s.m.a.r.t.
greenhouse

Tool Kit

#enterthegardens

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S.M.A.R.T Greenhouse Project
Demo Sites

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Agriculture Solution

The project aims to create a network of sustainable gardens in Cyprus and Crete that promote zero waste and circular economy practices, agro-entre-preneurship, and community inclusion. The project targets farmers and individuals residing in rural areas, who have basic IT abilities, social media users, and lack the financial resources or time to attend specialized training. The project's objectives include achieving sustainable development, circular economy, enabling locals to become agro-entrepre-neurs, and generating scalable impact. The project is motivated by the need to educate and challenge individuals and communities to achieve sustainable change through collective action, adapting new technologies and approaches, and addressing operational obstacles faced by agro-entrepreneurs. The project enhances the impact it has achieved through prior experience, which includes being recognized as one of the top 1000 most innovative ideas globally by Mission Innovation and providing tours, community presentations, and quality training. Two organizations, T.L. and Novatex Solutions, are collaborating with relevant industry experts to develop two demo gardens showcasing smart agriculture solutions, circular economy practices, and other modern approaches to provide hands-on training to trainees.

Ammoudi

Nicosia

MILETIA

Miletia

GARDENS OF THE FUTURE

Gardens of the Future

SUSTAINABLE DEVELOPMENT G♥ALS

Co-funded by the European Union

MILETIA

GARDENS OF THE FUTURE

NOVATEX SOLUTIONS.EU

Gardens of the Future
Elpinikis 9, Nicosia 1015, Cyprus

GARDENS OF THE FUTURE

Gardens of the Future is an award winning and leading organization in the eastern Mediterranean, located in Nicosia, Cyprus, pioneer in the EU, in matters of Community engagement, circular economy practices and urban transition. Gardens of the Future is a non-profit organization focused on promoting sustainable change through sustainable food growing, collective experiences, and education. The organization specializes in community building initiatives, offering educational courses for blended learning and piloting innovative modules to achieve a circular economy in cities. They aim to transform an abandoned space in Nicosia into a green paradise garden using community-led development, and their age range for learners is broad, ranging from 5 to 80 years old.

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Miletia's Garden
Chania 5, Ammoudi, Lygaria, Crete

Miletia is a non-profit organization that aims to cultivate and promote constructive cooperation by encouraging citizens to reconnect with the urban and rural environment around them as well as the history and culture that Crete has to offer. The organization focuses on raising awareness and informing the public about opportunities that arise with innovative aspects that can be adjusted and implemented at a local level, as well as any social, cultural, and political developments. In the field of this application, Miletia has been advocating for and raising awareness towards transferring and fostering innovative solutions on a local level, especially focusing on sustainability and strengthening local communities. The organization has been focusing on young people under 35, particularly those residing in Crete, and making an effort to reach isolated remote communities, especially through digital means. Currently, the organization has 20 members.

Plants

Great emphasis has been given to the cultivation of endemic plants and plants that do not need much water. All the plants in the garden are plants that are produced in Crete, such as tomatoes, peppers, eggplants, aubergines, pumpkins, strawberries, luisa, mint, lychee, thyme, rosemary and others. Also, there are some trees, such as lemon, orange, pomegranate, and almond trees, that are found in almost all areas of Crete.

Sensors

- Temperature and humidity sensors
- Leakage sensors
- Smart thermostat
- Door sensors
- Smart valves
- Soil moisture sensors
- pH measurements
- Power meter
- Sunlight Intensity Detection
- Mosquito trap
- Smart meter PV production
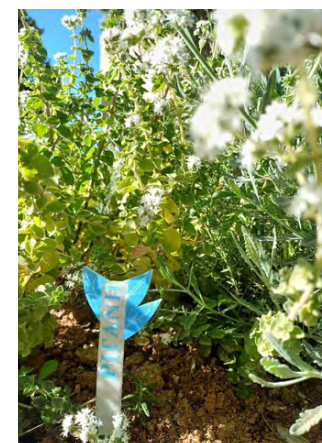
Novatex Solutions

Athalassas Ave. 176, Office 406, Strovolos, 2025

NOVATEX SOLUTIONS is a leading SME in Cyprus, specializing in ICT services, IoT smart devices and systems, robotics, and applied research in smart and precision agriculture. With a strong focus on innovation, Novatex is dedicated to providing solutions and technologies that enhance agricultural practices through smart technology. The company has vast experience in collaborating on various projects, managing research, and delivering technological solutions that improve the efficiency and sustainability of agriculture. As part of its commitment to sustainability, Novatex actively works on eco-friendly initiatives and plays a pivotal role in promoting the integration of smart agriculture practices.
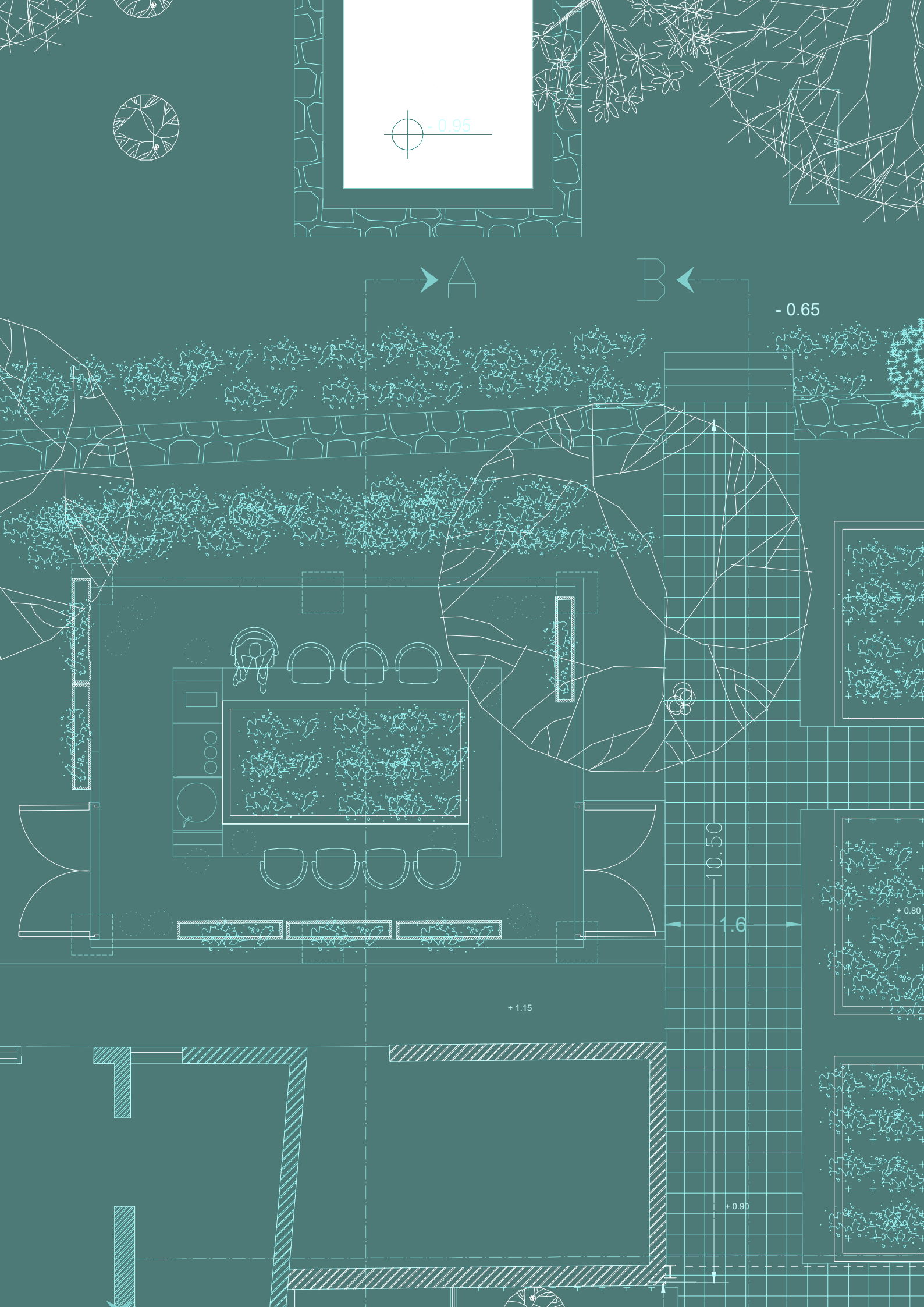
Open Source Design Definition
S.M.A.R.T Greenhouse Project

Open-source design offers a powerful opportunity to democratize knowledge and foster sustainable innovation by making design plans freely available to everyone. This accessibility encourages people and communities to build, customize, and improve upon existing designs without barriers or high costs, creating a shared resource that grows and evolves. Each adaptation and improvement feeds back into the open-source platform, enriching a collective knowledge base that benefits the entire community.

Community building naturally follows from open-source projects. When individuals collaborate to create, share, and improve designs, they form networks of support and expertise. This collaboration goes beyond individual goals, fostering a sense of shared purpose around sustainable practices. In our case, the **S.M.A.R.T Greenhouse Project** serves as a focal point for community gatherings, educational dinners, and workshops, encouraging people to engage not just as participants but as co-creators. The greenhouse thus becomes a tool for connecting people around shared values, cultivating an empowered community that's more resilient, self-sufficient, and environmentally conscious.

The concept of the **Urban Commons** further amplifies these effects. When communities can freely access shared resources and knowledge—like an open-source kitchen design—public spaces become places of creativity, sustainability, and cooperation. This is particularly impactful in urban environments where resources are often scarce and the need for communal, low-impact solutions is high.
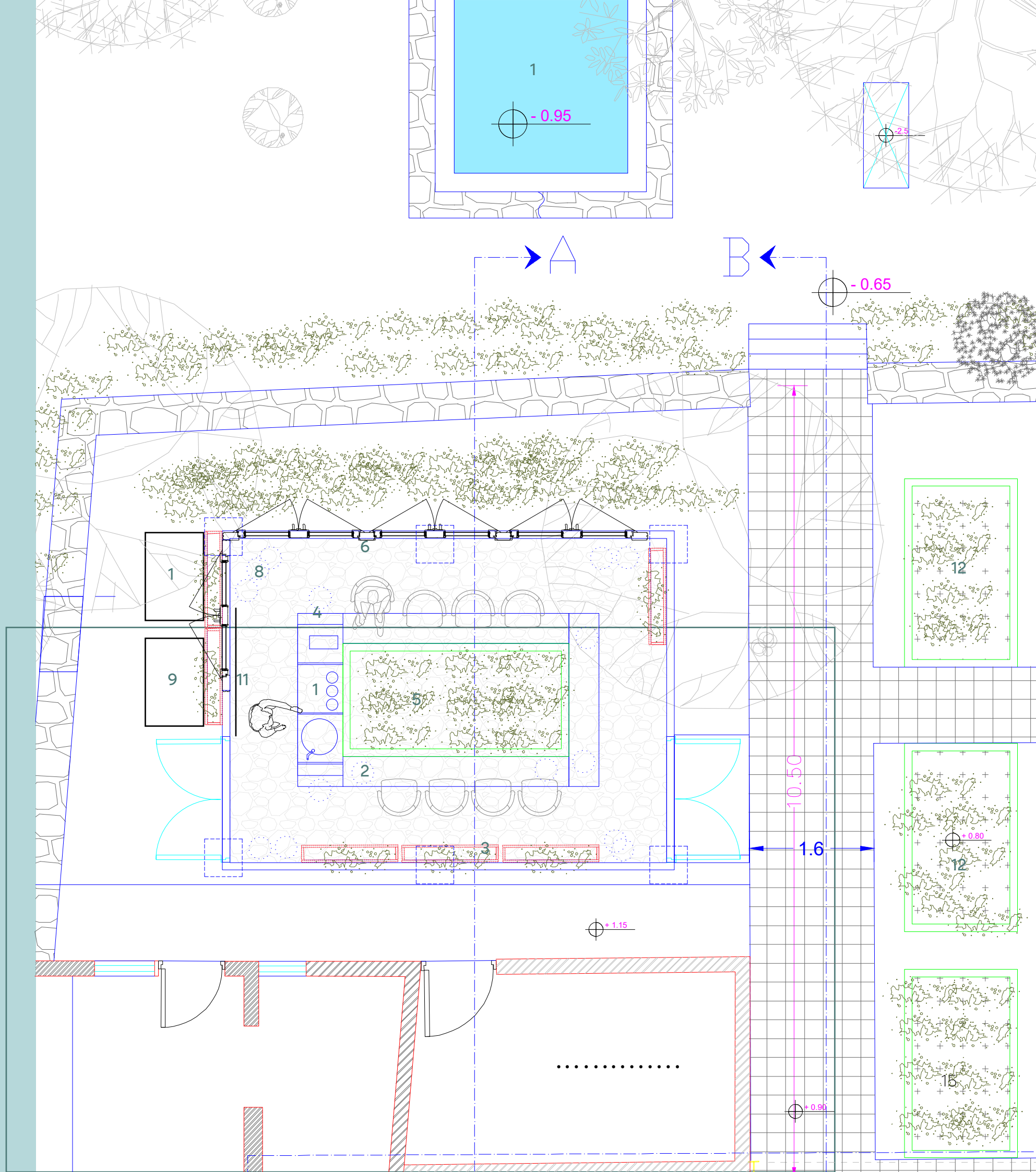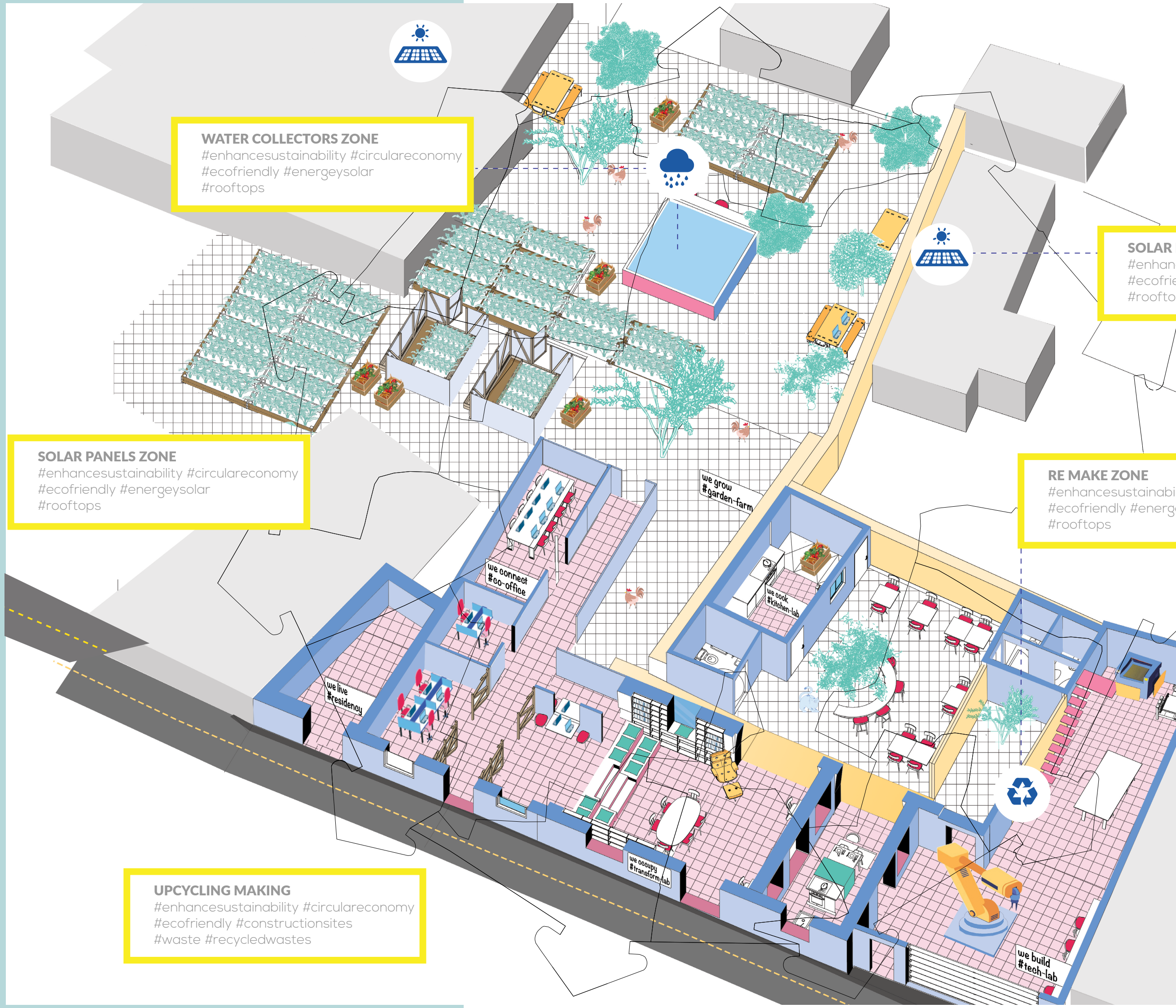
Implementation Plan
Overall Design

