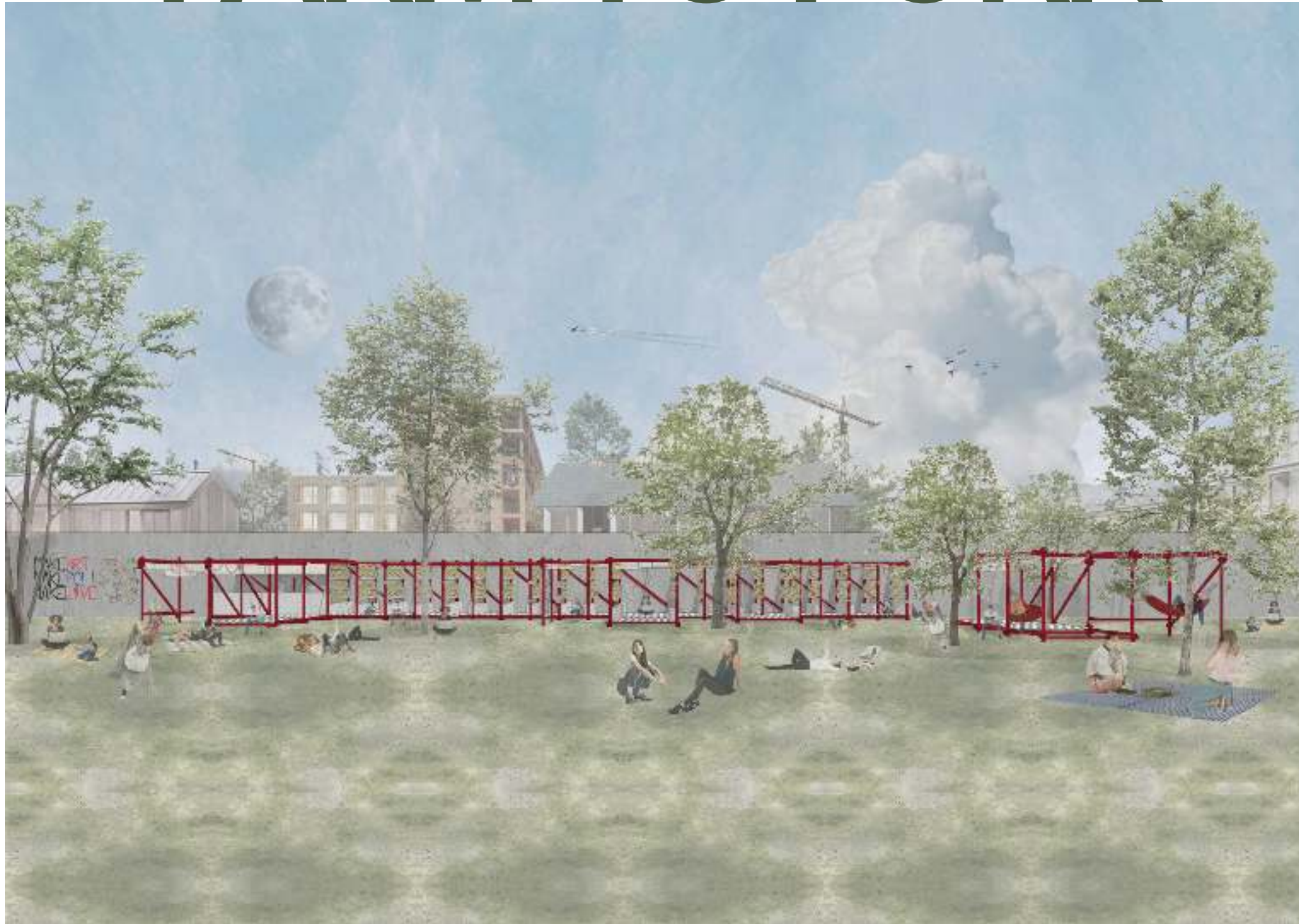


# FARM TO FORK



**POLITECNICO**  
MILANO 1863

**Group 05:**  
Wang Yuhan  
Lakshmi Raj Mookola  
Clara Pironi  
Najibeh Movahedi

**Ephemeral and Temporary spaces / 2**  
a.a. 2023-2024  
Interior and Spatial Design

**Professors:** Davide Fassi, Anna Meroni  
**Teaching assistants:** Lucia Viganego, Irene Bassi







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01

CONCEPT ATLAS

# Concept Atlas

## Challenge(s)

1. Food production and procurement	2. Food preparation	3. Distribution & Retailing	4. Consumption	5. Food Surplus & Waste Management
SELF SUSTAINABILITY	NATURAL ENERGY	TEMPORARY STALLS	MINDFULNESS	WASTE REDUCTION
ENERGY CONSERVATION	TRANSPARENCY	INTEGRATED PRODUCTION AND RETAIL	QUALITY SPACE	WASTE TO ENERGY
COMMIUNITY	ORGANIC PLANT BASED DIET		ZERO WASTE IN SERVING	WASTE REUSE
TRANSFORMING SPACES				

## Bluesky

Mindfulness	Choice	Deconstruction	Distribution & Packaging
The quality of the space where we serve food and eat is more than just essential. By focusing on the experience of eating, we gain more clarity about the foods we’re reaching for. This awareness frees up our conscious mind to choose foods that not only satisfy our appetite but also provide nourishing fuel for our bodies.	A plant-based diet promotes health both for people and the planet. The way food is displayed/ placed influences people choices. Promoting informed consumption leads to wiser and healthier choices.	Deconstruct and reconstruct used tea leaves to create new uses as an example of food waste management. Professors, students and citizens can interact with the whole process.Combine the waste and tea leaves to be sustainable.	Islamic geometric patterns showcase symmetry, tessellation, and geometrical constructions. Patterns carry symbolic representations of unity, infinity, reflecting philosophical and religious concepts within Islamic societies.

## Variables

Sustainable	Social dimension	Permeability	Locations	Target
CO2 Reduction Use clean energy and sustainable materials.	Group activities Cultivating and eating together as a communal activity within the campus.	Hybrid Spaces Multi-functional: farming, cooking, dining and also a leisure space.	Transit areas Multi-functional: farming, cooking, dining and also a leisure space.	Students Make the space younger and fun for students to join in.

## How might we/ what if

How can we transform the transit spaces on campus into more lively and engaging areas?
What if the place is to serve only plant-based balanced diet?
What if a single space that effortlessly brings together the production, preparation, and consumption of food?
How might we transform lunch breaks to a communal time?
How might we create a flexible space that can adapt to different uses over time?
How might we put in place a plan to achieve zero food waste?

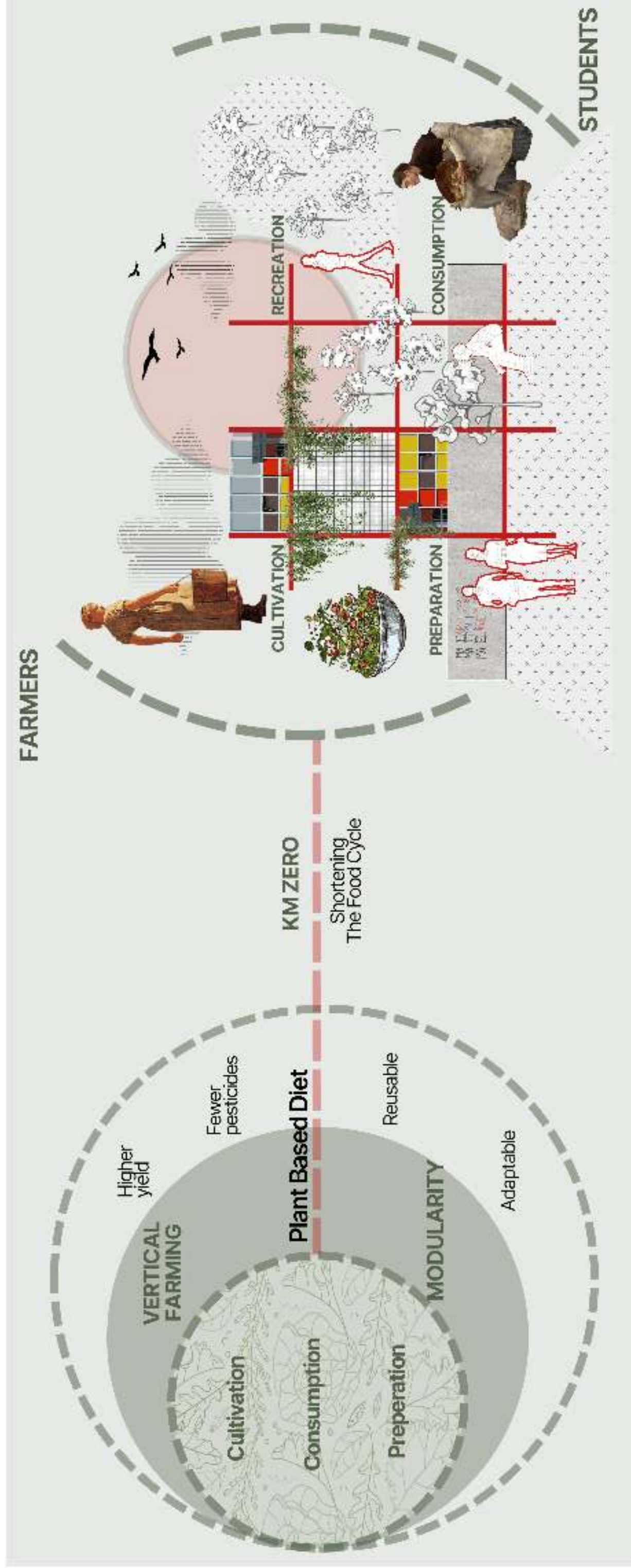
## Actors

Farmers Farmers are integral to this project, as they manage the cultivation of the hydroponics system and provide valuable insights into the local fruits and vegetables available. By leveraging their knowledge and experience, we can guarantee that the ingredients used are fresh and nutritious,enhancing the overall dining experience.
Workers nearby Workers are involved to run the kitchen and the service in general.
Students Students can also participate in the project, fostering a deeper connection and increasing their interest and engagement.

