons/

- **Lawrence Community Orchard - Lawrence, KS:** Part of the Sunrise Project, Lawrence Community Orchard provides a 'free food park' where the public can pick ripe fruit (Lawrence Public Library n.d.).

- **Grassland Heritage Foundation: Little Prairie Community Garden - Lawrence, KS:** "Hosts workshops that will provide active, hands-on native plant gardening education" (Grassland Heritage Foundation n.d.).

  Website: https://www.grasslandheritage.org/littleprairie

LOCAL FARMS & GARDENS IN LAWRENCE, KS

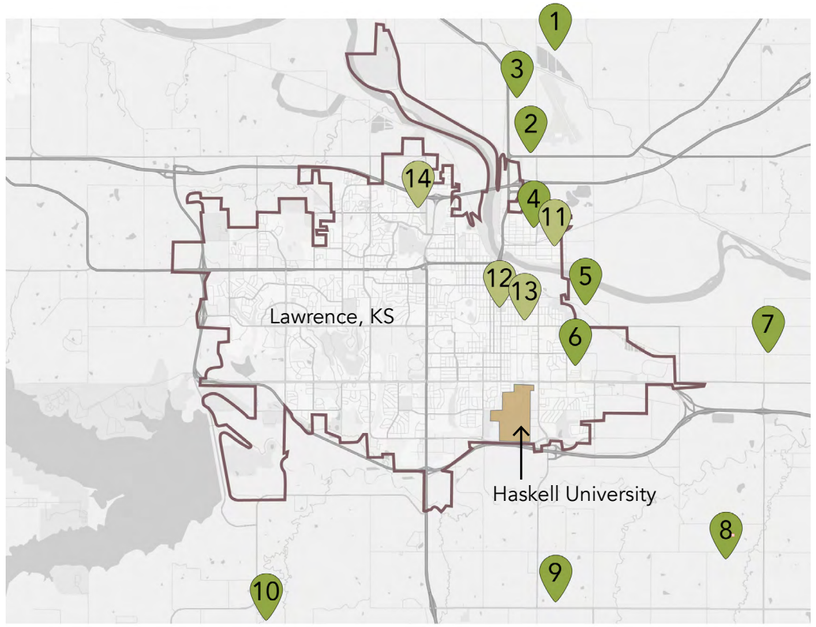


Figure 6.3 Local Farms & Gardens in Lawrence, KS (Swaney 2025).

Farms

1. Juniper Hill Farms
2. Maseualkualli Farms
3. Chestnut Charlie's Orchard
4. Pinwheel Farm
5. Mellowfields Farm LLC
6. Kaw Valley Farms LLC
7. Pendleton's Country Market
8. Wohletz Farm Fresh
9. The Saltbox Farm
10. Wakarusa Valley Farm

Gardens

11. Garden Incubator
12. PermaCommons Garden
13. Lawrence Community Orchard
14. Little Prairie Community Garden

Local Suppliers in Lawrence, KS

- **Maseualkualli Farms - Lawrence, KS:** Offers a seed breeding, reclamation, and sovereignty program. "Access to culturally specific food starts with access to culturally specific seeds" (Maseualkualli Farms n.d.).

  Website: https://www.masefarm.org/seeds

- **Leeway Franks - Lawrence, KS:** Indigenous Owned Culinary School. They offer classes on whole animal butchery, food sovereignty educational programs, and cooking classes with Native Chef Jason Champagne (Leeway Franks n.d.).

  Website: https://leeway-onlineordering.square.site/#12

- **Native Lands Restoration Collaborative (NLRC) - Lawrence, KS:** "A charitable organization that empowers diverse land stewards to protect and restore resilient native ecosystems through community education" (Native Lands Restoration Collaborative n.d.). They have a variety of native prairie seeds.

  Website: https://www.nativelandsks.org/

- **Pine's Garden & Market - Lawrence, KS:** A greenhouse and market operation that provides houseplants, landscaping plants, garden seeds, perennials and annuals, trees, and a wide range of growing supplies and tools (Pine's Garden and Market n.d.).

  Website: https://pinesgardenmarket.com/

- **Cottin's Hardware & Rental - Lawrence, KS:** A family-owned and operated hardware store. It has a variety of hardware, paint, tools, lawn and garden, housewares, plumbing, electrical, and beekeeping equipment (Cottin's Hardware & Rental n.d.).

  Website: https://cottinshardware.com/

Suppliers Outside of Lawrence, KS

- **Traditional Center for Indigenous Knowledge and Healing - Network:** Their mission is to revitalize and preserve traditional Indigenous culture through ancestral knowledge (Traditional Center for Indigenous Knowledge and Healing n.d.). Under 'Seed Stories' are lists of Indigenous-Owned companies, including seed & plant companies.

  Website: https://www.tcikh.org/blog-seedstories/indigenous-owned-seed-amp-plant-companies

- **Alliance of Native Seed Keepers - North Carolina:** "Our focus on heirloom and open-pollinated varieties not only supports seed-saving traditions but also empowers growers to cultivate sustainable, resilient crops" (Alliance of Native Seed Keepers n.d.). Provide a variety of vegetable, herb, and flower seeds.

  Website: https://www.allianceofnativeseedkeepers.com/

- **Taylor Creek Restoration Nursery - Baldwin City, KS:** Their mission is "A commitment to restore our nation's lands and waters with innovation and ecological integrity, to preserve the environmental balance for future generations" (Taylor Creek Restoration Nurseries n.d.). Native plants and seed distributor.

  Website: https://www.taylorcreeknurseries.com/

- **Hummert International - Topeka, KS:** "A family-owned and oriented distributor of horticultural products and services" (Hummert International n.d.). They offer research and export services, and plants and cuttings.

  Website: https://www.hummert.com/

- **Stuppy Greenhouse - Kansas City, MO:** "We supply top-quality greenhouses and cutting-edge hydronic heat systems, plus all of the equipment you need" (Stuppy Greenhouse n.d.).

  Website: https://www.stuppy.com/

- **Hamilton Native Outpost - Elk Creek, MO:** "Strives to provide a variety of adapted native plants and the knowledge to establish and maintain them for ecosystem restoration, wildlife habitat, grazing, and beauty in low-maintenance landscapes" (Hamilton Native Outpost n.d.). Native seed distributor to restore glade, prairie, savanna, and woodlands for wildlife and pollinators.

  Website: https://hamiltonnativeoutpost.com/

- **Missouri Wildflowers Nursery - Cole County, MO:** "We now grow and sell over 300 species of native plants to Missouri. In addition to wildflowers, we offer native trees, shrubs, vines, grasses, sedges, and ferns" (Missouri Wildflowers Nursery n.d.).

  Website: https://mowildflowers.net/

- **Morgan County Seeds - Barnett, MO:** Distributor of non-GMO seeds and one of the largest retail vegetable seed dealers in Missouri with over 1,000 varieties of seed (Morgan County Seeds n.d.). They also sell hydroponic, greenhouse, high tunnel, and irrigation supplies.

  Website: https://www.morgancountyseeds.com/

FUNDING RESOURCES

Garden programs, like many other initiatives, require funding to sustain operations, maintain resources, and support activities. Based on interview responses, there are multiple avenues for financial support. Many programs apply for federal and local grants aligned with relevant projects and initiatives. Additionally, fundraising events, donations, and market participation—such as selling produce, event tickets, and class fees—can generate revenue. However, funding availability varies depending on location, program type, and resources. To navigate financial constraints, it is recommended to establish partnerships with nonprofit organizations, local schools, and farmers while exploring creative solutions to secure long-term sustainability.

Grants

Research analysis indicates that grants serve as a primary funding source for garden programs. Numerous federal and local grants focus on education, agricultural practices, and Indigenous communities, offering financial support for garden initiatives. However, securing these funds requires strong grant writing skills and adherence to specific eligibility criteria. While grants can provide substantial financial support, they often demand significant time and effort to develop proposals, meet requirements, and implement new programs or projects effectively.

Donations

Donations provide another valuable funding avenue for university programs and initiatives. Hosting fundraising events can engage local community members who share similar goals and interests. These events may include shared meals, farm dinners, lectures, or classes highlighting cultural and educational practices at the university, along with interactive activities that demonstrate the garden program's impact on students and the community.

By fostering meaningful connections with potential donors, these events can help secure financial support and long-term investment in the program's success.