1. Open Source Kitchen Module
2. FarmBot
3. Portable Planting Modules
4. Re-Potting Station
5. Cultivation of plant-based food
6. Sensory System (Humidity)
7. Eating / Testing Place
8. Dirty Corner
9. Water Tank / System
10. Compost Station
11. TV for learning
12. Raised Beds
13. Cistern

// We Grow
// WeConnect
// WeLearn

WATER COLLECTORS ZONE
#enhancesustainability #circulareconomy
#ecofriendly #energeysolar
#rooftops

SOLAR
#enhan
#ecofrie
#roofto

SOLAR PANELS ZONE
#enhancesustainability #circulareconomy
#ecofriendly #energeysolar
#rooftops

RE MAKE ZONE
#enhancesustainabi
#ecofriendly #energ
#rooftops

we grow
#garden-farm

we connect
#co-office

we cook
#kitchen-lab

we live
#residency

we occupy
#transform-lab

we build
#tech-lab

UPCYCLING MAKING
#enhancesustainability #circulareconomy
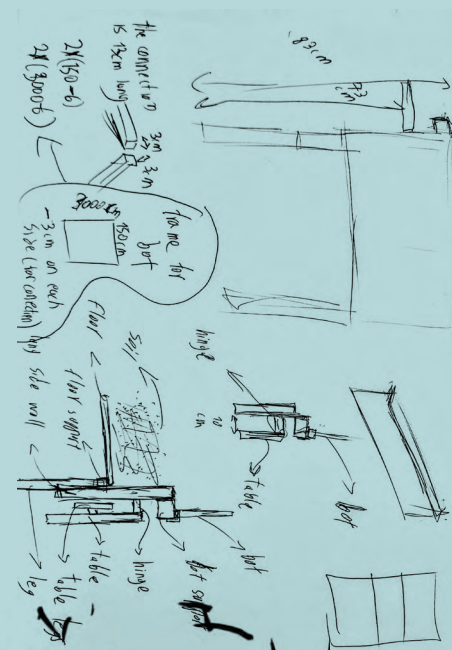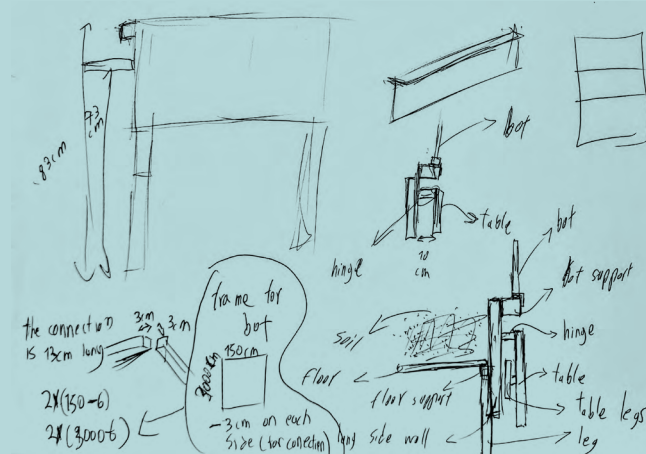#ecofriendly #constructionsites
#waste #recycledwastes

"We believe that an active and meaningful community is not a thing of the past, of poor islands and nomadic villages. We see pockets of dynamic neighborhoods with positive, involved healthy and self-reliant communities as the future of our cities."
We call it: wholebeing"

S.M.A.R.T Greenhouse

Conceptual

The conceptual phase of our greenhouse design process was crucial in shaping a resilient and innovative structure tailored to meet both environmental and community needs. During this phase, we focused on understanding the specific challenges and opportunities presented by our location and intended use, engaging with stakeholders to gather insights and aspirations. This collaborative approach allowed us to explore various design concepts that prioritized sustainability, modularity, and functionality, ensuring that the greenhouse would effectively support diverse activities such as education, community gatherings, and food production. By considering elements such as seasonal adaptability, resource efficiency, and aesthetic integration with the surrounding environment, we were able to create a blueprint that fosters a sense of community engagement and environmental stewardship. This foundational work ultimately guided the subsequent phases of design and construction, ensuring that our greenhouse would serve as a dynamic and sustainable hub for our community.
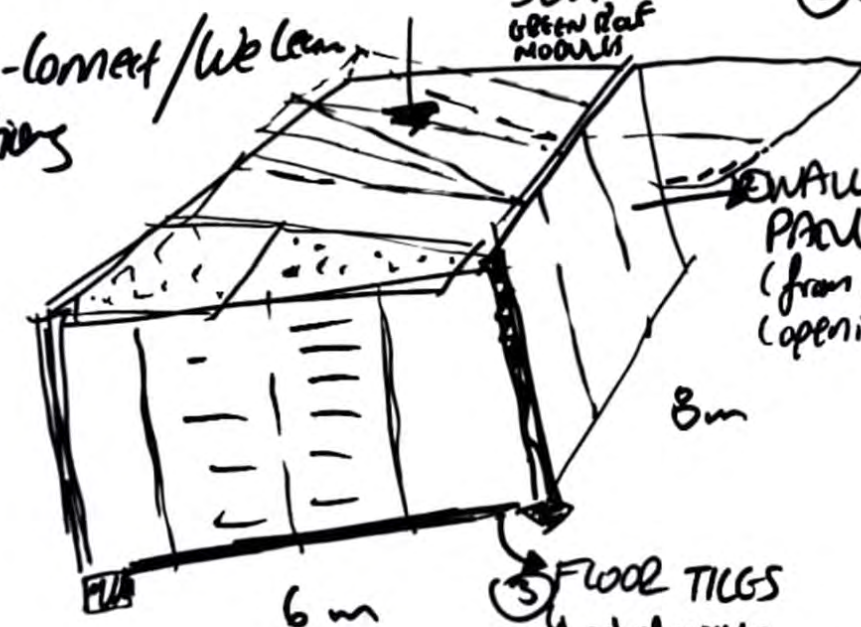
S.M.A.R.T Greenhouse

Assembly

Our greenhouse was constructed with a circular economy approach, emphasizing design for disassembly to reduce environmental impact and extend the life cycle of all materials used. Every component was carefully selected and assembled with screws instead of welding or casting, ensuring that each part can be easily removed, reused, or recycled. We repurposed old windows, giving them new life by securing them within a strengthened frame, which is supported by modular concrete block foundations for stability. These blocks connect with metal joints, creating a solid yet flexible structure that can be adjusted or moved as needed. This construction approach not only minimized resource consumption but also aligned with UN SDGs specifically Goal 11, Goal 12, and Goal 13.
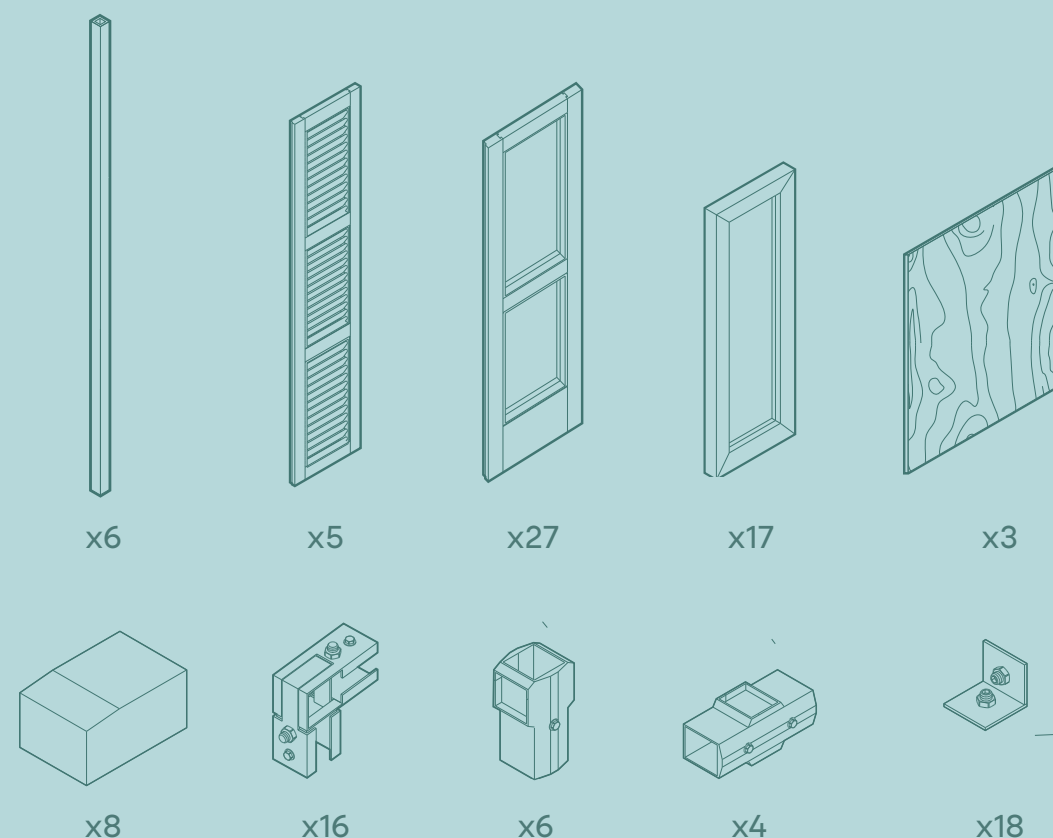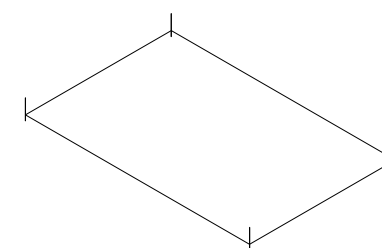

x6   x5   x27   x17   x3

x8   x16   x6   x4   x18
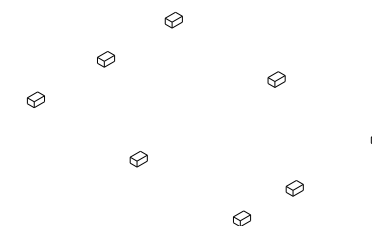
Construction Process:
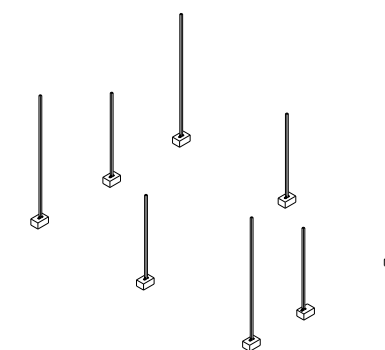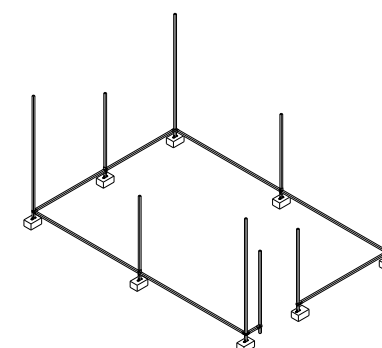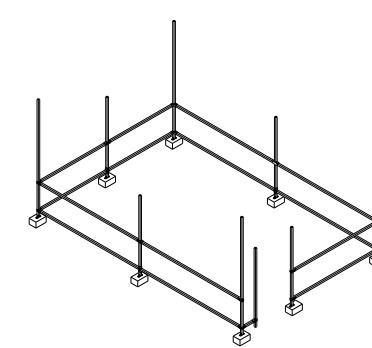

