

Under, On, And Around The Table: A Case Study On Designing For Food Equity And Climate Justice In Architectural Design Studios

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ABSTRACT: How do we teach thinking about systems in design studios? And, more importantly, how do we move systems beyond the building and into community relationships, environmental concerns, and social equity? Our food system is unbalanced and unjust; with the rising temperatures and climate crisis, our already uneven system is being pushed to its limits. This paper will be a case study centered around two fourth-year undergraduate studios. It will explore a pedagogical interdisciplinary approach to exploring the intersection of climate/environmental justice and food justice in the design studio. These studios will focus on three pedagogical approaches and themes: interdisciplinary studies, systems-level interventions, and climate realities. Through these three pedagogical approaches, students will develop an understanding of the building, not as an isolated formal exercise but as a contribution to existing communities. The key issues addressed are local food inequity, community, site, and environmental justice. These studio exercises build on ongoing university research exploring the intersection of urban research, pedagogy, and practice. Urban research has long been essential for understanding urban areas' challenges and opportunities. Still, the gap between academic research and practical implementation remains challenging, especially in design. We will discuss how studios could be used as public research infrastructures and leveraged as a design tool for bridging this gap.

KEYWORDS: Pedagogy, Food equity, Community design, Climate justice, Design studio

1.0 INTRODUCTION AND CONTEXT

In 1968, during the American Institute of Architects (AIA) annual meeting, civil rights leader Whitney M. Young Jr. gave a compelling Keynote speech demanding that architects not hide from societal issues behind the title of designer but instead use their expertise to create change toward a better society (Young Jr. 1968). With the growing set of “wicked problems” (Rittel 1973 160) surrounding environmental, political, social, and economic issues that impact the built environment, architecture students stand at the front lines. The architecture studio, usually the most significant course requirement within any curriculum, plays a crucial role in training our next generation of designers. We must equip our students to become problem solvers who seek to design for more just futures. It is critical that in our teaching, we present architecture as a part of a larger whole. Architecture does not occur in a vacuum; various factors, such as policy, funding, and access, among others, shape the built environment. As educators, we must center architectural practice around the community it serves and educate students that buildings are not isolated structures but are interconnected within larger systems.

Historically, design studios have been the foundation of architectural education; they carry the most credits and are often prioritized by professors and students (Dutton 1987, 16; Deamer 2020, 5; Malecha 1988, 124). Topics covered in studio classes can range from speculative briefs to design-build studios to comprehensive projects. Though we support all forms of studio briefs, studios should introduce students to larger thematic issues, whether it be issues of labor, climate change, or local community matters; studios bridge the gap between design education and problem-solving. As stated by Peggy Deamer,

the failure of a studio to engage with the world is linked to a school's failure to prepare an architect empowered professionally to serve society (Deamer 2020),

and within our department, we have emphasized the need to focus on the public. This paper will explore a design studio with a pedagogical interdisciplinary approach at the intersection of climate/environmental justice and food justice. Building on the work of John Dewey, a prominent education scholar who advocated for “learning through experience” and practical engagement in the real world (Dewey 1916), this studio allowed students to investigate these issues and ground their projects by applying their designs in a real neighborhood.

1.1 Context

Kean University and the foundations for this course are grounded in New Jersey. New Jersey, commonly referred to as “the Garden State,” boasts agriculture as its third largest industry. Yet, it has identified over 50 communities currently considered food deserts across the state. The United States Department of Agriculture (USDA) defines a food desert as an area with a minimum 20% poverty rate or, if located within an urban area, the closest grocery

store is over a mile away from at least 33% of the population (Dutko et al. 2012). New Jersey established the Food Desert Relief Act (FDRA) in 2021 and created a Food Equity officer position at the state level as part of its food access initiative. Part of this process was to create a food desert definition alongside the USDA's definition that reflects the reality of its communities. Focusing on factors such as walkability, food swamps, income relative to cost of living ratios, and percentage of households with internet access, the NJ FDRA expands the definition of food deserts within its community. With these new initiatives, the FDRA directs the state's Economic Development Authority investment of over

\$40 million per year for six years in tax credits, grants, loans, and technical assistance to increase access to nutritious foods and develop new approaches to alleviate food deserts (NJDEA 2022).

This has led to significant policy incentives, and food justice advocates eager to identify how to increase access to healthy food.