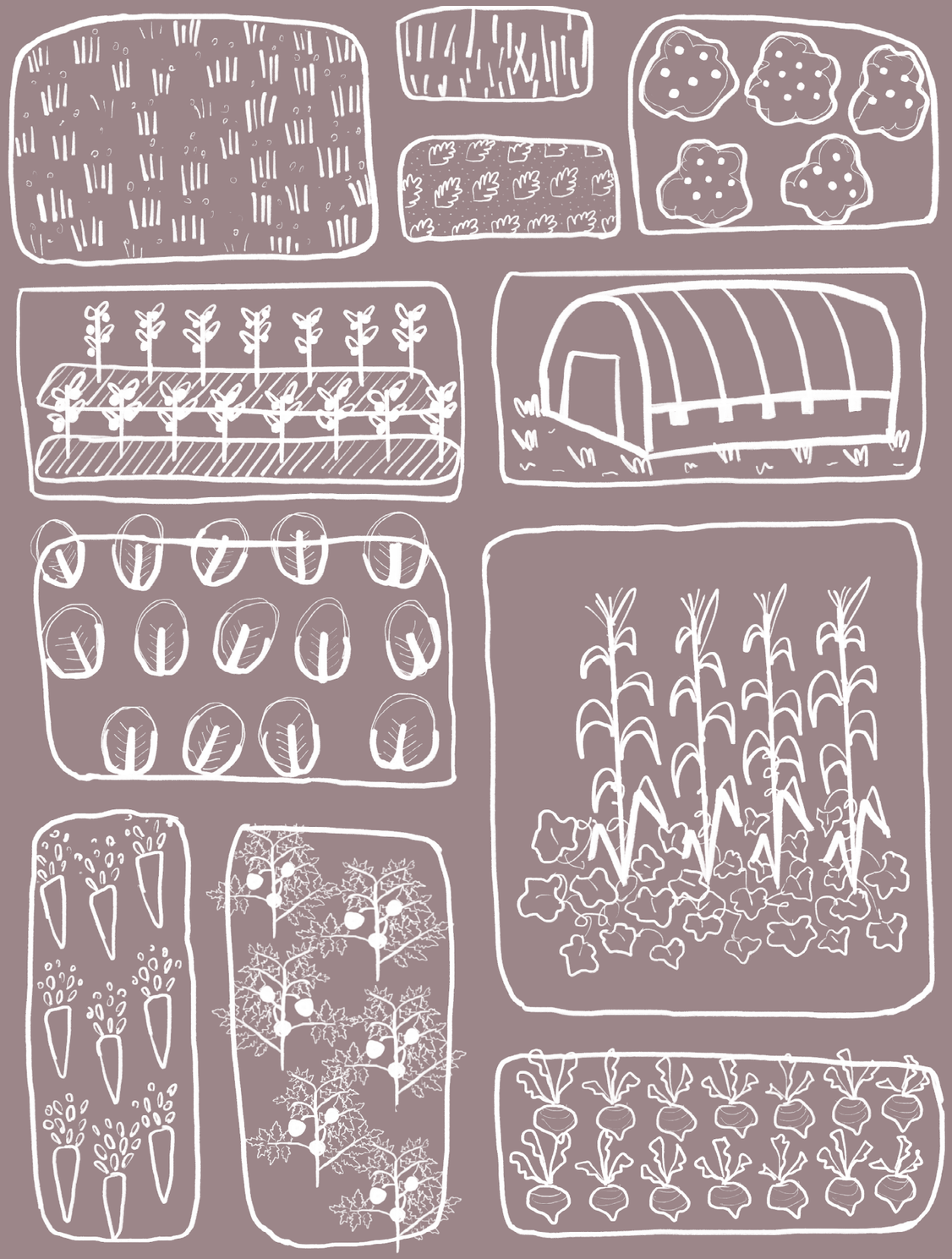
Market Sales

Depending on the garden program's values and goals, revenue can be generated through the sale of fresh produce, processed and canned goods, medicine bundles, and ticketed special events or training courses. By creating a sustainable revenue stream, the program can work toward self-sufficiency. However, relying solely on garden production for funding can be challenging due to unpredictable climate and weather conditions that may impact harvest yields.

Arlene Throness, the garden manager at Toronto Metropolitan University, shared an approach inspired by the honorable harvest and Indigenous principles of reciprocity (Throness 2024):

- Donate a third of the produce
- Sell a third at market price
- Offer a third at a discounted rate for students

This model of sharing fresh produce balances financial sustainability with community support, ensuring equitable food distribution while maintaining the garden's operational needs.



07. CONCLUSION

Many Americans lack knowledge about where their food comes from (Deelstra & Girardet 2017; Newsela 2017). Hands-on gardening programs offer experiential learning opportunities that enhance food education in both classrooms and communities. Research indicates that these programs not only improve food and nutrition education (McAleese & Rankin 2007; Morris & Zidenberg-Cherr 2002) but also contribute to health and wellness, environmental stewardship, and academic performance (Danks 2010; DiClaudio, Hughes & Savoca 2013; Klemmer, Waliczek & Zajicek 2005).

By integrating garden programs into schools or linking them with edible garden initiatives, students gain a deeper understanding of food production, increase their access to fresh, local foods, and are exposed to diverse agricultural practices and career opportunities. Additionally, these programs help students make meaningful connections to academic subjects and community initiatives, fostering a stronger local economy and social cohesion.

By conducting interviews with representatives from various garden programs—including school gardens, university gardens, non-profit garden programs, and Indigenous food system programs—along with case study analysis, this research developed guidelines to inform the projective design of Haskell University's campus garden and greenhouse program.

REPORT SUMMARY

This section provides a concise overview of the methodology and key findings of the report.

Research Methods & Findings

This research gathered diverse perspectives from garden program representatives through a series of interviews approved by K-State's IRB. The interviews provided valuable insights into how different garden programs operate, establish connections and partnerships with schools and organizations, manage their programs, and navigate challenges. Several key themes emerged from the responses, including the importance of integrating garden programs into educational curricula, developing relationships with local organizations and farmers to increase the program's impact, and incorporating diverse cultural representations through traditional foods, medicines, and land management practices.

Haskell Student Feedback

A design review session was conducted to gather feedback from Haskell Indian Nations University students on the proposed garden and greenhouse design, as well as potential future programming activities. Held virtually via Zoom, the session included participation from students across a range of academic disciplines, including Health and Exercise Science, American Indian Studies, and Environmental Science. Courtney King, the university's Greenhouse Manager and Lab & Field Research Assistant, also participated in the discussion. The insights shared by students played a crucial role in shaping the design direction and helped identify opportunities for programming that could foster deeper connections within the university and extend outreach to the broader Lawrence community.

Addressing the Research Question

This research addresses the central question: ***How do selected case study programs engage students in food education through garden-based learning and how can these approaches be adapted to support outreach and learning at an Indigenous university?*** Based on insights from the interviews, a set of recommendations has been developed to guide Haskell University in implementing a garden program tailored to its unique academic structure, land management practices, and community partnerships. While these recommendations are tailored to the context of Haskell, they may also serve as a valuable resource for other garden programs aiming to enhance food education and improve access to fresh, locally grown foods within their communities.

LIMITATIONS

The research revealed several limitations that could be addressed if this project were to be repeated or expanded upon.

Sampling Size

The research methods for this study were adapted due to unforeseen challenges, resulting in the removal of focus group discussions from the methodology. Consequently, direct feedback from Haskell Indian Nations University faculty and staff was not collected, which limited the project's ability to fully incorporate their needs and potential visions for the garden program within the university setting. Additionally, only a small number of students were engaged in the design and programming process due to time constraints. Although these students represented diverse academic backgrounds and had experience with greenhouse and garden operations, the inclusion of a broader student cohort would have offered a wider range of perspectives and more comprehensive insights to inform the design.

Indigenous Representation

This report also presents limitations related to the representation of Indigenous perspectives. Only one interviewee from the case studies identified as Indigenous, and due to time constraints, outreach to additional Indigenous representatives within the case study programs was not completed. This gap limits the project's cultural responsiveness and the incorporation of Indigenous voices that are especially relevant to the context of Haskell University.

Interview Questions

Furthermore, the interview protocol posed certain limitations. In order to streamline the Institutional Review Board (IRB) approval process, a single set of interview questions was used across all participating programs. While this approach facilitated consistency, it also proved challenging in cases where program structures varied significantly. For example, questions related to garden maintenance were not always applicable to programs centered around network-building or advocacy rather than hands-on garden management.

Project's Progression

Lastly, the project's evolution during the proposal phase—particularly the multiple changes to its objectives and the restricted project timeline— necessitated the merging of two distinct frameworks: a broad perspective on food education through urban agriculture and the culturally specific perspective of Indigenous food systems. As a result, the project was limited in its ability to explore either component in depth, ultimately narrowing the overall scope and depth of the research.

FUTURE RESEARCH

This research explored the benefits of garden programs in enhancing student food education with a particular focus on how Indigenous garden programs not only promote food education but also emphasize cultural education, representation, and community cohesion.

If this research were to be repeated or expanded, it is recommended that more feedback and insight be gathered directly from Indigenous representatives at Haskell University and from Indigenous-led garden programs. While this study examined a few Indigenous food system initiatives, the majority of interview participants were non-Indigenous, with only one exception. Moving forward, incorporating more Indigenous voices is essential to gaining a deeper understanding of the strategies and practices used to develop, manage, and sustain garden-based educational programs.

Beyond the scope of this research, future studies could explore the integration of cultural programming within school-based garden initiatives, the role of Indigenous networks in supporting these efforts, and the development of comprehensive curricula that embed garden-based learning into Indigenous academic programs. Expanding this area of study would contribute to the literature on how Indigenous communities utilize gardens and farm programs—not only to advance food sovereignty initiatives but also to improve food education and overall health within Indigenous communities.



08. REFERENCES

Alliance of Native Seed Keepers. n.d. Growing with Integrity: Our Seed Offerings. About Us. Accessed April 2025. https://www.allianceofnativeseedkeepers.com/pages/birth-of-the-alliance

Barrantes, Sam Williams. 2025. Interview by author. Email. February 12, 2025.

Berezowitz, Claire K., Andrea B. Bontrager Yoder, and Dale A. Schoeller. 2015. "School Gardens Enhance Academic Performance and Dietary Outcomes in Children." Journal of School Health. 85 (8): 508-518. https://doi-org.er.lib.k-state.edu/10.1111/josh.12278

Brassard, Bob. 2025. Interview by author. Teams Video Call. February 7, 2025.

Brauer, Alan. 2025. Interview by author. Zoom Video Call. February 18, 2025.

Bridging the Gap. n.d. What We Do. Home Page. Accessed April 2025. https://bridgingthegap.org/

Brown, Katherine H., Anne Carter. 2003. "Urban Agriculture and Community Food Security in the United States: Farming from the City Center to the Urban Fringe." Community Food Security Coalition's North American Urban Agriculture Committee. 1-29. https://www.socioeco.org/bdf_fiche-document-2494_en.html

Bureau of Indian Education. 2024. "Cultivating Connection: BIE Schools Embrace School Gardens." Accessed March 2025. https://www.bie.edu/news-article/cultivating-connection-bie-schools-embrace-school-gardens

Center for Ecoliteracy. 2024. "A Delicious Guide to Culturally Relevant Farm to School Education." Learning in the Real World. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://ecoliteracy.org/sites/default/files/media/ecoliteracy_eating_learning_growing_guide.pdf

Centers for Disease Control and Prevention. 2024. "Childhood Obesity Facts." Accessed October 2024. https://www.cdc.gov/obesity/childhood-obesity-facts/childhood-obesity-facts.html#:~:text=Expand%20All-,Age,%25%20among%20adolescents%2012%E2%80%9319.

Center for Sustainable Systems. 2024. "U.S. Cities Factsheet." University of Michigan. Accessed October, 2024. https://css.umich.edu/publications/factsheets/built-environment/us-cities-factsheet#:~:text=83%25%20of%20the%20U.S.%20population,9

Chestnut Charlie's Tree Crops. n.d. Welcome to Chestnut Charlie's. Accessed April 2025. https://www.chestnutcharlie.com/

Cottin's Hardware & Rental. n.d. Lawrence's Local Hardware Store. Accessed April 2025. https://cottinshardware.com/

Cultivate KC. n.d. "About." Our Work. Accessed March 2025. https://www.cultivatekc.org/our-work/about-us/

Cultural Survival. n.d. About Us. Accessed April 2025. https://www.culturalsurvival.org/about

Danks, Sharon Gamson. 2010. Asphalt to Ecosystems: Design Ideas for Schoolyard Transformation. New York: New Village Press. Accessed October 20, 2024. ProQuest Ebook Central.