02

CONCEPT





## Key Words

- KM Zero**  
A product qualifies as a zero-km product if it travels less than 100 km and is produced using ecological and organic methods. We have designed a space that integrates **all** stages of the food cycle: cultivation, preparation, and consumption, thereby minimizing environmental impact.
- Modularity**  
Modular construction provides numerous benefits, including enhanced speed, cost efficiency, quality, **environmental sustainability**, design **flexibility**, safety, and streamlined logistics. This approach utilizes a **scaffolding structure** composed of standardized components like frames, struts, and connectors, allowing for material reuse and reducing waste.
- Vertical Farming**  
Vertical hydro farming maximizes space, conserves water, reduces pesticides, and promotes local **sustainable food production**. Easily scalable and energy-efficient, it improves food security by offering continuous production in various climates, addressing modern agricultural challenges sustainably.

## Actors

- Farmers
- Students

## Target

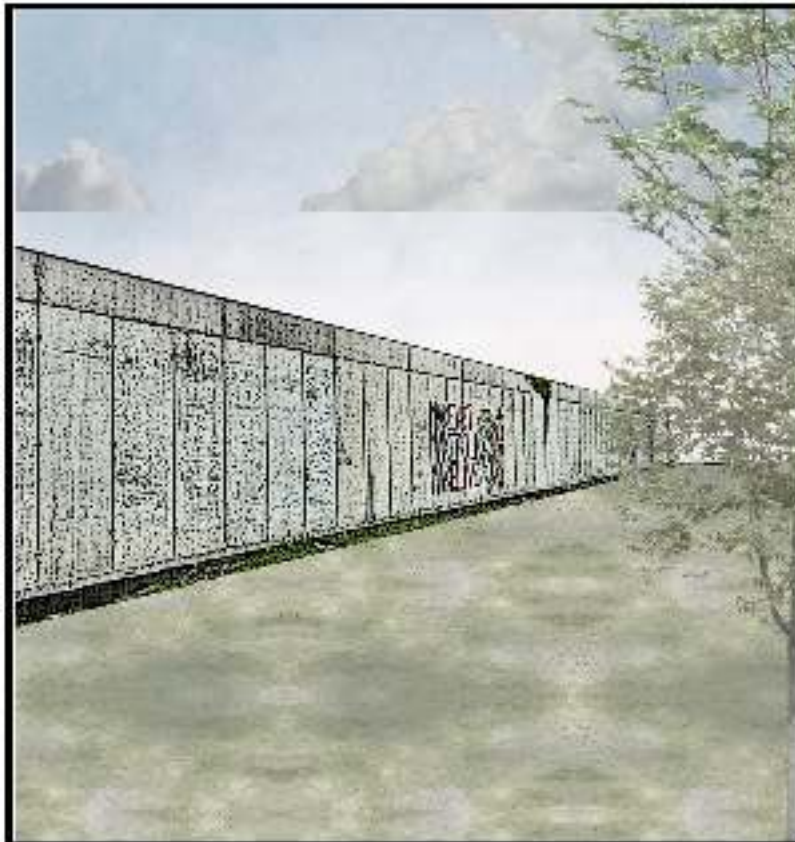
- Neighbourhood
- Students
- Staffs

## Sustainable Measures

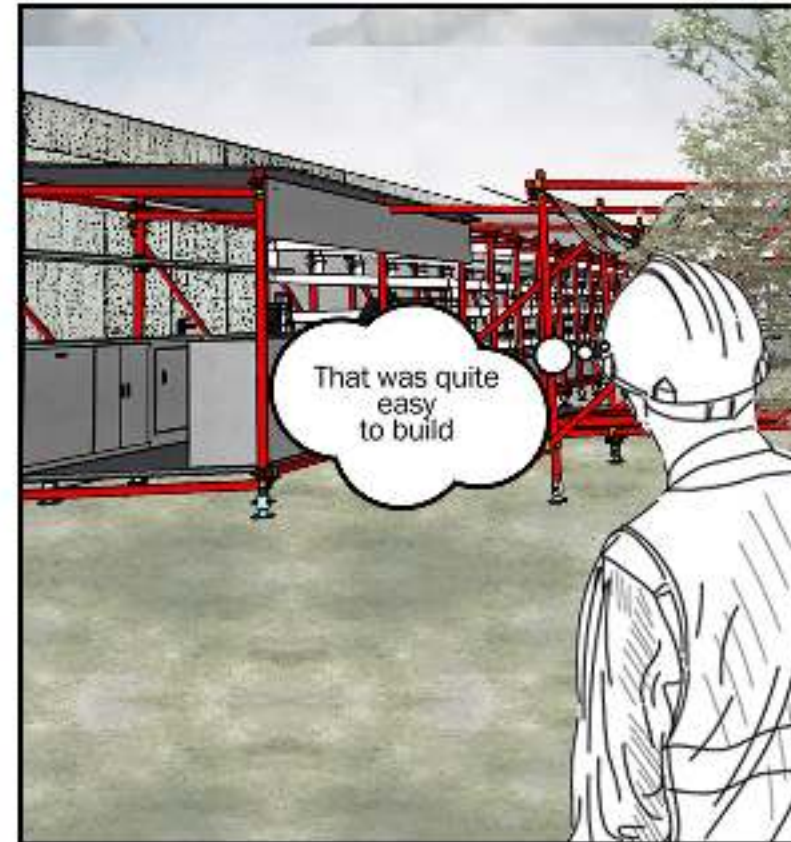
- Rain water for farming
- Solar Energy for Electricity
- Reusable Materials



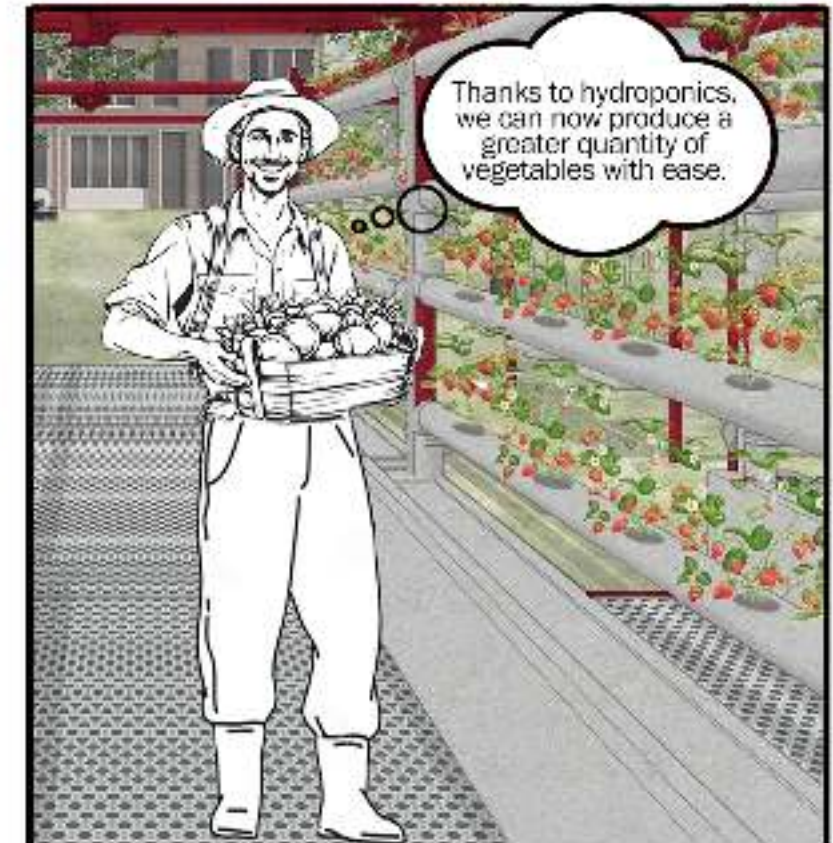
# THE STORY OF AN EMPTY WALL



The once silent and bare campus compound wall could be transformed into a breathing wall by growing food on it. This fusion of practicality and natural beauty would create a harmonious blend of nature.



Scaffolding employs cold joints for versatile combinations, simplifying assembly, disassembly, and transportation. These components are also reusable and recyclable.