Ground Leveling   Concrete Blocks   Columns

Support Beams 1   Support Beams 2   Support Beams 3
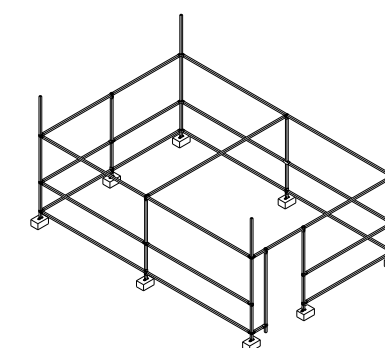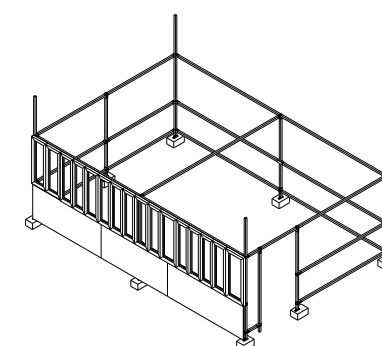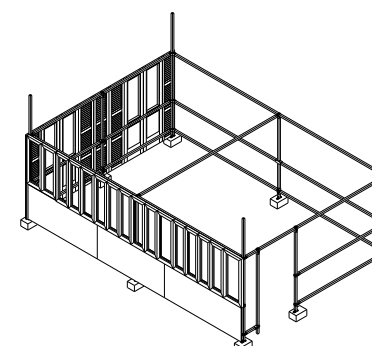
Attach Windows   Windows 2   Windows 3
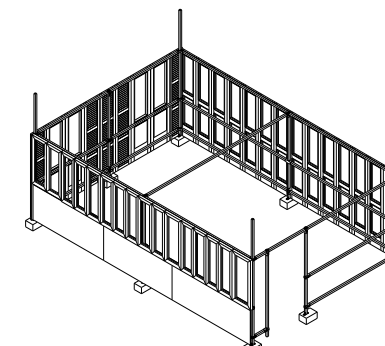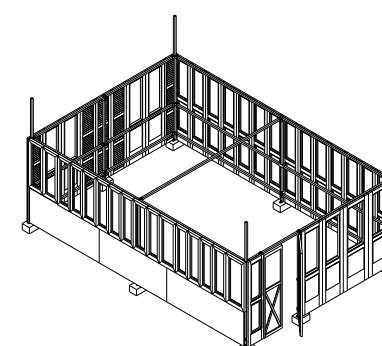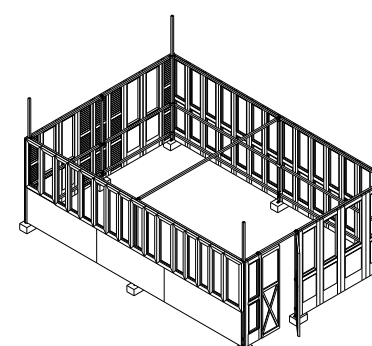
Front Facade   Smart Sensors   Final Roofscape

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Windows

Solid Panels

Structural Metal Frame

Openable Windows

Doors
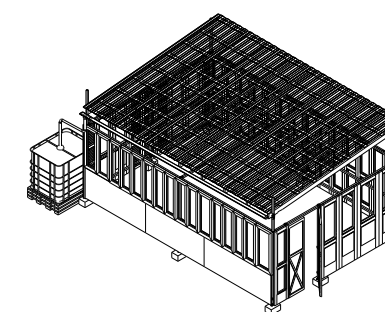
Structural Foundations
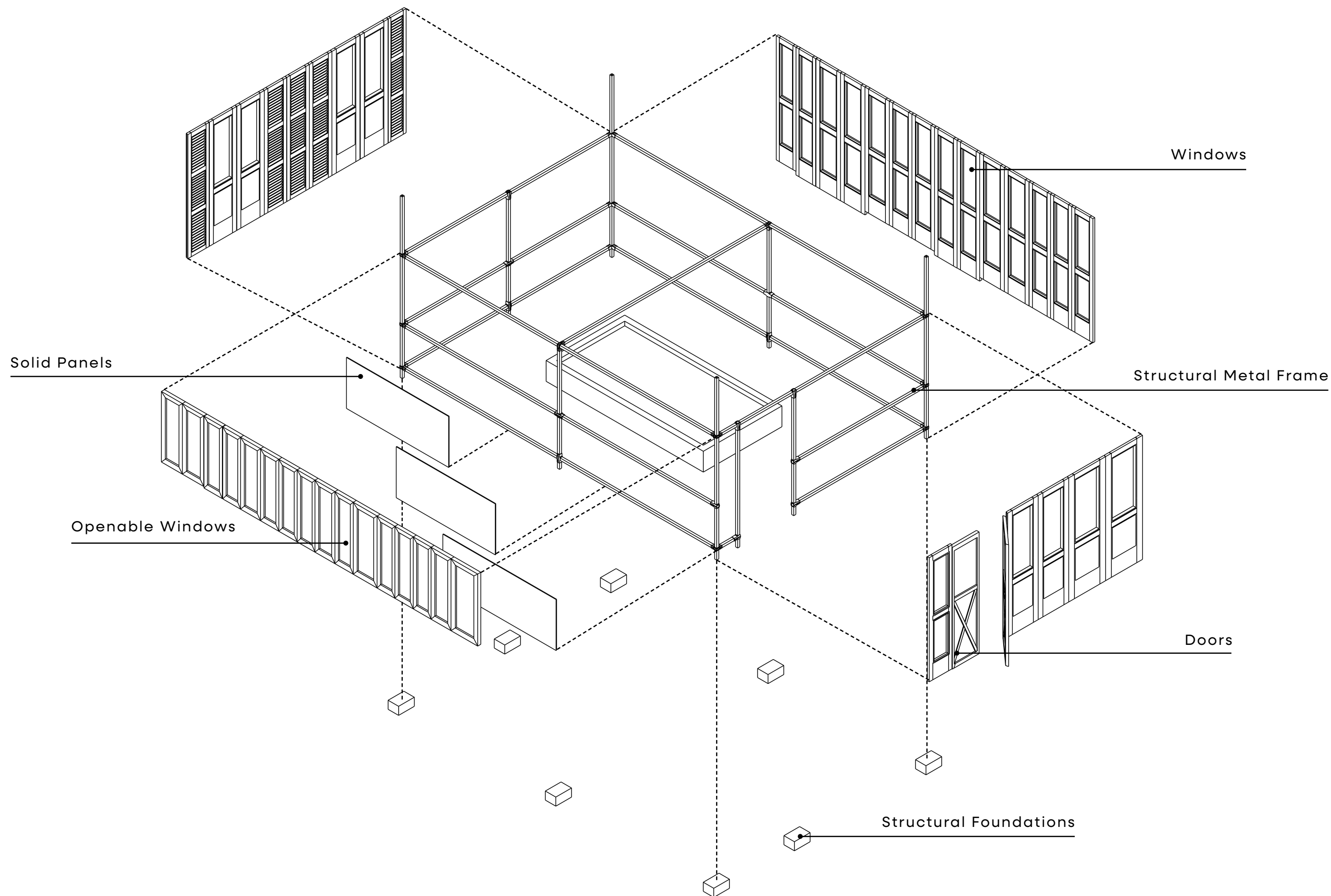
COMPONENTS OF THE GREENHOUSE

s.m.a.r.t.
greenhouse

Co-funded by
the European Union

Strategies

| Community Assembly

Build Together Sign Up Sheet:

E	L	W
Very easy	Know a little	Want to know

L	E
W	W
L	E
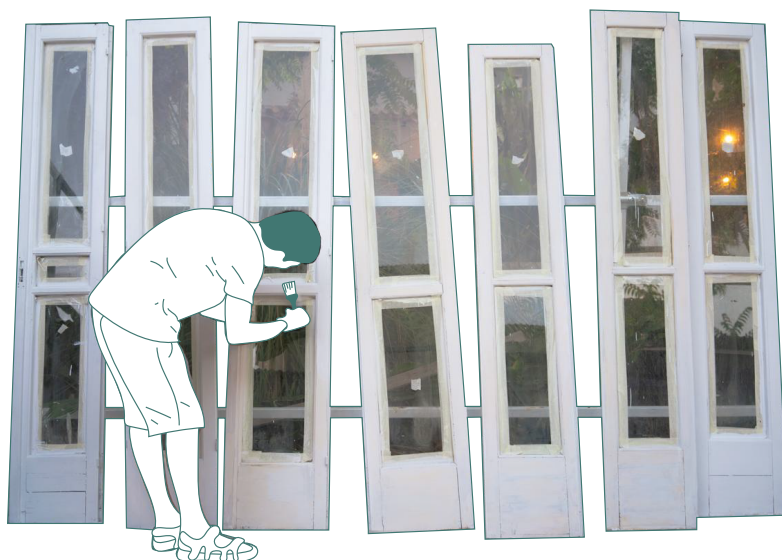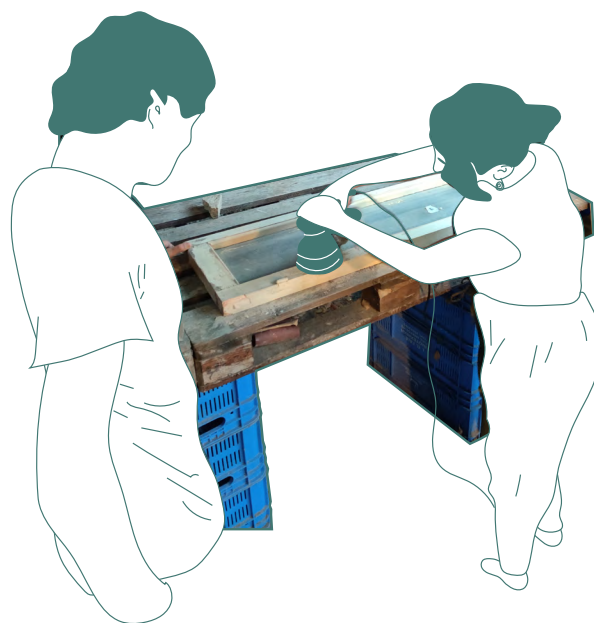
| Circular Economy

Columns / Foundations

The structural columns are screwed on modular concrete blocks to allow the structure to be flexi-blr for future disassembly
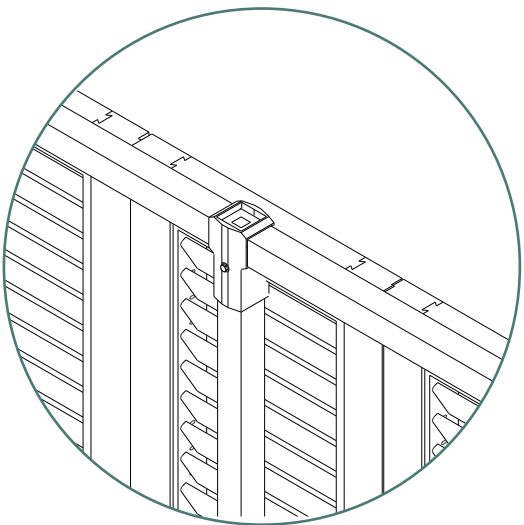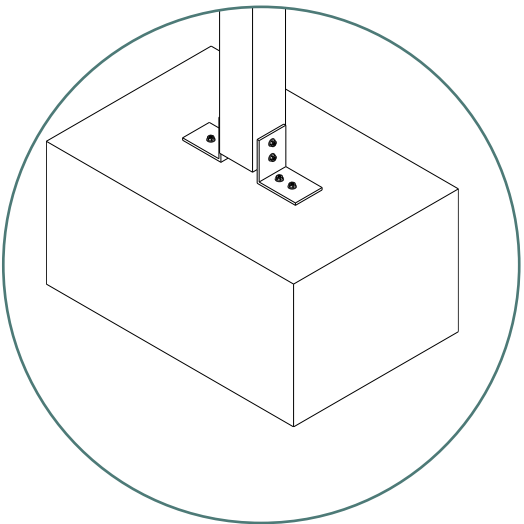
Attaching Windows

All components are designed for future reuse and disassambly, as they are screwed instead of welded or casted.

Reuse - Repurpose
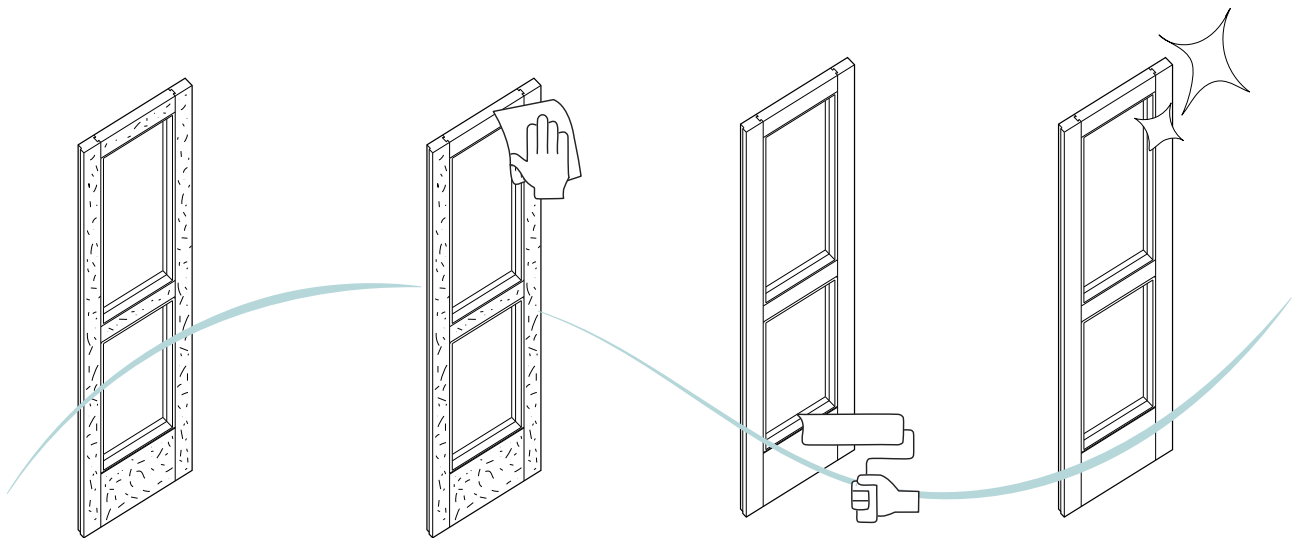
"When your core business prioritizes benefiting the planet and its people, it generates a positive impact on both the environment and society, creating value across all three dimensions."