Alongside governmental and state-funded initiatives within New Jersey to expand food security, the state also has robust grassroots food equity non-profits such as Interfaith Neighbors, New Jersey Food Democracy Collaborative, among others. As a part of the course, we introduced students to these non-profit organizations through a tour of Kula Urban Farms and a presentation about the current food system by a member of Interfaith Neighbors. In that talk, students learned not only about issues of New Jersey at large but also how funding is distributed between these systems, how climate change affects farmers, and the need to create robust networks between farms, food pantries, and markets. What was key for us when introducing the subject of food access and equity within the studio was to introduce students to the grassroots organizations that are experts in the field and are leading the way. The New Jersey Food Democracy Collaborative developed a roadmap for food system resilience outlining the interconnected systems of environmental justice, health equity, and climate resilience, which we used as a guide in developing the studio brief (Cava et al. 2022).

Food access issues are not isolated to New Jersey or our campus; the World Health Organization has recognized the need for access to nutritious food as a critical factor of the built environment for health, well-being, and quality of life. Under Sustainable Development Goal 2, the United Nations also calls to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture (United Nations 2023). Even on the smaller scale of the college campus, a 2019/2020 federal study by the National Postsecondary Student Aid Study (NPSAS) has shown that 22.6% of undergraduate students experience low food security, while 11.9% experience marginal food insecurity. These numbers are more than double the number of American households experiencing food insecurity (McKibben et al. 2023). When selecting a site for the studio brief, we chose a site within a 10-minute walk from campus. Right around the campus is a food desert, listed in the New Jersey Food Desert Community Designation Methodology report as one of the top 25 food deserts in the state. Students had to consider the site as an intersection of two communities: the city and their college campus.

2.0 FRAMEWORK

Building beyond the atelier studio model, where students share their ideas in a workshop setting, required expanding the studio past its six credits and using adjacent seminar and core classes to reinforce thematic threads. By creating connections between the studio and its adjacent courses, students could use systems thinking and explore the intersectionality of the issues presented. They were challenged to develop critical awareness in their coursework. Inspired by the work of Paulo Freire in developing "critical consciousness," students were encouraged to center their own lived experiences within their designs and research. Freire explains the concept of critical consciousness as having the capacity to intervene in that reality in order to change it (Freire 2005). Integrating real social issues into the studio allows the students to explore how design interventions can support social, economic, and environmental goals in addition to the architecture. Taking cues from architectural scholar and educator Dr. Sharon E. Sutton, we strongly agree that design studios should support *critical placemaking* within a community. While this semester did not have a community partner, the studios explored ideas of critical placemaking through local design interventions. Critical placemaking refers to the "participatory process of transforming racialized, under-resourced, and politically disenfranchised surroundings" (Sutton 2023 13). We designed our studios as an extension of a growing public research infrastructure within our institution. This studio, alongside the institutional interest in urban and local matters, can be a critical design tool for cultivating connections between academia, community, and practice. To create these connections, our studio brief was organized around three focus areas: Interdisciplinary Studies, Systems-level interventions, and Climate Realities.

2.1 Interdisciplinary studies

Beyond architecture, students had to think through an interdisciplinary lens to explore food studies, environmental justice, public health, and building systems and integrate these elements into their studio design projects. "Cooking as inquiry," as described in the essay by Jennifer Brady, is a technique that adds

layers to the typically disembodied practices of social research that have long overlooked the body and the mundane rituals of foodmaking as sites of knowledge (Brady 2011 322).

Using this food studies technique in the studio, students explore food as material by drawing the ground, exploring it as an ingredient, and how we eat together shapes a space. With an emphasis on commensality, food is presented as a necessity and a cultural binding agent, bringing and strengthening communities through eating together. In introducing the overlap between environmental justice, climate realities, and the built environment's impact on public health, students were challenged to expand how they think about their designs as part of a larger ecosystem, not as a single piece of architecture. This meant they had to view their project from a historical, anthropological, sociological, and architectural perspective.