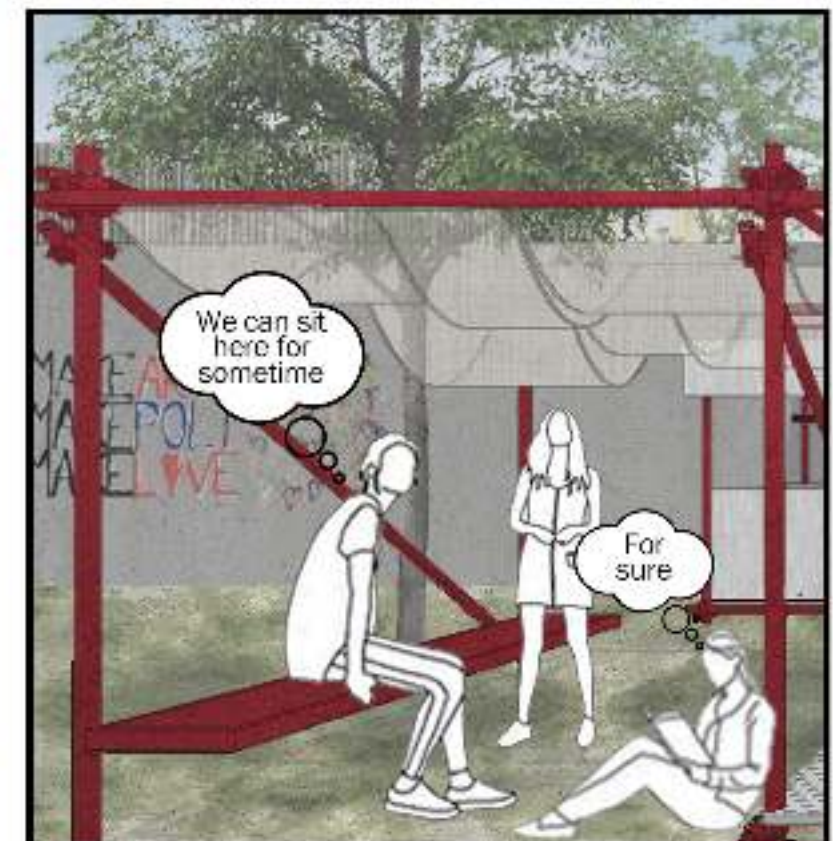
Hydroponic plants yield more fruits and vegetables because they can be grown more densely than in traditional soil-based farming and using rain water for the irrigation.



The kitchen serves plant-based meals made with fresh vegetables and fruits sourced directly from the farm, promoting localized food for a lower environmental impact.



Fresh plant-based food can foster a healthy food culture for students, encouraging better eating habits, promoting well-being and supporting sustainability.



The vacant modules have shades, swings, and seating for meals and leisure time. Visitors can also bring blankets for a picnic-style experience.



The project reimagines the food chain by integrating on-site farms with a dynamic space featuring kitchen, dining, and agricultural zones. Utilizing hydroponic gardening, rainwater harvesting, and solar energy, fresh, plant-based solutions are brought to the plate. Modular scaffolding constructions ensure flexibility and efficiency, all while promoting eco-friendly practices and repurposing unused space.



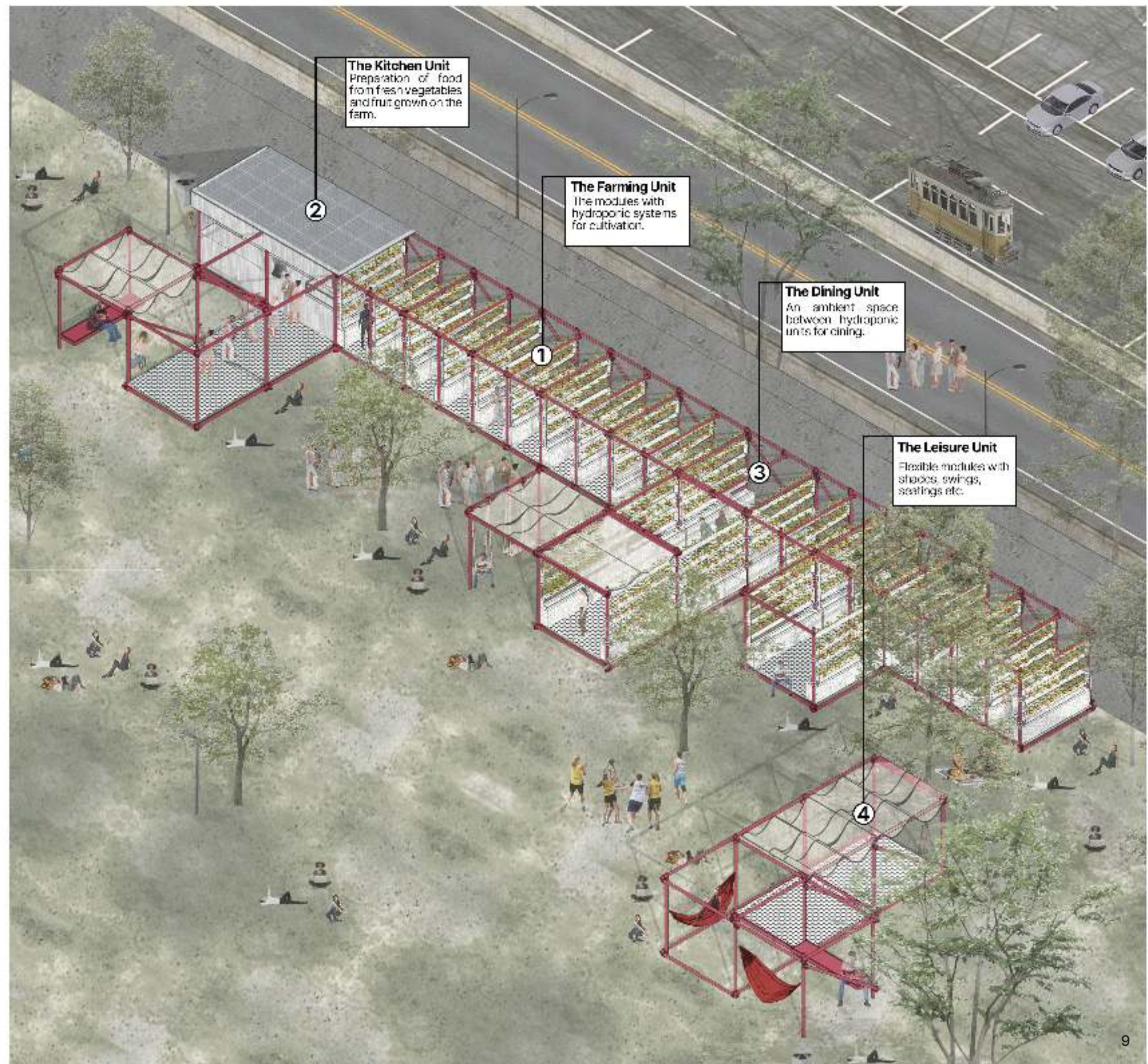
Farming Unit



Kitchen Unit



Dining Unit



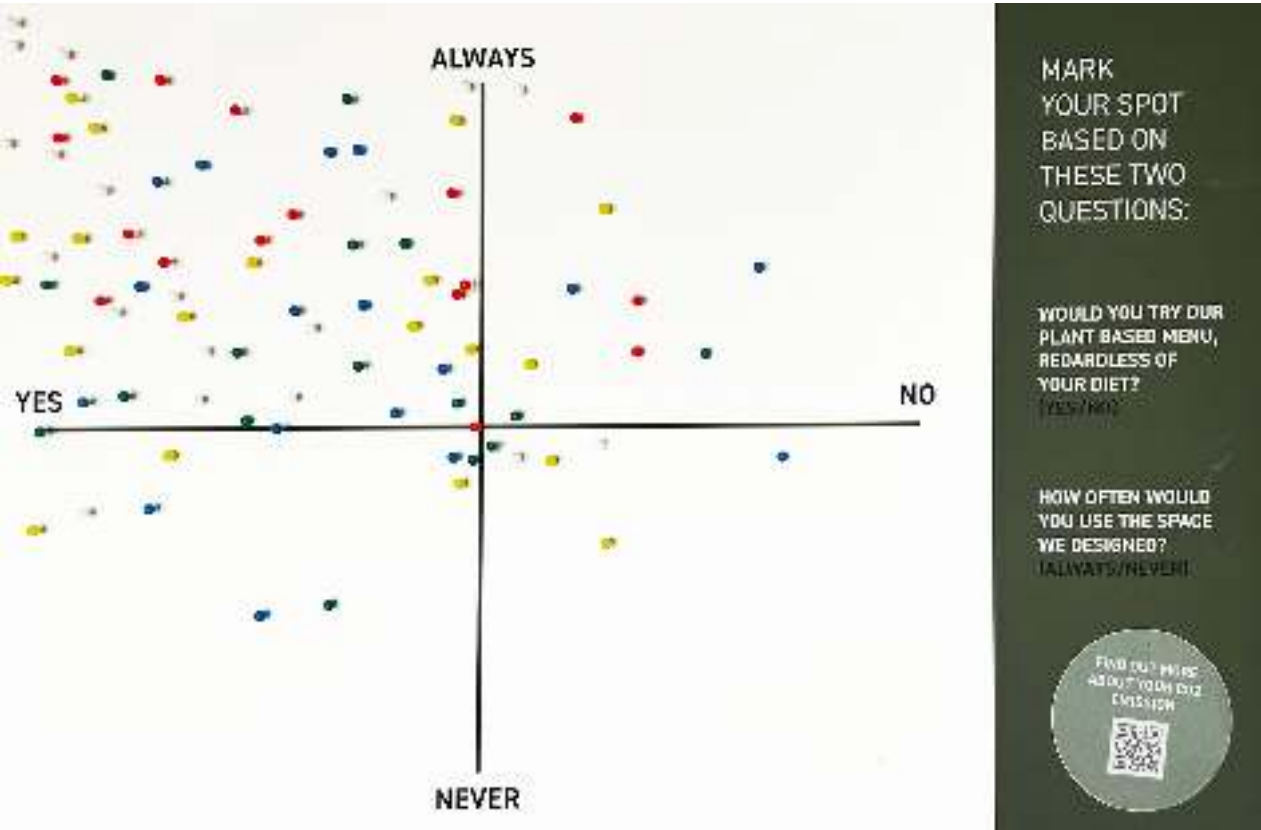


03

CODESIGN



# Feedbacks and Insights



## LIFESTYLE FOR SOME, SPACE FOR ALL



“DOES THIS PLANT BASED DIET INCLUDE **PROTEIN**?  
HOW CAN I MAKE SURE THAT IT IS **BALANCED**?”

