# UrbanFarm2024

**Integrating social, economic and environmental sustainability pillars for inmates rehabilitation in the new Trelleborg prison in Sweden**

UrbanFarm2024

# *Integrating social, economic and environmental sustainability pillars for inmates rehabilitation in the new Trelleborg prison in Sweden*

Francesco Orsini, Michele D'Ostuni, Andrea D'Aprile, Virginia Cioncoloni, Giuseppina Pennisi, Marie Larsson, Anna María Pálsdóttir

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA




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# GreenME project

Advancing Greencare in Europe: an integrated multi-scalar approach for the expansion of nature-based therapies to improve Mental health Equity.

The GreenME project is led by Universitat Autònoma de Barcelona (UAB) and, in a trans-disciplinary partnership, it involves six European countries, together with the UK and the US. The project started in September 2023 and will last 4 years. It is funded by the Horizon Europe research and innovation programme of the European Union.

GreenME understands exposure to nature as a three-scale continuum:


Existence of green and blue infrastructure for viewing and walks

Promotion of active interaction with nature such as gardening and conservation

Provision of treatment for individual patients

GreenME will:

- Diagnose the current state of the provision of nature-based therapies, nature-based health promotions, and nature-in-everyday life.
- Increase scientific evidence on the mental health and wellbeing benefits of exposure to nature, and
- Empower green care actors.

To, finally, increase the use of nature-based therapy and its integration within a multi-scalar green care framework to ultimately promote just climate resilient and sustainable healthy communities.

For more information about GreenME and its initiatives,
please visit greenme-project.eu

GreenME
Mental health for all through nature

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# Rosalba Lanciotti

## Urban Agriculture
### for interdisciplinary research and education

*by Rosalba Lanciotti, Director, Department of Agricultural and Food Sciences (DISTAL), Alma Mater Studiorum - University of Bologna*

The agricultural sector is currently facing several important challenges, seriously threatening food security and social stability. These include world population growth, soil erosion and desertification, and the growing scarcity of water and fossil fuels, among others. In the light of the COVID-19 pandemic, the role of urban food production has gained relevance in promoting food systems resilience in time of crisis. Accordingly, it becomes crucial to develop and adopt innovative food production strategies for our cities. Urban farming systems must adapt to climate change and ensure food security, be efficient in the use of resources and capable to boost impactful social benefits. Innovative technologies including, for instance, rooftop greenhouses, agricultural parks and vertical farms, are already emerging in several urban and peri-urban areas all over the world.

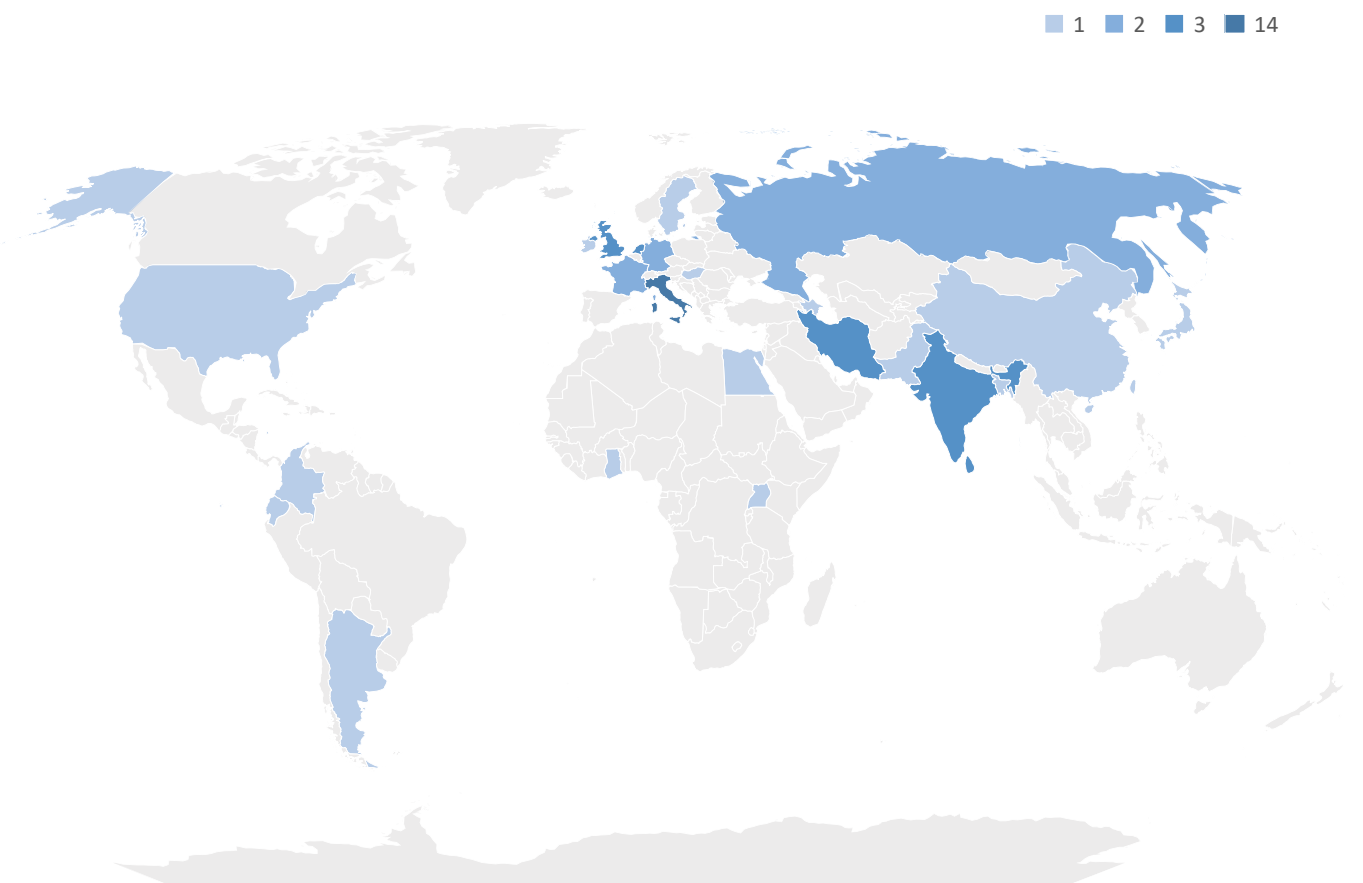
The Department of Agricultural and Food Sciences (DISTAL), one of the largest in the University of Bologna, represents a point of reference for horticulture, crop production and sustainable food systems. The DISTAL coordinates and takes

part in several European and National projects, and in 2023 it was awarded for the second time as a Department of Excellence from the Italian Ministry of Education and Research.

The international student challenge UrbanFarm is organized by the University of Bologna, and involves interdisciplinary teams of students from all over the world in the definition of urban regeneration projects. This year, 69 students from 25 different countries participated to the Challenge contributing to make UrbanFarm2024 one of the most multicultural and international edition.

Students are requested to re-develop urban vacant spaces into urban farming initiatives, aimed at boosting social, environmental, and economic sustainability. The projects collected in this publication were presented during the UrbanFarm2024 Grand Finale and were evaluated by an international jury of experts from various fields. This context allows students to elaborate problem-based solutions, acting in a stimulating and international environment and dealing with their peers from different origins and backgrounds. Projects integrate food production with architectural regeneration, energetic sustainability and economic viability.

I trust this activity has a great potential in increasing the knowledge and the skills of our students, and therefore I would like to express my gratitude to all the teams who participated in this challenge, and the numerous academics and researchers that contributed with their work in the committees to the project scientific outcomes.




**Geographical distribution of UrbanFarm2024 participants' countries of origin. Darker colours indicate the countries from where the largest number of students participated in the Challenge**

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# Christina Lunner Kolstrup

## Introduction speach from SLU Dean at the UrbanFarm 2024 Grand Finale at the SLU Campus, Anlarp (Malmö)

*by Christina Lunner Kolstrup*
*Dean of the Swedish Agricultural University (SLU)*

Welcome all students to our beautiful SLU campus Alnarp,

I am Christina Lunner Kolstrup and dean of this faculty – Landscape Architecture, Horticulture and Crop Production Sciences

I know that you during this course Urban Agriculture and Social Interactions have gained a lot of new knowledge and shared a lot of experiences. You have also written project proposals on this year's theme of UrbanFarm2024 --- and this, I have learned, that you have done with great commitment and enthusiasm. And - this topic has never been more relevant than now, considering everything that is happening in our world. We need to find good solutions to urban farming in what form it might be … and learn from all good examples around the world.

An exciting, educational and inspiring day awaits you - a day where you will have the opportunity to present and discuss among yourselves and

with others about your proposals on how urban farming can or needs to be improved. I know many have been looking forward to this day, and I hope you all take the opportunity to discuss, reflect, and encounter each other about the challenges and the potential opportunities and solutions you have identified -- and not least hopefully create future networks

You represent the future generation and with your newly acquired knowledge you will be able to participate and contribute to changes and solutions to the challenges that our global societies face from north to south and from east to west. It gives me great joy to see the commitment and initiative you have shown by participating in the course and the UrbanFarm2024. Finally, I just want to say ---- good luck with your presentations today and remember to feel very proud of the result you have achieved.

Thank you very much and we hope to maybe see you at other of our courses in the future :-)


**Images of the Grand Finale at SLU Campus in Anlarp. On top, Dean Lunner Kolstrup giving her speech. At the bottom, the winning team " Lingonträdgård" receiving their award**

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# Francesco Orsini, Michele D'Ostuni Giuseppina Pennisi

## Joining multiple branches of knowledge to rethink urban agriculture projects: urban farm challenge and experiences

*by Francesco Orsini*
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*Chair, Division on Landscape and Urban Horticulture, International Society for Horticultural Sciences (ISHS).*
*Coordinator, Food Systems in European Cities (H2020-862663-FoodE)*

*Michele D'Ostuni*
*Assistant professor, Alma Mater Studiorum - University of Bologna*

*and Giuseppina Pennisi*
*Assistant professor, Alma Mater Studiorum - University of Bologna*

Nowadays, with the current and foreseen scenario of urbanization and world population growth, urban agriculture (UA) represents an opportunity and a strategy to improve food production and supply, local economy, social integration, environmental sustainability as well as health conditions. Within this context, UA can reach and integrate the three pillars of sustainability: economic, social, and environmental. For these reasons, UA has become a popular and common urban land use form worldwide in many cities.

Indeed, in recent times, UA projects have spread across the world, guided as well as supported by governments and born by community-based initiatives. These projects may have a great variability: they range from low to high technological UA projects or they may have different purposes, being projects

with a purely social and educational purpose or instead mainly devoted to food production and environmental services. Therefore, UA brings together multidisciplinary fields and opportunities. To facilitate a wider uptake of innovative policies and instruments for the promotion of the sustainable goals associated with UA, it is fundamental to first create and raise awareness both between institutional stakeholders as well as civil society through innovative and interdisciplinary approaches.