2.2 Systems-level interventions

As part of the studio, students interacted with local food organizations such as Kula Urban Farms and the New Jersey Food Democracy Collaborative to develop an understanding of the scope of food inequity. Using drawing as a driving force, students represented food as material while using collage, mapping, diagrams, and analysis. The act of drawing acts as a way to understand and visualize the intersectional nature of the systems of a regenerative economy, focusing on the intersection between embodied energy through a study of mass timber and the act of embodying the meals we consume. One system-level intervention our students explored was urban agriculture, which includes “cultivation, processing, and distribution of agricultural products in urban areas” (Dutko et al. 2012). In *Beyond the Kale*, Cohen references how, in addition to food production, urban agriculture can also be a means for cultivating social or environmental change in communities (Reynolds, Cohen 2016). In bridging connections between how food production can occur within and around existing buildings, students were required to understand building systems and explore innovative ways of integrating systems with ways of supporting the cultivation of food and community.

2.3 Climate realities

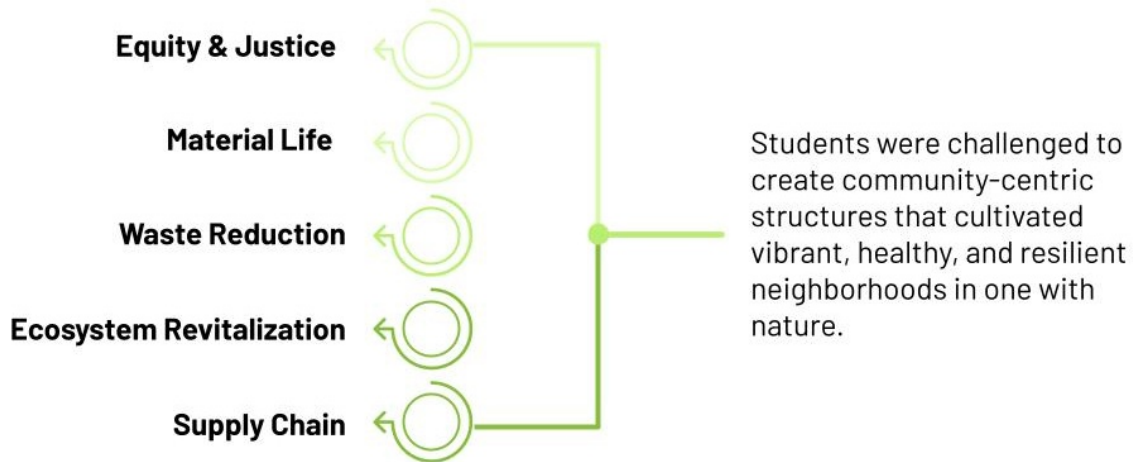


Figure 1: Diagram describing the multiple components inside the theme of climate realities. Source: (Author 2023)

This studio introduced sustainability as part of circular or regenerative principles. By embracing climate realities as a foundation of design education, we ensure that the next generation of architects can understand how the design of buildings impacts both natural and built spaces. By exploring concepts of equity and justice, waste reduction, ecosystem revitalization, material life, and supply chain, students were challenged to create community-centric structures that cultivated vibrant, healthy, and resilient neighborhoods in one with nature. Designers play a key role in determining how buildings generate and consume energy. Efficient building envelopes, onsite/renewable energy, and innovative water and waste management strategies can all contribute to a building that responds to climate action goals. Decarbonization requires us to consider the entire lifecycle of systems and shift from an extractive to a regenerative construction model. Cities are increasingly looking toward mass timber construction as one of the methods for achieving these goals. When ethically harvested, mass timber can efficiently “store carbon and offset lifecycle impacts” (Kuitennin et al., 2022). Climate realities extend beyond the sciences to the people; achieving climate justice requires a shift in social priorities, norms, and behaviors (Cruz 2023).

Through these three pedagogical approaches, students developed an understanding of the building, not as an isolated formal exercise but as a contribution to existing communities. Local food inequity, community, site, and environmental justice were among the critical issues addressed. These studio exercises build on ongoing university research exploring the intersection of urban research, pedagogy, and practice. Urban research has long been essential for understanding urban areas' challenges and opportunities. Still, the gap between academic research and practical implementation remains challenging, especially in design.