We plan to cultivate and serve a diverse range of foods, including legumes rich in **plant-based proteins**. Our menus will be thoughtfully designed to ensure they are both healthy and balanced, featuring seasonal fruits and vegetables grown on-site.

“CAN I **USE THE SPACE** EVEN IF I DON’T WANT TO EAT SOMETHING FROM THE MENU?”

Our space is designed to be welcoming to everyone. To enhance the experience, we will incorporate additional leisure-focused modules. Located in an area where students already hang out and eat, our space will seamlessly extend this environment, making mealtimes more enjoyable and providing more options for students who wish to try a plant based local menu.

## FEEDBACKS ANALYSIS

Out of **86** votes

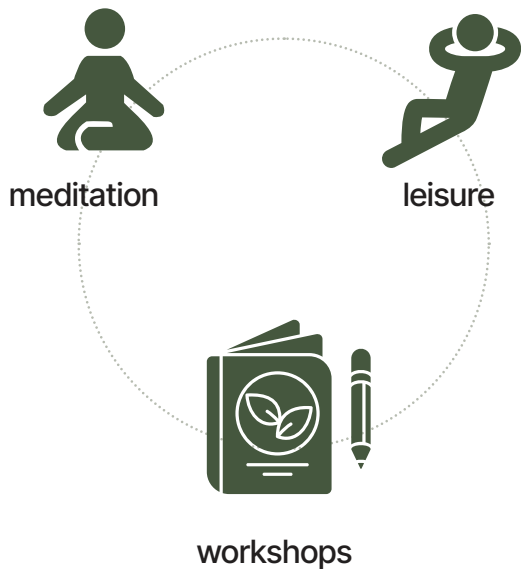
- **61** people are interested in trying the plant-based menu and using the designed space, highlighting a gap in services at Bovisa Campus.
- **10** people, even if not invested in a plant-based diet, still want to use the space.
- **6** people would probably never use the space or try our plant based menu.
- **9** people would probably try our plant based menu but not use the space often.

**70.9%**

of the people would use the space often and try our plant based menu.

## INSIGHTS

- Prioritizing leisure and dining modules over kitchen modules would better meet campus needs.
- Creating an inviting space with healthy, fresh food aims to attract more students and raise awareness of food provenance, environmental, and health considerations.
- To enhance food awareness, hosting workshops on mindful eating could be an effective way to educate and engage people.
- Hosting special events such as yoga and meditation classes can attract individuals interested in our menu but not yet familiar with our space. Additionally, these events can help utilize the space at different times of the day.





# 04

PROJECT  
DEVELOPMENT



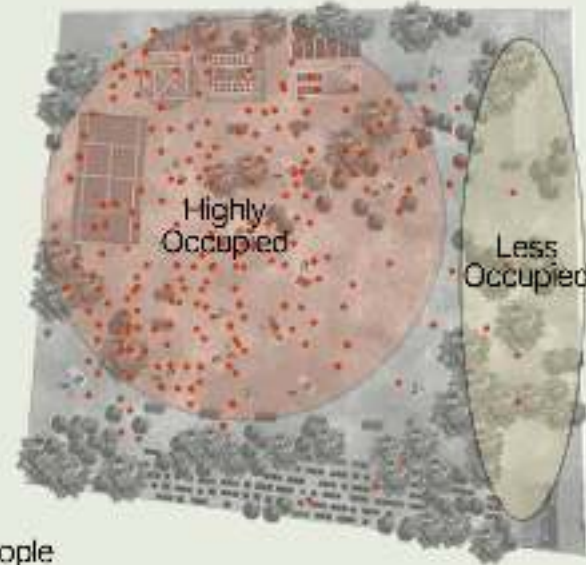
# Localization



Location : Bovisa Durando Campus,  
Politecnico di Milano

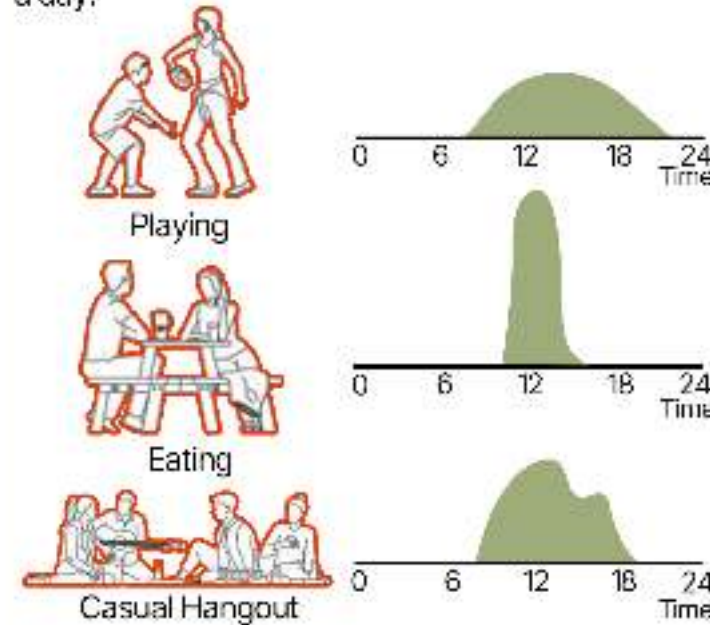
## People Presence on Site

People presence on site at midday (normal working day).



## Activities in Occupation Zones

General activities happening on the site over time in a day.

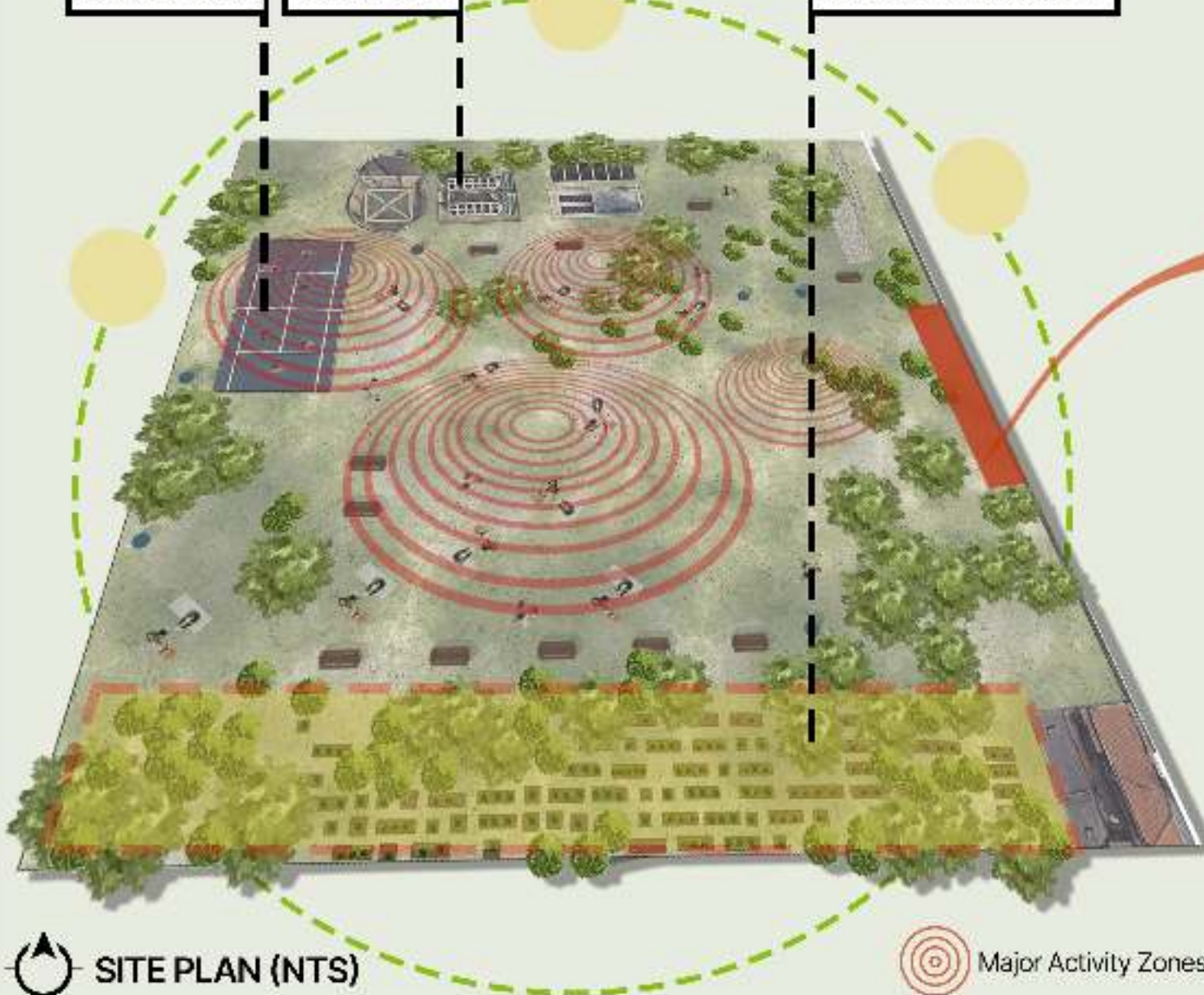


## The Inputs

Converting an abandoned plain wall into thriving, verdant living walls not only enhances the wall's functionality and aesthetic appeal but also presents an innovative solution to food challenges by enabling food growth. This integration of nature into our daily lives offers a sustainable approach to living.