Deelstra, Tjeerd, and Herbert Girardet. 2017. "Urban Agriculture and Sustainable Cities." ResearchGate (June): 43-65. https://www.researchgate.net/publication/284992045_Urban_agriculture_and_sustainable_cities

Delgado, Tomas. 2025. Interview with author. Teams Video Call. February 10, 2025.

DiClaudio, Denelle, Luanne Hughes, and LeeAnee Savoca. 2013. "Learning Through the Garden." Rutgers New Jersey Agricultural Experiment Station. 1-4. https://njaes.rutgers.edu/fs1211/

Douglas County. n.d. Kaw Valley Farm Tour. Events and Meetings. Accessed April 2025. https://www.dgcoks.gov/events/kaw-valley-farm-tour-day-1

Eat Well Guide. n.d. Wakarusa Valley Farm. Accessed April 2025. https://www.eatwellguide.org/listings/41039

Ecological Society of America. 2000. "Carbon Sequestration in Soils." ESA. Accessed November 2024. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.esa.org/esa/wp-content/uploads/2012/12/carbonsequestrationinsoils.pdf

Environmental Protection Agency. 2005. "Everyday Choices: Opportuntities for Environmental Stewardship." Report. Accessed March 2025. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://archive.epa.gov/stewardship/web/pdf/rpt2admin.pdf

Exploring Alternatives. 2019. "Growing Food in the City - Urban Rooftop Farm in Downtown Toronto." Video, 1:12. https://www.torontomu.ca/sciencerendezvous/activity-booths/urbanfarm/

Feeding America. n.d. "An America Where No One Goes Hungry." Our Work. Accessed March 2025. https://www.feedingamerica.org/our-work

First Nations. n.d. "Our Values." About Us. Accessed March 2025. https://www.firstnations.org/our-values/

Fowler, Catherine S., and Dana Lepofsky. 2011. "Traditional Resource and Environmental Management." In Ethnobiology, edited by E.N. Anderson, D. Pearsall, E. Hunn, and N. Turner, 1st ed., 285-304. Wiley. https://doi.org/10.1002/9781118015872.ch17.

Garden Incubator. n.d. Garden Home. Accessed April 2025. https://www.gardenincubator.org/

Grassland Heritage Foundation. n.d. "The Little Prairie at Little Prairie Community Garden." Act. Accessed March 2025. https://www.grasslandheritage.org/littleprairie

Growing Growers. n.d. Growing Growers. Home. Accessed April 2025. http://www.growinggrowers.org/

Habitat for Humanity. n.d. What is Habitat for Humanity? Your Local Habitat. Accessed April 2025. https://www.habitat.org/ks/lawrence/lawrence-hfh

Hahn, Erin R., Meghan Gillogly, and Bailey E. Bradford. 2021. "Children are Unsuspecting Meat Eaters: An Opportunity to Address Climate Change." Journal of Environmental Psychology. 78. DOI: https://doi.org/10.1016/j.jenvp.2021.101705

Hamilton Native Outpost. n.d. About. Accessed April 2025. https://hamiltonnativeoutpost.com/about/

Haskell Indian Nations University. n.d. "Haskell History." About. Accessed March 2025. https://haskell.edu/about/history/#:~:text=For%20over%20140%20years%2C%20Haskell,Onward%20Haskell!

Havrelock, Deidre and Edward Kay. 2023. Indigenous Ingenuity: A Celebration of Traditional North American Knowledge. New York: Christy Ottaviaho Books.

Hawes, Jason K., Dimitrios Gounaridis, and Joshua P. Newell. 2022. Does Urban Agriculture Lead to Gentrification? Elsevier. Landscape and Urban Planning. 225. DOI: https://doi.org/10.1016/j.landurbplan.2022.104447

Hodgson, Kimberley, Marcia Caton Campbell, and Martin Bailkey. 2011. Urban Agriculture: Growing Healthy, Sustainable Places. Chicago: American Planning Association.

Hummert International. n.d. We Know Growers! Home. Accessed April 2025. https://www.hummert.com/

Indigenous Native Chef. n.d. About. Accessed April 2025. https://www.indigenousnativechef.com/about

Indigenous Farm Hub. n.d. “IFH Mission and Vision.” Who We Are. Accessed February 2025. https://indigenousfarmhub.org/10475-2/

Indigenous Farm Hub. n.d. “Who We Are.” Accessed February 2025. https://indigenousfarmhub.org/who-we-are/

Indigenous Food Systems Network. About. Accessed April 2025. https://www.indigenousfoodsystems.org/about

Juniper Hill Farms. n.d. “Juniper Hill Farms.” Growing For You. Accessed March 2025. https://www.jhf-ks.com/#meet-scott-thellman-section

Just Food. n.d. “Just Food Fighting Hunger in Douglas County.” Home. Accessed March 2025. https://www.justfoodks.org/

Kansas City Community Gardens. n.d. Who We Are. Home Page. Accessed April 2025. https://kccg.org/

Kansas State Department of Education. 2024. “Agriculture, Food & Natural Resources.” The Kansas State Department of Education. Accessed October 2024. https://www.ksde.org/Agency/Division-of-Learning-Services/Career-Standards-and-Assessment-Services/Content-Area-A-E/Agriculture-Food-Natural-Resources-CTE-Career-Cluster

Kansas Permaculture Institute. n.d. PermaCommons. Accessed April 2025. https://kansaspermaculture.org/projects/permacommons/

Kimminau, Kim S., and Kimberlee C. Murphy. 2006. “Kansas Public School Health: Nutrition, Physical Education and Physical Activity Policies and Practices.” Kansas Health Institue. Accessed October 2024. https://www.khi.org/articles/kansas-public-school-health-nutrition-physical-education-and-physical-activity-policies-and-practices/

Klemmer, C.D., T.M. Waliczek, and J.M. Zajicek. 2005. “Growing Minds: The Effect of a School Gardening Program on the Science Achievement of Elementary Students.” Hort Technology. 15 (3): 448-452. DOI: https://doi.org/10.21273/HORTTECH.15.3.0448

K-State Olathe. n.d. Olathe Horticulture Research & Extension Center. Accessed April 2025. https://olathe.k-state.edu/local-resources/olathe-horticulture-center/

K-State Research and Extension. 2024. “Supporting Kansas Communities.” Kansas State University. Accessed October 2024. https://www.ksre.k-state.edu/

K-State Research & Extension Douglas County. n.d. K-State Research and Extension Douglas County. Accessed April 2025. https://www.douglas.k-state.edu/

K-State University Horticulture & Natural Resources. n.d. Willow Lake Farm. Accessed April 2025. https://hnr.k-state.edu/about/facilities/willow-lake/

Kuhnlein, Harriet V., Bill Erasmus, and Dina Spigelski. 2009. Indigenous Peoples’ Food Systems: The Many Dimensions of Culture, Diversity and Environment for Nutrition and Health. Rome: Food and Agriculture Organization of the United Nations Centre for Indigenous Peoples’ Nutrition and Envrionment.

Langemeyer, Johannes, Cristina Madrid-Lopez, Angelica Mendoza Beltran, et al. 2021. “Urban Agriculture - A Necessary Pathway Towards Urban Resilience and Global Sustainability.” Landscape and Urban Planning 20: 1-8. https://doi.org/10.1016/j.landurbplan.2021.104055.

Lanza, Kevin, Melody Alcazar, Deanna M. Hoelscher, et al. 2021. “Effects of Trees, Gardens, and Nature Trails on Heat Index and Child Health: Design and Methods of the Green Schoolyards Project.” BMC Public Health. 21 (98): 1-12. https://doi.org/10.1186/s12889-020-10128-2

Lawrence Public Library. n.d. Lawrence Community Orchard. Community Resources. Accessed April 2025. https://lplks.org/content/sunrise-community-orchard/

Leach, Sabreena. 2024. “Recognizing the First Ecological Designers: Weaving Indigenous Narratives into Landscape Architecture Curriculum.” Master’s Report, Kansas State University, Manhattan, KS. KREX

Leeway Franks. n.d. Classes/Education. Accessed April 2025. https://leeway-onlineordering.square.site/#12

Leigh Anne Neal. n.d. “About.” Accessed January 2025. http://www.leighanneneal.com/about.html

Lineberger, Sarah E., and Jayne M. Zajicek. 2000. “School Gardens: Can a Hands-on Teaching Tool Affect Students’ Attitudes and Behaviors Regarding Fruit and Vegetables?” Hort Technology. 10 (3): 593-597. DOI: https://doi.org/10.21273/HORTTECH.10.3.593

Living Architecture Monitor. n.d. “Episode 7 - Food, Social Justice, and Community Healing.” A Green Roofs for Healthy Cities. Accessed January 2025. Arlene: https://livingarchitecturemonitor.com/sustainable-futures-podcast/episode-7-food-social-justice-and-community-healing

Living Architecture. 2023. "Rooftop Farm Living Lab: Research Takes Root at the Urban Farm at TMU." Green Roofs for Healthy Cities. Accessed February 2025. https://livingarchitecturemonitor.com/articles/rooftop-farm-living-lab-research-tmu-sp23#:~:text=This%20location%20officially%20opened%20in,residential%2C%20commercial%20and%20institutional%20buildings.

Louv, Richard. 2005. Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder. London: Atlantic Books.

Luse, Jess. 2025. Interview by author. Phone call. February 7, 2025.

Maseualkualli Farms. n.d. Maseualkualli Farms. Home. Accessed April 2025. https://www.masefarm.org/seeds

McAleese, Jessica D., Linda L. Rankin. 2007. "Garden-Based Nutrition Education Affects Fruit and Vegetable Consumption in Sixth-Grade Adolescents." Journal of the American Dietetic Association. 107 (4): 662-665. https://doi.org/10.1016/j.jada.2007.01.015

McBride, B.B., C. A. Brewer, A. R. Berkowitz et al. 2013. "Environmental Literacy, Ecological Literacy, Ecoliteracy: What Do We Mean and How Did We Get Here?." Ecosphere. 4 (5): 1-20. DOI: https://doi.org/10.1890/ES13-00075.1

Mellowfields Farm. n.d. Mellowfields Farm. Home Page. Accessed April 2025. https://www.mellowfields.com/?utm_source=google&utm_medium=wix_google_business_profile&utm_campaign=229500204550297177

Mihesuah, Devon A., and Elizabeth Hoover. 2019. Indigenous Food Sovereignty in the United States: Restoring Cultural Knowledge Protecting Environments and Regaining Health. University of Oklahoma Press.