3.0 HOW THE STUDIOS RAN

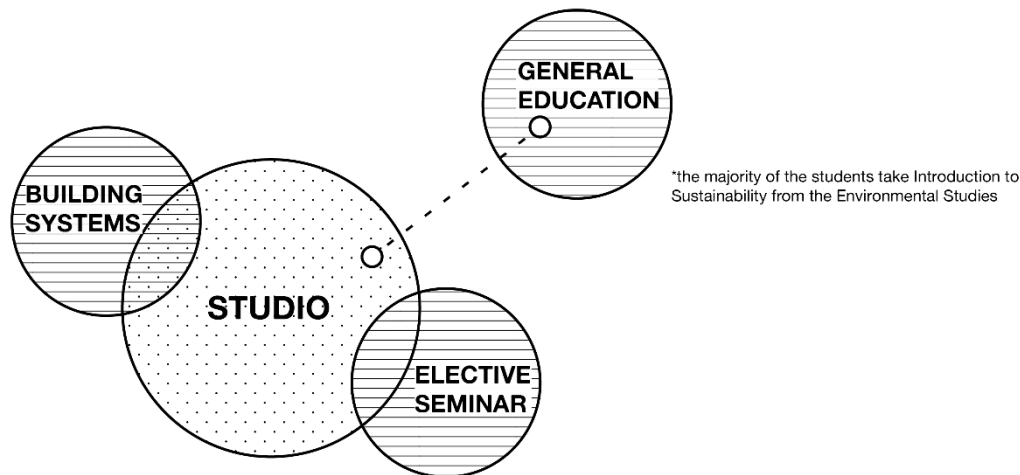


Figure 2: Course diagram describing the connections between the courses. Source: (Author 2023)

“Under, On, and Around the Table: Designing for Food Equity” was a coordinated fourth-year studio that tackled a food hub program and was coordinated with its adjacent courses, Building Systems I (BSI), and the elective seminars. This case study not only focuses on the studio itself but also its relationship with the adjacent courses. The intention behind aligning and coordinating adjacent courses with the studio prompt of food equity was to provide students with a series of different viewpoints as they worked on developing their designs. Students could select from one of four thematic seminars; topics explored ranged from food colonization to urban studies.

The four seminar focuses were:

- *Waste Practices* was a seminar that dealt with waste issues from multiple aspects, such as health, labor, politics, and climate change. Focusing on the social problems around waste production and how we envision waste as a culture, the seminar emphasized how waste could be recontextualized in architectural design.
- *Food Landscapes* focused on how the history of colonization and the built environment are inherently intertwined with food production and access. Through this historical perspective, students were asked to trace the lineage of food production, agriculture, and markets through the urban environment, beginning with Columbus’ arrival to current movements in food equity and access.
- *Community Energies* focused on community-centered approaches around energy, urban design, equity, and power. The seminar explored how communities are impacted by policies and regulations of the built environment and the energy dynamics of transportation, infrastructure, and resource distribution, as well as green and public spaces on neighborhoods and public health.
- *Faceted Urbanism* focused on the formal aspect of cities ranging from squares, parks, neighborhood fabric, etc. Using both Western and Non-Western architectural precedents, the course expanded the students’ knowledge of urban environments through a cross-cultural perspective that emphasized the social, cultural, and environmental aspects of the built environment.

Though students in each studio were a part of different seminar sections, we discovered that students began to share information from their respective seminars with their classmates and introduce those concepts within their studio projects. For example, a student in the *Community Energies* seminar incorporated water from a nearby river into her project and was inspired by an indigenous method of growing called *chinampas*, or floating gardens, that they had learned in the seminar. Another student in the *Waste Practices* seminar became interested in composting and food waste and changed the programming of their project to focus on it. By having diverse yet thematically linked seminars that students took alongside their studio and building system courses, students could make broader connections regarding their studio design projects around food equity and designing a food hub for their local community.

For the design studio portion, there were a total of four sections. All sections had an overarching brief about food equity, site research, sustainable architecture, and its correlation to the facade and structural design, which would be further developed in their Building Systems I course. All four sections were given autonomy under the umbrella syllabus, creating four perspectives focused on food equity. Each section could tailor their brief to include more growing spaces, market spaces, or other programs that fit their overall pedagogical intentions. One section focused on non-human food production and designing spaces for them, another on permaculture, and the other two on food systems and food as a material. The latter two sections are the focus of this case study and will be referred to as Section 01 and Section 02. As part of the studio, all sections had the same site and were introduced to food equity issues in New Jersey by meeting with Kula Urban Farms, a local urban farm in Asbury Park that is part of a larger non-profit organization called Interfaith Neighbors.