The international student challenge UrbanFarm2024, which has now reached its 6th edition, is dedicated to the design of new spaces, activities, and solutions for the development of a new prison facility in Trelleborg (SKÅNE, Sweden): the aim is to integrate the prison's architectural design with agricultural facilities to facilitate inmates rehabilitation through farming activities, while, at the same time, reaching fruit and vegetables self-sufficiency within the facility. Similarly to previous editions, the teams had the task of bridging the most innovative strategies in urban farming as well as environmental technology and solutions with multifunctional planning of the prison's external spaces. Moreover, students also had the opportunity to discuss their solutions with the Swedish Prison and Probation Service (Kriminalvarden) in Malmö. Through this challenge, teams must apply their knowledge in real contexts, dealing with the environment and spaces as well as with the local policies. Moreover, they gain a significant opportunity to exchange views and approaches with their peers from different countries as well as backgrounds. Their dissemination and soft skills may also take advantage and be improved, for instance in how to prepare a promotional video or how to orally present their project in front of an audience, making this challenge an important teaching tool.

This publication aims to summarize the main ideas, projects, and solutions that student teams brought together with enthusiasm, dedication, and effort. We believe that these kinds of ideas and projects may not only raise awareness on these topics but also inspire urban planners and institutions to foster the sustainability and liveability of their cities.

**UrbanFarm Student Challenge 2024, group photo taken at Anlarp's Farm in Malmö.** © Marie-Claire Feller

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# Anna María Pálsdóttir, Marie Larsson

## The importance of preparing students to meet the challenges of urban agriculture

*by Anna María Pálsdóttir*
*Associate professor in environmental psychology of landscape architecture and Senior Lecturer in Nature-Based Interventions (NBI). Dept. of People and Society, Swedish University of Agricultural Sciences (SLU), Alnarp, Sweden.*

*and Marie Larsson*
*Landscape Architect and Senior lecturer in Landscape Architecture, emphasising collaboration planning and urban garden cultivation at the dept. of Landscape Architecture, Planning and Management, Swedish University of Agricultural Sciences (SLU), Alnarp, Sweden.*

During the last years, urban agriculture (UA) in Sweden has rapidly grown and covers a vast range of actors, such as municipalities, organizations, and private initiatives. The need for competent advisers and growers is warranted and educational institutions, such as SLU, need to provide adequate education to meet these demands. One such initiative is the course Urban Agriculture and Social Interaction. The course is interdisciplinary on the theme of urban agriculture.

From a global and national perspective, urban agriculture is discussed as a social and political expression in society. Its significance as a marker for ecological resilience and participative citizenship is taken up. On a more detailed scale, the possibilities for urban agriculture are analyzed: what is allowed in the urban areas, how to consider the identity and cultural values of the site, what can you cultivate and how, as well as

what kind of risks and outcomes there may be.

Urban agriculture is a complex field, encompassing various actors from private initiatives to governmental offices. While the approaches and techniques may vary, the need for sustainable solutions, competent growers, and advisers is universal. At SLU, we are committed to meeting these demands and addressing the societal challenges of urban agriculture. One such initiative is our transdisciplinary course, Urban Agriculture and Social Interaction, which tackles food security, technology, environmental sustainability, economics, community engagement, and health benefits. As a part of the course, the students work in international and transdisciplinary teams to solve the UrbanFarm2024 challenge. In that way, they train to work in an international context, solving real-world challenges and gaining insights into the dynamics of urban agriculture through hands-on work. This year included challenges in a confined context, namely prison, which is an extraordinary situation in urban agriculture.

**Example of a urban agriculture garden in Stockholm**

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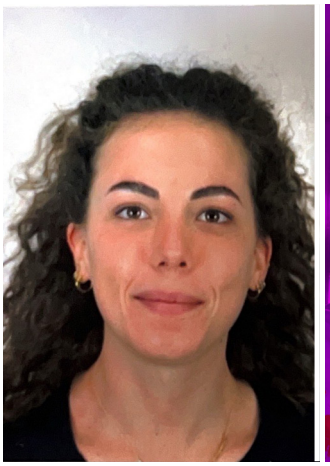
# Andrea d'Aprile, Virginia Cioncoloni

## The Benefits of Green Spaces in Urban Agriculture - Exploring the Advantages of Green Spaces for Inmates

*by Andrea D'Aprile*
*Scolarship recipient, Alma Mater Studiorum - University of Bologna,*

*and Virginia Cioncoloni*
*Ph.D. candidate, Alma Mater Studiorum - University of Bologna*



The benefits of green spaces have been well-documented for decades, particularly in research involving war veterans and elderly people in nursing homes. Only recently, some studies have begun to explore the unique advantages that these spaces can offer to prison populations. Accordingly, horticultural therapy (HT) programs have emerged as a promising solution. These programs have been shown to benefit the mental health of inmates by decreasing depression and anxiety, and by promoting openness and a non - non-judgmental setting using plants as a common element. Additionally, HT programs have been demonstrated to be cost-effective, often offering an economic return on the investment within a few years. Furthermore, they can provide inmates with access to healthy fruits and vegetables, which can improve both their mental and physical health.

In this regard, a green space offers a multitude of benefits when used for therapeutic purposes. These benefits can be observed across multiple areas simultaneously:

**Cognitive Benefits**
Mental health issues are prevalent among incarcerated individuals, up to three times more than the general population. Green spaces offer a relaxing environment that can reduce stress, anxiety, and depression, thereby improving emotional well-being and quality of life. Engaging in horticultural activities activates cognitive processes such as spatial, verbal, and numerical tasks, as well as memory and logic, through activities like designing flowerbeds or reading seed packets.
Therapeutic horticulture also positively impacts linguistic and communicative skills, fostering communication and social interactions related to plant cultivation and green care.

**Physical Benefits**
Green spaces promote physical activity, which is associated with better mental health. Horticultural activities facilitate improvements in mobility, muscle strength, coordination, and balance. They also serve as preventive measures by encouraging healthy eating and the use of organic products.

**Psychological Benefits**
The restricted environment of prisons can have a negative impact on the psychological health of inmates and hinder their rehabilitation. It has been demonstrated that horticultural activities can be an effective means of improving psychological health, fostering a sense of achievement, and rebuilding self-esteem. This is important, as it can result in a re-evaluation of one's capabilities and a regained sense of control over one's life. Furthermore, it has been demonstrated that HT programs can assist in the reduction of emotional distress and psychological issues, thereby facilitating the recovery process from addiction.

**Social Benefits**
The presence of green spaces within correctional facilities facilitates social interaction, thereby promoting positive relationships between inmates, staff, and the community. The act of gardening fosters a relaxing and inclusive atmosphere that encourages communication and collaboration. Such activities facilitate the development of a sense of responsibility, mutual respect, and support within the prison community. Furthermore, participation in green spaces provides inmates with valuable skills and a constructive outlook that can facilitate their reintegration into society. Empirical evidence indicates that HT programs facilitate the reintegration of adolescents into society.

Therapeutic green spaces offer a multitude of cognitive, physical, psychological, and social advantages, particularly for prison populations. It is recommended that they be regarded as an essential element of prison rehabilitation programs, given their capacity to enhance mental health, facilitate positive social interactions, and impart practical skills for reintegration into society. Further research is required to gain a fuller understanding of these programs and to facilitate their wider implementation across the country. It is important to identify and utilize the specific strengths of these programs in order to achieve the desired rehabilitation outcomes.

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# Krook & Tjäder, Kriminalvården

## Innovative landscape design and institutional agriculture for the new Trelleborg prison


*Jennie Edfast*
*Leader of the design team, Architect at Krook & Tjäder*

*Andreas Wallin*
*Kriminavården - Project owner, head of institution*

*Karolina Halldin*
*Leader of the landscape team, Architect, Landscape Architect at Krook & Tjäder*

*Elvira Grandin*
*Landscape team, Landscape Architect at Krook & Tjäder*


Sweden is faced with a challenge to develop several new prison facilities in the upcoming years. The directive is to develop highly effective, secure, and economically viable facilities. However, there are also opportunities to take the new developments into the future with, for instance, measures that increase health, well-being as well as biodiversity, and sustainability. The Swedish

Correctional Services (Kriminalvården) has a target image of 'better out'. One way of achieving this is to incorporate evidence-based design and established ecosystem services that contribute to health and well-being, economic- and ecological sustainability within the facilities.

That is how the idea to provide the Trelleborg prison as a case study for the UrbanFarm2024 student challenge first came out. Accordingly, the whole process has proven to be a great asset for the project, with students working very hard to plan agricultural activities within the facility through stimulating investigative work. The proposed solutions are, indeed, incredibly valuable, and will help the design process by showing well-tested ways, guidelines, and regulations in the field of urban and institutional horticulture.

Specifically, students were asked to design indoor and outdoor spaces of a brand new prison located in a coastal setting in southern Sweden - Trelleborg, Skåne which is surrounded by flat open land with small villages and farms on high-quality agricultural land. Here, we deem that the conditions for a productive urban farm are highly favorable.

Accordingly, the brief for UrbanFarm2024 had two main targets; propose recreational landscapes in the prison courtyard and design the productive landscape in the outdoor areas of the prison.
In this regard, the design proposals needed to focus on improving inmates' and staff' s mental health, personal wellbeing, and providing areas for meaningful leisure time for the inmates. It was also requested that the students would take into consideration the strong safety requirements of a prison, where there should be no risk for inmates - or staff - to get hurt while using the designated spaces or equipment. Accordingly, all outdoor spaces should be easy to monitor and control.

The students were presented with two cases within the prison site; Case 1 `The Recreational Garden' and Case 2 'Indoor and Outdoor Farming System'

The Recreational courtyard gardens are easily accessible outdoor spaces within each block and can be used more frequently than other outdoor areas. These have the potential to become outdoor Living rooms for the inmates. The students were asked for schemes that take into consideration the different needs of inmates and maximize the benefits of contact with the outdoors and nature while dealing with constraints such as shade, security, and limited space Approximately 40 inmates can use each courtyard at one time and it needs to be easily monitored by staff. Each inmate should be able to use the courtyard to their needs hence important to provide both social and contemplative areas as part of the proposals.

The focus of case two, the productive landscape, was to foster intense food production, promote education for inmates create new job opportunities, and reach food self-sufficiency in the prison. The total area for cultivation is about 3,000 $m^2$ for the indoor greenhouse, and 10,000 $m^2$ in the outdoor agricultural field. As part of the task the students were asked to consider crops yearly cycles, with equal inamtes' workload throughout the seasons, faciliting and enabling social and educational activities, fostering inclusion and therapeutical aspects of horticulture. Throughout the year, up to 40 inmates will be involved in agricultural activities and although they will always be accompanied by staff the site must be easily controlled and monitored.