Missouri Wildflowers Nursery. n.d. Missouri Wildflowers Nursery. Home. Accessed April 2025. https://mowildflowers.net/

Moles, Doug. 2025. Interview by author. Teams Video Call. February 3, 2025.

Morgan County Seeds. n.d. About Us. Accessed April 2025. https://www.morgancountyseeds.com/about-us/

Morgan, Philip J., Janet M Warren, David R Lubans, et al. 2010. "The Impact of Nutrition Education with and Without a School Garden on Knowledge, Vegetable Intake and Preferences and Quality of School Life Among Primary-School Students." Cambridge University Press. 13 (11): 1931-1940. DOI:10.1017/S1368980010000959

Morris, Jennifer and Sheri Zidenberg-Cherr. 2002. "Garden-enhanced Nutrition Curriculum Improves Fourth-grade School Children's Knowledge of Nutrition and Preferences for Some Vegetables." Journal of the American Dietetic Association. 102 (1) 91-93. DOI: 10.1016/s0002-8223(02)90027-1

National Farm to School Network. n.d. "About National Farm to School Network." About NFSN. Accessed February 2025. https://www.farmtoschool.org/about-nfsn

National Farm to School Network. n.d. "Farm to School in Native Communities." Native Communities. Accessed February 2025. https://www.farmtoschool.org/our-work/native-communities

National Farm to School Network. 2021. "Meet Our New Teammates." News and Articles. Accessed February 2025. https://www.farmtoschool.org/news-and-articles/meet-our-new-teammates

National Farm to School Network. n.d. "Our Call to Action." Call to Action. Accessed February 2025. https://www.farmtoschool.org/about/calltoaction

National Park Service. n.d. "Indigenous Knowledge and Traditional Ecological Knowledge." Overview of TEK. Accessed March 2025. https://www.nps.gov/subjects/tek/description.htm

Native American Food Sovereignty Alliance. n.d. "Welcome to the Native American Food Sovereignty Alliance." Home. Accessed March 2025. https://nativefoodalliance.org/

Native Lands Restoration Collaborative. n.d. Who We Are. Accessed April 2025. https://www.nativelandsks.org/who-we-are

NC State Extension. n.d. Community Supported Agriculture (CSA) Resource Guide for Farmers. Growing Small Farms. Accessed April 2025. https://growingsmallfarms.ces.ncsu.edu/growingsmallfarms-csaguide/#:~:text=Community%20Supported%20Agriculture%20(CSA)%20is,lump%20sum%20or%20in%20installments.

Neal, Dr. Leigh Anne. 2025. Interview by author. Teams Video Call. January 28, 2025.

Newsela. 2017. "Many Students Have No Idea Where Food Comes From and How It Is Made." Washington Post. Adapted by Newsela. Accessed September 2024. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.wcpss.net/cms/lib/NC01911451/Centricity/Domain/3855/Week%206%205th%20and%206th%20Period%20.pdf

NISN. n.d. "What We Do." About Us. Accessed February 2025. https://www.nacainspiredschoolsnetwork.org/what-we-do

North American Traditional Indigenous Food Systems. n.d. “Our Vision.” About. Accessed March 2025. https://natifs.org/vision/

Paul, Kayli. 2020. “Preparing Today’s Children for Tomorrow’s Needs: Agricultural Education in America’s Public Schools.” Drake Journal of Agricultural Law 25 (1): 224-243. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://aglawjournal.wp.drake.edu/wp-content/uploads/sites/66/2023/03/Paul-Macro-Final.pdf

Pendleton’s Country Market. n.d. “Pendleton’s Country Market.” Home. Accessed March 2025. https://www.pendletons.com/

Pevec, Illéne. 2016. Growing a Life: Teen Gardeners Harvest Food, Health, and Joy. United States: New Village Press. Accessed October 2024. ProQuest Ebook Central.

Philips, April. 2013. Designing Urban Agriculture: A Complete Guide to the Planning, Design, Construction, Maintenance, and Management of Edible Landscapes. Hoboken, NJ: John Wiley & Sons.

Pine’s Garden and Market. n.d. Turning Thumbs Green and Growing Dreams Since 1962. About. Accessed April 2025. https://pinesgardenmarket.com/about

Pinwheel Farm. n.d. Welcome. Accessed April 2025. https://www.pinwheelfarm.org/

School Garden Support Organization Network. n.d. “Vision.” Home. Accessed March 2025. https://sgsonetwork.org/#values

Shawnee Mission School District. n.d. “Efficiency/Composting and Recycling.” About. Accessed February 2025. https://www.smsd.org/about/departments/sustainability/efficiency-composting-and-recycling#:~:text=All%20Shawnee%20Mission%20School%20District,administrators%2C%20parents%20and%20community%20partners.

Shawnee Mission School District. 2020. “Broadmoor Urban Farm: Sustainable, Educational Community Resource.” Accessed February 2025. https://www.smsd.org/about/news-archives/news-archive-details/~board/2020-2021-district-news/post/broadmoor-urban-farm-sustainable-educational-community-resource

Shawnee Mission School District. n.d. “School Gardens and Natural Areas.” About. Accessed February 2025. https://www.smsd.org/about/departments/sustainability/school-gardens-and-natural-areas

Shawnee Mission School District. n.d. “Sustainability.” About. Accessed January 2025. https://www.smsd.org/about/departments/sustainability

Skelly, Sonja M., and Jennifer C. Bradley. 2000. “The Importance of School Gardens as Perceived by Florida Elementary School Teachers.” Hort Technology. 10 (1): 229-231. DOI: https://doi.org/10.21273/HORTTECH.10.1.229

Stuppy Greenhouse. n.d. Structures and Solutions. Home. Accessed April 2025. https://www.stuppy.com/

Sunrise Project. n.d. “About Us.” Accessed March 2025. https://www.sunriseprojectks.org/about-us

Swan, Allison. n.d. “Broadmoor Bistro.” City Lifestyle. Accessed February 2025. https://citylifestyle.com/articles/broadmoor-bistro

Taylor Creek Restoration Nurseries. n.d. Taylor Creek Restoration Nurseries is now part of RES. Home. Accessed April 2025. https://www.taylorcreeknurseries.com/

The Giving Grove. n.d. “The Giving Grove.” Home. Accessed March 2025. https://www.givinggrove.org/

The Saltbox Farm. n.d. Our Story. Accessed April 2025. https://www.thesaltboxfarm.com/more-about-us

Throness, Arlene. 2024. Interview by Author. Teams Video Call. December 17, 2024.

Toronto Metropolitan University. n.d. “Urban Farm.” Online Resources. Accessed February 2025. https://www.torontomu.ca/sciencerendezvous/activity-booths/urbanfarm/

Traditional Center for Indigenous Knowledge and Healing. n.d. Home. Accessed April 2025. https://www.tcikh.org/

Tucson Village Farm. n.d. “About Tucson Village Farm.” About. Accessed February 2025. https://tucsonvillagefarm.arizona.edu/about/about-tvf

Tucson Village Farm. 2022. “Focus on the Farm Part 1.” Video, 5:14. Accessed February 2025. https://www.facebook.com/TucsonVillageFarm/videos/focus-on-the-farm-part-1/652917323098725/?locale=hi_IN

Tucson Village Farm. n.d. “Mission and Vision.” Accessed February 2025. https://tucsonvillagefarm.arizona.edu/mission-and-vision

Tucson Village Farm. n.d. “Our Learning Spaces.” About. Accessed February 2025. https://tucsonvillagefarm.arizona.edu/learning-spaces

Uncover KC. n.d. Our Mission. About. Accessed April 2025. https://uncoverkc.org/our-mission

United Way Kaw Valley. n.d. Making an Impact. Home Page. Accessed April 2025. https://www.uwkawvalley.org/

University of Kansas. n.d. Native Faculty Staff Council. Finding Community. Accessed April 2025. https://sovereignpartnerships.ku.edu/nfsc

University of Kansas Biological Survey & Center for Ecological Research. n.d. Welcome to the KU Field Station. Accessed April 2025. https://biosurvey.ku.edu/fieldstation

University of Kansas Employee Wellness. n.d. Crops to Campus. Accessed April 2025. https://wellness.ku.edu/csa#:~:text=Crops%20to%20Campus%20is%20a,for%20the%202024%20growing%20season.

U.S. Department of the Interior. n.d. "Bureau of Indian Education (BIE)." About. Accessed March 2025. https://www.bia.gov/bie#:~:text=Furthermore%2C%20the%20BIE%20is%20to,Institute%20in%20Albuquerque%2C%20New%20Mexico.

USDA. n.d. "I'm New to Farm to School." The Patrick Leahy Farm to School Program. Accessed March 2025. https://www.fns.usda.gov/f2s/im-new-farm-school

USDA. n.d. "USDA Indigenous Food Sovereignty Initiative." Programs and Services. Accessed March 2025. https://www.usda.gov/about-usda/general-information/staff-offices/office-tribal-relations/programs-and-services/usda-indigenous-food-sovereignty-initiative

VELA. 2021. "Land-Based Learning Keeps Native Traditions Alive." Accessed February 2025. https://vela.org/land-based-learning-keeps-native-traditions-alive/

VELA. 2021. "How Land-Based Learning Supports Indigenous Students." Video, 2:45. Accessed February 2025. https://vela.org/land-based-learning-keeps-native-traditions-alive/

Ward's World. n.d. "Indigenous Ecological Practices: Harnessing Traditional Wisdom." Biology. Accessed March 2025. https://wardsworld.wardsci.com/biology/indigenous-ecological-practices-harnessing-traditional-wisdom

Wildcat, Daniel R. 2023. "On Indigenuity: Learning the Lessons of Mother Earth." Fulcrum Publishing

Winter, Jordan. 2022. "Lawrence's Indigenous Community Center Launches New Food Sovereignty Farm." The Lawrence Times. Accessed March 2025. https://lawrencekstimes.com/2022/02/10/icc-farm/

Winter, Jordan. 2025. "Haskell Alum Opens Wadulisi's Indigenous Food to Preserve Native Culture Through Education." The Lawrence Times. Accessed April 2025. https://lawrencekstimes.com/2025/04/07/haskell-alum-opens-wadulisis/

Wise, Poppy. 2014. "Grow Your Own: The Potential Value and Impacts of Residential and Community Food Gardening." The Australia Institute. 1-26. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://australiainstitute.org.au/wp-content/uploads/2020/12/PB-59-Grow-Your-Own.pdf

Wohletz Farm Fresh. n.d. Welcome. Accessed April 2025. https://wohletzfarmfresh.com/



09. APPENDICES

APPENDIX A
Design Enlargements

APPENDIX B
Figure Citations

APPENDIX C
Image Permission

APPENDIX D
IRB Approval and Approved Interview Questions

APPENDIX A

DESIGN ENLARGEMENTS

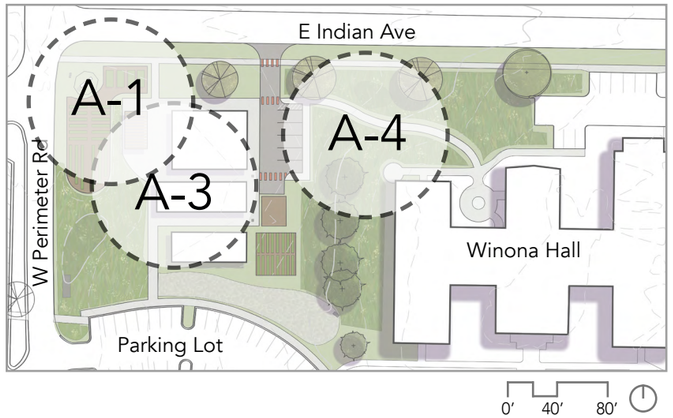
FIGURE A-1:

MAIN ENTRANCE PERSPECTIVE

This image illustrates the entrance experience when approaching campus from East Indian Ave or West Perimeter Road. The sign is prominently positioned at the corner, enhancing visibility, while the public garden along the road edge further highlights Haskell's innovation and research.