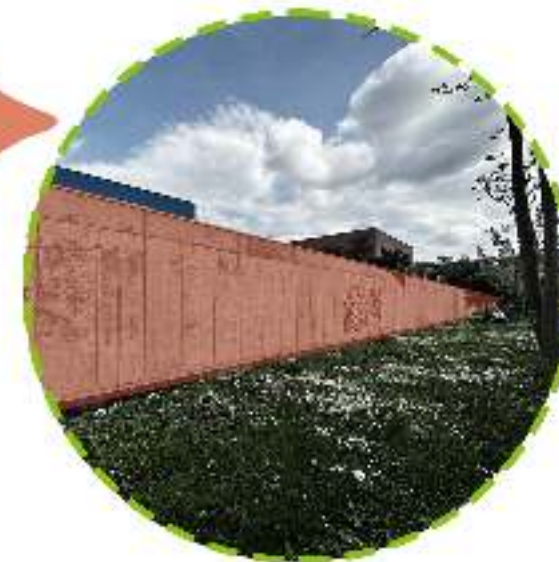
- The structure easily assembles and dismantles according to the season.
- The structure shouldn't disrupt the existing vegetation
- The structure shouldn't disrupt the existing Activities.

Volleyball court Service Area Coltivando Farming Area



## Less Occupied Zone

Upon study, it was clear that the area next to the compound wall was sparsely populated, showing signs of abandonment. The compound wall remains as a neglected structure.



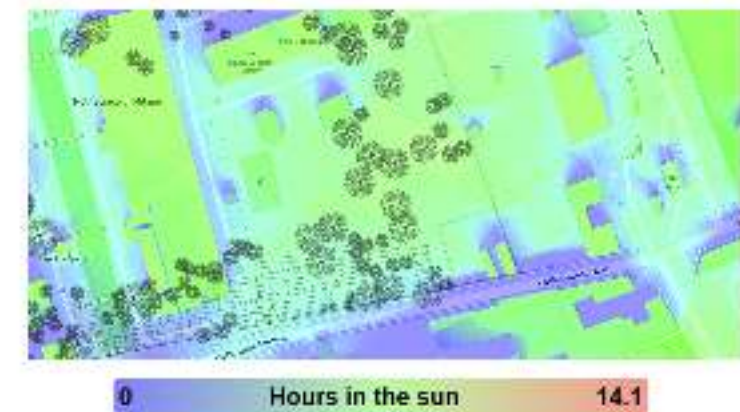
- No Facilities for Sports
- Less benches

## Inference

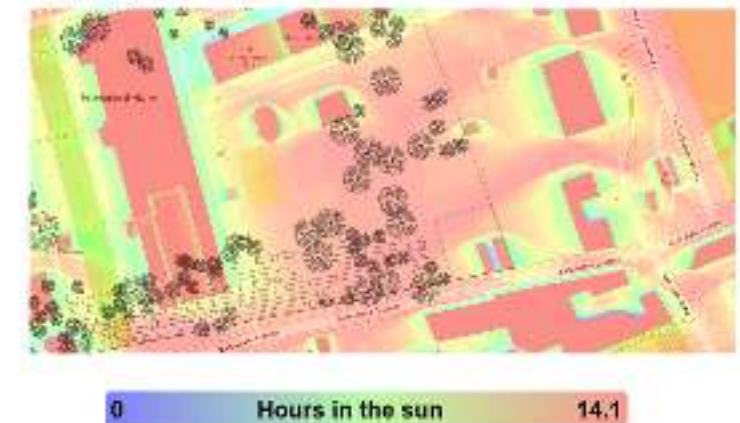
Based on the activity study, it was observed that the majority of individuals utilize this area for leisure and lunch activities. This suggests an opportunity for implementing innovative solutions within the underutilized spaces without disrupting the current activities.

## Sunlight Availability

Summer



Winter



The availability of sunlight is good in this area and there is a high potential to use solar energy for the working of design.



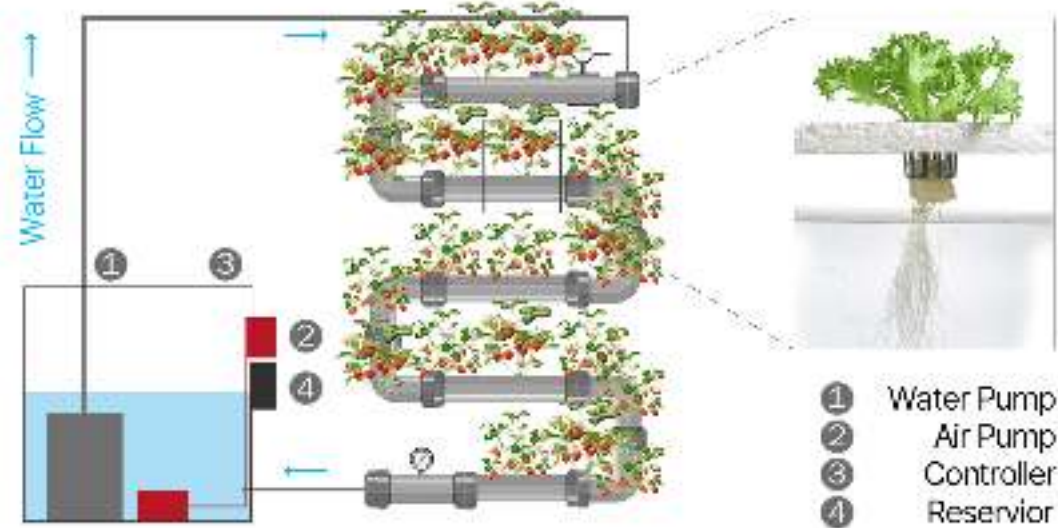
# Vertical Farming

## Method Research

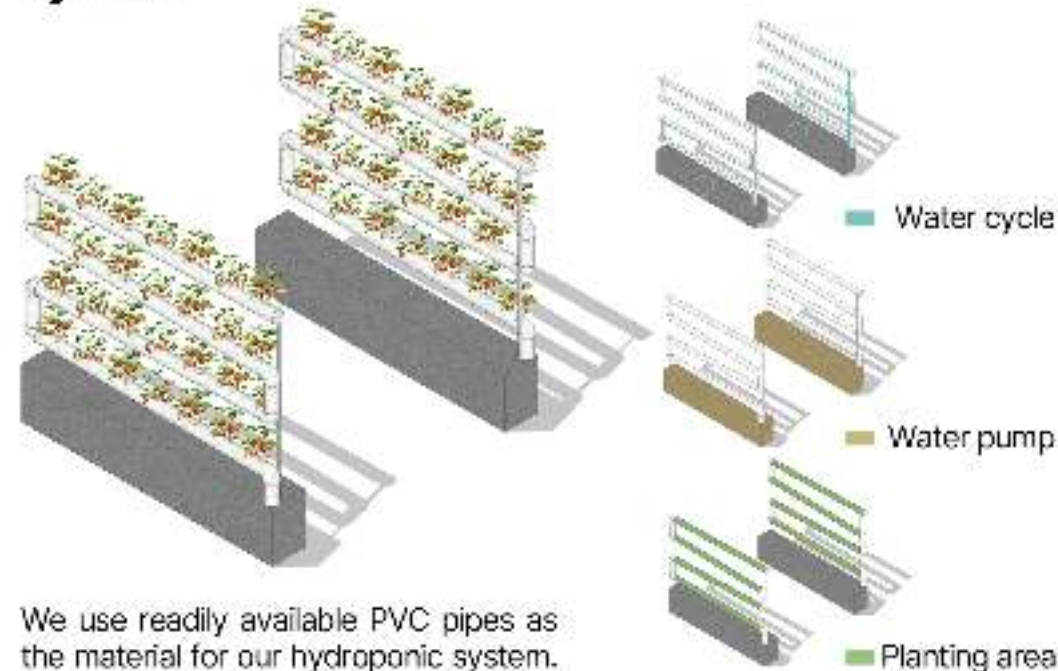
	Medium	Water usage	labor	Difficulty
Hydroponics	In nutrient water			
Aeroponics	In nutrient air			
Substrate Culture	In inert media			
Soil-based Farming	In soil			

We select hydroponics for its low technical and labor demands, simple management, and efficient water conservation properties.