Finally, UrbanFarm2024 has provided us with a stimulating, thought-provoking process, which we are very grateful for, and happy to have been part of. We are immensely impressed with all the different proposals and the related outcomes. Each different team had a very interesting and unique proposals that truly will inspire us in the process of planning the Trelleborg new Prison.

# Evaluation committee

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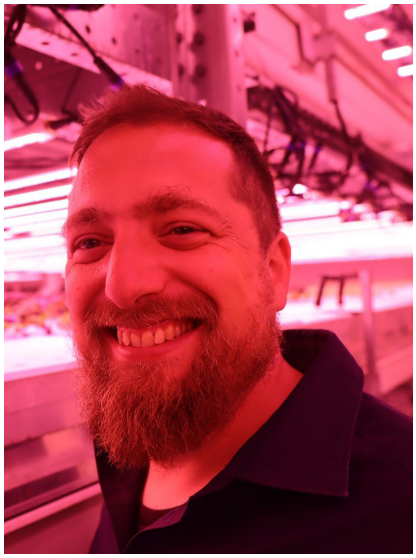






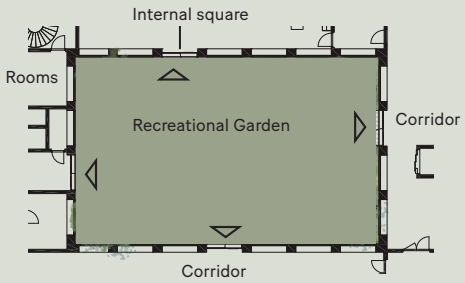



# Trelleborg (Skåne), SWE
# New prison facility

The site in Trelleborg, Skåne, is based on high quality agricultural land in a coastal setting. The surroundings consist of flat open land with small villages and farms. To properly carry out the project, the design proposals must focus on improving inmates and staff mental health, personal wellbeing, and providing areas for meaningful leisure time for the inmates. It is also necessary that the project has a strong focus on safety, so that no one can hurt themselves or others while using the tools and the spaces. Accordingly, avoid loose furniture and hanging wires. Furthermore, all outdoor areas should be easy to check and control with no 'hidden' areas, to always keep watch on the inmates and their work.

Students should elaborate their proposals for two project areas:

**Case 1. Recreational gardens**
In each building, there are two recreational gardens, serving 80 inmates each. Approximately, up to 40 inmates can use the space at the same time, but usually there are no more than 20 altogether at a time. The Recreational gardens are an easily accessible workspace which can be used during workdays, evenings, and weekends. They are surrounded by 2-3 story brick or concrete buildings on all sides, and function like contemplative monastery courtyards. Each inmate can interact with the area differently, and they could function as kitchen gardens with herbs or spaces for barbeque and seating. There is an internal common area with a library, a church, lounge seating, ceramic workshop, etc. that can be opened to the garden. The gardens have different orientations so sun/shade will vary in the different gardens. In the recreational gardens the activities carried out by inmates should always be controlled by the prison's guards to ensure the safety of inmates and staff at all times.




**Case 1. Recreational gardens**

**Purpose of the study**

To investigate how a small-scale outdoor space in a prison environment can be designed using evidence from research as well as high biodiversity and sustainable drainage.

**Requirements**

- Daylight to buildings
- Views from buildings
- Areas for socialising
- Contemplative areas (areas where one can choose to be alone)
- Secure materials and furniture
- Searchable between client groups.
- No hidden areas

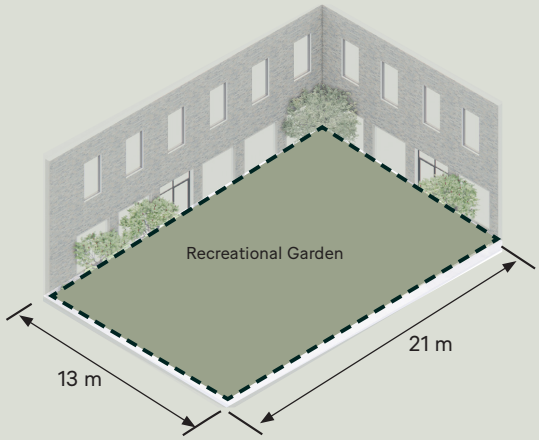
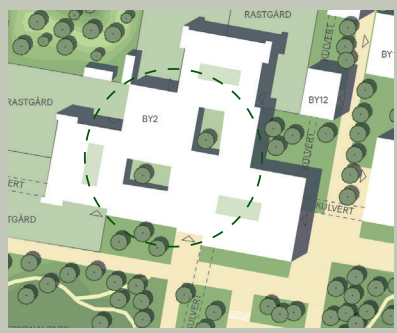



Image showing a test design for Recreational gardens. As part of the project tests are conducted to push boundaries for biodiversity and well-being of the intakes. These test will be evaluated against security requirements, functional needs, logistics, sustainability, maintenance, well being of clients etc.




Case 1. Recreational gardens

**Case 2. Indoor and outdoor farming system**

The focus of this task is to foster intense food production, promote education for inmates creating new job opportunities, and finally reach food self-sufficiency in the prison. Up to 40 inmates will be involved in agricultural activities in the indicated area. The farming activities should be considered intense, with equal workload throughout the seasons in the fields or in the indoor greenhouse. The total area for cultivation is about 3,000 m2 for the indoor greenhouse, and 10,000 m2 in the outdoor agricultural field. The facilities should enable social and educational activities, while also fostering inclusion and therapeutical aspects of horticulture. In this case, the safety requirements mostly refer to materials, tools, and furniture. In the cultivation areas, the inmates are always accompanied by staff, so the need to control the whole area from one spot is not as crucial as in Case 1; however, it is still important that the cultivation spaces are easily controlled and monitored.

**Case 2. Indoor and outdoor farming system**

**Purpose of the study**

To investigate how an indoor farming system and an outdoor agricultural area in a prison environment can be designed using evidence from research as well as integrating the assessment of related social, economic and environmental impacts. Definition of the optimal business model and revenue flows associated with the activity. Self-suffiency for 1200 people. Production and work tasks for the inmates is needed even in winter time. Green house area can contain different climate zones.

**Requirements**

- Safe materials and furniture
- Chain-link fencing to the perimeter of the space
- Possible to overview space with cameras and staff
- Equal workload throughout the year
- Maximum bulding height 13 m
- Work intense
- No hidden areas

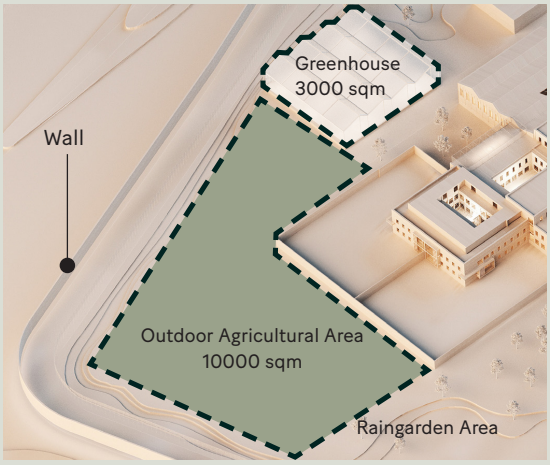



Image showing a test design proposal for the Greenhouse and the Outdoor Agricultural Area.
As part of the project tests are conducted to push boundaries for farming, biodiversity and well-being of the intakes. These test will be evaluated against security requirements, functional needs, logistics, sustainability, maintenance, well being of clients etc.

**TEAMS**

*Participating students*

## Biophilia Cultivators

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## Skogna Bolåne

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## Green is the new Orange

Astrid Helgesson Liljedahl , Daria Korneeva, Eve Florence Palmer, Lucie Lasnel, Mathilde Rouault, Sebastiano De Angelis, Takakazu Sonoki

## Hyphae

Arman Neisi, Giuseppe Rizzello, Harry Whiteley, Lijo C Raju, Marie Gabrielle Von Elpons, Sabaya Quayum Chowdhury

Jurre Severs, Lisa Hartmann, Martina Daguerre, Mattia Fabris, Salma Ayman Zidan Abdelhamid, Suada Pastacaldi, Vera Smekalina

## Biophilia Cultivators

**Abstract - Biophilia and the Practice of Biophilic Design An Approach to Recidivism Prevention in Trelleborg (Skåne) Prison's Facility**

The Biophilia Cultivators group strongly aligns with the Biophilia Hypothesis, stating that humans are inherently inclined on a genetic and psychological basis to affiliate with nature and focus on life and life-like processes, due to their evolutionary dependency on nature for survival, development, and self-fulfillment. It has been proven, that dismal and restricted environments negatively impact humans' mental and physical health, whereas frequent contact with nature is beneficial. Individuals in rehabilitation programs are in dire need of others to connect with nature for self-improvement. Sweden's Trelleborg prison facility provides an opportunity where activities and elements from nature can aid in the rehabilitation and self-fulfillment of inmates, enabling them to rejoin their society and communities after their sentence.
With the comprehension of biophilia, the group wants to incorporate the architectural concept of Biophilic Design in the recreational gardens (case 1) and entangle nature with human-made spaces via visual (colorful ornamental plants; paint; artificial lighting), acoustic (speakers for birds-chirping or wave sounds), textural (stone seating; grass and sand barefoot areas) and fragrant elements (herbs, ornamental and medicinal plants). The aim is to provide inmates with frequent affiliation to a nature-like space, where they can reflect, calm their fight-or-flight sense, sequester, and converge for leisure. All plants incorporated via biophilic design in the recreational gardens are to be propagated and cultivated year-round in the greenhouse (case 2) to guarantee low-cost maintenance and allow for inmates to experience seasonal change.

Regarding the indoor and outdoor farming facilities (case 2), the group aims to create an agricultural system that focuses on biodiversity preservation, carbon footprint reduction, circular economy, and social sustainability. Bordering the outdoor farming area, shrubs will be cultivated as windbreakers and as habitats for pollinators and beneficial biocontrol insects, thus preserving populations,

providing habitat for augmentation, and making the farm more self-sustaining and less reliant on chemical pesticides. The outdoor farming area will be divided into smaller fields, where crop rotation will maintain soil aggregates and fertility qualities, thus sustainably preparing the prison's land for a future that will change with global warming with minimal inputs.
The prison's wastewater is to be integrated with drip irrigation systems; heat and $CO_2$ are to be transported via tubes to maintain favorable indoor farming conditions in the greenhouse. In addition, solar panels are to be installed on the prison's flat roofs, thus reducing dependency on fossil fuels, and transitioning to renewable energy sources.
Crops cultivated will be those aligned with the prison's kitchen meal plan and foreseen circular economy to reduce costs. Surplus produce will be supplied to programs that curate to the less fortunate. Economically, the goal is to self-sustain, keeping initial investment costs constant in the short-term and scaling an economic return through community initiatives in the long term.

