

2021 Sustainability Summer Research Proposal

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Faculty: Brent Sturlaugson

Food Justice Design Systems

Purpose:

For my Sustainability Summer Research Fellowship, I will address how food systems can become localized with food production and agriculture through the deployment of two hundred high-tunnel greenhouses in targeted communities. Working closely with Black Soil, we will design a process for deploying these greenhouses to produce, process, and distribute nutritious food to people that have limited access to healthy food sources. By localizing agriculture, we hope to reconnect small farmers with surrounding communities, introduce new opportunities within agriculture and urban design, and promote healthy living with an influx of economic resources into the community.

Background:

I am currently an Architecture student partnering with Black Soil, an organization based in Lexington, KY that explores how the food-system industry can be reconnected with local agriculture, food production, and the community to help solve food insecurity and food apartheid. To help fight injustice, Black Soil is currently working with Grow Appalachia to provide funding and implementation of two hundred greenhouses in the Louisville and Lexington area.

As part of my studio in the fall semester of 2020, I worked with Black Soil to propose designs for a fulfillment center that serves as a regional food hub. Through this project, I was able to understand the mission of Black Soil and their steps on improving food access to underserved populations. In the spring 2021 semester, I continued this work by creating an independent study that focuses on the relationship between human interaction, the built environment, and access to healthy food. One of my goals in this project is to improve the quality of life through design while remaining relevant to current political, social, and economic factors.

Food deserts in urban environments are growing at an alarming rate in low-income minority communities. Deploying greenhouses in these areas helps reimagine the landscape of food production and consumption while providing access to healthy food sources. According to the USDA, food insecurity is “a lack of access, at times, to enough food for an active, healthy life for all household members and limited availability of nutritionally adequate foods”. The USDA measures food access for households and individuals, and defines which areas are classified as food deserts. Neighborhoods and households that are flagged as food deserts will exhibit the following characteristics: 1.) low accessibility to sources of healthy food, measured by distance to a store or by the number of stores in an area; 2.) individual-level resources that may affect accessibility such as income or vehicle access; 3.) neighborhood-level indicators of resources, such as the average income of the neighborhood and the availability of public transportation.

Methods and Potential Outcomes:

Building on my research from the fall 2020 design studio and my spring 2021 independent study, I will continue my work with Black Soil to complete three tasks. First, I will use open-source map-making software and data from the Food Access Research Atlas to create a series of maps that visually compare food access in different neighborhoods in Lexington and Louisville. These maps will reveal what food insecurity looks like, providing and detailing accurate information and factors that contribute to food injustice. It is important for the public to visually see how systematic factors unfairly limit vulnerable communities to their access of food. Data that I will draw from include urban census tracts, low-income areas, areas flagged as food apartheid, and population counts for people that are two, five-, and ten-miles distance from a supermarket with no vehicle accessibility. The entirety of this research, data, and maps will be organized into a digital publication, which will serve as a guide for users to understand the problem of unevenly distributed food access and how Black Soil and other organizations are working to solve it.

Second, I will work with Black Soil to assemble a high-tunnel greenhouse on East Seventh Street and Maple Avenue in Lexington that serves as a demonstration site. At this site, I will also design and build raised beds for future use. During this phase, we will adhere to all safety precautions, and if needed, the construction process can be delayed until pandemic conditions improve. To assist in the construction of the high-tunnel and the raised beds, I will use the design manual I am currently producing as part of my independent study and make any required changes to the document along the way.

Third, I will analyze the interior environmental conditions of the completed high-tunnel, using remote data loggers. These data loggers were obtained by my professor, Brent Sturlaugson, and as part of my independent study, I am learning about their functionality and use. Once deployed, these data loggers will provide continuous readings of temperature, relative humidity, and light levels from inside the high-tunnel. This information can then be used by Black Soil and their partner farmers to create a more efficient planting strategy.

Three Pillars of Sustainability

This project simultaneously advances economic vitality, ecological integrity, and social equity in unique ways. Economic vitality reflects the commitment the City has planned for economic development that prioritizes long-term financial stability and community priorities. Our commitment to food justice corresponds to the growing issue of food insecurity and linked health problems in communities experiencing food apartheid. Our efforts to engage agriculture and urban design supports the definition of ecological integrity, which is the ability of a system to support and maintain a community of diversity within their region. Graphically representing how systematic factors impact vulnerable communities will show how a strategy for deploying high-tunnel greenhouses can promote greater social equity. By addressing economic, ecological, and social factors, this project promotes sustainability through improved access to healthy food.

Budget

Phase 1

Mapping

Materials: \$0

Labor: \$250

Phase 2

High-Tunnel Construction

Materials: \$0 (donated by Black Soil and Grow Appalachia)

Labor: \$1,500

Raised Beds Construction Materials: \$500

Labor: \$250

Phase 3

Interior Environmental Analysis

Materials: \$0 (borrowed from Professor Brent Sturlaugson)

Labor: \$500

Total: \$3,000

References

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