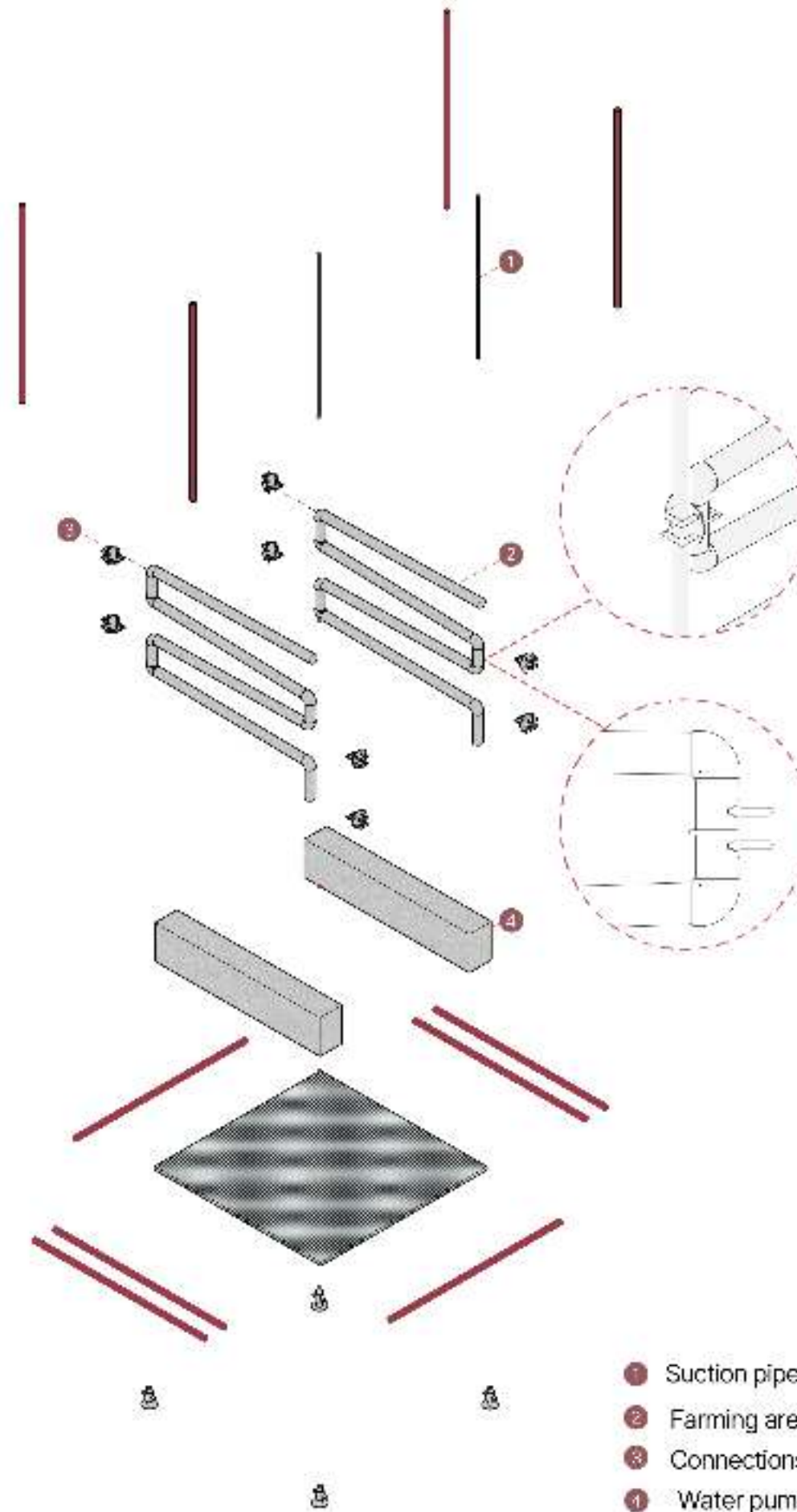
## Hydroponics Concept



## System



## Structure



## Vegetables

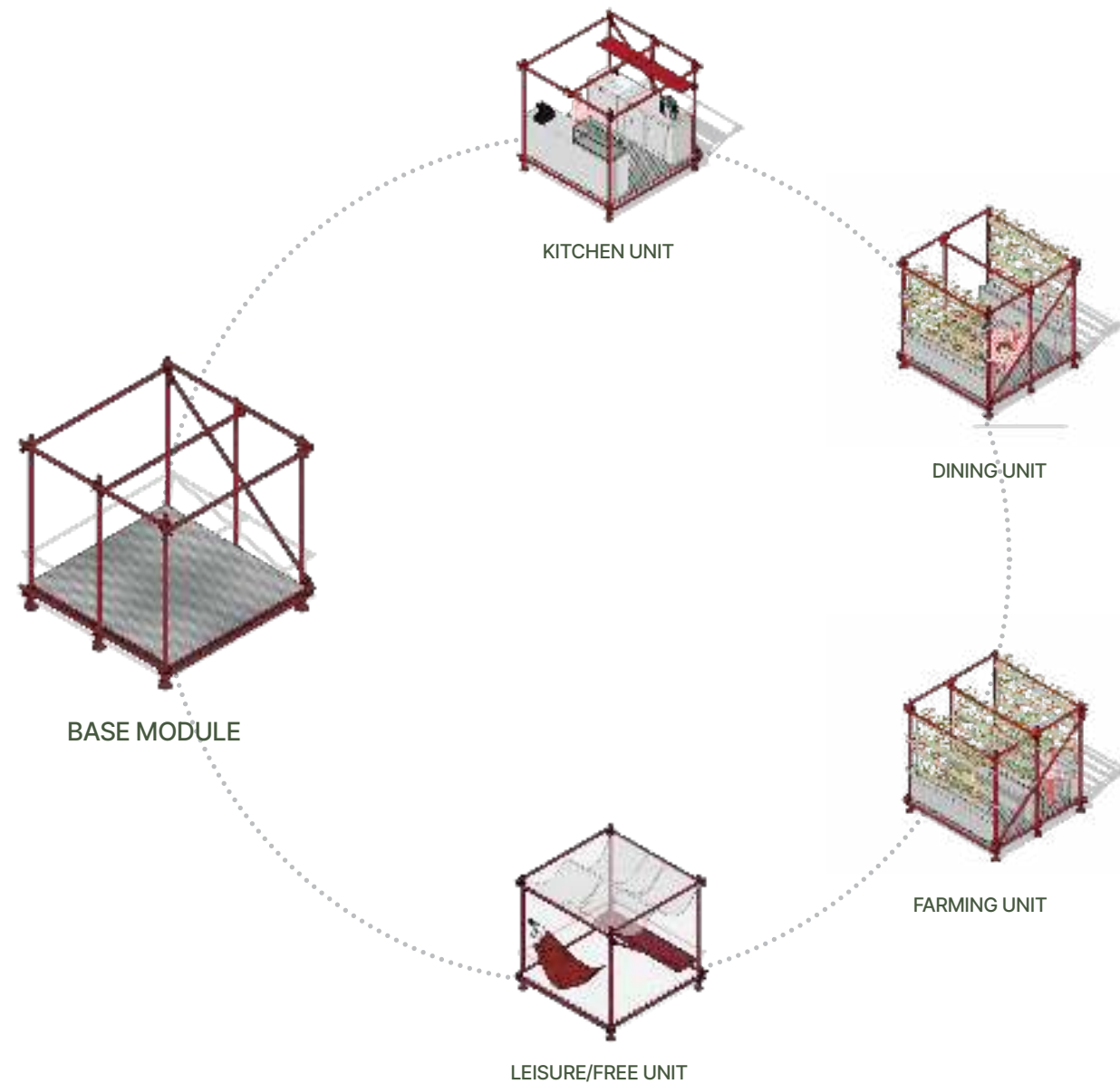
- Growing Season: Spring, Summer and Autumn  
Best Placement: Any level
- Growing Season: Year Round (in mild climates)  
Best Placement: Top level
- Growing Season: Late Spring and Summer  
Best Placement: Bottom level
- Growing Season: Autumn and Spring  
Best Placement: Bottom level
- 

## FARM TO FORK MENU

- SALAD**
  - Summer Refreshing Salad  
Zucchini, Tomato, Cucumber, Spinach, Strawberries, Peppers
  - Mediterranean Style Salad  
Cucumber, Kalamata, Feta, Lemon, Olive Oil, Avocado
  - Rainbow Vegetable Salad  
Broccoli, Tomato, Cucumber, Spinach, Strawberries, Peppers
- WRAPS**
  - Zucchini and Tomato Wrap  
Zucchini, Tomato
  - Spinach and Kale Wrap  
Spinach, Kale
  - Eggplant and Peppers Wrap  
Eggplant, Peppers
- BEVERAGE**
  - Strawberry Smoothie  
Strawberries, Yogurt
  - Strawberry Juice  
Strawberries, Sugar, Water
  - Asian Greens Infused Water  
Asian greens