Reference Figure 5.20 Main Entrance Perspective (Swaney 2025)

FIGURE A-2: SITE PLAN PERSPECTIVE KEY



Reference Figure 5.19
Site Plan Perspective Key
(Swaney 2025)



FIGURE A-3:

OUTDOOR CLASSROOM PERSPECTIVE

This image illustrates how classes can use the pavilion or set up flexible work tables for harvesting, planting, seed collection, and other programming activities.

Reference Figure 5.21 Outdoor Classroom Perspective (Swaney 2025)

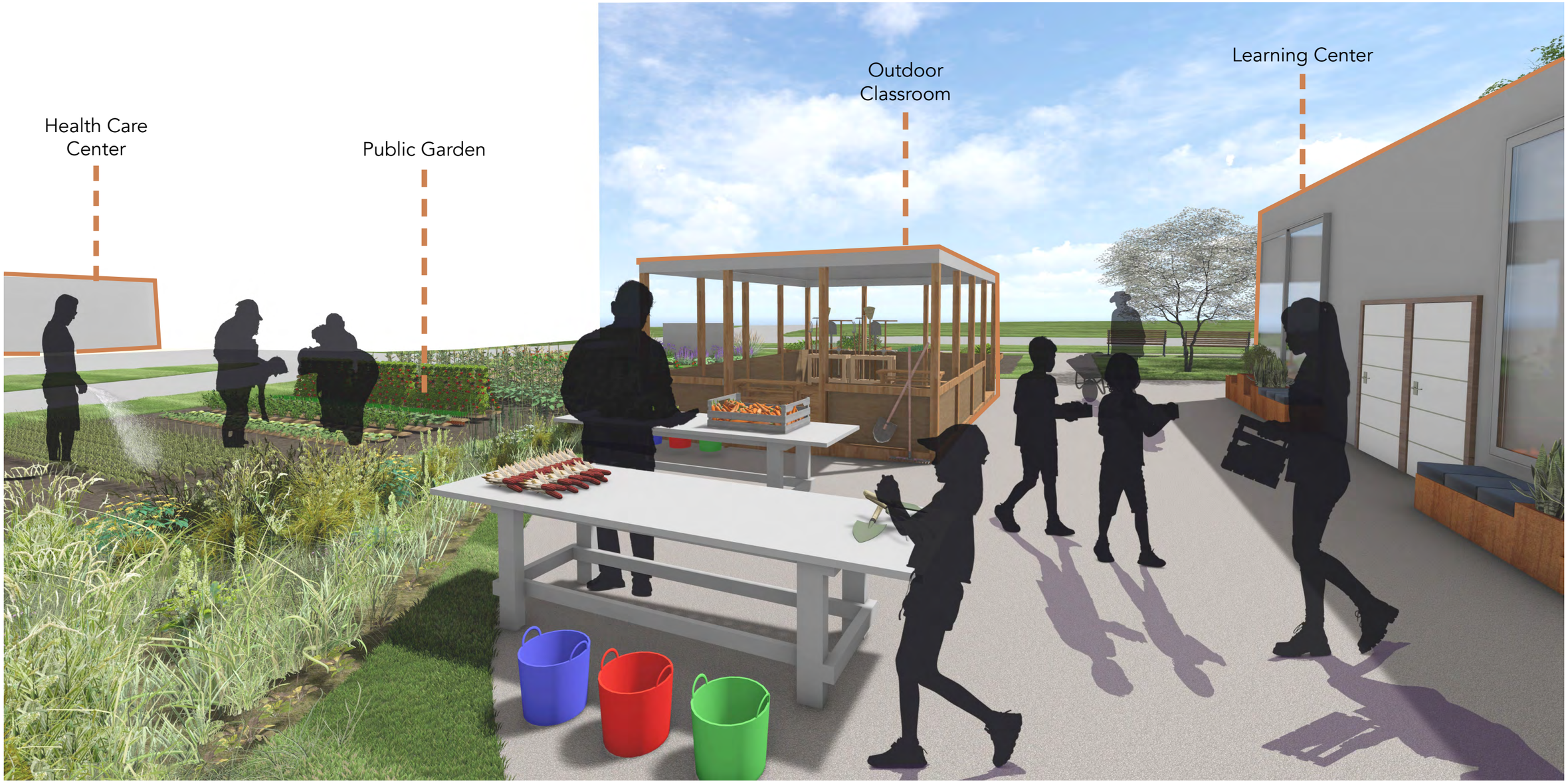


FIGURE A-4:

WINONA WALKWAY PERSPECTIVE

Residents at Winona Hall can walk through the native prairie landscape as they enter the garden space, immersing themselves in the natural setting. A view of a mural along the Learning Center highlights how Indigenous artwork can be thoughtfully integrated into the space.

Reference Figure 5.22 Winona Walkway Perspective (Swaney 2025)



FIGURE A-5:

BIRDSEYE VIEW

This perspective shows a birdseye view from the southwest corner of the site looking north. This view highlights the relationship between the public garden and the surrounding infrastructure. A sidewalk connection from the parking lot creates a central axis, guiding visitors toward key activity areas. The view also captures the prairie swale and a series of check dams designed to manage and slow water flow during rain events.

Reference Figure 5.25 Birdseye View (Swaney 2025)

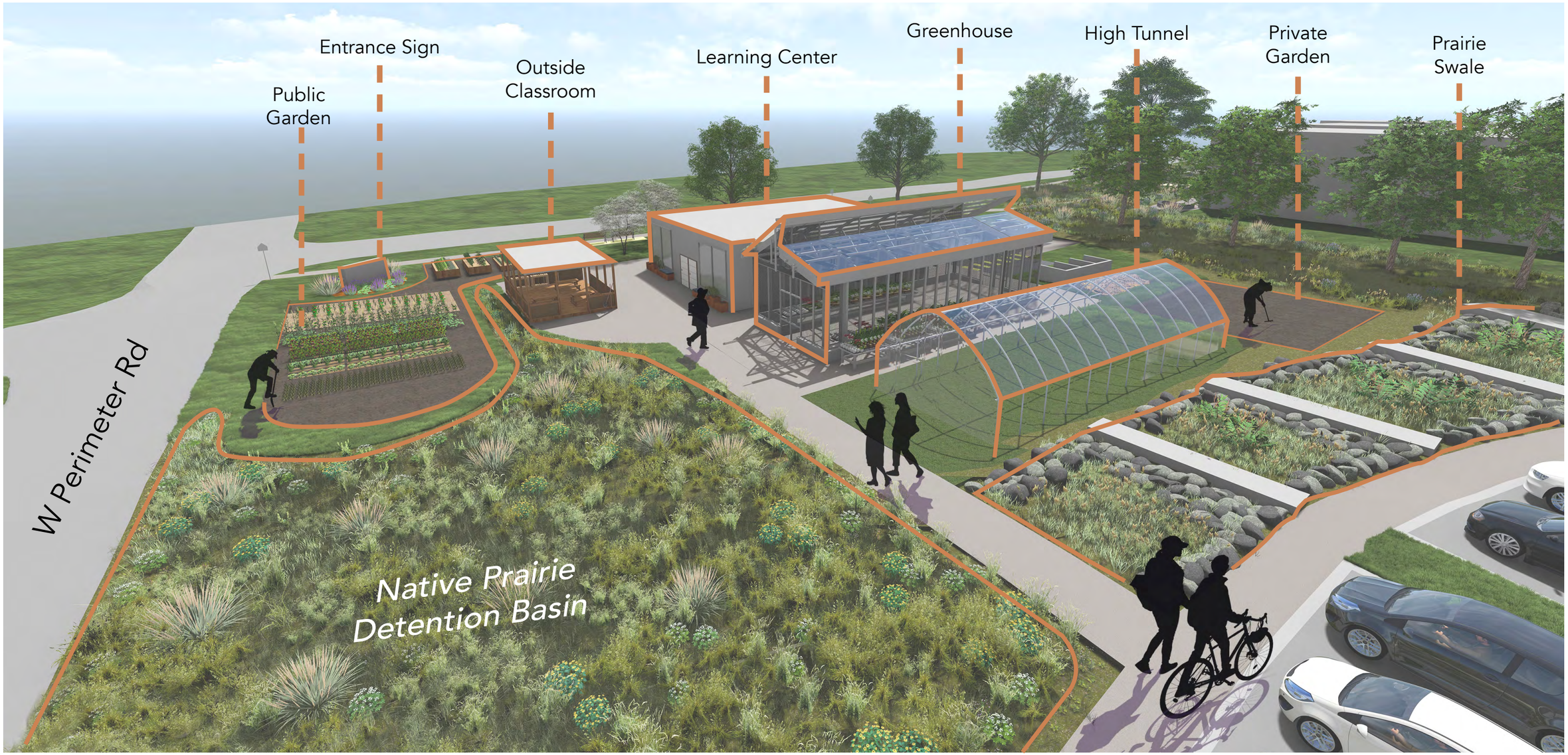
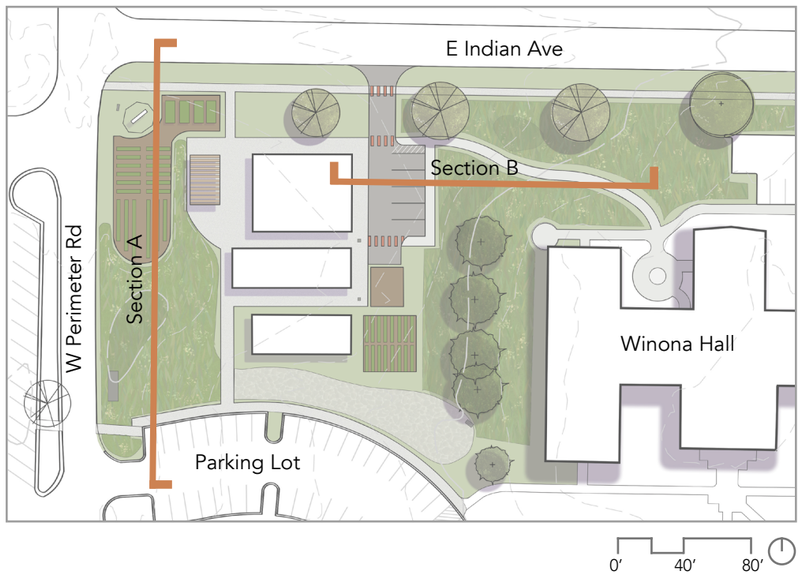