Strategies
| Possible Uses
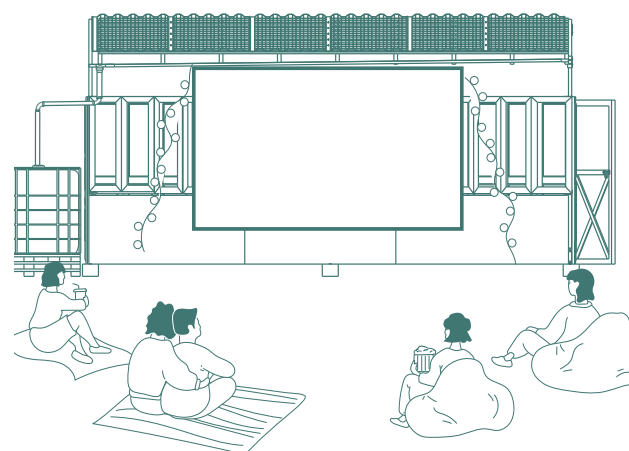
Cinema / Viewings
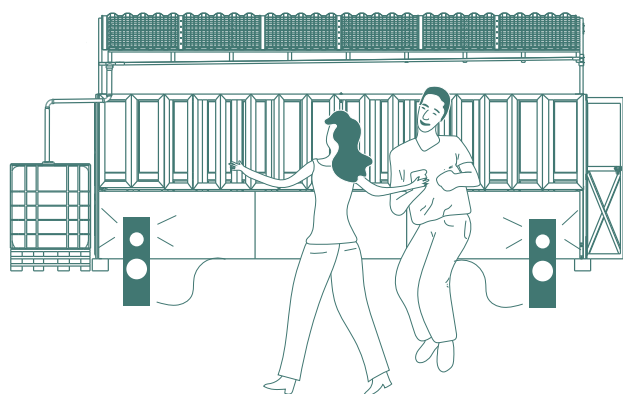
Music Events

Cooking Workshops
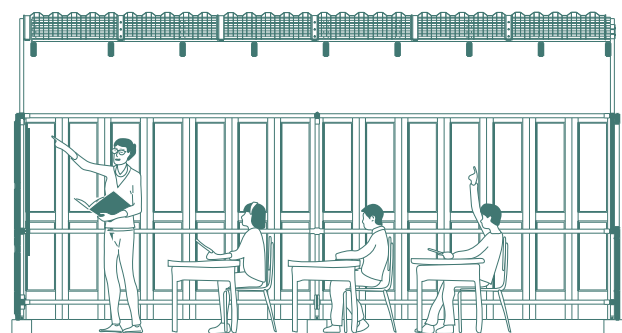
Lecture / Training Room
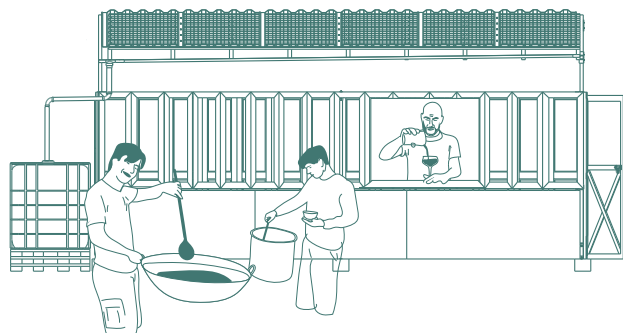
Window Bar / Food
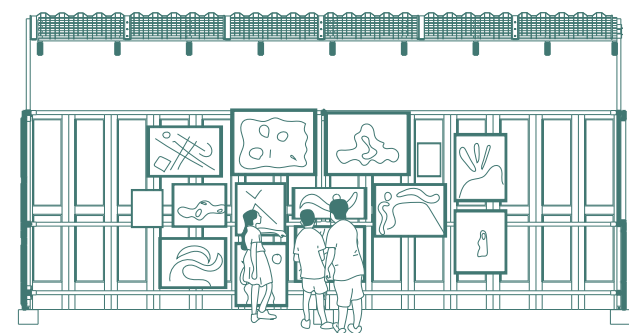
Art Exhibition

Farmer's Market
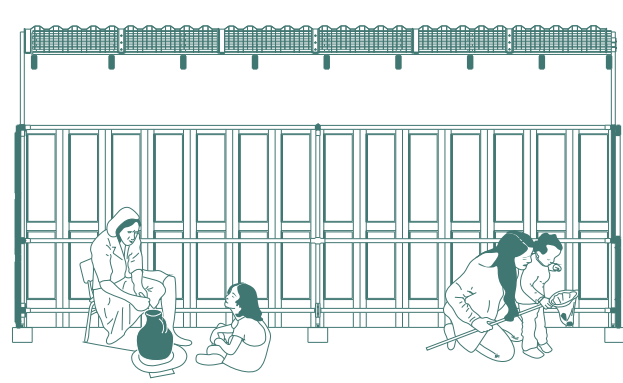
Intergenerational Workshops
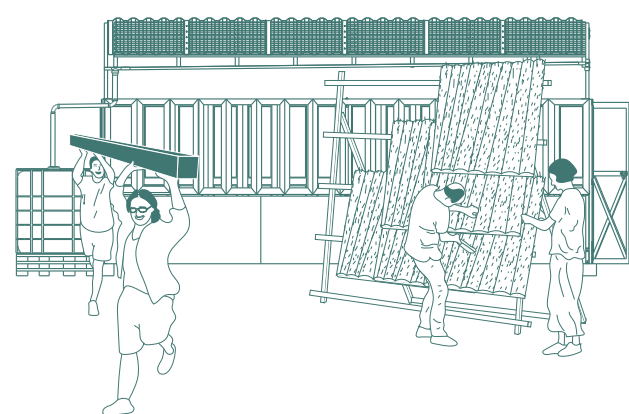
Design + Build Workshops
/ Material Test Site

Co-funded by
the European Union

Smart Sensors

Rainwater Harvest

Photovoltaics

Fog Catcher

Humidifier System

Smart Water Valve

Soil Sensor

Humidity Sensor

FarmBot
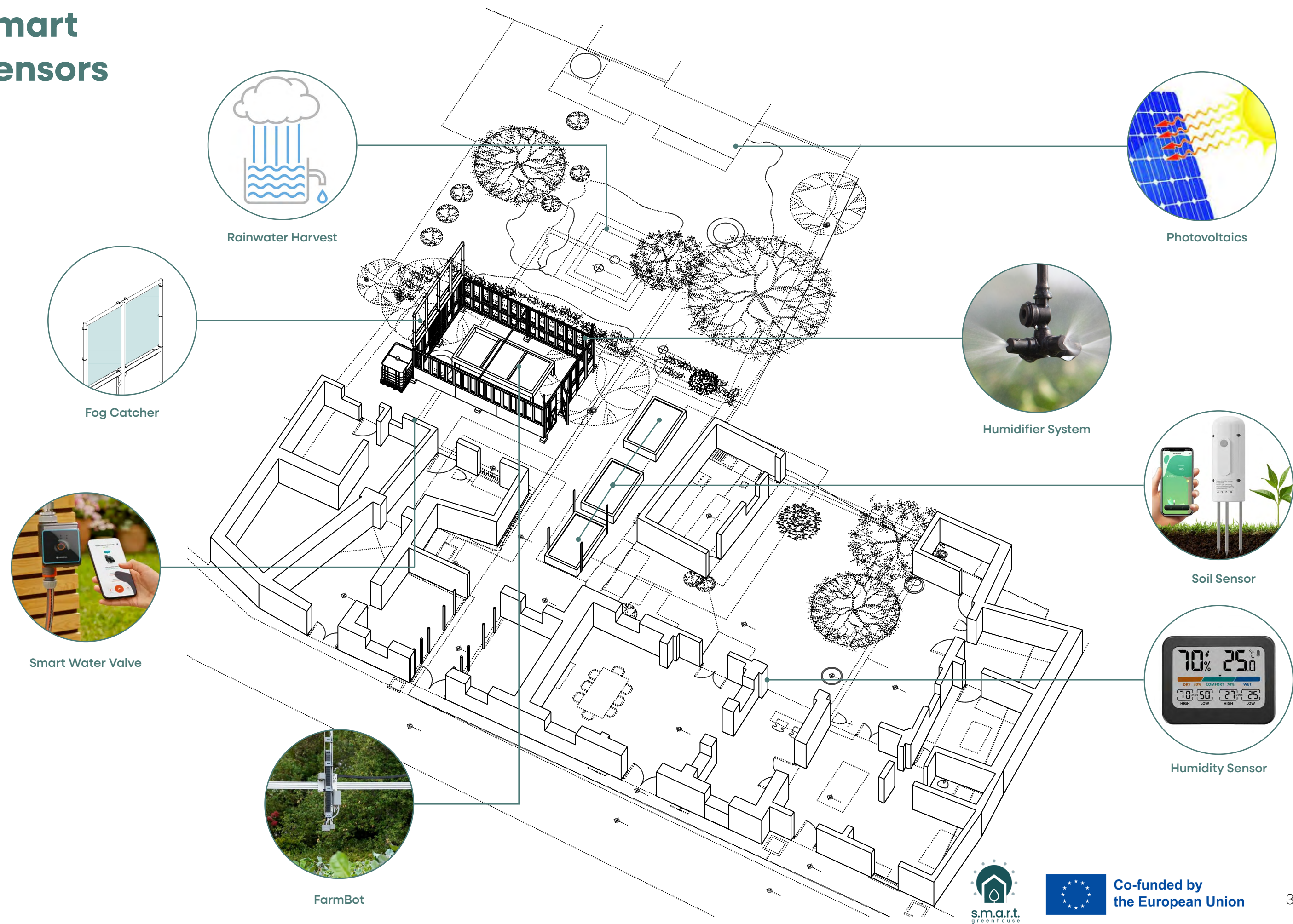
"We do not live in earth, we ARE earth. The more we change our lifestyle and fast- consuming behaviour the more we save our planet".

S.M.A.R.T Greenhouse

Winter Module

Our winter greenhouse is designed to protect plants from the harshest weather conditions while enabling precise regulation of the interior climate, ensuring optimal temperatures and humidity levels even during the colder months.
 The structure incorporates a repurposed polycarbonate roof, which not only provides excellent insulation but also serves a dual purpose by harvesting rainwater. This roof channels rainwater into a storage tank, creating a sustainable water source that can be used during dry periods, reducing dependency on external water supplies.
 By implementing this efficient water-harvesting system and using upcycled materials, our greenhouse contributes to the United Nations Sustainable Development Goals (SDGs), specifically **Goal 6** (Clean Water and Sanitation), **Goal 12** (Responsible Consumption and Production), and **Goal 13** (Climate Action). This setup demonstrates a commitment to eco-friendly agriculture and resource conservation, fostering sustainability in food production year-round.

UN SDGs:

6 CLEAN WATER AND SANITATION

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

November ———————————————— March

Rainwater Harvesting

Closed Roof with Polycarbonate Panels

Water Tank

Planting Area
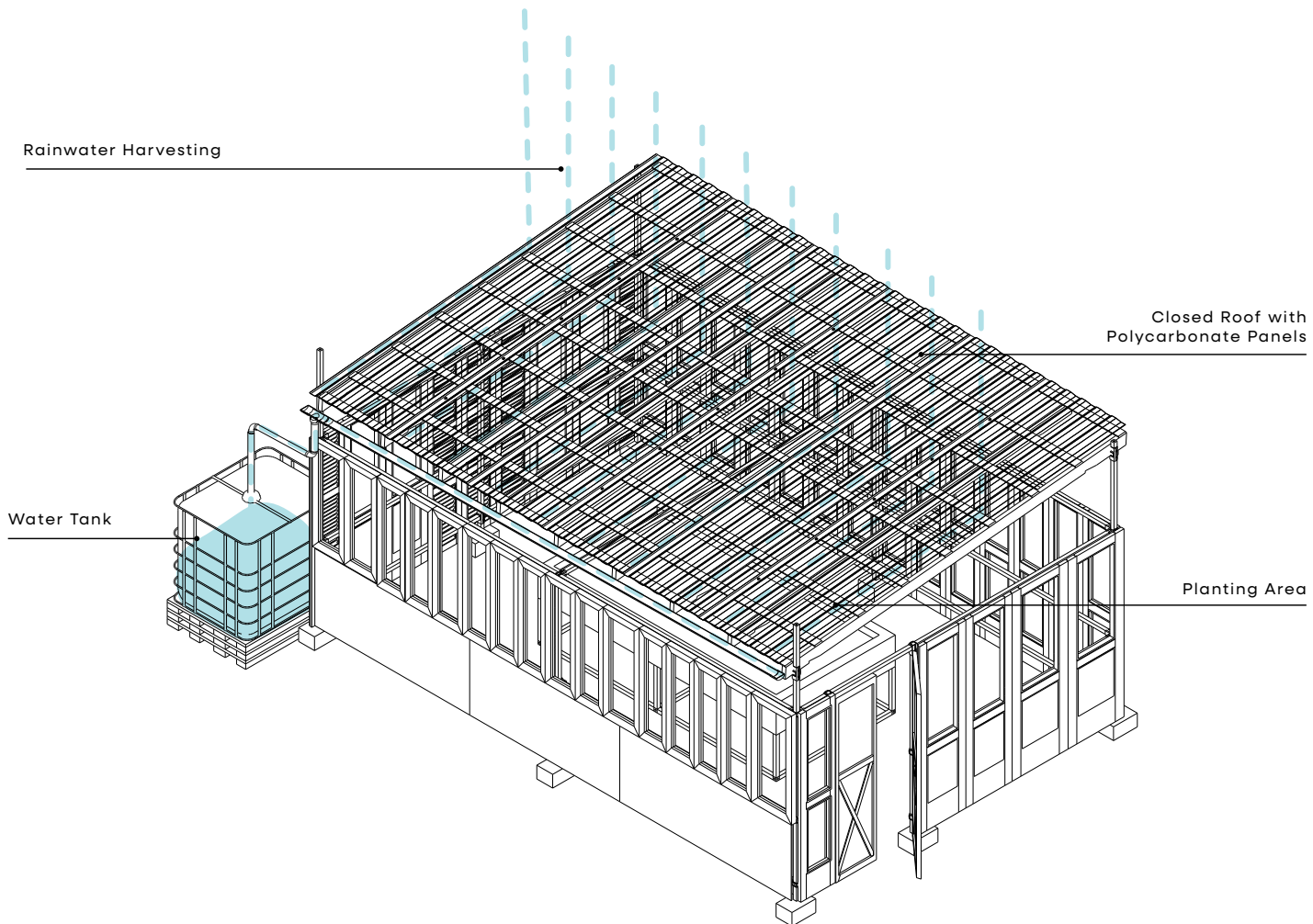
GREENHOUSE IN WINTER

s.m.a.r.t. greenhouse

Co-funded by the European Union

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S.M.A.R.T Greenhouse

Summer Module

During the summer dry season, our greenhouse transforms to meet the unique demands of hotter and more arid conditions. The polycarbonate roof, initially used to insulate and protect in winter, is re-purposed as side paneling, providing structural integrity while freeing up the roof for alternative uses. In its place, a breathable net roof is installed, offering partial shade and creating a cooler, ventilated environment for plants and people alike.
 Additionally, a retractable fog-catcher crafted from upcycled plywood captures moisture from the air, supplementing water needs in an eco-friendly way. This setup allows for humidity retention, while the netting doubles as a soft decorative canopy, perfect for hosting summer dining events in a relaxed, shaded setting.
 Through these adaptive uses of repurposed materials and natural resource conservation, the greenhouse supports several United Nations Sustainable Development Goals, notably **Goal 6** (Clean Water and Sanitation), **Goal 11** (Sustainable Cities and Communities), **Goal 12** (Responsible Consumption and Production), and **Goal 13** (Climate Action). This innovative, adaptable system highlights a commitment to sustainable practices that enhance food production while respecting seasonal climate shifts.