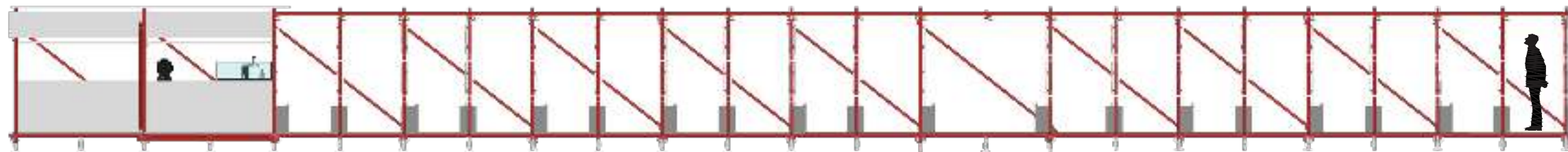


# Modular System



## ADAPTABLE DESIGN FOR DYNAMIC CAMPUSES

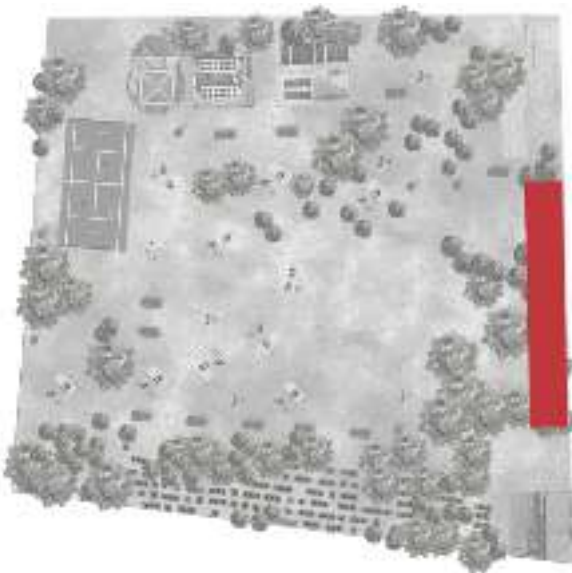
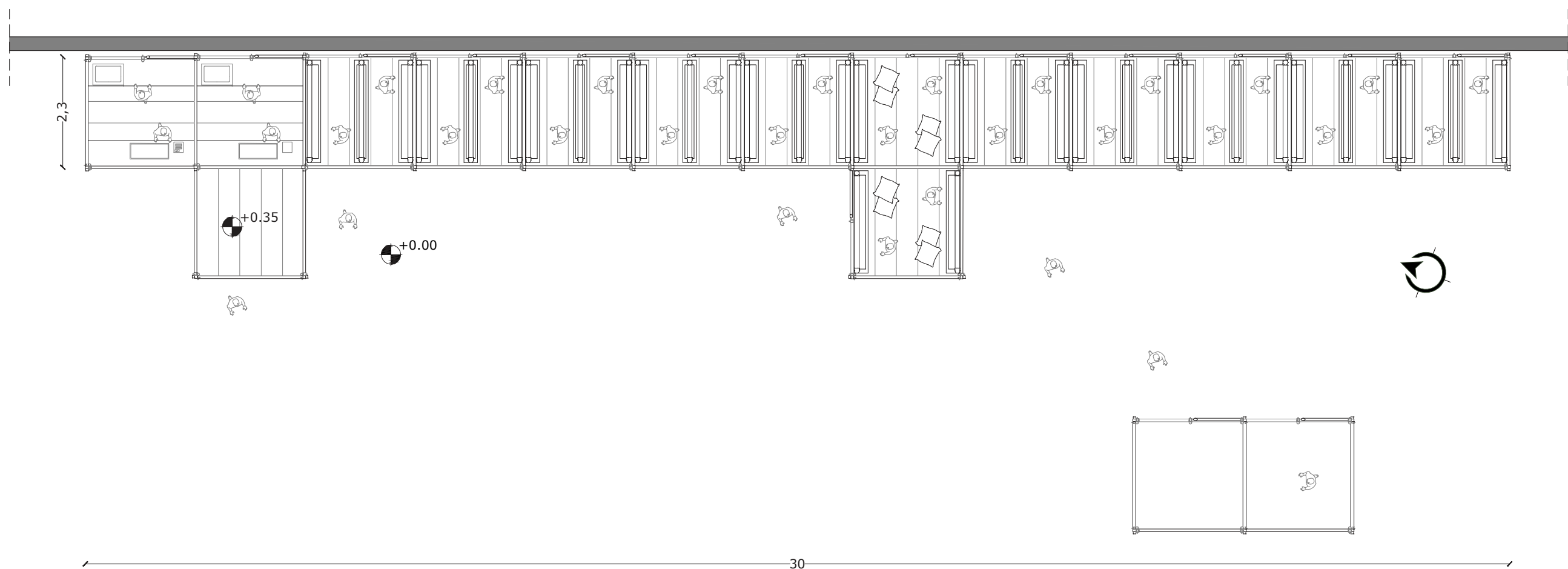
One of the main aspects of the project is its **modularity**. Using scaffolding structures, the design can be easily adjusted to **fit the specific needs** of the campus. Initially developed to meet the requirements of the Durando Campus in Bovisa, the project can be expanded to suit any green or unused space. The modular system allows **flexibility** in configuring the number of kitchen, dining, farming, and leisure units based on varying needs. Starting from a base unit, the space can be transformed even by combining various activities, such as integrating farming and dining within a single unit.





# General Plan

Scale 1:100



## TAILORED MODULAR LAYOUT FOR DURANDO CAMPUS

The configuration of the modules is tailored to accommodate the specific needs of the campus. The design primarily develops **along a horizontal line** to utilize an unused wall effectively. Additional modules can be placed freely around the area, taking into account the positioning of green spaces and trees. Our initial design includes two kitchens and ten modules dedicated exclusively to hydroponic farming. Other modules, combining both farming and dining, are incorporated in varying numbers. Additionally, there are modules placed freely to create leisure spaces.