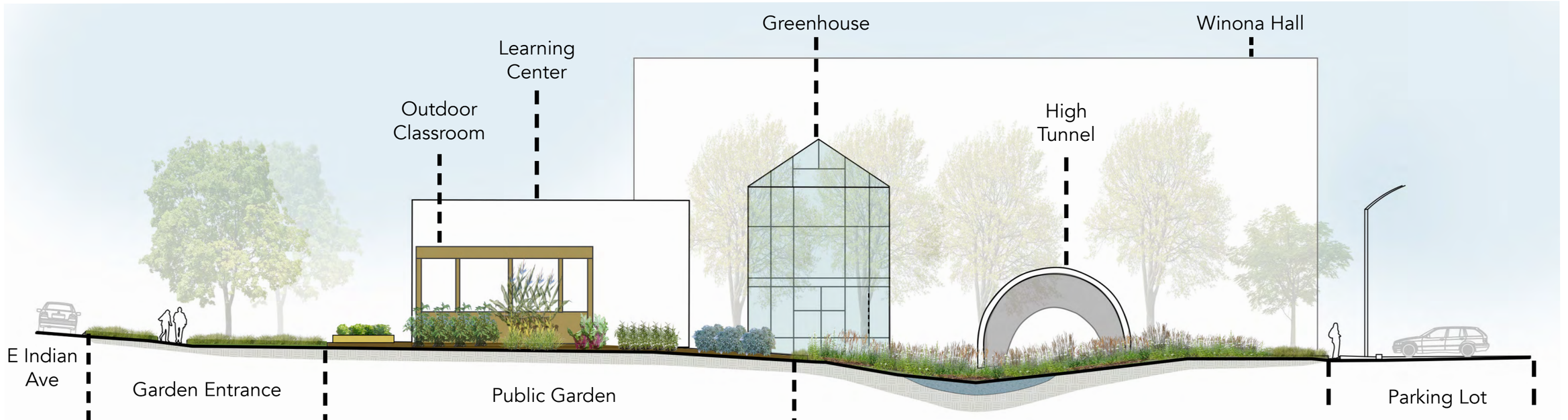
FIGURE A-6: SITE PLAN SECTION KEY



Reference Figure 5.23
Site Plan Section Key
(Swaney 2025)

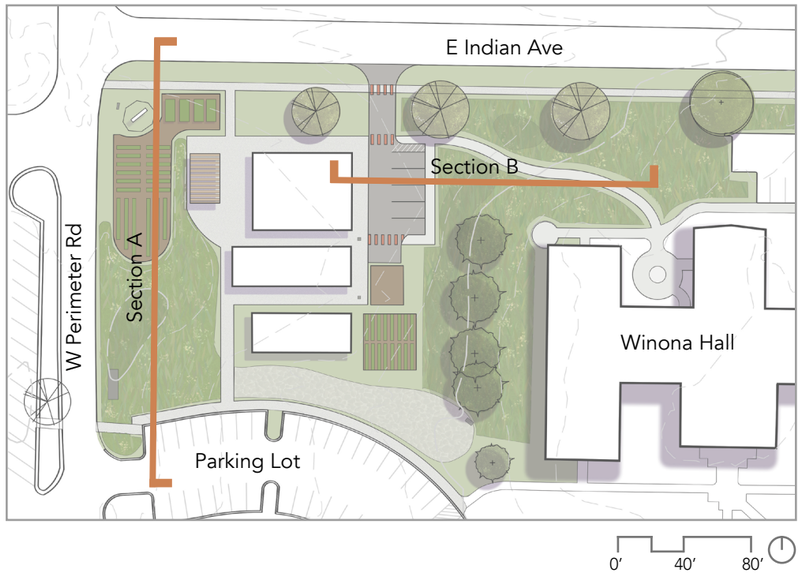
FIGURE A-7:

SECTION A: GARDEN ELEMENTS



Reference Figure 5.24 Section A (Swaney 2025)

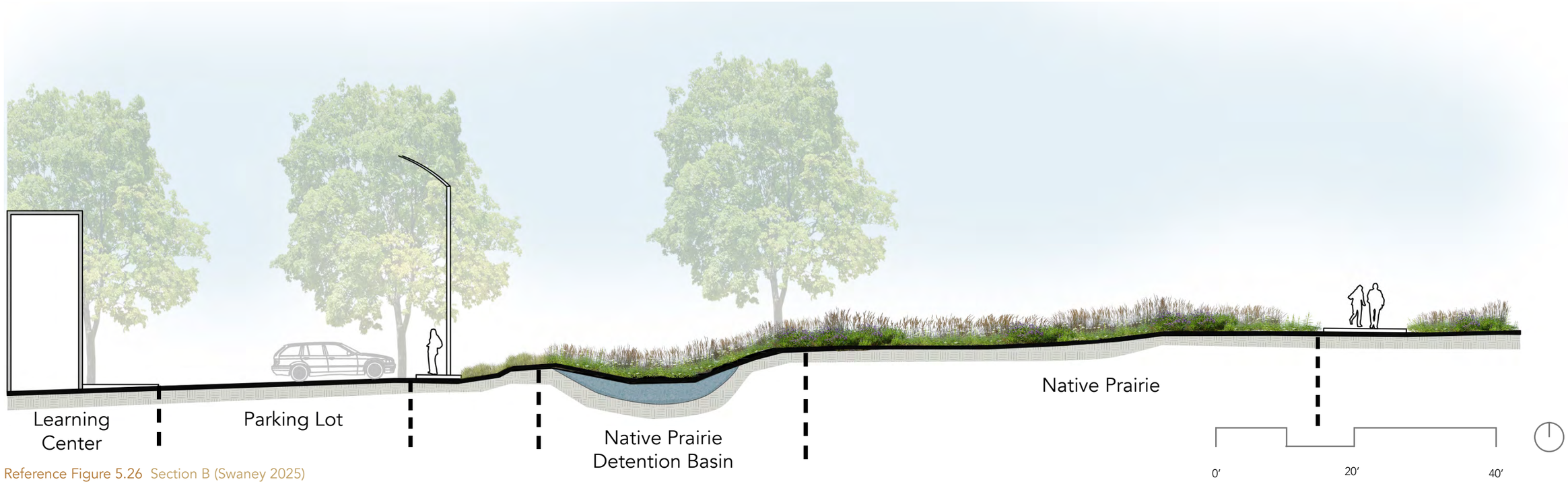
FIGURE A-8: SITE PLAN SECTION KEY



Reference Figure 5.23
Site Plan Section Key
(Swaney 2025)

FIGURE A-9:

SECTION B: WINONA WALKWAY CONNECTION



Reference Figure 5.26 Section B (Swaney 2025)

APPENDIX B

FIGURE CITATIONS

01 Introduction

Figure 1.1 Swaney, Madelynn. 2025. Methodology Diagram. [Adobe InDesign graphic].

Figure 1.2 Swaney, Madelynn. 2025. MPR Timeline. [Adobe InDesign graphic].

02 Background

Figure 2.1 Swaney, Madelynn. 2025. Literature Review Map. [Adobe InDesign Infographic].

Figure 2.2 Swaney, Madelynn. 2025. Phytoremediation Diagram. [Adobe Illustrator and Adobe Photoshop graphic].

Midjourney v 5.2. Response to "Illustration of a tree with roots." AI-generated image. February 2025, Midjourney Inc.

Figure 2.3 Swaney, Madelynn. 2025. Benefits of Urban Agriculture Diagram. [Adobe Illustrator and Midjourney graphic].

Midjourney v 5.2. Response to "Illustration of school garden." AI-generated image. February 2025, Midjourney Inc.

Midjourney v 5.2. Response to "Illustration of local farmers." AI-generated image. February 2025, Midjourney Inc.

Midjourney v 5.2. Response to "Illustration of a hand holding vegetables." AI-generated image. February 2025, Midjourney Inc.

Midjourney v 5.2. Response to "Illustration icon of intergenerational community members working together." AI-generated image. February 2025, Midjourney Inc.

Midjourney v 5.2. Response to "Illustration of children gardening." AI-generated image. February 2025, Midjourney Inc.

Midjourney v 5.2. Response to "Illustration icon of environmental processes with trees and root systems." AI-generated image. February 2025, Midjourney Inc.

Midjourney v 5.2. Response to "Illustration icon of bees, butterflies, and wildlife." AI-generated image. February 2025, Midjourney Inc.

Figure 2.4 Skabelund, Lee R. May 2022. *Students Engaging in Physical Activity Through Gardening at the University of Michigan campus*. Photograph. Share Point Folder

Figure 2.5 Swaney, Madelynn. 2025. School Garden Collage. [Adobe Fresco, Adobe Photoshop and Midjourney graphic].

Midjourney v 5.2. Response to "Illustration of school building." AI-generated image. February 2025, Midjourney Inc.

Midjourney v 5.2. Response to "Illustration of kids learning in a garden." AI-generated image. February 2025, Midjourney Inc.

Midjourney v 5.2. Response to "Illustration of vegetable raised bed garden." AI-generated image. February 2025, Midjourney Inc.

Figure 2.6 Swaney, Madelynn. 2025. University Garden Collage. [Adobe Fresco, Adobe Photoshop and Midjourney graphic].