Section 01 began the semester studying and exploring food systems by having students select a specific vegetable or fruit and research its history, cultivation, and how it ends up on our table. With an emphasis on understanding who the stakeholders are throughout the entire process, including production, processing, distribution, and consumption, students were asked to analyze through a series of mapping exercises how these ingredients end up in our home critically. Students explored the food around them alongside their broader food systems research. They visited the apple orchard and vegetable garden on campus to understand different types of growing spaces, from hydroponics to more traditional forms of cultivation. With their food systems research and exposure to local growing spaces and conditions, students conducted site research focused on the climate conditions and how that would affect the overall design of the structure and the programmatic growing spaces.

Section 02 focuses on food as a material. Based on the methodology laid out by Jennifer Brady in her essay, “Cooking as Inquiry: A Method to Stir Up Prevailing Ways of Knowing Food, Body, and Identity,” students were asked to recontextualize their relationship with food (Brady 2011). Their first exercise, *As It Grows*, had students select a vegetable or fruit actively growing in New Jersey. Once selected, they had to get the ingredients and study their texture, pattern, and tactile experience. By understanding the sensory information of the ingredient, they then drew the ingredient from roots to the sky, using only black and white patterns to get a layered and textured drawing. Following the initial drawing, their next exercise, *When We Cook*, asked students to make a dish from their ingredients and replicate it in the drawing. Through the act of cooking or designing a dish, students had the opportunity to consider how their ingredient is part of a dish and how it transformed. The last exercise, *When We Dine*, asked students to explore the spatial relationship between dining and commensality. Using the drawings from their previous exercise, students, with tables around the studio, were asked to rethink how we dine together and what it means to share a meal together. Based on these organizations, inspired by the diagrams and work of Teddy Cruz and Fonna Forman’s book *Spatializing Justice*, students created their own building blocks based on food equity and commensality (Cruz, Forman, 2023). These exercises asked students to recontextualize their relationship to food and understand it as a potential material.

For both sections 01 and 02, students did site research on the climatic conditions on the site. Our site and the surrounding area suffer from flooding, which has worsened as climate change progresses. These conditions are experienced throughout the state of New Jersey. Alongside their climate research, students looked into the affordability and access to fresh food in the area, denoting that there was only one small grocery store within a 10-minute walk, and their prices were considerably higher than larger grocery stores for the same or slightly worse quality food. Students also noted that the site and area around it is a food swamp, full of unhealthy food options like fast-food restaurants and convenience stores. These were compiled into climate, food, and site research booklets. Students in both sections also developed a precedent booklet for their entire studio. These precedents were a mixture of food hub buildings and mass timber construction. As part of the booklet and precedent research, students had to programmatically and structurally analyze their precedents.

4.0 ASSESSMENT

In both sections, students took an exceptional interest in food research and understanding stakeholders, food as material, food access issues, and the area’s climatic conditions. Though we ran a few mass timber lectures, had the BSI faculty join us for midreview, informal desk critiques, and finals reviews, and asked students to analyze and draw details of their mass timber precedents, some students struggled to take their abstract ideas of food and give them tectonic clarity. In its coordination, we realized that since students take their first Building System courses during this studio, they have yet to be adequately exposed to structure and tectonics. To alleviate this condition in future studios, we will need to run specific structural and tectonic exercises so students have a more robust understanding before they start designing. They could take the analysis of the mass timber precedents further and apply elements of their structure, such as CLT, glulam post and beam, and other systems, directly to their project to explore the spatial implications of their design process.

Due to this, the translation between early food research and final production needs further development with more specific exercises to guide students. Though students earnestly took to the earlier assignments and exercises, when asked to produce a structure and building for the studio, they defaulted to traditional design methods instead of investigating how their food systems and food as material research could lead them to new design forms. Those who took more of an interdisciplinary and community-focused approach when developing their building projects could create layered and complex projects that showed an understanding of what a food hub could be a community building and had structural and tectonic clarity. Below are three projects that exemplify the project’s goals and deal with food equity, mass timber construction, and climate resiliency issues.