Education on the farm is pivotal for the Biophilia Cultivators, as it can reduce recidivism rates and allow inmates to gain skills that can be used after they reintegrate into society. Inmates with main employment in agricultural activities will have to opportunity to learn numerous propagation and cultivation skills in addition to maintenance methods based on the species grown outdoors and indoors year-round. Agricultural activities can be integrated with counseling, occupational therapy, environmental education, and other recreational or educational activities to facilitate rehabilitation and social reintegration of inmates.

| PROJECT DEFINITION 01 | MARKETING AND SALES STRATEGIES 05 |
|---|---|
| The mission of our project is to provide a positive learning and rehabilitation environment for inmates through sustainable agriculture. We are committed to using the green space within the prison to grow fresh and nutritional produce, promoting environmental responsibility and self-sufficiency.<br>(Vision) we imagine an environment in which prisoners acquire agricultural skills, develop greater environmental awareness, and experience a sense of accomplishment and hope for their future | Partnership with local business, markets and restaurants.<br>• dedicated section for the preparation of ready-to-eat or for raw vegetables that will be delivered<br>• cooperative ventures with restaurants |
| BUSINESS MODEL 02 | MONITORING AND EVALUATION 06 |
| Biophilia Cultivators will operate as a social enterprise within the Trelleborg prison facility, collaborating with prison authorities and stakeholders to implement its initiatives. The business model encompasses two main revenue streams:<br>• **Recreational Gardens:** Designing and maintaining biophilic recreational gardens within the prison premises. Revenue will be generated through government grants, donations, and potential fees for guided tours or workshops conducted for external visitors.<br>• **Agricultural Operations:** Cultivating crops in indoor and outdoor farming facilities. Revenue will be generated through the sale of produce to the prison kitchen for meal plans, surplus produce distribution to community programs, and potential partnerships with local markets or restaurants. | Key performances indicators:<br>• Crop yield per square meter/area<br>• safety incidents in the garden<br>• percentage of produce consumed internally<br>• percentage of recidivism among participants<br>• community engagement<br>• volunteer participation<br>• community event attendance |
| KEY ACTIVITIES 03 | RISK ANALYSIS 07 |
| • Biophilic Design Implementation: Designing and implementing biophilic elements such as visual, acoustic, textural, and fragrant features in recreational gardens.<br>• Agricultural Operations: Managing indoor and outdoor farming facilities, including crop cultivation, biodiversity preservation, and sustainable farming practices.<br>• Education and Training: Providing agricultural education and vocational training programs for inmates, integrating agricultural activities with counseling and therapy sessions.<br>• Community Engagement: Collaborating with local communities, businesses, and organizations to foster social integration and support community initiatives. | • security issues<br>• adverse weather conditions<br>• regulatory changes |
| MARKET ANALYSIS 04 | FINANCIAL PROJECTIONS 08 |
| The market for biophilic design and sustainable agriculture within correctional facilities is growing, driven by increasing awareness of the benefits of nature-based interventions in rehabilitation and the rising demand for sustainable food production. Biophilia Cultivators aims to capitalize on this market opportunity by offering comprehensive solutions tailored to the needs of Trelleborg prison and potentially expanding to other correctional facilities in the future. | Initial investment will be required for infrastructure setup, equipment acquisition, and staff training. However, the project aims to achieve self-sustainability in the short term by optimizing resource utilization and maximizing revenue streams from garden tours, produce sales, and educational programs. Long-term economic returns will be scaled through community initiatives, partnerships, and potential expansion opportunities. |

Adriana del Pilar Pérez Rubiano, Alessandra Alario, Giovanni Ferrigato, Isabel Becdach, Nidhi shalini Dungdung, Sára Gyöngyösi, Sonali Basnayaka

# Green Escape Designers

**Abstract - Green Escape, feel the senses**

The Green Escape project unfolds within the confines of the Trelleborg Prison in Sweden. We are a team of visionaries who are re-imagining incarceration. Our focus is to design sustainable open spaces that allow prisoners to metaphorically "escape" to mental freedom, transforming their emotional state within the prison walls.

Our principal idea is to create Green Spaces, where inmates engage all their senses consciously. When they touch the soil, taste a freshly picked tomato, or listen to the gentle flow of water, they find themselves fully present. These moments of mindfulness can lead to productivity, self-awareness, and improved emotional well-being.

The prison provides two central spaces. The first space will be a recreational garden, planted with herbal, medicinal, and aromatic plants such as lavender and basil. It will also include a sensorial element of sound, touch, and sight. The presence of a water fountain will give a soothing auditory sense while the vibrant flowers will provide visual calmness and the installation of a gravel path and grass lawn will stimulate the sense of touch. The recreational area will also have an outdoor library for the inmates to engage themselves in reading.

For the second space, there is an outdoor agricultural area, which has been divided into four major sections, each from every season of the year, allowing inmates to perform different activities. As the seasons progress, each plot transitions for different crops like zucchini, peppers, radishes, leeks, onions, and potatoes, with Camelina (*Dorella coltivata*) reintroduced strategically to enrich the soil during cover crop phases.

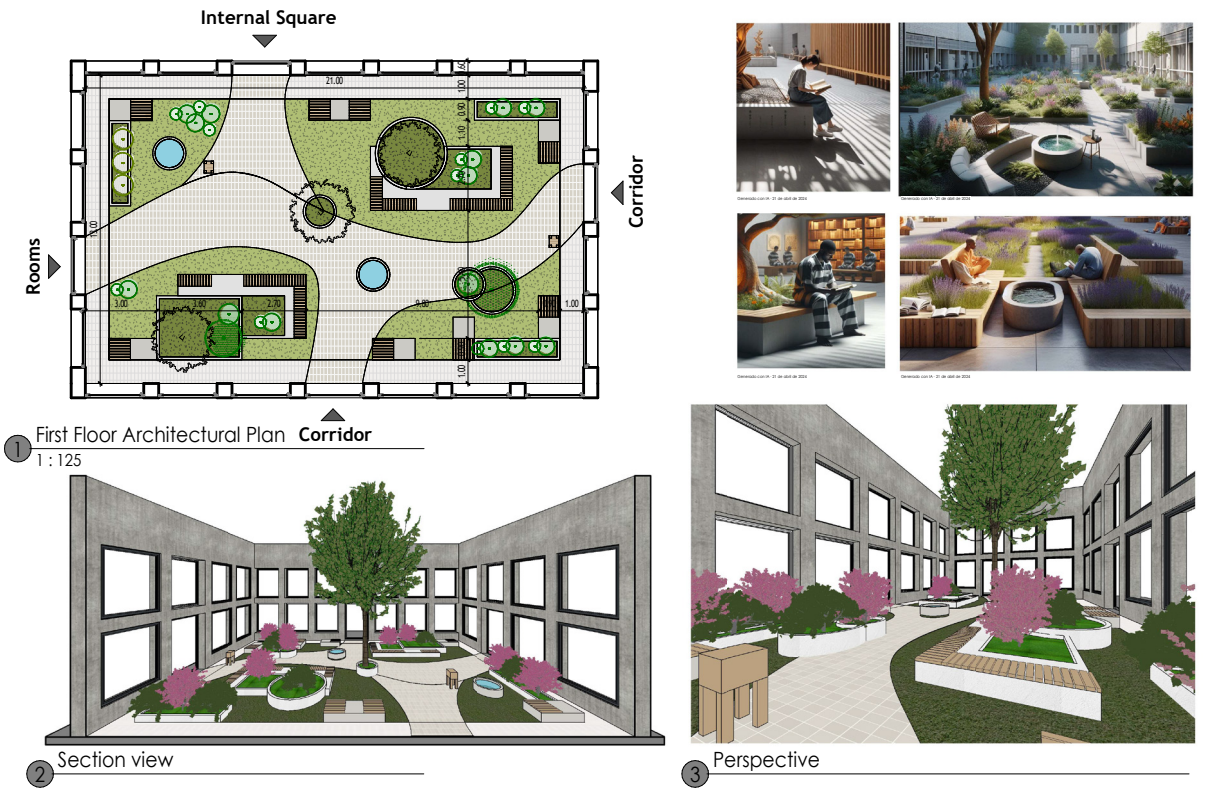
Over two years, every plot undergoes a rotation that includes six months of Camelina cover crop, enhancing soil fertility, promoting biodiversity, and mitigating soil erosion. This practice not only

sustains the health of the soil ecosystem within the prison grounds but also serves as an educational opportunity for inmates to learn about sustainable agriculture and environmental stewardship. As a team, they would get a chance to work together socially, harvesting through the seasons, whether planting in spring, reaping in summer or pruning in autumn. Each task will become a mind full of activity. A beehive will also provide huge benefits, encompassing ecological, economic, and social dimensions. Fruit crops will also be present, giving the inmates the possibility to grab a pear, prune an apple, or make cherry syrup.

The greenhouse will contain hydroponic and aquaponic systems, ensuring a year-round supply of fresh produce of leafy vegetables, tomatoes, and strawberries. Vertical towers will be implanted to maximize the production of vegetable kitchens.

Achieving environmental sustainability is pivotal in our project. As such, our proposal focuses on the efficient use of water. Rainwater harvesting, tap-water recycling, and reclaimed water strategies are used to minimize water waste. Our plan also emphasizes on efficacy of energy, solar panels will be placed above the existing greenhouse to produce electricity, thus reducing the carbon footprint. Vermicompost bins will be made to produce natural manure. This will promote soil fertility and reduce waste in the system.

The Green Escape project teaches us that even in challenging environments, the simplest experience of gardening can lead to personal growth and connection with oneself, finding joy in the rhythm of nature, we discover a pathway to inner freedom, where the barriers of incarceration fade away.




**Design and virtual images of the Recreational gardens**

Adeline Langlet, Alice Benagli, Azadeh Hajipour, Carolina Ess, Ella Herbez, Gioia Riolli, Lorenzo Ferri

# Regeneration

**Abstract**

This year's UrbanFarm Challenge is about designing green areas with two distinct purposes regarding the project implementation of the new Trelleborg prison: a recreational area characterized by two separate but similar spaces accessible by the inmates; and a horticultural garden with a greenhouse, aiming to provide as much self-sufficiency to the future 1,200 inmates as possible. Our team “Regeneration” developed a design based on the concept of giving a second chance to grow by acquiring new skills, and the healing capacity of nature and gardening.

The design of our recreational gardens aims at offering a stimulating and calming environment. Local flowers and aromatic herbs will trigger the senses of sight, smell, and taste. In a sun-shaped disposition surrounding a carp pond, inmates will have access to gathering places such as tables, as well as more isolated and personal spaces located in the corners of the gardens.