Midjourney v 5.2. Response to "Illustration of university campus skyline." AI-generated image. February 2025, Midjourney Inc.

Midjourney v 5.2. Response to "Illustration of a university greenhouse and farm field." AI-generated image. February 2025, Midjourney Inc.

Figure 2.7 Swaney, Madelynn. 2025. Non-Profit Garden Collage. [Adobe Fresco, Adobe Photoshop and Midjourney graphic].

Midjourney v 5.2. Response to "Illustration of urban community garden." AI-generated image. February 2025, Midjourney Inc.

Midjourney v 5.2. Response to "Illustration of a farmers market." AI-generated image. February 2025, Midjourney Inc.

Midjourney v 5.2. Response to "Illustration of a school bus with kids visiting a farm." AI-generated image. February 2025, Midjourney Inc.

Figure 2.8 Swaney, Madelynn. 2025. Indigenous Food System Collage. [Adobe Fresco, Adobe Photoshop and Midjourney graphic].

Midjourney v 5.2. Response to "Illustration of a farm with rows of vegetables, high tunnel and shed." AI-generated image. February 2025, Midjourney Inc.

Midjourney v 5.2. Response to "Illustration of a Kansas prairie with native grasses and plants." AI-generated image. February 2025, Midjourney Inc.

03 Methodology

Figure 3.1 Swaney, Madelynn. 2025. Methodology Diagram. [Adobe InDesign graphic].

Figure 3.2 Shawnee Mission School District Collage.

[Image of a native landscaped bed in front of a school building] n.d. photograph. Shawnee Mission School District. https://www.smsd.org/about/departments/sustainability/school-gardens-and-natural-areas

[Image of students working in a greenhouse] April 26, 2024, photograph. Broadmoor Urban Farm Facebook Page. https://www.facebook.com/photo.php?fbid=884377217035812&set=pb.100063906253809.-2207520000&type=3

[Image of vegetable rows] July 4, 2024. photograph. Broadmoor Urban Farm Facebook Page. https://www.facebook.com/photo.php?fbid=884377217035812&set=pb.100063906253809.-2207520000&type=3

[Image of students building a raised bed] n.d. photograph. Shawnee Mission School District. https://www.smsd.org/about/departments/sustainability/school-gardens-and-natural-areas

[Image of students gardening outside near a greenhouse] 2020. photograph. Shawnee Mission School District. https://www.smsd.org/about/news-archives/news-archive-details/~board/2020-2021-district-news/post/broadmoor-urban-farm-sustainable-educational-community-resource

Figure 3.3 Toronto Metro University Rooftop Garden Collage

Lisman, Alex. [Image of trellised vegetable rows] 2023. photograph. Toronto Metropolitan University. Shared Folder.

Lisman, Alex. [Image of students listening and working on the rooftop garden] 2023. photograph. Toronto Metropolitan University. https://www.torontomu.ca/university-business-services/urban-farm/.

Lisman, Alex. [Image of three sister garden with skyscrapers in the background] 2023. photograph. Toronto Metropolitan University. Shared Folder.

Lisman, Alex. [Image of circular garden] 2023. photograph. Toronto Metropolitan University. Shared Folder.

Lisman, Alex. [Image of rooftop garden with the city skyline in the background] 2023. photograph. Toronto Metropolitan University. https://www.torontomu.ca/university-business-services/urban-farm/.

Figure 3.4 Tucson Village Farm Collage

[Image of students learning from farm staff] n.d. photograph. Tucson Village Farm. https://tucsonvillagefarm.arizona.edu/field-trips.

Culinary Medicine Summer Summit. 2024. photograph. Tucson Village Farm. https://tucsonfoodie.com/2024/05/01/tucson-village-farm-may-2024/.

[Image of students harvesting squash] n.d. photograph. Tucson Village Farm. https://tucsonvillagefarm.arizona.edu/events/saturday-service-day.

[Image of kids digging in soil] n.d. photograph. Tucson Village Farm. https://tucsonvillagefarm.arizona.edu/programs-and-camps.

[Image of Tucson Village Farm] 2022. photograph. Google Maps Image Tucson Village Farm. https://tinyurl.com/47ryu9wc.

Figure 3.5 National Farm to School Native Communities Collage

National Farm to School Network. [Image of kids holding squash] 2023. photograph. Whole Kids Blog. https://www.wholekidsfoundation.org/blog/get-to-know-national-farm-to-school-network/.

National Farm to School Network. [Image of kids learning how to prepare vegetables and cook] 2023. photograph. Whole Kids Blog. https://www.wholekidsfoundation.org/blog/get-to-know-national-farm-to-school-network/.

National Farm to School Network. [Image of kids touring the farm field] 2023. photograph. Whole Kids Blog. https://www.wholekidsfoundation.org/blog/get-to-know-national-farm-to-school-network/.

Figure 3.6 Indigenous Farm Hub Collage

[Image of corn kernels in hand] n.d. photograph. Indigenous Farm Hub. https://indigenousfarmhub.org/who-we-are/.

[Image of Indigenous Farm Hub Sign] n.d. photograph. Indigenous Farm Hub. https://indigenousfarmhub.org/who-we-are/.

[Image of students with masks harvesting corn] n.d. photograph. Indigenous Farm Hub. https://indigenousfarmhub.org/who-we-are/.

[Image of students harvesting] n.d. photograph. Indigenous Farm Hub. https://indigenousfarmhub.org/who-we-are/.

[Image of students working in the farm] n.d. photograph. Indigenous Farm Hub. https://indigenousfarmhub.org/who-we-are/.

04 Analysis

Figure 4.1 Swaney, Madelynn. 2025. Methodology Diagram. [Adobe InDesign graphic].

Figure 4.2 Swaney, Madelynn. 2025. Interviewee Background Table. [Adobe InDesign Infographic].

Figure 4.3 Swaney, Madelynn. 2025. Garden & Farm Operations Comparative Matrix Chart. [Adobe Illustrator Infographic].

Figure 4.4 Swaney, Madelynn. 2025. School Engagement Strategies Comparative Matrix Chart. [Adobe Illustrator Infographic].

Figure 4.5 Swaney, Madelynn. 2025. Challenges Faced Comparative Matrix Chart. [Adobe Illustrator Infographic].

Figure 4.6 Swaney, Madelynn. 2025. Funding Resources Comparative Matrix Chart. [Adobe Illustrator Infographic].

Figure 4.7 Swaney, Madelynn. 2025. Key Takeaways Chart. [Adobe InDesign graphic].

Figure 4.8 Swaney, Madelynn. 2025. Garden Program Collage. [Adobe Photoshop and InDesign graphic].

Jiaqian AirplaneFan, *Community Garden in Montreal-Nord*. July 6, 2012, photograph. Wikimedia Commons. https://commons.wikimedia.org/wiki/File:Community_garden_in_Montr%C3%A9al-Nord_-_panoramio.jpg

Tree Planting with the Heartland Tree Alliance. Nov. 16, 2024, photograph. The Resilient Activist. https://www.theresilientactivist.org/event/tree-planting-with-the-heartland-tree-alliance/

Kids Gardening Together. n.d. AI-Generated Image. StockCake. https://stockcake.com/i/kids-gardening-together_946021_255439

[Image of a farmer standing in front of a greenhouse] n.d. photograph. Rawpixel. https://www.rawpixel.com/search/garden%20school%20education?page=1&path=_topics%7Csearch_filter-%24photos&sort=curated

Evans, Amy C. *Vegetable Garden Detail*. June 19, 2008, photograph. Flickr. https://www.flickr.com/photos/southernfoodwaysalliance/2593250285

Gardening Across Generations. Nov. 20, 2012, photograph. D-olwen-dee. Flickr. https://www.flickr.com/photos/d-olwen-dee/8202779802

Unsplash, *Abundance of Tomatoes Growing on Plant*. n.d. image. FreeRange. https://freerangestock.com/photos/94877/abundance-of-tomatoes-growing-on-plant.html

Stierch, Sarah. *Indian Taco*. April 27, 2024, photograph. Flickr. https://www.flickr.com/photos/sarahvain/53688707168

Negro, Salmon. *Preparation of Organic Sweet Corn Tamales*. July 13, 2024. IStock. https://www.istockphoto.com/photo/preparation-of-organic-sweet-corn-tamales-gm2160349840-580889205

05 Design

Figure 5.1 Swaney, Madelynn. 2025. Map of Lawrence, KS. [Adobe Illustrator map].

Figure 5.2 Swaney, Madelynn. 2025. Floodplain Map. [Adobe Illustrator map].

Figure 5.3 Swaney, Madelynn. 2025. Surrounding Land Use Map. [Adobe Illustrator map].

Figure 5.4 Swaney, Madelynn. 2025. Haskell University Building Context Map. [Adobe Illustrator map].

Figure 5.5 Swaney, Madelynn. 2025. Site Map of Existing Conditions. [Adobe Photoshop and Adobe Illustrator map].

Figure 5.6 Swaney, Madelynn. 2025. Project Site Visit Map. [Adobe InDesign].

Figure 5.7 Swaney, Madelynn. 2024. *Drain Cover at Haskell University*. Photograph. Personal Photograph Collection.

Figure 5.8 Swaney, Madelynn. 2024. *Inside of Drain Cover*. Photograph. Personal Photograph Collection.

Figure 5.9 Swaney, Madelynn. 2024. *Drain Outlet.* Photograph. Personal Photograph Collection.

Figure 5.10 Swaney, Madelynn. 2024. *Haskell University Sign*. Photograph. Personal Photograph Collection.

Figure 5.11 Swaney, Madelynn. 2024. *Project Site South View.* Photograph. Personal Photograph Collection.

Figure 5.12 Swaney, Madelynn. 2024. *Project Site East View*. Photograph. Personal Photograph Collection.

Figure 5.13 Swaney, Madelynn. 2025. Constraints Map. [Adobe Illustrator graphic].

Figure 5.14 Swaney, Madelynn. 2025. Opportunities Map. [Adobe Illustrator graphic].

Figure 5.15 Swaney, Madelynn. 2025. Design Iterations. [Trace Paper, Adobe Photoshop and Adobe Illustrator graphic].

Figure 5.16 Swaney, Madelynn. 2025. Site Plan. [AutoCAD and Adobe photoshop graphic].

Figure 5.17 Swaney, Madelynn. 2025. Drainage Strategy Diagram. [AutoCAD, Adobe photoshop, and Illustrator graphic].