Section 01 - Alexa Acuna’s project “Juxtaposed Flows” inspired by the spatial openness of Thorncrown Chapel by Fay Jones, was developed by examining the circulation of the overlapping communities on the site to create an open food experience and community gathering space. Focused on sustainable self-resilience, the project’s use of hydroponics is intended to provide fresh food for the community.

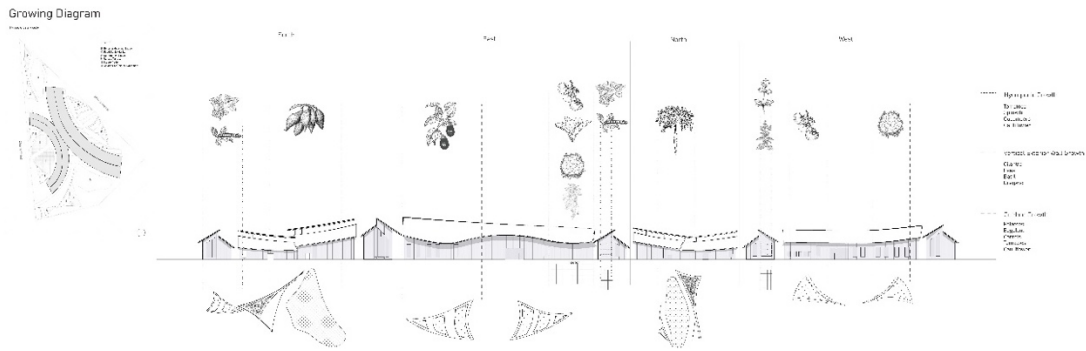


Figure 3: Growing Diagram of "Juxtaposed Flows." Source: (Author 2023)

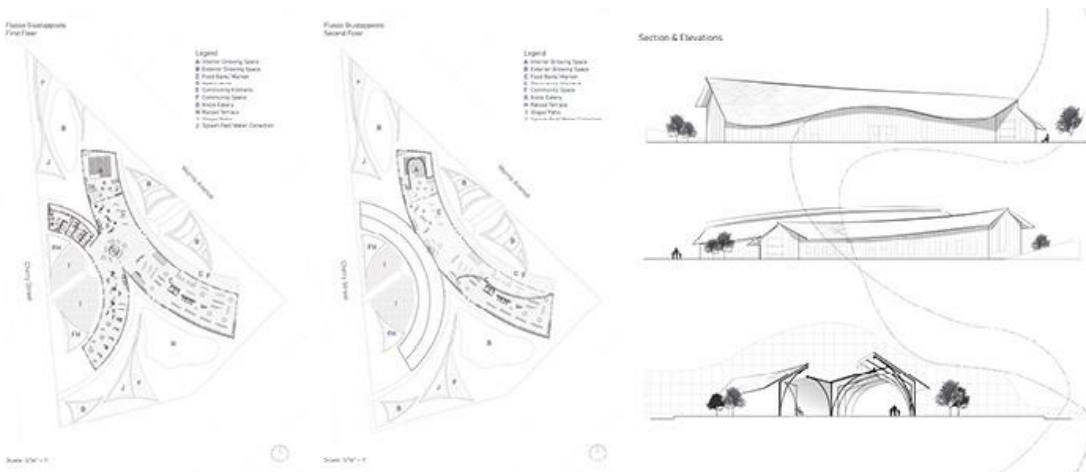


Figure 4: Floor Plans (left), Elevations, and Section (right) of "Juxtaposed Flows." Source: (Author 2023)

Section 02 - Kamila Diaz Calderon's project was focused on creating a food hub that provided educational possibilities to the local elementary school nearby, as well as providing more considerable resources the community could need, such as a medical clinic, commercial kitchens for local business owners, offices for immigration lawyers, indoor/outdoor growing, and indoor/outdoor classroom spaces. The large mass timber grid creates a shaded outdoor space for the project while the volumes break that grid.