The horticultural garden will have highly productive areas combining new technologies in the greenhouse using Deep Water Culture (DWC) hydroponics and mushroom containers to allow continuous productivity all year round. Using a circular water system, reduction of water usage, and reuse of $CO_2$ from mushroom containers to further increase productivity. Agricultural practices following agroecological principles such as crop rotation, crop diversification, no-dig, and compost mulching will be used in the open field. Composting using food wastes from the prison's kitchen and used substrate from mushroom cultivation will reduce the amount of external fertilizers, increasing the environmental sustainability of the agroecosystem. We will also favor varieties adapted to the Swedish climate in order to grow food that is nutritional and culturally adapted to the consumers. An area of the garden will also be dedicated to the cultivation of flowers (Tulips) with the aim of commercializing them.

The use of these agroecological practices relying on hand labor as well as a continuous production cycle allowed by the greenhouse will provide a high level of activity to the 40 inmates in charge of that area. We considered the following elements in our design to maintain this activity level:

- techniques to increase the growing season;
- post-harvest activities such as harvest preservation techniques, canning, fermenting, drying, etc.

Spaces to gather and provide education will also be included to offer continuous training and skill transfer to increase the chance for inmates to find a job after rehabilitation. A training certification in association with an external education organization could also be planned.

The main external inputs in our system are energy and fertilizers for the DWC. We will aim at reducing energy consumption using renewable energy sources such as solar panels and eventually a wind turbine. The use of natural conservation techniques such as root clamping and evaporation cooling systems will also contribute to the reduction of energy costs. Agroecological practices limiting the quantity of external inputs, like the reuse of wastewater from DWC and substrate from mushroom containers, will be further considered for the greenhouse and mushroom production.


**Value chain analysis**


Dinesha Rathnayke, Dmitrii Ivanov, Hamayun Shabir, Laëtitia Boirel, Lamrot Gebremariam, Matilde Frascari, Tara Murk

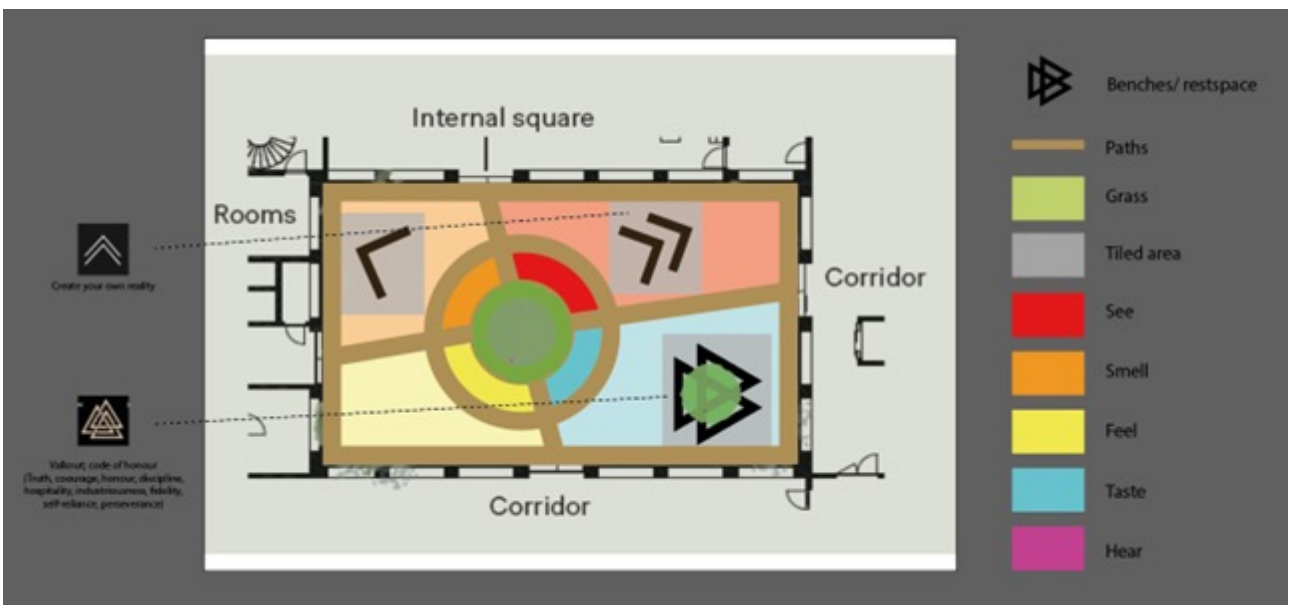
# Green Mates

**Abstract - Cultivate your future**

Within the confines of a Swedish prison in Trelleborg, a groundbreaking initiative is underway to develop an urban agriculture project aimed at transforming the rehabilitation landscape. This report delves into the comprehensive planning and implementation of this project, which seeks to revolutionize the prison system's approach to inmate engagement, education, and sustainability.
The primary objective of the project is to foster intense food production within the prison grounds, thereby promoting self-sufficiency and providing meaningful employment opportunities for up to 40 inmates. Through the cultivation of a diverse range of crops across a total area of 13,000 $m^2$, including both indoor greenhouses and outdoor fields, the project aims to create a dynamic agricultural ecosystem that operates year-round, regardless of seasonal variations.
Safety and security are paramount considerations in the project's design, with measures such as chain-link fencing, surveillance cameras, and carefully selected materials ensuring the well-being of both inmates and staff. Moreover, the project emphasizes equal workload distribution throughout the year, ensuring that inmates remain engaged in productive activities regardless of the season.
Innovative agricultural techniques are at the core of the project's implementation. The greenhouse facilities, spanning 3,000 $m^2$, will host the cultivation of strawberries, lettuce, and tomatoes, offering inmates the opportunity to learn and work in sophisticated production systems. Meanwhile, outdoor vegetable gardens and native plant nurseries will contribute to biodiversity conservation and provide hands-on learning experiences for the participants. Environmental sustainability lies at the heart of the project's ethos, with a focus on energy efficiency, water conservation, and waste management. Advanced technologies, including LED lighting and automated climate control systems, are being integrated to minimize energy consumption. Rainwater harvesting and greywater recycling systems ensure efficient water usage. Materials selection prioritizes sustainability, with locally sourced and recyclable materials minimizing the project's ecological footprint. Beyond its practical objectives, the project seeks to harness the social and educational potential of urban agriculture

within a prison setting. Gardening activities are envisioned as therapeutic outlets, offering inmates a chance to reconnect with nature, reduce stress levels, and develop valuable skills in agriculture and horticulture. Furthermore, the project fosters community engagement through workshops, beekeeping initiatives, and interactions with neighboring residents, promoting social inclusion and rehabilitation. Education is a key component of the project, with inmates participating in workshops on seedling transplantation, vegetable processing, and construction of insect boxes.

Additionally, the establishment of a native plant nursery serves as an educational tool, providing insights into Sweden's native flora and supporting conservation efforts. The project's economic viability is also addressed through a comprehensive business plan, value chain analysis, and sales budget. By creating opportunities for sustainable food production and skill development, the project aims to empower inmates with valuable vocational training and promote their successful reintegration into society upon release. In conclusion, this urban agriculture initiative represents a holistic approach to rehabilitation within the Swedish prison system. By combining intensive food production, environmental sustainability, and social inclusion, the project embodies the potential for transformative change, offering inmates a pathway to rehabilitation, empowerment, and a brighter future beyond the prison walls.





**Sensory approach to the recreational garden**

Alexandra Chiriac, Amina Bayramova, Arthur Wilfred Afeugueu Simo , Gianmarco Gai, Syed Abdullah Shah, Viktoriia Koltinova, Yuetong Li

## Fenceless Farmers

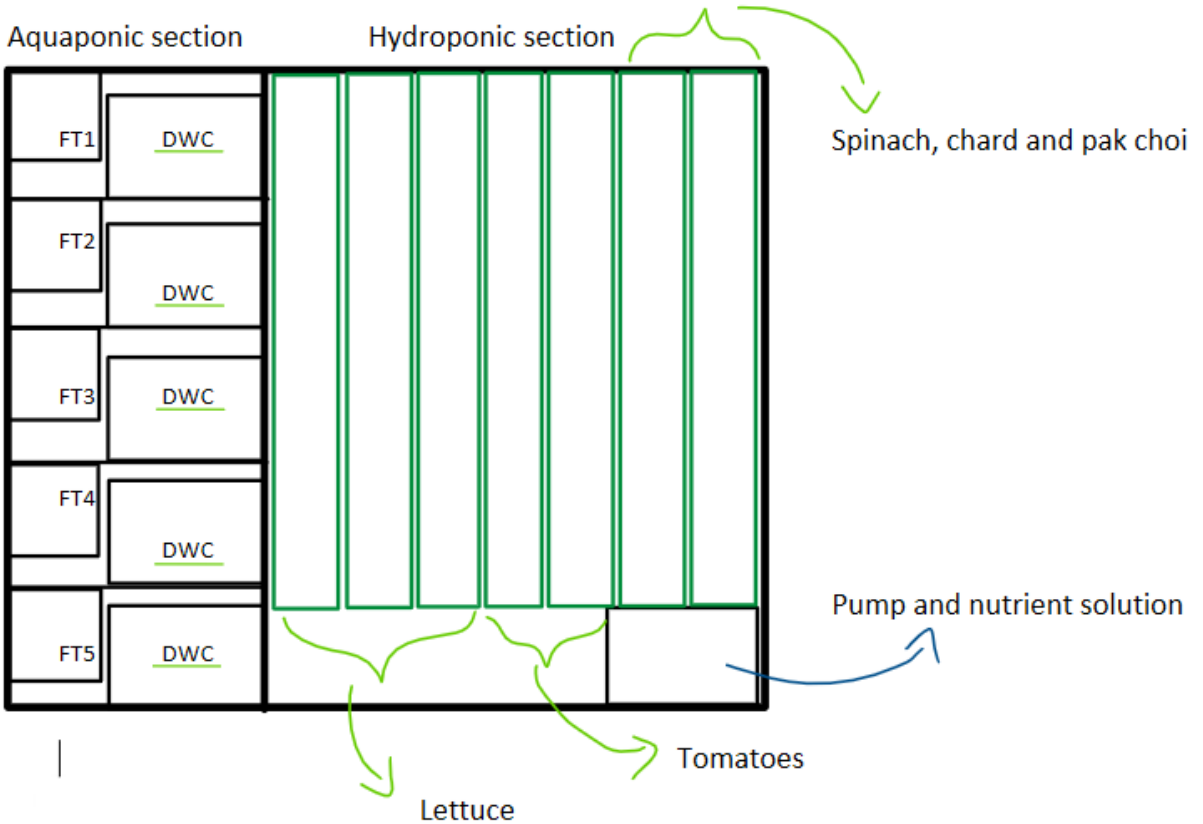
**Abstract**

In case 1, we designed a small outdoor space with high biodiversity and sustainable drainage in a prison environment in Trelleborg. We chose the appropriate biological species by studying the location of the prison and determined the focus of the design by learning about the mental health concerns of inmates in prisons in Sweden and rationalizing these all at the required scale. Our design can be broadly categorized into:

- mental health building zones such as yoga areas, gyms, art galleries, a church, a library, some educational workshops for spiritual and intellectual growth;
- ecological and agricultural diversity zones such as gardens and animal houses.