UN SDGs:

6 CLEAN WATER AND SANITATION

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

Fog Catcher using Mesh

Open Roof

Water Tank

Planting Area
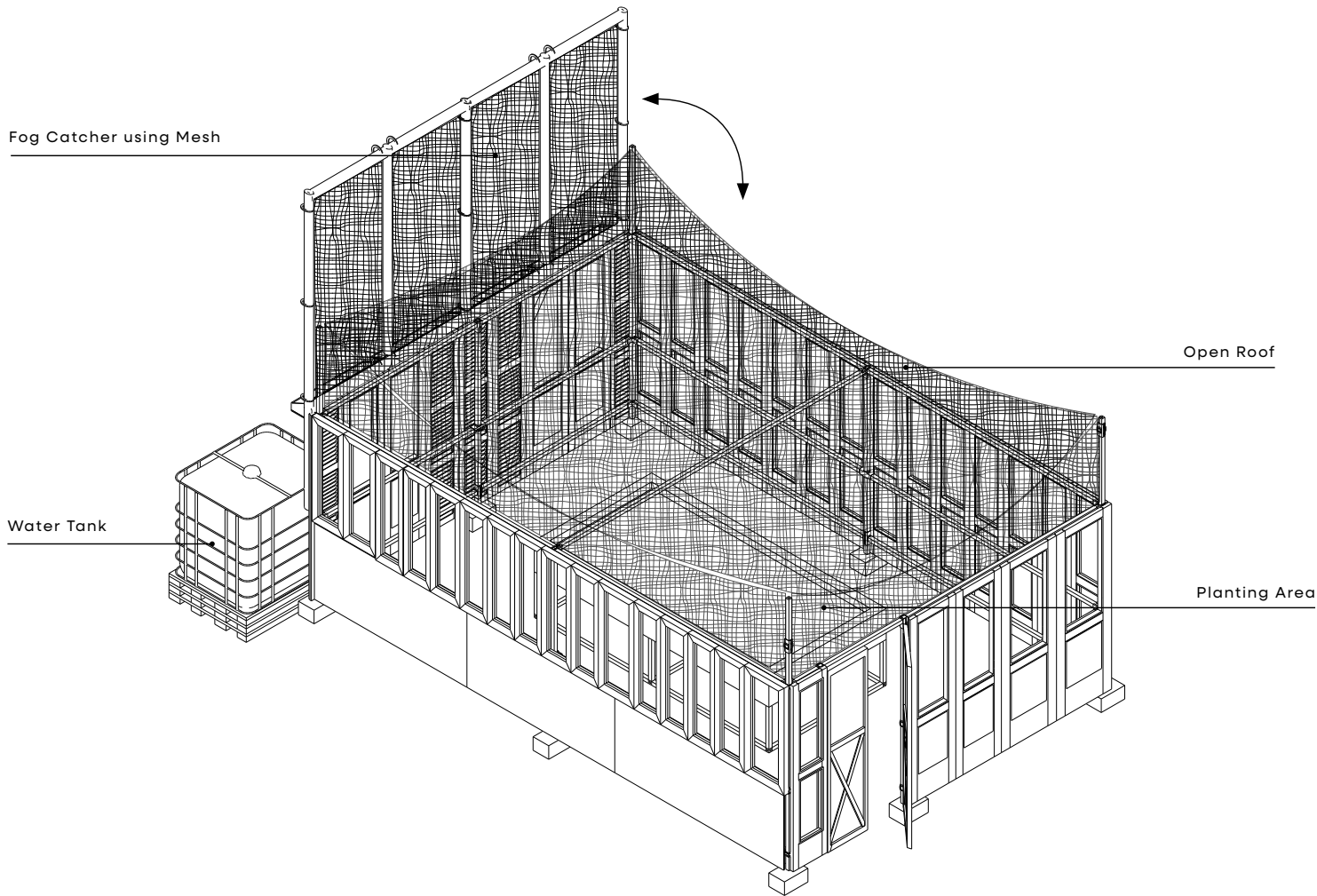
GREENHOUSE IN SUMMER

April

October

s.m.a.r.t. greenhouse

Garden Modules

FarmBot
Open Source Farming

Grow food for yourself, your family, and your community by installing FarmBot on a raised bed, urban rooftop, or in a small greenhouse at home. Enjoy the freedom of food sovereignty and knowing things are taken care of when heading out of town. Fully automated, hyper-local food production has never been so attainable.

Open Source
FarmBot is 100% Open-Source and built to respect your freedom. Scan the QR Code to view the step-by-step assembly instructions to get your FarmBot up and running. Then dive into the CAD models, schematics, and bill of materials to modify, repair, and build upon your FarmBot.

UN SDGs:

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION
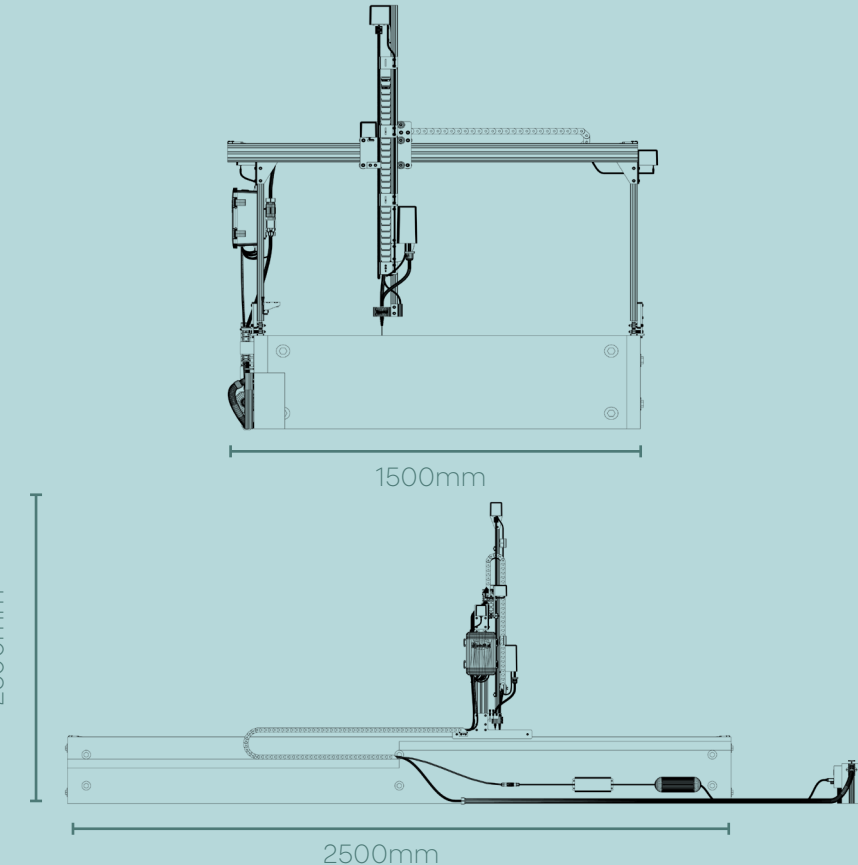
Open Source Files:

Dimensions:
Width: 1500mm
Length: 2500mm
Height: 1550mm

Capacity:
Up to 50 plants.
60L of Soil.

Author:
FarmBot.io

1500mm

2500mm

2500mm

FarmBot App
Using the manual controls you can send movement commands, operate any of the peripherals, or even use a virtual version of the electronics box buttons. With just a tap, take photos of your veggies, turn the lights on for a night time harvest, or impress the neighbors with a quick demo.
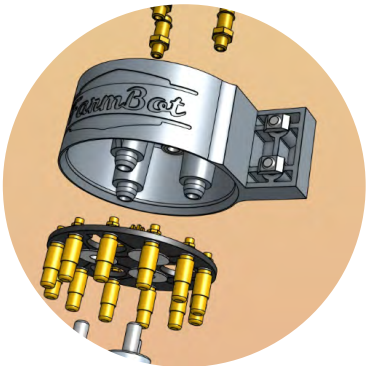
Universal Tool Mount
Allows our machine to mount and dismount a variety of lightweight tools — whichever one is appropriate for the task at hand (seeding, watering, weeding, etc).
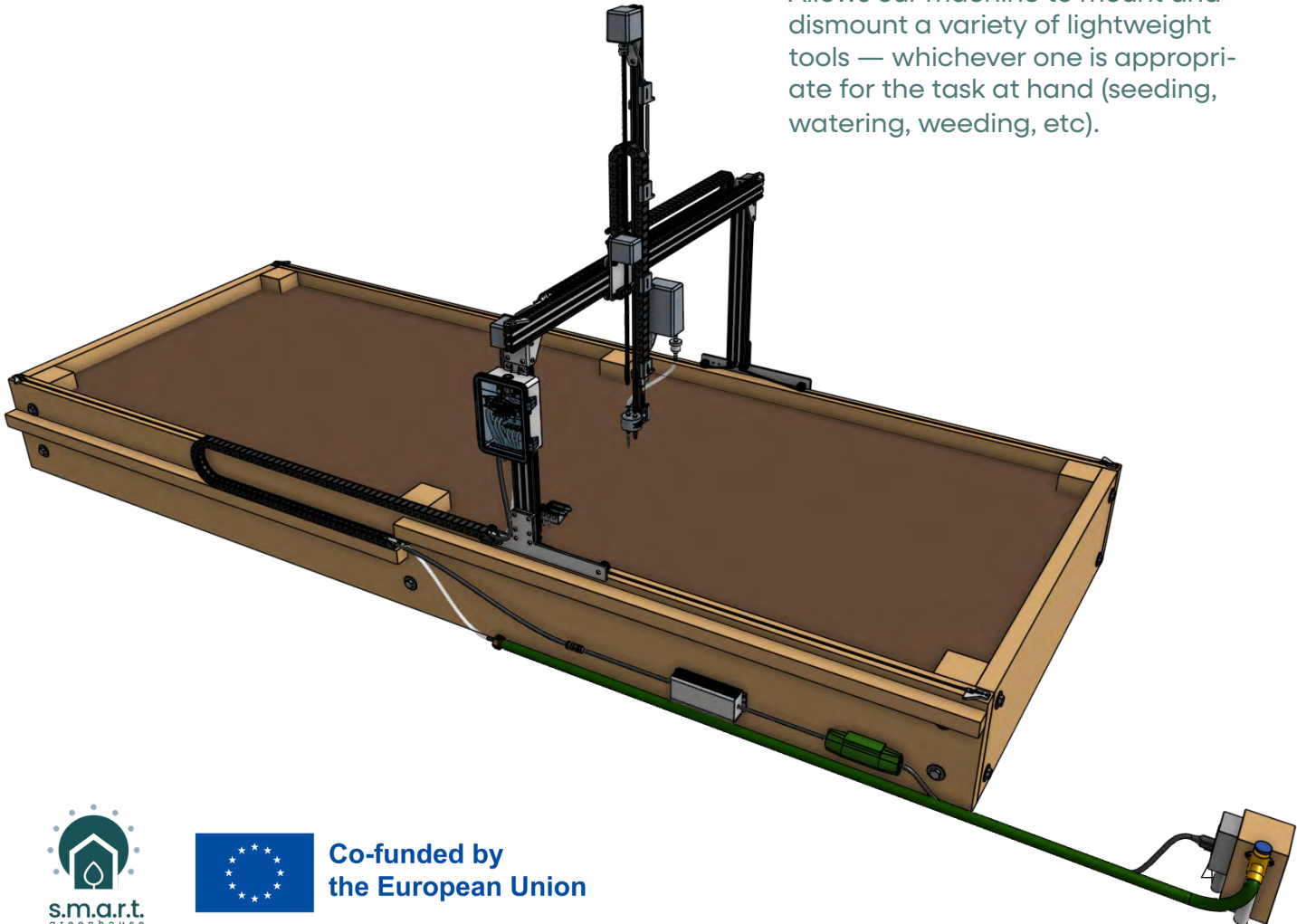
s.m.a.r.t. greenhouse

Co-funded by the European Union

"The S.M.A.R.T Greenhouse Project succesfully tackles the four categories of wasted values: wasted resources, wasted capacity, wasted life-cycles and wasted embedded values."

Garden Modules

Open Source Kitchen Table

The open-source kitchen is built with sustainability at its core, designed to be modular, adaptable, and easy to replicate. By utilizing an open-source model, we invite others to build, modify, and improve upon the design, spreading sustainable practices and reducing the need for new materials. Each of the three main modules: washing, cooking, and serving, is crafted to be durable and multifunctional.
The kitchen table supports educational dinners within the greenhouse, creating an interactive space for learning about sustainable food practices and design.

UN SDGs:

4 QUALITY EDUCATION

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

Washing Module   Cooking Module   Serving Module

650mm

650mm

800mm

300mm

550mm
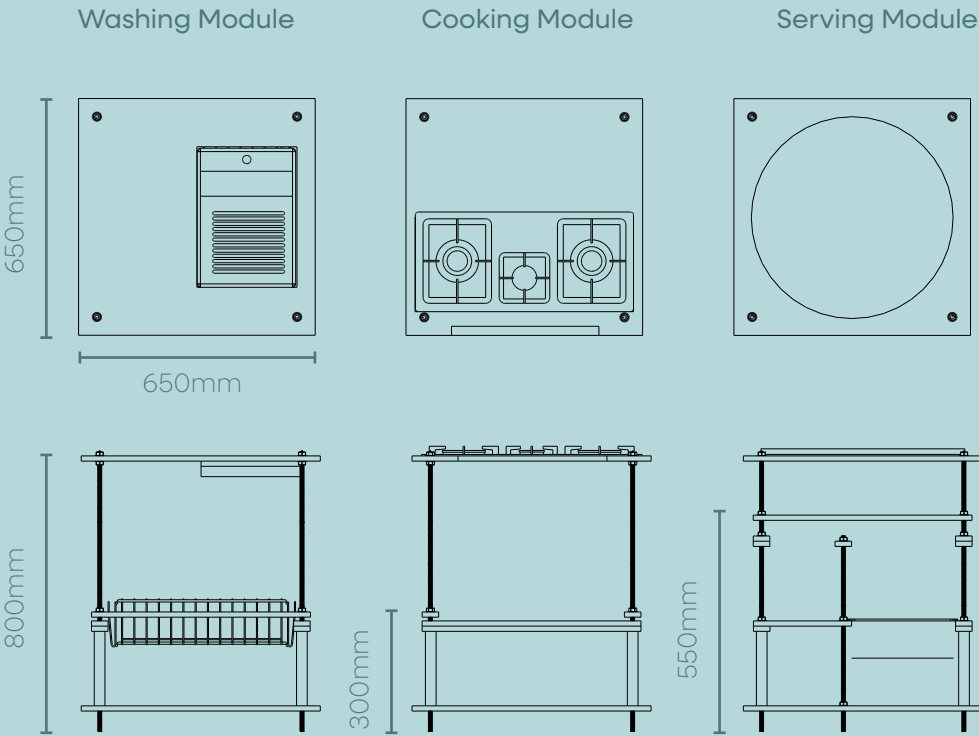
Dimensions:
Individual Module
Width: 650mm
Length: 650mm
Height: 800mm