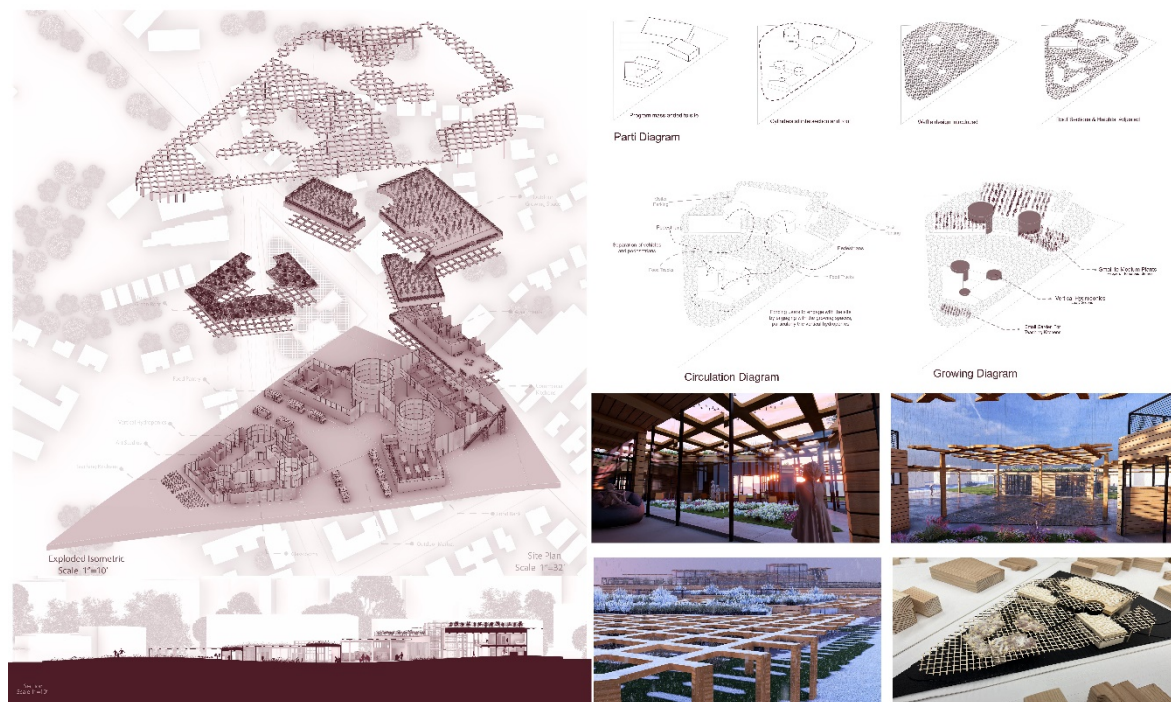


Figure 5: Images from Kamila Diaz Calderon's project. Exploded axonometric and section (left), diagrams (top right), and interior renderings and model photo (bottom right). Source: (Author 2023)

Section 02 - Christian Garganta's project was focused on creating a community commons; his project elevates the building and terrain to create a flood-resistant structure. On the edges of the site, Christian's project focuses on exterior growing spaces that can provide erosion support for the soil, and in its interior courtyard, there are educational spaces for the school nearby. The indoor spaces comprise indoor growing areas, classrooms, market spaces, and a commercial kitchen for local business owners.



Figure 06: Images from Christian Garganta's project. Rendered section perspective (top), growing diagram (bottom left), site plan (bottom middle), and interior rendering (bottom right). Source: (Author 2023)

CONCLUSIONS

Overall, the studio accomplished what it set out to do. As we plan for future iterations of this studio, one thing became clear - we need to develop stronger community connections with an active plan earlier. This studio is a core course with four sections, and each section has around fourteen students; we need to choreograph how students interact with non-profit organizations without becoming a burden to them while also accomplishing all the curricular needs of the semester. These complex studios tackle tectonics, social issues, and community impact in architectural design, and they need to be part of the core curriculum courses instead of peripheral option studios. Through this case study and studio, we were able to make connections within New Jersey's food systems that will aid us in providing those opportunities for future studios. At the end of the semester, students understood the role of food access within their community and how architecture and the built environment contribute to inequities. Though not all students grasp the translation between food research, site, and designing a building, we believe that by emphasizing the building blocks in Teddy Cruz and Fonna Forman's *Spatializing Justice* and Dr. Sharon E. Sutton's *Pedagogy of the Beloved Commons*, we can create a series of exercises to guide students through the process without being formally prescriptive for future iterations of the course.