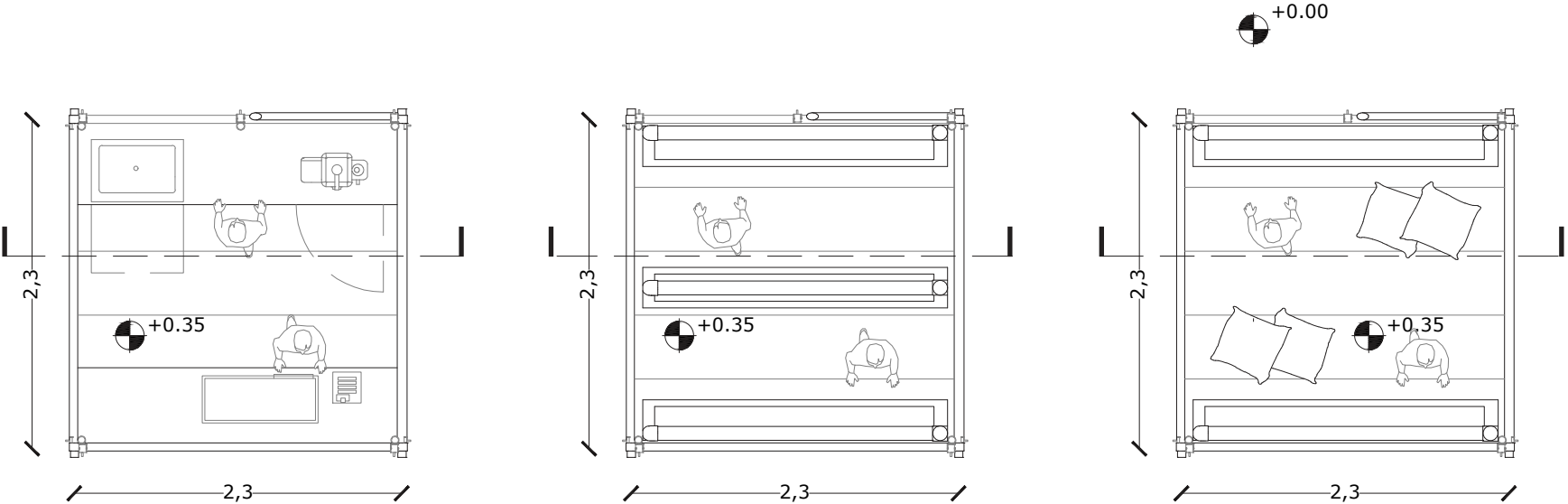
# Technical Drawings

Scale 1:50

KITCHEN

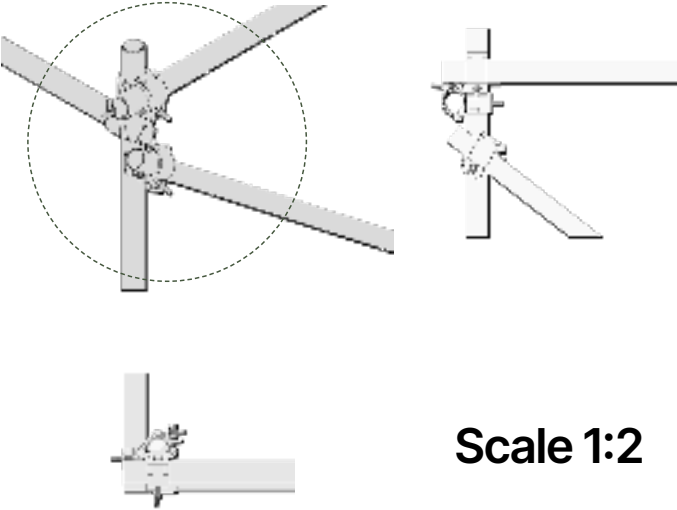
FARMING

DINING

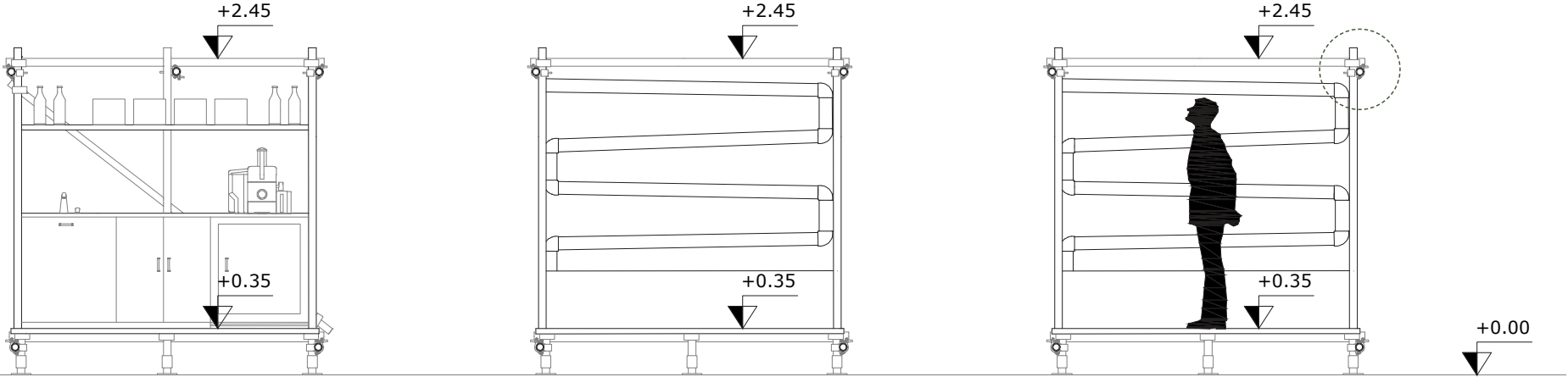


Plans

Joints details



Scale 1:2



Sections



# Structural details and materials

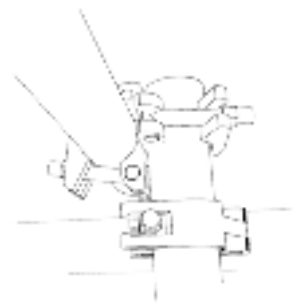
## The Roof

Transparent **polycarbonate sheets**, 6mm thick, to ensure ample sunlight availability inside the structure.



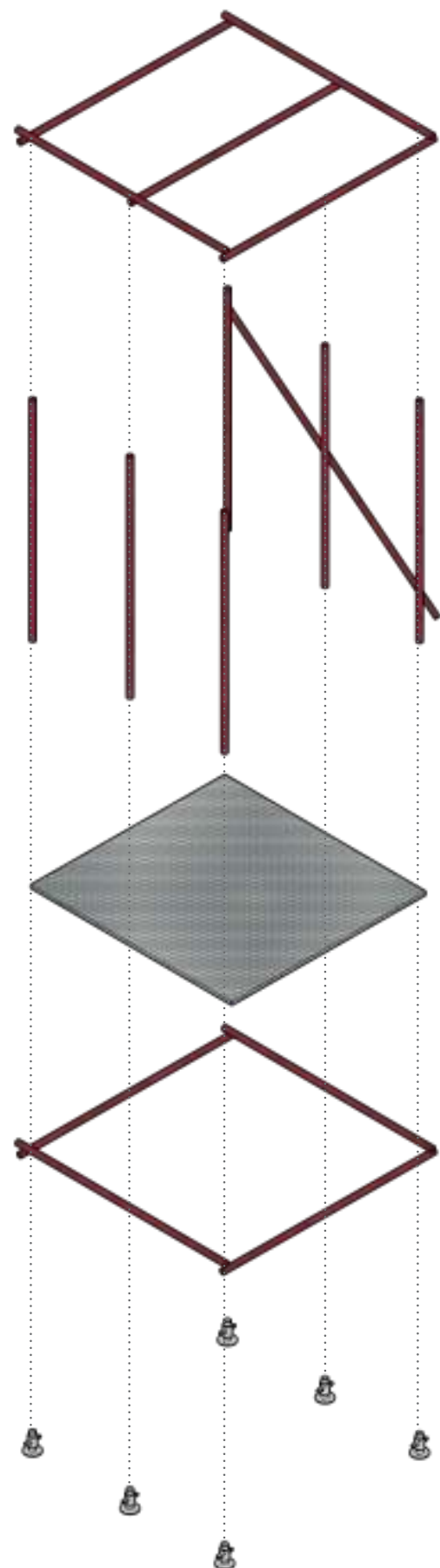
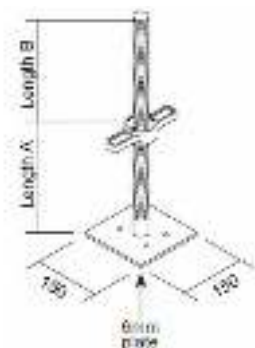
## The Joint

A strong drop-forged coupler connects two scaffold tubes with a 60.3mm outer diameter, providing strength in **load-bearing** situations and joining the tubes at 90-degree angles.



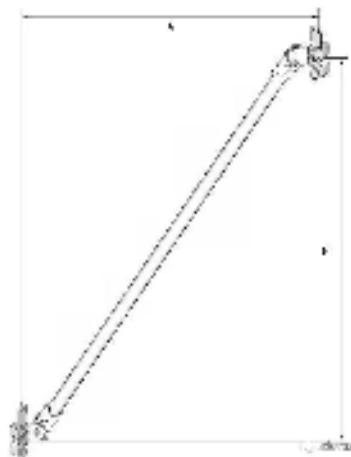
## The Base Jack

The adjustable scaffolding base jack allows the scaffold legs to be levelled. When the legs of the scaffolding system are on **surfaces with different heights**, the base jack can adjust the legs to ensure they are at similar levels. This ensures that the supporting points of the scaffolding have approximately equal bearing on the substrate beneath the tower.



## The Diagonal Rod

Diagonals are essential for scaffolding braces, providing **stabilization** to the structure. They are often seen on the exterior of the Ringlock scaffolding system. These diagonal braces are necessary to stabilize the scaffold and reinforce the system, preventing it from racking and swaying.



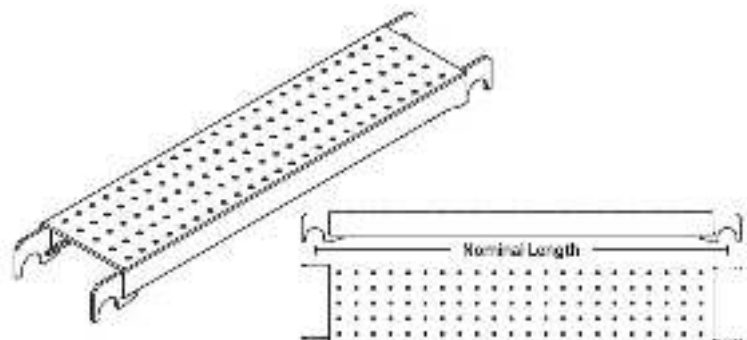
## The Rods

**Tubular steel rods** with a radius of 3 cm, which form the entire framework of steel scaffoldings, can be dismantled and erected much more



## The Floor

Galvanized steel planks are durable, **corrosion-resistant** components used in scaffolding and construction. Coated with zinc to prevent rust, they provide a strong, stable platform for workers, offering a long-lasting and **economical** solution.















05

INTERACTIONS

# Interaction with the public, Mantova

## Handmade model



Resting area



Kitchen area



Vertical farming area



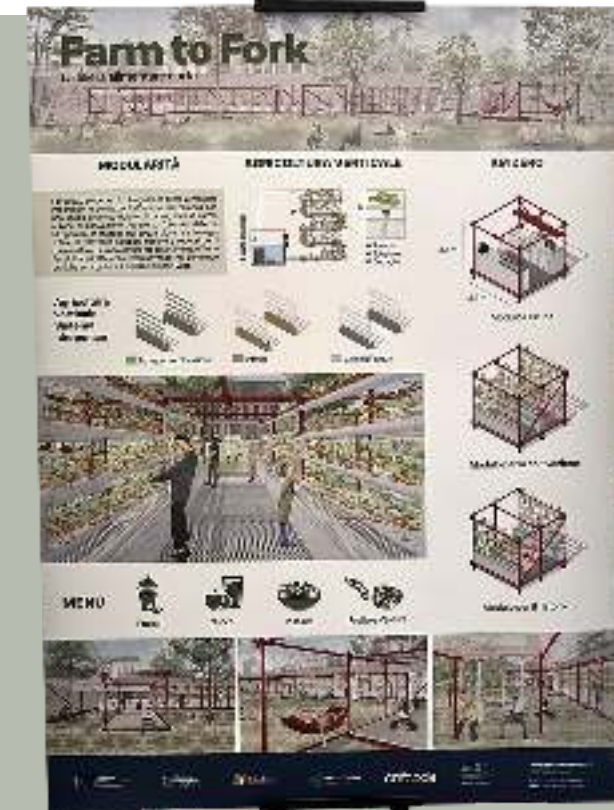
We arranged the completed modules as needed, allowing people to organize them in any sequence they desire. They could combine them in pairs or line them up in a long row, making them easy to customize.

## DIY Hydroponics

Prioritizing **self-sustainability** in food culture and reducing the **carbon footprint** is crucial today. This project aims to promote these ideas on campus and serve as a prototype for any location with an empty wall. Brochures were provided to raise awareness about this concept.

Public awareness about creating vegetable gardens was successfully raised, demonstrating how easily it can be done in **small spaces** with limited resources, such as plastic bottles from daily use.

Fifty used plastic water bottles were collected and turned into a DIY hydroponic system for the public. Participants received instructions and salad seed packs to start their own gardens.



## The process







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