Author:
Soumela Makanika
University of Thessaly,
Department of Architecture
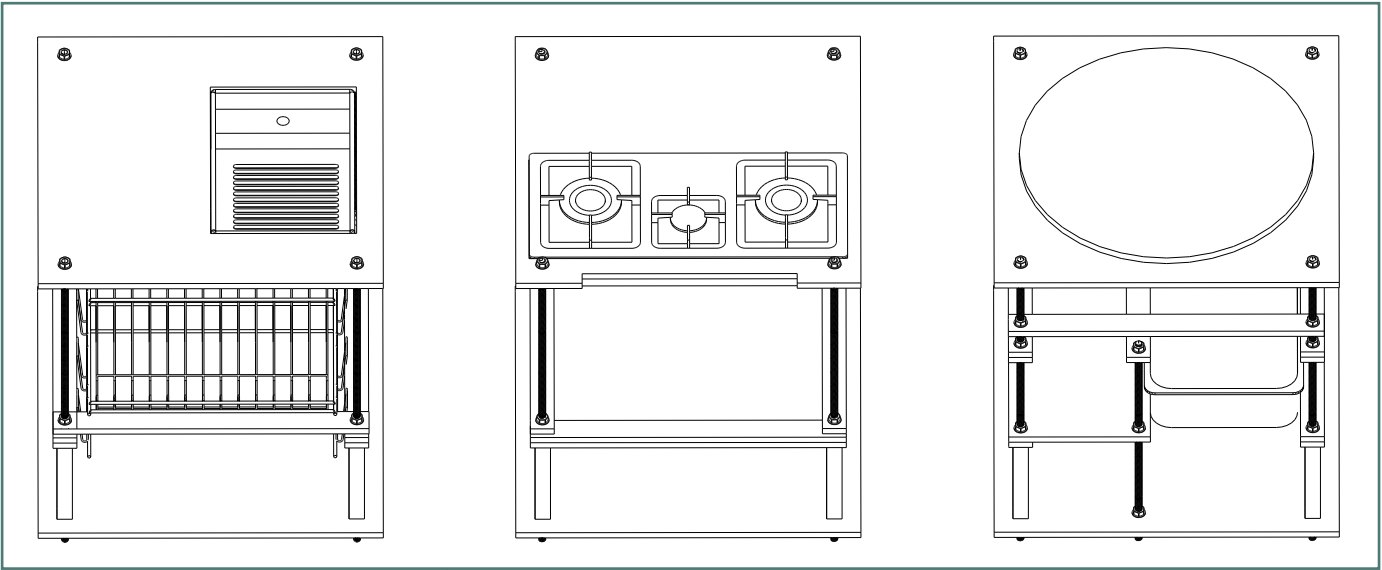
Educational Dinner Setup:
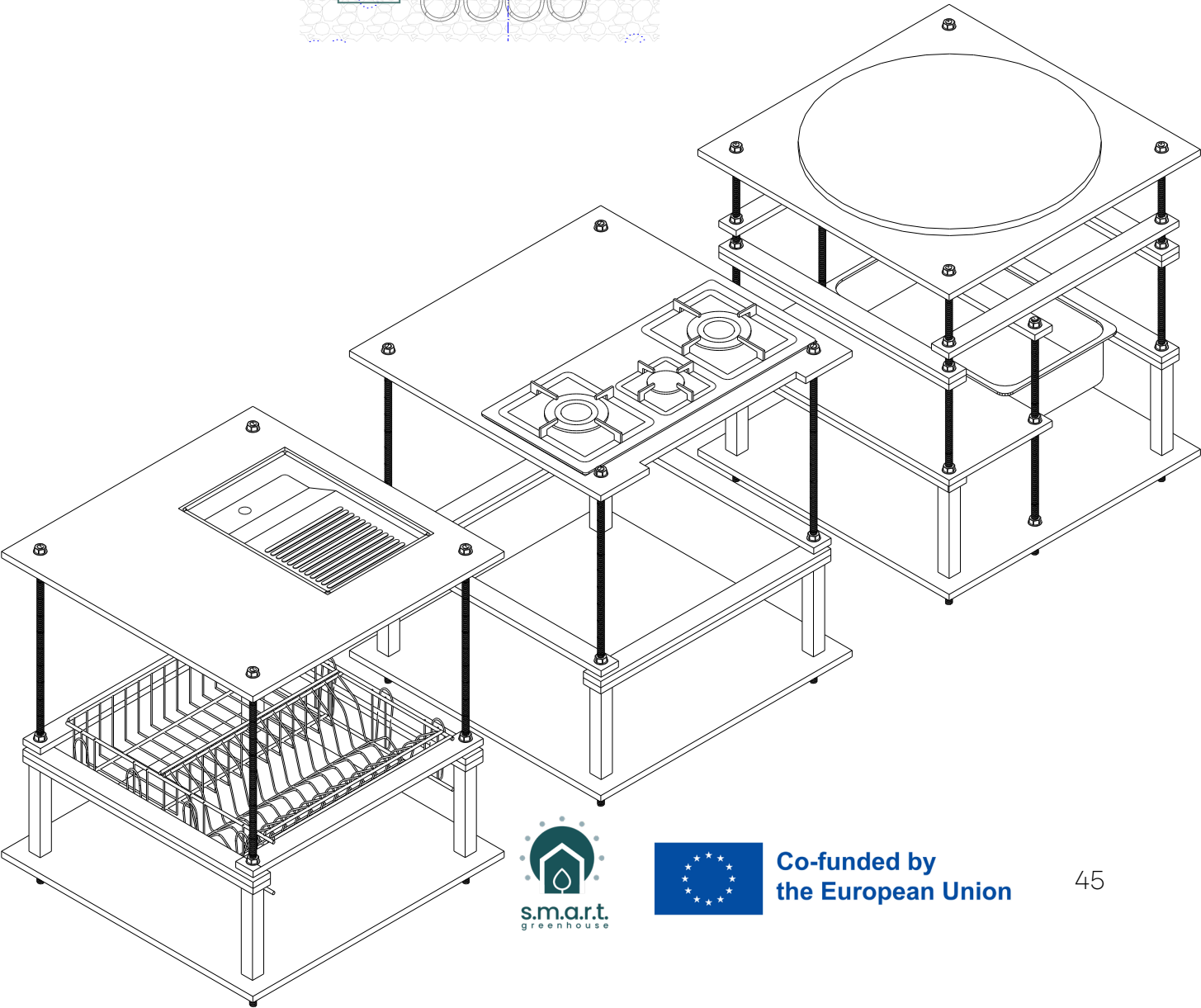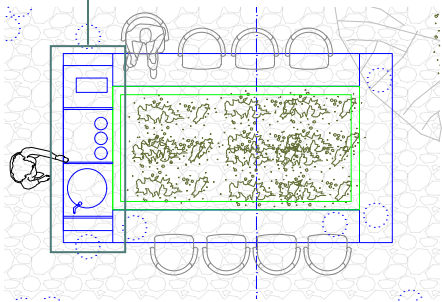
Garden Modules

Compost Station

Our community garden incorporates a compost station made from repurposed window shutters, demonstrating creativity and sustainability in waste management. By reusing these materials, we divert waste from landfills while providing an effective composting solution that enhances soil health and fertility. The compost station is designed for easy access and maintenance, encouraging community members to contribute organic waste and learn about the benefits of composting. This initiative not only reduces food waste but also promotes a circular economy within our garden, where materials are reused and nutrients are recycled back into the soil.

Dimensions:

Width: 420mm
Length: 1550mm
Height: 1065mm

Capacity:
Up to 100 Litres of Compost Soil.

Author:
Gardens of the Future
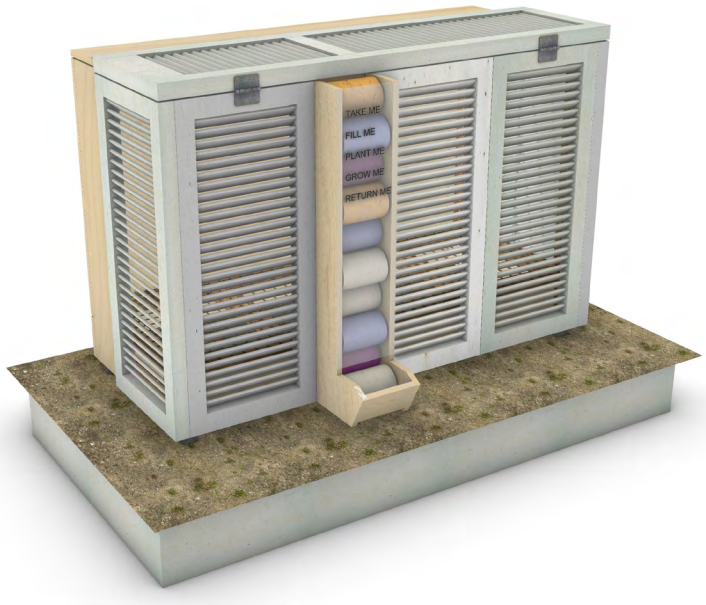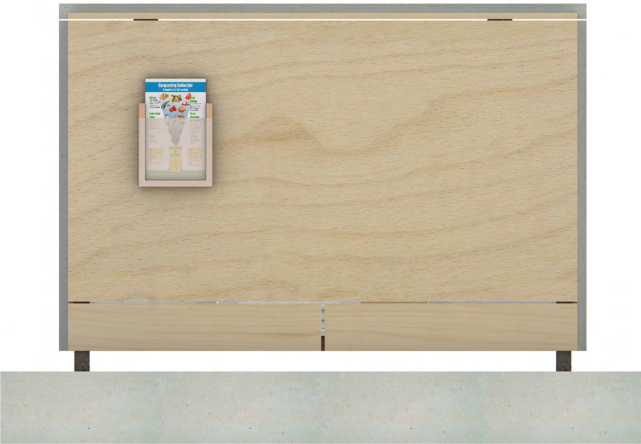
"Composting is nature's way of showing us the beauty of closing the loop. Transforming waste into life and nourishing the soil for a sustainable future"

Garden Modules

Raised Beds

Our community garden features modular, open-source farmer-raised beds designed for easy assembly, adaptability, and resource efficiency. Built from accessible, recycled materials, these raised beds provide an ideal growing environment while promoting sustainable practices that the whole community can replicate. The open-source design enables anyone to construct, modify, and share improvements to the beds, fostering a collaborative spirit and knowledge-sharing within the community. The modular structure allows the beds to be reconfigured or expanded based on seasonal needs or specific crop requirements, maximizing productivity and flexibility

UN SDGs:

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

Dimensions:
Individual Module
Width: 2500mm
Length: 1500mm
Height: 400mm

Capacity:
Up to 60 plants
16L of Soil

Author :
Gardens of the Future
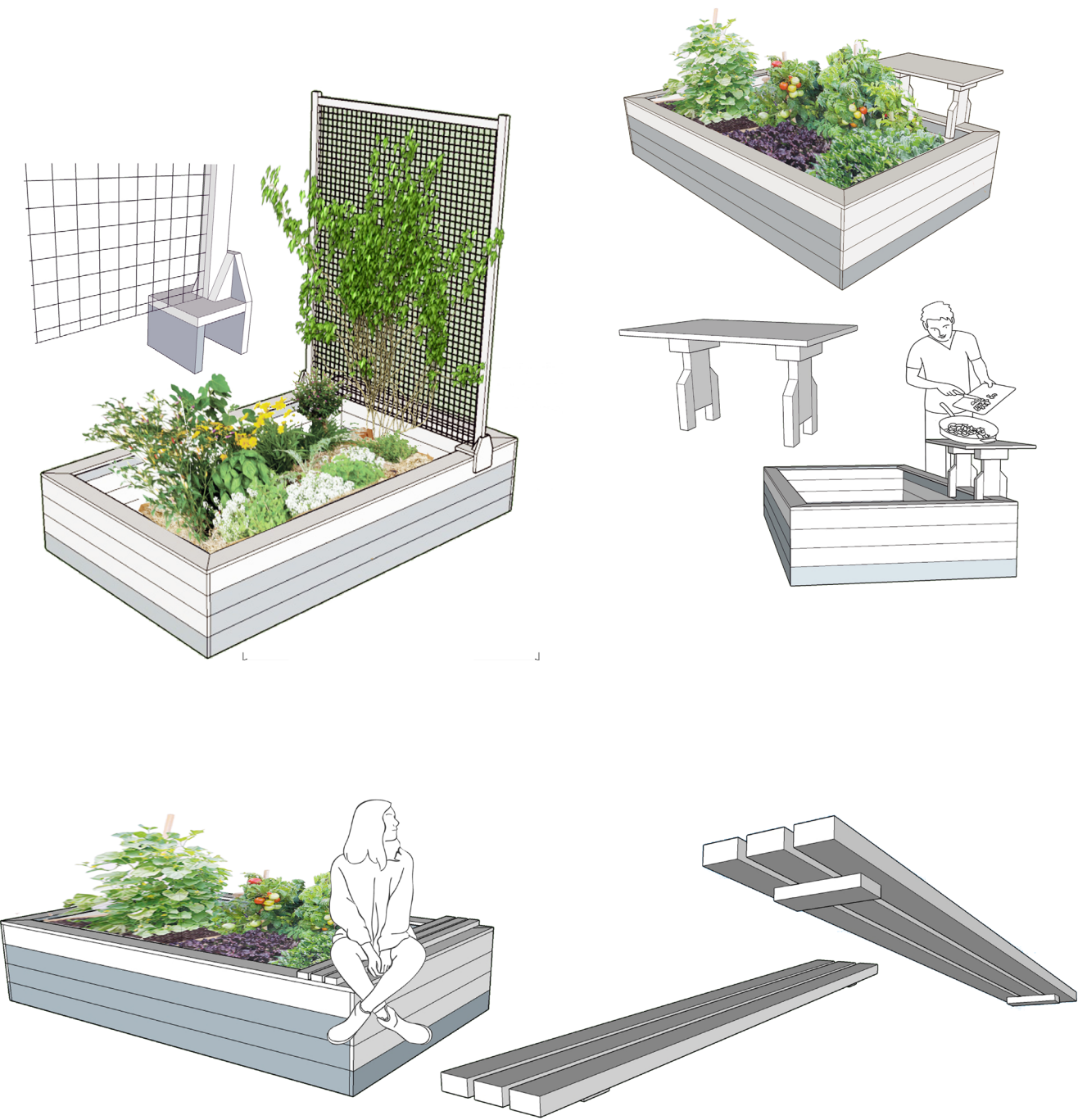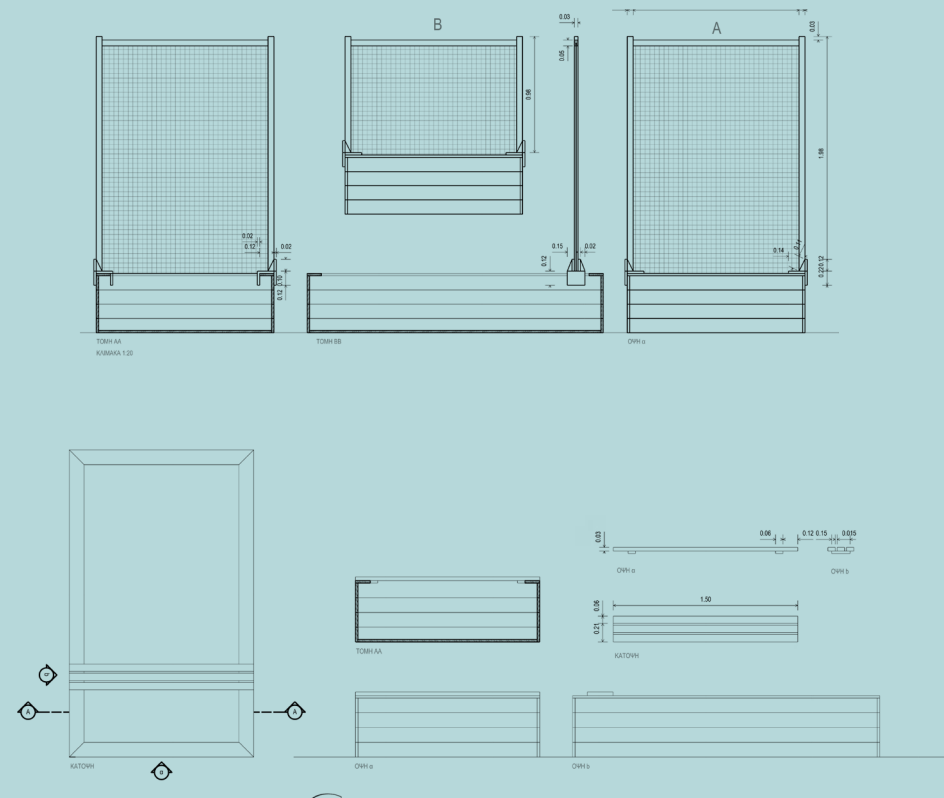
"By reimagining how we grow, share and live with nature, we plant the seeds for a holistic future where communities and ecosystems thrive together in harmony."