REFERENCES

- Brady, Jennifer. 2011. "Cooking As Inquiry: A Method to Stir Up Prevailing Ways of Knowing Food, Body, and Identity." *International Journal of Qualitative Methods* 10 (4): 321–334. <https://doi.org/10.1177/160940691101000402>.
- Cava, Jeanine, Sarah Elnakib, Rachel Fisher, and John Gershman. 2022. *NJ Roadmap For Food System Resilience: A Holistic Justice Framework For Food System Transformation*. New Jersey Food Democracy Collaborative. <https://static1.squarespace.com/static/62227d789c070f19e7f60492/t/62bf24c25495cd6013b97b8c/1656693958530/NJ+Roadmap+for+Food+System+Resilience+FINAL+3.8.22.pdf>. n.d.
- Cruz, Teddy, Fonna Forman, and NODE Berlin Oslo. 2023. *Spatializing Justice: Building Blocks*. Berlin: Hatje Cantz Verlag.
- Deamer, Peggy. 2020. "Design Pedagogy: The New Architectural Studio and Its Consequences." *Architecture MPS* 18 (1). <https://doi.org/10.14324/111.444.amps.2020v18i1.002>.
- Dewey, John. 1916. *Democracy and Education: An Introduction to the Philosophy of Education*. Reprint, New York: Free Press, 1997.
- Dutko, P., M. Ver Ploeg, and T. Farrigan. 2012. *Characteristics and Influential Factors of Food Desert*. United States Department of Agriculture. Accessed January 2024. https://www.ers.usda.gov/webdocs/publications/45014/30940_err140.pdf. n.d.
- Dutton, Thomas A. 1987. "Design and Studio Pedagogy." *Journal of Architectural Education* (1984-) 41 (1):16–25. <https://doi.org/10.2307/1424904>. Accessed 24 January, 2024.

- Ebel, Roland. 2020. "Chinampas: An Urban Farming Model of the Aztecs and a Potential Solution for Modern Megalopolis", *HortTechnology* 30 (1): 13-19. <https://doi.org/10.21273/HORTTECH04310-19>. Accessed January 10, 2024.
- Freire, Paolo. 2005. *Education for Critical Consciousness*. London: Continuum International Publishing Group.
- Malecha, Marvin J. 1988. "Architectural Education." *Ekistics* 55 (328-330): 121-132. <http://www.jstor.org/stable/43622063>. Accessed 24 January 2024.
- McKibben, Bryce, Jiayao Wu, and Sara Abelson. 2023. "New Federal Data Confirm That College Students Face Significant—and Unacceptable—Basic Needs Insecurity." *The Hope Center* (blog). August 23, 2023. Temple University. <https://hope.temple.edu/npsas>. n.d.
- New Jersey Economic Development Authority (NJEDA). 2022. *New Jersey Food Desert Community Designation Methodology*. <https://www.njeda.gov/wp-content/uploads/2022/02/New-Jersey-Food-Desert-Community-Designation-Methodology-Final-2-9-22.pdf>. n.d.
- O'Connell, Lauren. 2020. "Ecole des Beaux-Arts". In *Oxford Bibliographies in Architecture, Planning, and Preservation*. <https://www.oxfordbibliographies.com/display/document/obo-9780190922467/obo-9780190922467-0016.xml?rskey=d5eNAI&result=21> Accessed 29 January 2024
- Organschi, Alan, Matti Kuittinen, and Andrew Ruff. 2022. *Carbon: A Field Manual for Building Designers*. Hoboken, NJ: John Wiley & Sons, Inc.
- Reynolds, Kristin, and Nevin Cohen. 2016. *Beyond the Kale: Urban Agriculture and Social Justice Activism in New York City*. Geographies of Justice and Social Transformation 28. Athens, GA: University of Georgia Press.
- Rittel, Horst W. J. and Melvin M. Webber. 1973 "Dilemmas in a general theory of planning." *Policy Sciences* 4 : 155-169.
- Simon, Madlen. 2002. "Professional Education in the Beaux-Arts Atelier." Paper presented at the ACSA International Conference.
- Sutton, Sharon E. 2023. *Pedagogy of a Beloved Commons: Pursuing Democracy's Promise through Place-Based Activism*. First ed. Polis: Fordham Series in Urban Studies. New York: Fordham University Press.
- United Nations. n.d. "Sustainable Development Goals." <https://sdgs.un.org/goals/goal2> Accessed 29 January 2024
- Young Jr., Whitney M., 1968. "AIA Keynote". Speech presented at the AIA Annual Convention, Portland, Oregon.