The agricultural section emphasizes the responsible utilization of resources, with wastewater repurposed for irrigation to sustain diverse crops including vegetables, fruits, and ornamental plants. Vertical gardens adorned with flowering vines enhance the aesthetic appeal while providing a serene environment for inmates. In the pursuit of environmental sustainability, the incorporation of energy-efficient lighting, rainwater collection, and recycling initiatives underscores the commitment to minimize resource consumption and emissions. A waste management plan further promotes recycling and composting efforts, ensuring the closed-loop utilization of organic waste. Through these initiatives, the Trelleborg prison facility exemplifies a model of sustainability and empowerment, enriching the lives of inmates while contributing to environmental conservation.
In case 2 we will plant both vegetables and fruit trees, in outdoor and indoor environments. In the outdoor spaces, we decide to produce species that fit well in the environment choosing varieties as local as possible. As vegetables we will harvest potatoes, onions, carrots, black kale, and iceberg lettuce, these products will help the prison to reach food self-sufficiency. Concerning fruit production, we decided to plant fruit trees that grow naturally in Swedish woods and opted for six different

species of berries: raspberries, blackberries, red currant, black currant, bilberries, and strawberries. These products will be eaten by the inmates, sold to the community, and transformed into jams for educational and social purposes. All the production will be organic and we will use compost originating from the prison's organic waste. In the greenhouse, we will use both simple hydroponic and aquaponic systems. This way, we could produce both vegetables and fish that can be eaten by inmates. Lettuce, leafy plants, and tomatoes (not all over the year) will be the main vegetables produced in the greenhouse with a Deep Water Culture (DWC) system. Next to the greenhouse, we will put a container for mushroom production, where the $CO_2$ produced by the container will be used inside the greenhouse. We plan to construct LED panels and UV lights, these installations will ensure consistent, optimized light exposure, promoting the growth of crops throughout the year, regardless of external weather conditions. The project enables inmates to engage in meaningful agricultural work, fostering a sense of responsibility and accomplishment. Furthermore, participating in such productive activities offers a constructive way to utilize their time, potentially reducing recidivism rates by promoting a smoother transition back into society.




FT: Fish Tank; DWC: Deep Water Culture (for lettuce connected to the fish tanks)

**Aquaponic system inside the Greenhouse**


Isolde Mulder, Julia Gaude, Maria Caterina Vaccari, Monica Preda, Razieh Shirgir, Stefania Bianco, Yun-Syuan Wang

## Intertwine

**Abstract**

Intertwine like the mycelium of a fungus, the flight of the bees, the mycorrhiza of the roots, the crop, and the trees in an agroforest, the human bonds.

The project "Intertwine" aims to interconnect various aspects of biodiversity and human well-being, ensuring at the same time food security and personal growth. Through the diversification of activity that will occur inside the prison, the inmates will discover the benefit of living in symbiosis with nature while gaining practical expertise that can be used in their future lives. At the same time, environmental protection and several ecosystem services will be ensured.

The recreational garden will be a mindfulness garden, where inmates will take their spiritual time and where they will link with each other, intertwining positive relationships. This serene environment will be supported by aromatic plants and water elements, enhancing the overall experience and promoting a sense of tranquility and connection.

The outdoor cultivation area will become an agroforest. The alley-cropping system will include rows of trees for fruits, nuts, or wood production divided by annual crops of cereals and legumes. Around the agroforest, there will be insect hotels, birdhouses, and bee hives. The animals will work as pollinators and will promote biodiversity; furthermore, the physical structures where they can live will be created by the inmates during workshops.

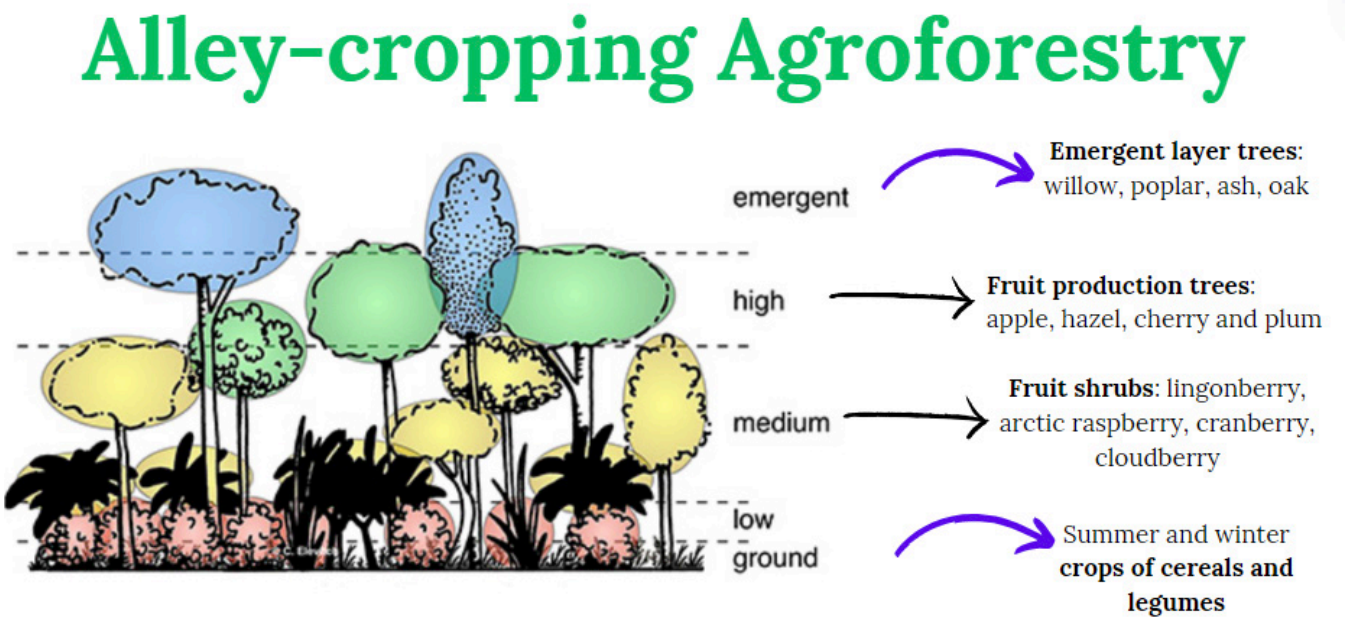
The greenhouse will be divided into an indoor mushroom cultivation and a vegetable indoor cultivation. The greenhouse will be built with sustainable materials, such as recycled materials and glass windows based on durability. Water will be harvested from the roof; plus, hydroponic technique and nutrient film techniques will be used to reduce water consumption.

Environmental sustainability is one of the main pillars of the project: the high plant biodiversity value of the agroforest, as well as the animals going around, will ensure high ecosystem services. Furthermore, the system aims to reach circularity through clean energy production, water harvesting, grey water treatment through innovative techniques, community compost with earthworms, and wood provisioning.

Social sustainability will be reached through the training of the inmates in several activities: planning and planting an agroforest, beekeeping, growing mushrooms, building shelters for animals, working with wood, growing food in the greenhouses with innovative techniques and finally post-harvest activities will be organized. The training purpose is not just learning farming skills, but also how to convey them to other inmates, encouraging community building and cooperation.

Economic sustainability will be ensured with the differentiation of resources the project will provide: crops, fruits and vegetables, honey, mushrooms, and wood. All these will be used inside the prison to support the self-maintenance of the system. These resources support the prison's self-maintenance while potentially attracting external support from Swedish associations interested in sustainable agriculture.

Intertwine aims to create a holistic and sustainable environment within the prison, where inmates can reconnect with themselves, each other, and the environment. The project seeks to intertwine the three sustainability dimensions, creating a regenerated socio-ecological-economics ecosystem.




**Conceptualizing the Agroforest**

Esmeralda Vita, Julie Lavabre , Levin Pafumi, Marcus Holmström, Nicola Rachael Smith, Racheal Hellen Nakirya, Rahul Bikram Karki

**Skogna Bolåne**

**Abstract - Grow My Future**

Our "Grow my Future" project aims to apply sustainable agriculture practices within a prison in Trelleborg, Sweden. The project's approach focuses on four key concepts: multifunctionality, circularity, self-empowerment, and biodiversity.

The project places a strong emphasis on the multifunctional utilization of resources within the prison environment. Our urban design strategy supports infrastructure that serves multiple purposes, including the integration of modular buildings.
This includes areas for processing and cultivation, creativity and gathering, solitary reflection, and free sections for unplanned activities.
Our plant selection includes species assisting pest control and climate regulation, contributing to a more balanced ecosystem. Within our sensory gardens, we have a diverse range of plants to engage all senses. In our greenhouses, modern technologies such as vertical hydroponic and air circulation systems will enhance efficiency, promote environmental sustainability, offer economic benefits, and improve the well-being of prisoners.

Circularity is a core principle of the project, focusing on the efficient management of organic waste, air, and water, the aim is to create a closed circle of integrated systems. Through composting organic waste from the prison kitchen and agricultural activities, nutrients are recycled back into the system, reducing the reliance on external inputs.

Additionally, innovative solutions like air purification using plant-based systems utilizing greenhouse air for indoor circulation within the prison compound enhance resource circularity.
Our stormwater management and treatment technologies further contribute to the circularity of resources, ensuring a more sustainable and self-sufficient ecosystem within the prison facility.

We attach great importance to self-empowerment and in setting up a market, this is a way for inmates to collaborate and create links with the outside community.

Making jams with berries growing in the garden would be an initial product inmates could be proud of producing. They would be actively responsible for the brand organization, making decisions and strategic changes. In our producing fields, beehives will offer inmates the opportunity to work as beekeepers, supporting pollination efforts, gaining valuable skills, and providing a sustainable source of honey. This initiative encourages collaboration among inmates, staff, and local communities, fostering a sense of pride and ownership in the products produced. By involving inmates in meaningful work and skill-building activities, the project aims to support their rehabilitation and reintegration into society.

Our design integrates biodiversity through different plant species, composting, crop rotation, natural pest control, and garden management. The inmates will grow a variety of vegetables using sustainable farming practices like permaculture, mimicking natural ecosystems and enhancing biodiversity, soil health, and resilience to environmental challenges. Furthermore, the presence of green spaces within the prison environment has been shown to improve mental health and overall well-being among inmates.

The project aims to promote environmental stewardship, social cohesion, and rehabilitation among inmates. The concepts are interconnected and complement each other within a cohesive framework, synergistically contributing to the project's goals. Through collaborative efforts and a holistic perspective, the project seeks to create a more sustainable and inclusive future for all.