Figure 5.18 Swaney, Madelynn. 2025. Programming Diagram. [AutoCAD, Adobe photoshop, and Illustrator graphic].

Figure 5.19 Swaney, Madelynn. 2025. Site Plan Perspective Key. [AutoCAD, Adobe photoshop, and InDesign graphic].

Figure 5.20 Swaney, Madelynn. 2025. Main Entrance Perspective. [AutoCAD, Adobe photoshop, SketchUp, and Lumion graphic].

Figure 5.21 Swaney, Madelynn. 2025. Outdoor Classroom Perspective. [AutoCAD, Adobe photoshop, SketchUp, and Lumion graphic].

Adomaitis, Clark. *Graham Biyaal harvests blue corn on his four acres farm on a rainy day in Shiprock, NM*. Oct. 17, 2022. KSUT Four Corners Public Radio. https://www.aspenpublicradio.org/environment/2022-10-17/a-navajo-seedkeeper-shares-his-ancestors-food-with-the-world

Figure 5.22 Swaney, Madelynn. 2025. Winona Walkway Perspective. [AutoCAD, Adobe photoshop, SketchUp, and Lumion graphic].

[Interpretative Signage Kiosk] n.d. CultureMaps Central NSW.https://centralnsw.com/map-location/mount-canobolas/?mpfy-pin=4883

Colorful Art in the Revitalized (as of 2021) North Topeka, colloquially NoTo, Artsy neighborhood in the Kansas Capital City of Topeka. n.d. Rawpixel. https://www.rawpixel.com/search/shawnee?page=1&path=_topics&sort=curated

Figure 5.24 Swaney, Madelynn. 2025. Section A. [AutoCAD, Adobe photoshop, and InDesign graphic].

Figure 5.25 Swaney, Madelynn. 2025. Birdseye View. [AutoCAD, Adobe photoshop, SketchUp, and Lumion graphic].

Figure 5.26 Swaney, Madelynn. 2025. Section B. [AutoCAD, Adobe photoshop, and InDesign graphic].

06 Recommendations

Figure 6.1 Swaney, Madelynn. 2025. Lawrence Non-Profit Map.
[Adobe Illustrator map].

Figure 6.2 Swaney, Madelynn. 2025. Kansas City Metro Non-Profit Map.
[Adobe Illustrator map].

Figure 6.3 Swaney, Madelynn. 2025. Local Farms & Gardens in Lawrence, KS.
[Adobe Illustrator map].

APPENDIX C

IMAGE PERMISSIONS

Email from Doug Moles from Broadmoor Urban Farm on February 27, 2025, for the permission to use Broadmoor Urban Farm Facebook photos.

Email from David Smith (Chief Communications Officer) on February 27, 2025, for the permission to use Shawnee Mission School District photos.

Email from Alan Brauer (Senior Director) on February 27, 2025, for the permission to use Indigenous Farm Hub photos.

Email from Jess Lucy Bell (Community Engagement and Development Coordinator) on February 27, 2025, for the permission to use Tucson Village Farm photos.

Email from Daniella Erwood (Strategic Lead, Communications Administration and Operations) on March 3, 2025, for permission to use Toronto Metropolitan University photos.

Email from Vanessa Cruz (School Food Program Specialist at Grants Whole Kids) on March 6, 2025, for permission to use National Farm to School Network photos.

Email from Tami Graham (Executive Director) on March 26, 2025, for the permission to use KSUT Four Corners Public Radio photos.

APPENDIX D

D-1: Case Study IRB Approval

D-2: Case Study Interview Questions

D-3: Focus Group IRB Approval

D-4: Focus Group Modification IRB Approval

D-5: Focus Group Discussion Questions

D-1: Case Study IRB Approval

KANSAS STATE UNIVERSITY | Office of Research Integrity, Compliance and Security

TO: Lee Skabelund
Landscape Archit & Comm Plan
Manhattan, KS 66506

Proposal Number: IRB-12547

FROM: Lisa Rubin, Chair
Committee on Research Involving Human Subjects

DATE: 12/12/2024

RE: Proposal Entitled, "Growing Connections: Garden Programs for Youth Education in Food Literacy and Nutrition."

The Committee on Research Involving Human Subjects / Institutional Review Board (IRB) for Kansas State University has reviewed the proposal identified above and has determined that it is EXEMPT from further IRB review. This exemption applies only to the proposal - as written – and currently on file with the IRB. Any change potentially affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Based upon information provided to the IRB, this activity is exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects, **45 CFR §104(d), category:Exempt Category 2 Subsection ii.**

Certain research is exempt from the requirements of HHS/OHRP regulations. A determination that research is exempt does not imply that investigators have no ethical responsibilities to subjects in such research; it means only that the regulatory requirements related to IRB review, informed consent, and assurance of compliance do not apply to the research.

Any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Committee on Research Involving Human Subjects, the University Research Compliance Office, and if the subjects are KSU students, to the Director of the Student Health Center.

Electronically signed by Lisa Rubin on 12/12/2024 5:35 PM ET

203 Fairchild Hall, 1601 Vattier St., Manhattan, KS 66506 | 785-532-3224 | fax: 785-532-3278 | comply@k-state.edu

D-2: Case Study Interview Questions

Background Info:

Can you describe your role and responsibilities in the program, and how long have you been in the position?

How did your program get started, and what motivated its development?

Program and School Connections:

How is the program structured? (e.g., curriculum integration, extracurricular activity, community involvement)

In what ways do schools typically find or connect with your program? What is the onboarding process like for schools that want to participate?

Approximately how many schools are currently involved in the program?

Maintenance:

How do the gardens get maintained and who is responsible for garden maintenance?

Management:

How do you plan and organize activities for the garden program?

Who are the key stakeholders involved in managing the program, and what are their roles?

What strategies do you use to ensure continuity in program leadership and management, especially during staff turnover or school breaks?

How do you document and track progress or changes in the garden program over time?

How is funding typically acquired to support your program's efforts?

Successes & Challenges:

What resources (e.g., funding, volunteers, partnerships) are critical to the program's success?

What are the most significant challenges the program faces?

What suggestions do you have for those initiating food garden education programs on an Indigenous peoples' campus?

D-3: Focus Group IRB Approval

KANSAS STATE UNIVERSITY | Office of Research Integrity, Compliance and Security

TO: Lee Skabelund
Landscape Archit & Comm Plan
Manhattan, KS 66506

Proposal Number: IRB-12548

FROM: Lisa Rubin, Chair
Committee on Research Involving Human Subjects

DATE: 12/19/2024

RE: Proposal Entitled, "Growing Connections: Garden Programs for Youth Education in Food Literacy and Nutrition."

The Committee on Research Involving Human Subjects / Institutional Review Board (IRB) for Kansas State University has reviewed the proposal identified above and has determined that it is EXEMPT from further IRB review. This exemption applies only to the proposal - as written – and currently on file with the IRB. Any change potentially affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Based upon information provided to the IRB, this activity is exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects, **45 CFR §104(d), category:Exempt Category 2 Subsection ii.**

Certain research is exempt from the requirements of HHS/OHRP regulations. A determination that research is exempt does not imply that investigators have no ethical responsibilities to subjects in such research; it means only that the regulatory requirements related to IRB review, informed consent, and assurance of compliance do not apply to the research.

Any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Committee on Research Involving Human Subjects, the University Research Compliance Office, and if the subjects are KSU students, to the Director of the Student Health Center.

Electronically signed by Heath Ritter on 12/19/2024 12:09 PM ET
On Behalf of IRB Chair

203 Fairchild Hall, 1601 Vattier St., Manhattan, KS 66506 | 785-532-3224 | fax: 785-532-3278 | comply@k-state.edu

D-4: Focus Group Modification IRB Approval

KANSAS STATE UNIVERSITY | Office of Research Integrity, Compliance and Security

TO: Lee Skabelund
Landscape Archit & Comm Plan
Manhattan, KS 66506

FROM: Lisa Rubin, Chair
Committee on Research Involving Human Subjects

DATE: 02/10/2025

RE: Proposal #IRB-12548, entitled "Growing Connections: Garden Programs for Youth Education in Food Literacy."

MODIFICATION OF IRB PROTOCOL #IRB-12548, ENTITLED, "Growing Connections: Garden Programs for Youth Education in Food Literacy"

EXPIRATION DATE: Exempt

The Committee on Research Involving Human Subjects (IRB) has reviewed and approved the request identified above as a modification of a previously approved protocol. **Please note that the original expiration remains the same.**

All approved IRB protocols are subject to continuing review at least annually, which may include the examination of records connected with the project. Announced in-progress reviews may also be performed during the course of this approval period by a member of the University Research Compliance Office staff. Unanticipated adverse events involving risk to subjects or to others must be reported immediately to the Chair of the IRB, and / or the URCO

It is important that your human subjects activity is consistent with submissions to funding / contract entities. It is your responsibility to initiate notification procedures to any funding / contract entity of any changes in your activity that affects the use of human subjects.

Electronically signed by Lisa Rubin on 02/10/2025 4:42 PM ET

203 Fairchild Hall, 1601 Vattier St., Manhattan, KS 66506 | 785-532-3224 | fax: 785-532-3278 | comply@k-state.edu

D-5: Focus Group Discussion Questions

General Interest & Engagement:

How do you see yourself interacting with the campus garden (e.g., learning, teaching, relaxing, volunteering)?

What aspects of a campus garden would make it more inviting and engaging for you?

Have you had any experience gardening, farming, or growing food? If so, what was your experience like?

Desired Features & Uses:

What specific elements or features would you like to see included in the garden? (e.g., seating areas, pollinator habitats, medicinal gardens, study areas)

What programs or activities would you like to see offered in the garden? (e.g., workshops, guided tours, hands-on learning, traditional ecological knowledge sessions)

How should the garden serve the campus community beyond providing green space? (e.g., food access, educational opportunities, community gatherings)

Indigenous Practices & Cultural Integration:

How can the garden reflect and honor Indigenous cultures and practices?

Are there specific Indigenous plants, gardening techniques, or traditions you would like to see incorporated into the garden?

In what ways can the garden foster cross-cultural learning and awareness of Indigenous food systems and ecological knowledge?

Curriculum Integration:

What types of learning experiences would you like to see in the garden? (e.g., research opportunities, hands-on planting, storytelling, soil and water studies)

What support or resources would help you integrate the garden into your courses or programs?

Closing Thoughts:

What challenges do you foresee with implementing and maintaining a campus garden, and how can we address them?

Do you have any additional thoughts or ideas on how the campus garden can serve the members of the university?