Garden Modules

Fog Catcher

A fog catcher is an innovative and sustainable solution for collecting water in arid yet humid environments, like Cyprus, where water scarcity is a growing challenge. By capturing moisture from the fog that often drifts through the area, fog catchers provide a passive, low-energy method to harvest fresh water. The collected water can be stored and used for agricultural irrigation, reforestation, or even potable purposes after treatment, reducing dependency on conventional, often stressed, water sources. Fog catchers are highly scalable, as they can be deployed as standalone units or in large arrays across mountain slopes, coastal areas, or valleys where fog is frequent. Their relatively simple design and low maintenance requirements make them ideal for community-based projects and adaptable to various geographical scales. This water collection method directly supports the United Nations Sustainable Development Goals, particularly **Goal 6** (Clean Water and Sanitation), by providing access to a clean, renewable water source, and **Goal 13** (Climate Action), by reducing the need for energy-intensive water extraction and promoting climate-resilient water practices. Additionally, by supporting local ecosystems and agriculture, fog catchers contribute to Goal 15 (Life on Land), fostering biodiversity and promoting sustainable land use in water-stressed regions.

UN SDGs:

6 CLEAN WATER AND SANITATION

13 CLIMATE ACTION

Dimensions:
Individual Module
Width: 100mm
Length: 4000mm
Height: 2500mm

Capacity:
From 4.3l/m2 to 11.6l/m2 per day.
(Summer time)

Author :
Gardens of the Future

s.m.a.r.t.
greenhouse
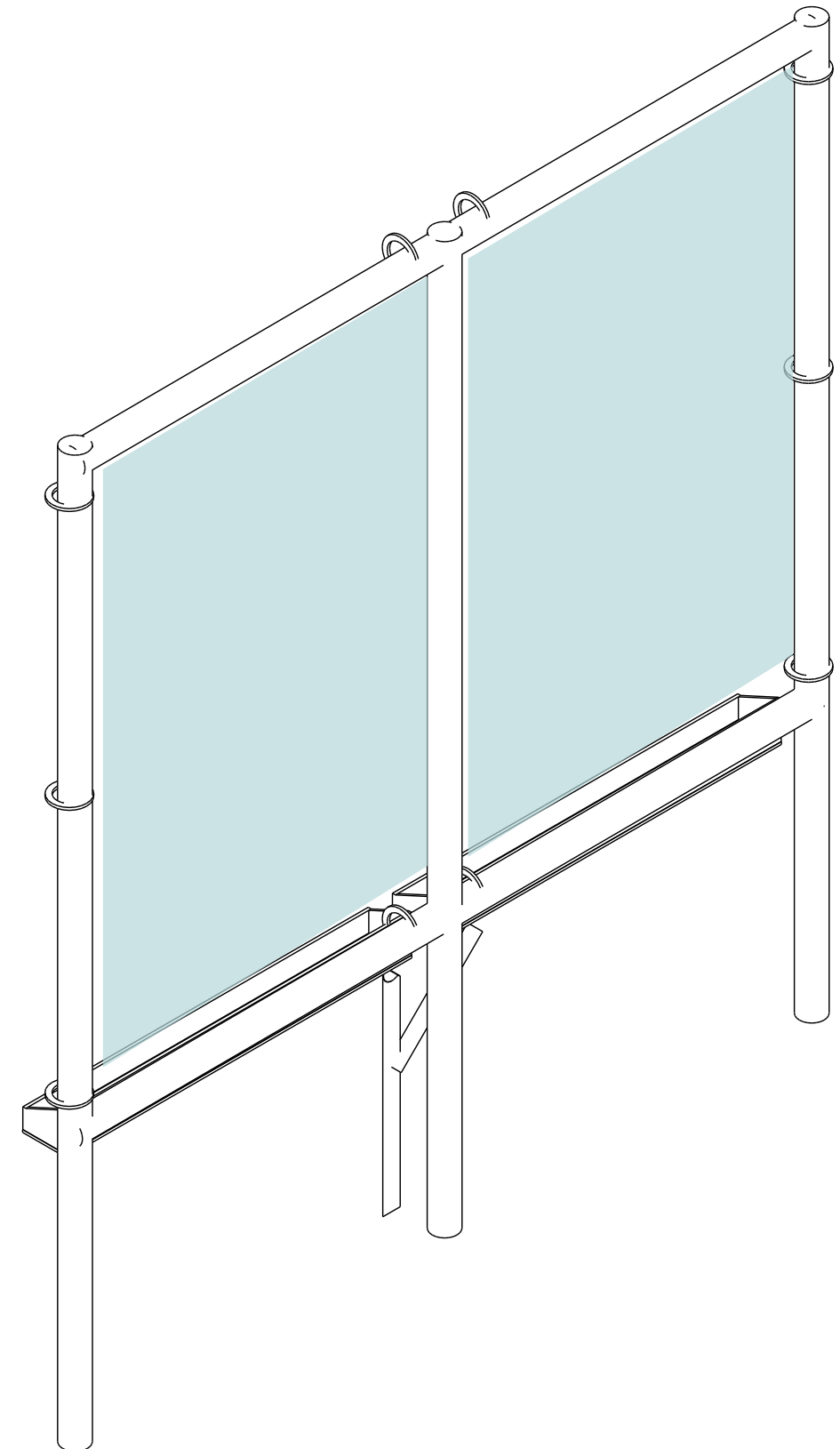
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Garden Modules

Hydroponics

6 CLEAN WATER AND SANITATION

A fog catcher is an innovative and sustainable solution for collecting water in arid yet humid environments, like Cyprus, where water scarcity is a growing challenge. By capturing moisture from the fog that often drifts through the area, fog catchers provide a passive, low-energy method to harvest fresh water. The collected water can be stored and used for agricultural irrigation, reforestation, or even potable purposes after treatment, reducing dependency on conventional, often stressed, water sources. Fog catchers are highly scalable, as they can be deployed as standalone units or in large arrays across mountain slopes, coastal areas, or valleys where fog is frequent. Their relatively simple design and low maintenance requirements make them ideal for community-based projects and adaptable to various geographical scales. This water collection method directly supports the United Nations Sustainable Development Goals, particularly **Goal 6** (Clean Water and Sanitation), by providing access to a clean, re-

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

HYDROPONIC BENEFITS

Soil-less

Water Conservation

Affortable

Indoor Use

Quick Harvest

Higher Yield

Fewer Pesticides

Fewer Pests

Dimensions:
Individual Module
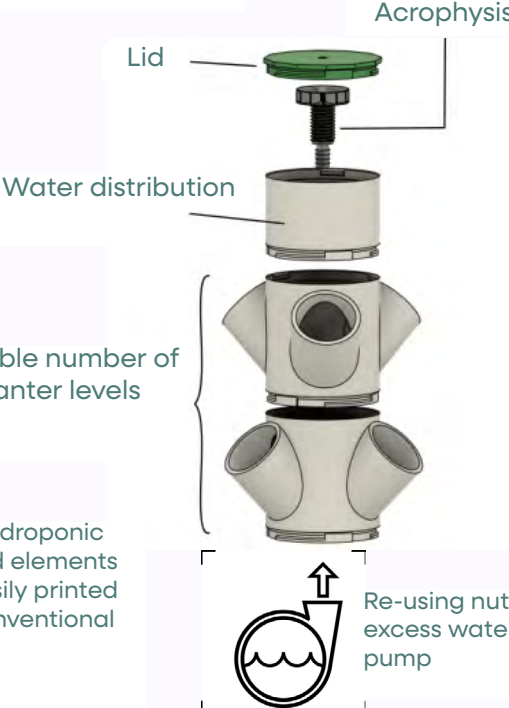Width: 100mm
Length: 4000mm
Height: 2500mm

Capacity:
From 4.3l/m2 to 11.6l/m2 per day.
(Summer time)

Author :
Miletia's Garden

DIY HYDROPONIC TOWER:

Acrophysis

Lid

Water distribution

Variable number of planter levels

Multiple hydroponic towers and elements can be easily printed using a conventional 3D printer.

Re-using nutrients in excess water via a pump

DAY 1

DAY 15

Scenarios

Scenario 1:
Automated Cooling Response in Case of Overheating

1. Scenario:

On a particularly hot summer day, the temperature rises above 35°C, creating a risk of overheating in your garden or outdoor area. To protect your plants and avoid heat stress, you've automated the system to respond by activating the main water valve. This keeps the environment cool and prevents potential damage due to excessive heat. The system is designed to keep your garden or outdoor space efficiently cooled even when you're not around to manually manage it.

2. How to Set It Up:

Step 1: In your SMARTlife app, create a new automation rule and label it appropriately (e.g., "Overheat Response").
Step 2: Set the **IF condition** to trigger when the temperature exceeds **35°C**. You can adjust this threshold based on your specific needs.
Step 3: As the **THEN action**, choose to activate the **main water valve.**
Step 4: (Optional) You can add preconditions such as ensuring the water valve is connected and ready.
Step 5: Save the automation and test it to ensure it triggers at the appropriate temperature.

3. Benefits:

Automatic Temperature Control: This automation helps prevent over heating and ensures a cool environment for plants, pets, or other outdoor assets.
Water Conservation: By automating the process, you avoid unnecessary water usage, only activating the valve when it's truly needed.
Peace of Mind: With this setup, you don't have to worry about monitoring temperatures manually, giving you more freedom and security.

This automation is especially useful for people with busy schedules who need to maintain control over outdoor areas during extreme weather conditions.

4. Equipment used:

Temperature sensor
Water valve
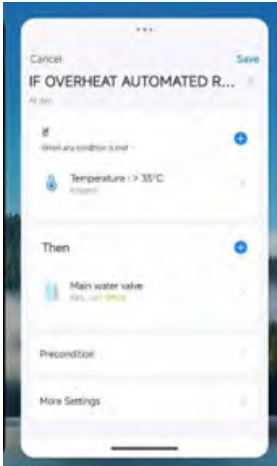
Scenario 2:
Automated Watering System for Garden Maintenance

1. Scenario:

Imagine it's a dry season, and the humidity in your garden drops below 30%. Instead of manually checking and watering the plants every day, you've set up an automated watering system. The SMARTlife app is connected to a humidity sensor (SGS01) and a main water valve. When the humidity goes below 30%, the water valve automatically turns on and irrigates the garden for five minutes. This system ensures that your plants get the water they need to thrive, even when you're away or too busy to manage it manually.

2. How to Set It Up:

Step 1: Open the SMARTlife app and create a new automation rule called "Automated Watering."
Step 2: Set the **IF condition** to trigger when the **humidity sensor (SGS01)** detects a humidity level of less than **30%**. You can adjust the humidity threshold based on your specific plant requirements.
Step 3: For the **THEN action**, set the **main water valve** to turn on automatically.
Step 4: (Optional) You can add a timer for how long the water valve should stay open, such as **5 minutes**.
Step 5: Save the automation and run a test to ensure it activates the water valve when humidity drops.

3. Benefits:

Consistent Garden Maintenance: Automated watering helps maintain optimal moisture levels in your garden without requiring manual intervention.
Water Efficiency: By setting specific humidity triggers, you ensure that water is used only when necessary, reducing waste.
Healthy Plants: Maintaining consistent humidity and watering schedules improves plant health and reduces the risk of under- or over-watering.

This automation is perfect for maintaining a lush, green garden with minimal effort, especially during dry seasons or periods when you're unable to water regularly.

4. Equipment used:

Temperature sensor
Water valve
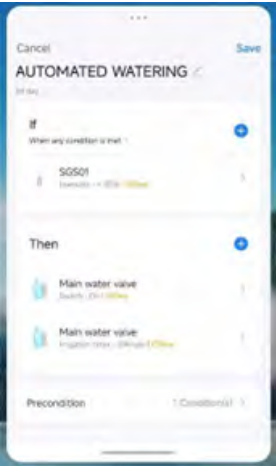
Scenarios

Scenario 3:
Optimized Planting and Watering Grid for FARMBOT

1. Scenario:

You've planted a garden in a well-organized grid, with various plants spaced according to their growth requirements. Using FARMBOT's mapping system, you've established an automated plan to water each plant based on its specific position within the grid. FARMBOT navigates the grid efficiently, ensuring each plant receives the right amount of water without any waste. This setup allows you to manage a large number of plants while optimizing water use and plant health.

2. How to Set It Up:

Step 1: Use the FARMBOT interface to create a visual map of your planting area, similar to the grid displayed.
Step 2: Identify each plant's location on the grid based on coordinates (e.g., plants located at 1600, 1000, or 1200, 500).
Step 3: Set up an irrigation sequence where FARMBOT waters each plant at its exact grid location. You can adjust the watering schedule depending on the plant's specific needs (e.g., more frequent watering for certain plants, less for others).
Step 4: Monitor the progress of the watering system via FARMBOT's live tracking, ensuring that all plants are watered correctly and efficiently.

3. Benefits:

Precision Watering: FARMBOT's grid system ensures each plant receives the exact amount of water needed, reducing waste and improving plant health.
Efficient Garden Management: The visual grid allows for easy planning, planting, and irrigation without manual labor.
Scalability: This system can be scaled to accommodate larger areas, making it suitable for home gardens or small agricultural projects.
This system is ideal for anyone looking to automate their garden care using FARMBOT, providing accuracy and efficiency in watering across a carefully planned planting grid.

This automation is especially useful for people with busy schedules who need to maintain control over outdoor areas during extreme weather conditions.