## *"Grow My Future" Brand Business Plan*

| Cost centers | | Value propositions | Profit centers | |
|---|---|---|---|---|
| **Key partners** | **Key activites** | | **Customer relationships** | **Customer segments** |
| Swedish government<br>Area municipality<br>Stakeholders general (private, supermarket chains, cooperatives)<br>Prison administration<br>Suppliers<br>Non government organisations | Sustainable agriculture<br>Cultivating the land<br>Harvest the products<br>Transform the product<br>Quality Control<br>Processing and packing"<br>Post production refinery<br>Marketing<br>Selling products from the garden<br>Training | Food waste -> composting<br><br>Distance from the outside community -> sales of garden product<br><br>Stigmatisation of prisoners -> robust communication and marketing strategy | Social media<br>Friends / Family<br>Guards<br>Community engagement | Local residents<br>Friends / family<br>Guards<br>Community institutions (schools, hospitals etc) |
| **Cost structures** | **Key resources** | Economic self-sufficiency->reduce operating costs and generate revenue through sales<br><br>Competition-> consistency in production of good quality product, robust marketing and clear communication about product's origin and production methods.<br>Initial funding constraints -> secure consistent funding through grants<br><br>Recruting and retaining staff -> adequate training, support and work environment | **Channels** | **Revenue streams** |
| Initial build-, installation costs<br>Seeds / equipment<br>Mulch<br>Energy consumption<br>Product refinement equipment<br>Packaging material<br>Soil<br>Fertilizer / nutrient solution<br>Crop security expenses (bio. pest contr. / mesh)<br>Wages<br>Insurance<br>Training | Seeds<br>Mulch<br>Compost station<br>Gardening tools (shed)<br>Cooking equipment<br>Washing station<br>Water sources (garden taps / drip irrigation)<br>Hydroponic systems (Greenhouse)<br>LED-lights (Greenhouse)<br>Vertical garden racks (Greenhouse)<br>Nutrient solution (A+B solutions, hydropon.)"<br>Pre-cultivation unit (Greenhouse)<br>Jam / saft / misc. food prodution | | Online platforms<br>Retailers<br>Direct sales<br>"Charities<br>Wholesalers"<br>Agents<br>Community engagement | Jam / saft / misc. food production<br>Governmental funding<br>Subsidies<br>Grants<br>Product sales |

**Trelleborg prison Business Plan**

Samuel Martintoni1, Shubham Bam, Shannon Cronin, Hasara Kumaragama, Allison Sermarini, Emily Kroll, Goutham Nidhi

## Lingonträdgård - 1st RANK

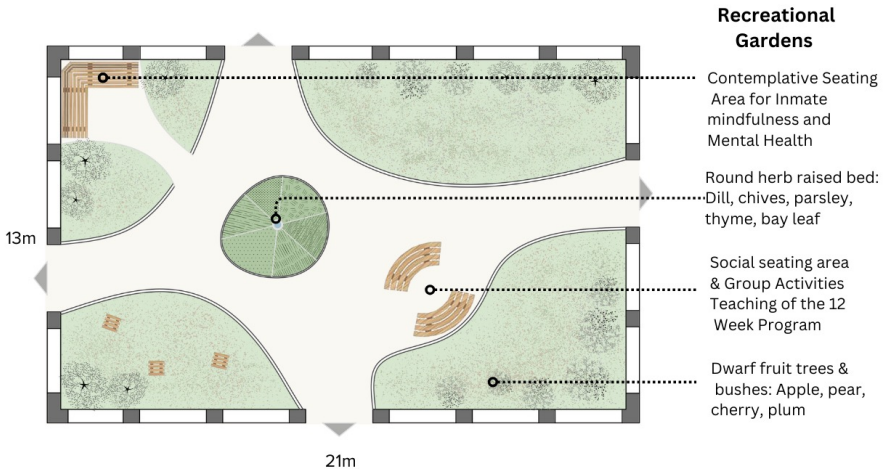
**Abstract**

The Lingonträdgård project, an interdisciplinary urban farming and landscaping initiative held in the Trelleborg, Sweden prison, represents an innovative collaboration between the Swedish University of Agricultural Sciences in Alnarp and the University of Bologna in Italy. This partnership leverages the strengths and expertise of both institutions to create a multifaceted program aimed at inmate rehabilitation through agriculture, environmental stewardship, and horticultural therapy.
Studies state that the frequency of prisoners with mental health issues is more than three times that of the general population. Mental health disorders, such as anxiety, depression, post-traumatic stress disorder, bipolar disorder, and schizophrenia are a few of the main diagnoses. Unfortunately, many prisoners in the system remain undiagnosed. Correctional agriculture and gardening programs have proven to positively impact inmates' physical, social, and mental health, including rehabilitation and recidivism. Testimonies from inmates working in facility gardens stated feeling pride in their labors, fostering a climate that supported their well-being while also providing a space to avoid conflicts that could have significant consequences.

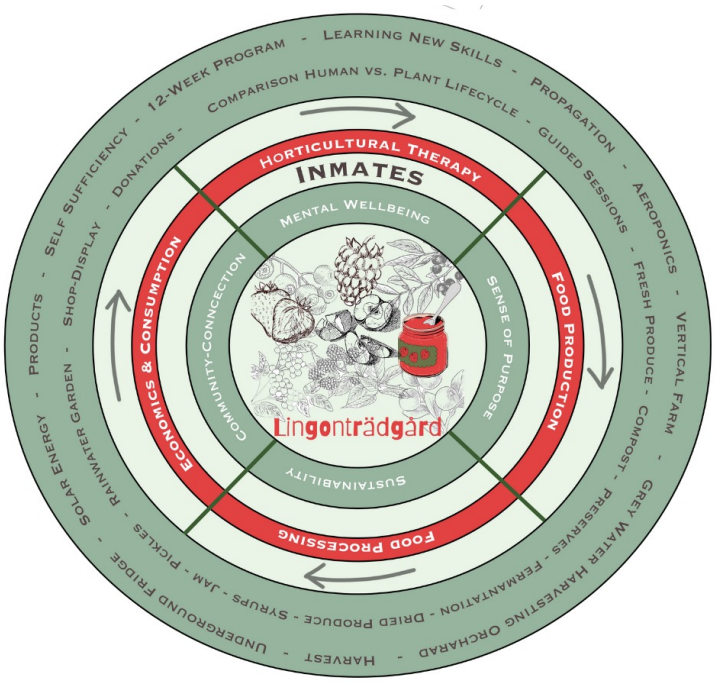
Agricultural production will be divided into three areas. The first area is the greenhouse, equipped with a vertical farm hydroponic system. Crops in the greenhouse will be bell peppers, eggplants, strawberries, lettuce, tomatoes, and basil. The second area will be dedicated to outside traditional cultivation of onions, potatoes, cabbages, carrots, turnips, and spinach. This area will be encircled by a small area dedicated to cloudberry production, which doubles as a wind barrier, to avoid terrain erosion. Lastly, a small orchard will be built, with a production of varieties of apples, cherries, cowberries and plums specifically selected to be pathogen-resistant. Moreover, the project introduces innovative solutions such as ground fridges for efficient storage and natural cooling. Agricultural produce from both the farm and greenhouses will be utilized to create a range of products from sauces, jams, preserves, and other food processing activities, aimed at equipping

inmates with culinary and preservation skills, and served to inmates fresh as well.
We also aim to establish a circular economy that spans all sectors, from production to waste management to conserve resources for as long as possible. Leftover organic waste will be composted to produce biofertilizers. Rainwater will be collected within the prison premises to ensure efficient irrigation practices. Farmed produce will supplement prisoner's diets reducing purchasing food costs, diversifying their diets, and promoting self-sufficiency. Products created within the prison will also be distributed for sale through nearby local shops to promote the transparency of the prison and improve the perception of inmates within the community.

Inside the prison's recreational areas, the Lingonträdgård project will focus on creating an attractive space for social gatherings, reflection, and connection for all inmates to enjoy. A voluntary 12-week horticultural therapy program will take place to create a small herb garden and partake in discussions focused on social and cognitive skills. By combining urban agriculture, cognitive therapy, and work training inmates at the Trelleborg prison will be able to develop skills that will help them thrive and integrate when released into society.




**Floorplan and functions of the Recreational gardens**





**Key aspects, benefits, and relations in the new Trelleborg prison**

Astrid Helgesson Liljedahl , Daria Korneeva, Eve Florence Palmer, Lucie Lasnel, Mathilde Rouault, Sebastiano De Angelis, Takakazu Sonoki