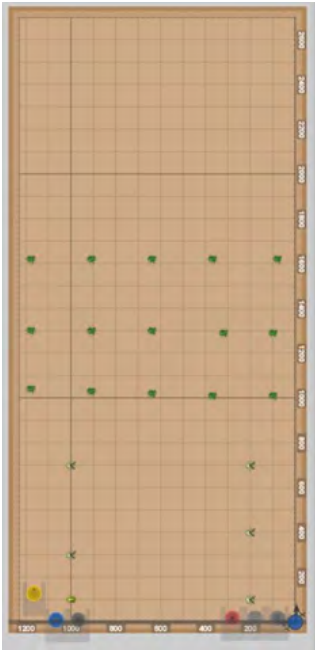**4. Equipment used:**

FARMBOT

Scenario 4:
Monitoring Soil Moisture Levels with FARMBOT Sensors

1. Scenario:

To optimize the watering schedule for your garden, you've set up a soil moisture sensor using FARMBOT. The sensor measures the moisture levels of the soil, providing real-time data that helps you determine when your plants need water. In this scenario, the soil moisture level is currently **59**, and the sensor data is being tracked and recorded for analysis. This allows you to make informed decisions about when and how much water to apply, ensuring your plants stay healthy and preventing overwatering or underwatering..

2. How to Set It Up:

Step 1: In the **FARMBOT app**, navigate to the Sensors section.
Step 2: Select the **Soil Moisture** sensor and click **Read Sensor** to get the current moisture level (in this case, it's 59).
Step 3: Use the **Sensor History** section to track how the soil moisture level changes over time. Choose the desired **time period** (e.g., **Day**) and set the **Period End Date** (in this case, June 12, 2024).
Step 4: You can adjust the **X, Y, Z** coordinates to monitor specific areas of the garden and assess how the soil moisture levels vary.
Step 5: Review the graph that displays real-time sensor data. This visual representation helps you track the fluctuations in soil moisture throughout the day or over an extended period.

3. Benefits:

Data-Driven Watering: By using real-time soil moisture data, you can create precise watering schedules that respond directly to your plants' needs, avoiding guesswork.
Water Conservation: Monitoring moisture levels helps reduce water waste by ensuring that you only water when necessary, preventing overwatering.
Plant Health: Regularly tracking soil moisture ensures your plants remain in optimal conditions, preventing stress caused by either too much or too little water.

With this automated sensor system, you can maintain a healthy garden while maximizing efficiency and conserving resources. It's especially useful for anyone managing a garden in varying weather conditions or with different plant species requiring tailored care.

4. Equipment used:

FARMBOT

Mentors:

Dr. Natasa Christou
Director
Gardens of the Future

George Georgiou
Director
Novatex Solutions

Katerina Economou
Environmental Researcher

Katriona Pillay
Architect

Andia Georgiou
Landscape Architect

Olivia Skordi
Ecologist
Friends of the Earth

Nikolas Anastasiou
Electronic Engineer
ARTYAN Innovations
Smart Systems
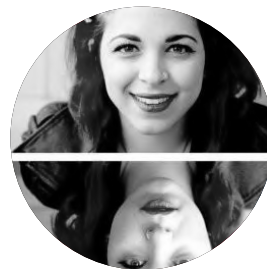
Marisa Satsia
Bio-Designer and Researcher

Konstantinos Charilaou
Industrial Designer

Demetris Ktorides
Architect
University of Nicosia

Aknowledgements
S.M.A.R.T Greenhouse Project

Evita Dialyna
Environmental Engineer
Miletia

Manos Dialynas
Production Engineer
Miletia

Loukianos Katomoniati
IT Engineer

Andrija Stojanovic
Mechanical Engineer

Assembly Engineers:

Rafael Tsentides
Architect

Talat Guler
Interior Architect

Nektarios Gregoriou
Product Designer

Kyriakos Gregori
Agronomist

Maro Manoli
Project Manager
Novatex Solutions

Maria Ioannou
Event Coordinator

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s.m.a.r.t. greenhouse

Cyprus:

Cyprus University of Technology

Γραφείο Επιτρόπου Περιβάλλοντος

Δήμος Λευκωσίας
Nicosia Municipality

Elysee

SOCIALTECH LAB

YOUTH MAKERSPACE
LARNAKA

Premier
Shukuroglou

Greece:

ΕΛΛΗΝΙΚΟ ΜΕΣΟΓΕΙΑΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ

Εκπαιδευτικός ΟΡΓΑΝΙΣΜΟΣ
PERFECTION FOR PROFESSION

Κε.Δι.Β.Μ 1
ΚΕΠΑΝΣΗ

Ι.Ι.Ε.Κ
MORFI

ΠΟΛΙΤΙΣΤΙΚΟΣ ΕΞΩΡΑΪΣΤΙΚΟΣ ΣΥΛΛΟΓΟΣ ΑΜΜΟΧΩΣΤΟΥ
2006

Δήμος Ηρακλείου

ΔΗΜΟΣ ΜΑΛΕΒΙΖΙΟΥ
Municipality of Malevizi

Appendix

Planting Advice

Our Planting Guide Booklet is a comprehensive, user-friendly resource designed to help amateur home growers cultivate a thriving edible garden year-round. Tailored for beginners, the booklet provides a seasonal planting calendar that guides you through which fruits, vegetables, and herbs to plant at each time of year for optimal growth and harvest. Alongside seasonal advice, we cover companion planting tips, helping you understand the best plant pairings to naturally boost growth, deter pests, and improve soil health. Filled with simple instructions, visual guides, and practical advice, this booklet empowers you to grow food sustainably in your own home—no green thumb required! Whether you're planting in a garden, balcony, or small indoor space, our guide supports your journey toward a healthy, home-grown harvest.

UN SDGs:

2 ZERO HUNGER

4 QUALITY EDUCATION

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

Preview:

s.m.a.r.t. greenhouse

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Brassicas

The Brassica family (Brassicaceae), which includes cabbage, broccoli, kale, and cauliflower, is packed with nutrients and cold-hardy, making it a garden staple. These plants benefit from companions like onions and herbs that help deter pests, allowing for healthier growth and harvests.

	Cabbage	Cauliflower	Radish	Turnip	Kohlrabi	Broccoli	Brussel sprouts
Light	Full Sun			Full Sun			
Hardiness	Frost Hardy, likes a high organic content	Frost Hardy, likes a high organic content	Hardy and low maintenance	Hardy and low maintenance	Hardy, high organic content	Frost Hardy, likes a high organic content	Frost Hardy, likes a really high organic content
Key Problems	Cabbage root fly Caterpillars Flea Beetle Slugs and snails	Flea Beetles, Aphids, Cabbage Worms	Flee Beetles, Cut Worms	Flea Beetles, Cabbage Flies, Root Maggots	Cabbage Aphids, Cabbage Loopers, Cutworms, Flea Beetles	Cabbage Worms, Cabbage Loopers, Root Maggots, Aphids	Cabbage Worms, Cabbage Loopers, Flea Beetles, Root Maggots
Water	10 litre of water per square meter when top 5cm of			compost is dry(every 2-3 days), needs consistent moisture			
Planting Period	November	November	Sept - Dec Mar - Apr	Sept - Dec Mar - Apr	Sept - Dec Mar - Apr	November	November
Planting Distance	45- 60cm	30-45cm	3-8cm	5-10cm	20-25cm	45-60cm	30-45cm
Harvesting Period	60-110 days	60-80 days	21-50 days	35-40 days	55-60 days	100-150 days	90-110 days
Useful Tips	In the case of seedlings, hardening off by putting them outside the night before transplanting helps with transplanting shock.	Gather some large outer leaves and pull them gently toward the center. These will cover the head loosely. Then secure it on top with twine or a rubber	Radishes are very prone to bolting in the heat, leaving to flavor and texture toast. On the contrary established plants may even sweeten up in the cold.	Harvest young for the most tender and sweet roots, ideally when they are golf ball-sized or slightly larger. Afterwards they can easily get woody	Once the kohlrabi reaches 5-10cm, you can harvest the bulbs. More mature kohlrabi bulbs become woody with age. Good median size of about 7-8cm	When harvesting,the head should be tight, stiff, and fully colored. Usually, it will be fist-sized or larger. Most varieties will send out off-shoots after harvest.	Frost actually improves the flavor of, so wait until the winter sets in to harvest Brussel sprouts
Basic Consumption	Great pair for salads, legumes and stir fry. Also homegrown cabbage makes a great sauerkrau	Cauliflower pickled on veggie platters, raw with dip, mashed as a potato substitute, or even roasted in buffalo sauce as "cauliflower wings".	Radishes give a wonderful peppery, crisp flavor in your salads or on cheese platters.	Shredded in a salad or slaw or sliced and eaten with hummus. You can roast them. Ideal for pickles or fermented kimchi blends.	Kohlrabi are better eaten raw straight from the garden, with dip or slightly pickled	Eat them as you would collard greens. Opened flowers and seed pods can also be eaten, usually as a garnish or sprinkled in salads.	Boil them for 3 minutes in salty water and then throw them in a pan with oil,garlic,ginger and chili. Excellent stir-fry full of nutrients.

Solanums

The Solanum family (Solanaceae), including tomatoes, potatoes, peppers, and eggplants, is valued for its nutrient-rich, flavorful crops. While highly productive, these plants are heavy feeders, thriving alongside companion plants like basil and carrots that can help deter pests and enhance growth.

	Tomato	Potato	Eggplant	Pepper	Tamatillo
Light	Sheltered Fulll Sun	Full Sun	Sheltered Fulll Sun	Full Sun	Full Sun
Hardiness	Frost Tender	Frost Tender, Low Maintenance	Hardy, Heavy Feeeder	Heat Loving, Heavy Feeder	Hardy, Frost Tender
Key Problems	Aphids, Powdery Mildew	Slugs, Potato Beetle	Tarnighed Plant, Bugs, Aphids	Aphids, Cellery Fly, Caterpillars	Cabbage Loopers, Cutworms, Aphids
Water	10 litre of water per square meter when top 5cm of		compost is dry (every 3-4 days)		
Planting Period	Apr - Nov	Sep - May	Apr - Nov	Apr - Nov	Apr - Nov
Planting Distance	20-25cm	10cm	45-60cm	20-40cm	24-36cm
Harvesting Period	90 days	70-120 days	60-100 days	60-90 days	60-85 days
Useful Tips	The easiest tomatoes to grow in pots are bush varieties, which don't need to be staked. Insert a 1.5m bamboo cane and loosely tie the stem.	Keep the mulch topped up approximately every 4 weeks and add some liquid feed or fertiliser every two to three waterings to add extra nutrition.	As long as it has enough heat and water, eggplant will yield in great abundance throughout the summer.	You can use strong sticks buried by the base of the plant and tied to the plant for added support. Careful never to tie too tight choke or snap the stem	Treat a tomatillo like a determinate (bush) tomato and guide it to grow up its cage or stay within the bounds of fencing and string.
Basic Consumption	Tomatoes can be used in anything and do everything better. Salads, sauces, eat them as a snack, everything.	For potatoes, less is more. My recommendation, roast them and add some flaky salt and rosemary on it. Perfection.	It's most well known for the signature eggplant parmesan of Italy, the Middle Eastern relish dip called baba ganoush, Greek moussaka.	Pepper are a great choice for soups, stir-fry and of course stuffing.	Only the mature fruits of tomatillos are edible. They can be enjoyed raw in salsas, chutneys, jams, and as garnishes. They are also cooked into stews, soups.

DIGITAL PH/TDS/EC METER TESTER

Measuring water purity and quality parameters

WHY: Essenatial for maintaining water quality in various applications, ensuring safe and optimal conditions for plants

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PHOTOCATALYTIC MOSQUITO KILLER

Attracts and kills mosquitos

WHY: Can attract and kills mosquitos combining air suction and special lights

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WATER LEAKAGE DETECTOR

Wifi leakage detector

WHY: It sends real time alerts when there is water leakage ot water level is reached

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SMART POWER PLUG

Remote control and automation of electrical devices

WHY: Enhances home automation, allowing users to control devices remotely, schedule operations, and monitor energy consumption

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IRRIGATION SYSTEM
Smart irrigation control for gardens

WHY: Provides efficient water managment, remote control, and scheduling, reducing water waste and ensure optimal plant hydration

GARDENS OF THE FUTURE

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HYDROPONIC GROW KIT
Soiless cultivation for vegetables and flowers

WHY: Utilizes nutrient film tegnology to produce more plants with higher yields, making it ideel for maximazing productivity in limited spaces

GARDENS OF THE FUTURE

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VERTICAL GARDENING

GARDENS OF THE FUTURE

WHY: Designed for effient plant cultivation on balconies, patios, or gardens, optimizing space and enhancing accesibility for urban gardening

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SCAN ME TO LEARN MORE

TEMPERATURE AND HUMIDITY SENSOR

GARDENS OF THE FUTURE

Monitoring temperature and humidity

WHY: Ensures acomfortable and healthy indoor enviroment by providing accurate and real-time climate data

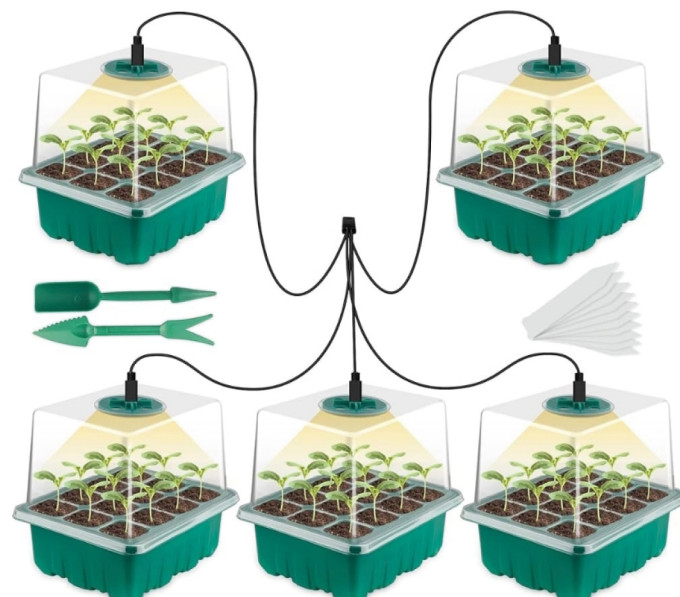Co-funded by the European Union

s.m.a.r.t. greenhouse

SCAN ME TO LEARN MORE

MINI GREENHOUSE PROPAGATION SET WITH SUN-LIKE PLANT LIGHTS

Indoor seeding propagation with Led Plant lights

WHY: Prvides an optimal enviroment for seed generation and growth with adjustable humidity and temperature control, enchancing pant development indoors

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AUTOMATED WEATHER STATION
Automated weather station connected to the internet

WHY: It measures outdoor temperature, humidity, wind speed and direction. Solar radiation, rain as well as barometric pressure which are important parameters related to plant growth

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