# Green is the new Orange

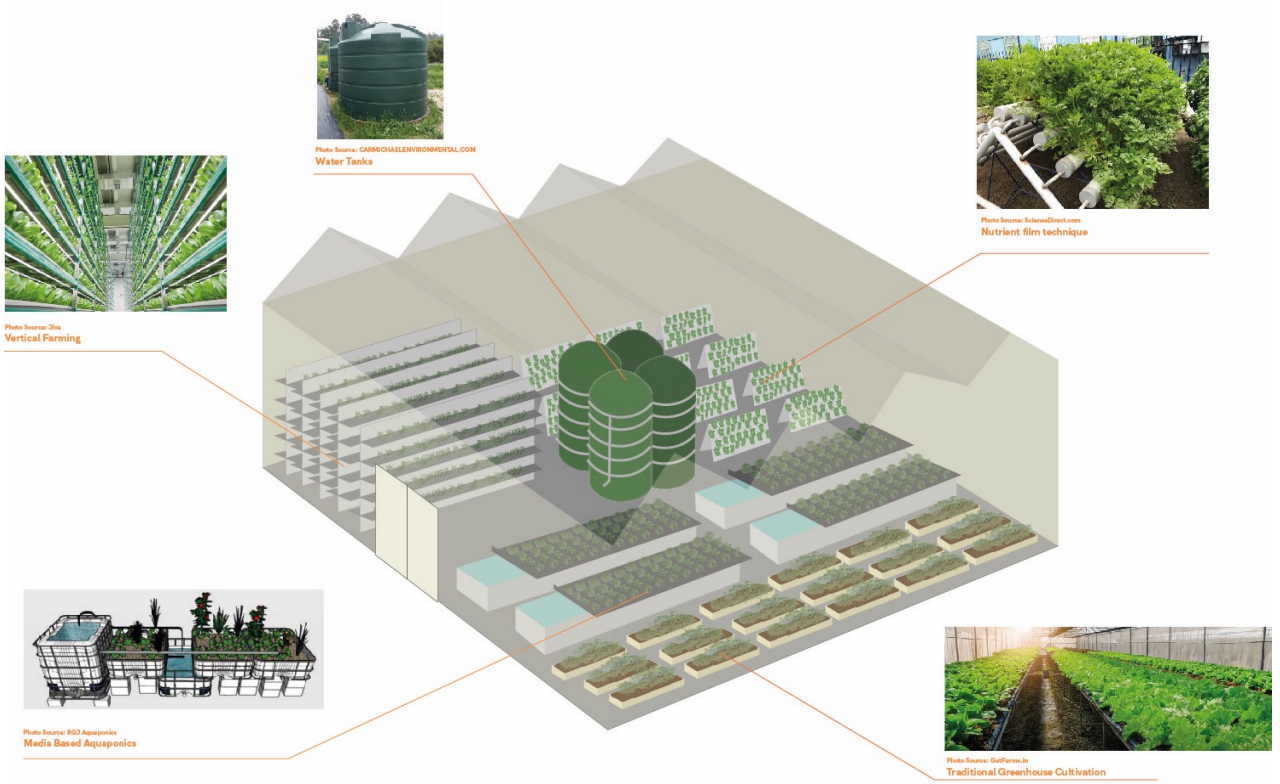
**Abstract**

Our garden aims to increase the physical and mental wellness of inhabitants and provide a peaceful environment for enrichment activities. Our first area will be dedicated as a sensory garden. This addition helps to reconnect and engage inmates with nature, whilst providing an educational aspect to maintain the garden. The plants chosen, such as lavender, are ideal for shaded environments like the courtyard space and can survive the weather conditions in Sweden. Raspberry and blueberry bushes and aromatic herbs are used for the taste and smell element, furthermore will be able to be used within the prison for cooking. Bird boxes placed around the garden can contribute to the sound aspect. Eye-catching flowers, such as Coneflowers, can provide a sight element that can also attract pollinators to the garden.
With the second allotment, the addition of a small Prunus tree will be a vocal point. As it is a deciduous species, inhabitants can watch it grow and change with the seasons. Using logs around the tree as benching within the garden creates a social atmosphere where inhabitants can relax and bond. The use of recycled tree logs helps to reduce costs rather than purchasing a new piece of furniture, moreover is easy to maintain and adds another habitat for small insects. Furthermore, the addition of a dedicated space for health and physical activity with bars and rings enables inmates to increase their productivity and release stress in a controlled setting. Pathways of bark help to separate each section without disturbing organisms with an artificial surface.

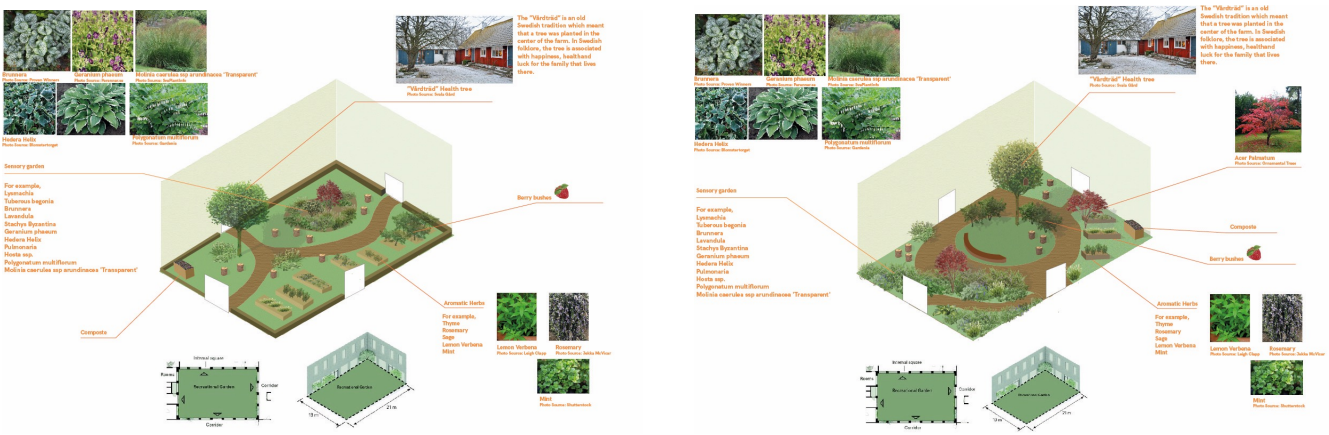
The outdoor farming system will be separated into two areas. To begin, approximately 5,000 m² will be dedicated to a classic horticultural production. Half of the land will be used for soil production to educate the inmates on soil biodiversity and its management. Inmates will be involved in crop rotation and management of the fallow land. Low labor on the soil will be applied to avoid the use of machines. The other half of the land will be occupied by growing boxes to diversify the way to cultivate and to involve the inmates in the application of nutrients and water. Then, the 5,000 m²

that remains will be a meadow to promote biodiversity production. A part of the meadow will be covered by productive trees and beehives. A blank space will be left untouched for the inmates to build a project.

The indoor system will be separated into three areas. The first area will be dedicated to the hydroponic culture of chili peppers, peppers, tomatoes, and cucumbers. The purpose is to grow expensive products that cannot be grown outside of Sweden. In the second area, vertical hydroponic cultures will be in place to maximize the yield per square meter. And finally, a nursery will be installed to start seeds. It's a way to involve the inmates from the seeds to the harvest.




**Indoor farming conceptual design**



**Recreational gardens conceptual design**


Arman Neisi, Giuseppe Rizzello, Harry Whiteley, Lijo C Raju, Marie Gabrielle Von Elpons, Sabaya Quayum Chowdhury

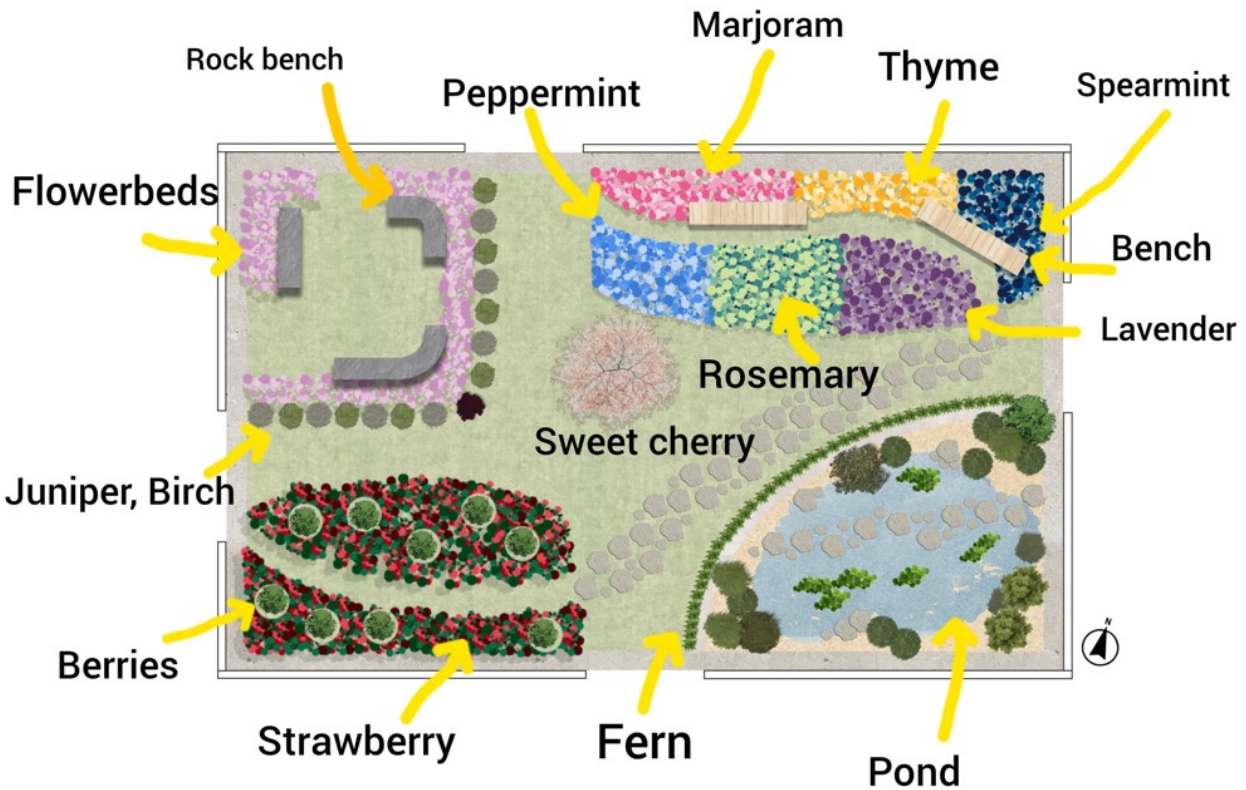
# Hyphae

**Abstract - Smultronställe**

Our project located in Trelleborg, Skåne County in Sweden aims to provide a rewarding and peaceful environment using agriculture and nature to achieve an environment where people feel at ease and one with the world. A prison is indeed a place with myriad challenges and this project aims to mitigate this through the opportunities and the environment our project aims to provide.
This project, Smultronställe, consists of two key components, utilizing agricultural and recreational spaces. Smultronställe aims to transform Trelleborg prison into a landscape that promotes inmate rehabilitation, social reintegration, mental health, enhanced sustainability, and environmental stewardship. Moreover, the project provides spaces for relaxation and solitude, as well as makes a sense of inclusion, whilst facilitating themes of commitment to self-sufficiency, economic viability, and environmental care. The intended result is the creation of a peaceful environment for both inmates and staff.
The agricultural element involves two sections, an outdoor field, and an indoor space via a greenhouse. It is planned to apply permaculture as an approach in the design and management of these spaces. Inmates will cultivate a diverse range of crops in all seasons, ensuring an equal workload for them throughout the year, as well as maximizing productivity, food quality, and skill development. Also, waste recycling and greywater usage are part of our plan to enhance the farm's self-sufficiency and promote its cyclical nature. Furthermore, we utilize innovative farming techniques such as vertical farming and hydroponics within the greenhouse to provide a variety of crops throughout the year, while solar panels supply the energy for electrical equipment. These structures will allow for professional education workshops through working on the farms to cultivate skills allowing inmates to access future career opportunities. Once the project reaches its full potential, there is an additional opportunity to attain economic returns from the obtained products which can also be processed with the cooperation of staff, creating connections among them
The recreational element consists of two small-scale garden courtyards providing green spaces for

promoting socializing, physical activity, and relaxation. This will be done through a combination of patches dedicated to various purposes, such as cultivating native aromatic herbs, shrubs, and trees, as well as providing contemplative spaces. Within these meditative spaces, inmates will have room for group activities and solo self-reflection. This naturalistic environment will be further proliferated through landscaping and water features. Furthermore, this all provides an environment that enhances biodiversity ensuring a deep and personal connection to nature. Moreover, the project contributes to a broader environmental goal by promoting eco-friendly practices.

This comprehensive approach aligns with three pillars of sustainability, economic, environmental, and social. It presents a sustainable approach for the future of farm and greenspace design within correctional institutions. Integrating these initiatives will provide inmates with opportunities to develop their professional skills, and to take part in therapeutic activities in aid of fostering personal growth. Through this project, a biophilic environment will be formulated, whilst empowering inmates to contribute meaningfully to their rehabilitation and the broader community.




**Recreational garden conceptual design**

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