UrbanFarm2022

UrbanFarm2022. Building multi-disciplinary knowledge for urban green regeneration and sustainable food systems

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Francesco Orsini, Elisa Frasnetti, Michele D'Ostuni, Ilaria Zauli, Laura Carotti, Giuseppe Picca, Giuseppina Pennisi

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

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Food Systems in European Cities (FoodE)

Scan Me

Scan Me

www.foode.eu

Led by the University of Bologna and financed under Horizon 2020*, FoodE brings together a highly qualified consortium of 23 organizations, including universities, research institutes, SMEs, NGOs, as well as city councils distributed across 8 EU countries.

The project aims to build and promote a "Think global, eat local" mindset with a view to accelerate the rise of City/Region Food Systems (CRFS) that are sustainable and resilient, thus able to guarantee food security while boosting local economies.

Cities and Regions represent the scale at which ecological, social, and economic interconnections may be fostered through co-governance and active involvement of urban and regional institutions and players, such as:

- Citizens;
- Food system start-ups and small businesses operating in the urban food landscape;
- Cities and regional authorities;
- Academia;
- Schools.

By increasing the relationships and interlinkages between the different actors of the food chains, FoodE will pave the way for job creation, enhance local economies, and enable local communities to contribute to the United Nations Sustainable Development Goals.

* The European Union Research and Innovation Framework Programme (2014-2020)

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Giovanni Molari

UrbanFarm
Targeting global sustainability goals through an international student challenge

by Prof. Giovanni Molari Rector - Alma Mater Studiorum - University of Bologna

Credits: ©Foto Schiassi

The Alma Mater Studiorum - University of Bologna has historically been an institution that strongly cared about the education of its students. Thanks to its professors, students, and all personnel, the University has always been able to propose cutting edge research in response to the most pressing societal and environmental challenges, promoting innovation and international cooperation. Indeed, one of the University strengths is to foster the collaboration with other universities and research groups located in Italy and all over the world.

The UrbanFarm Student Challenge follows this trail, promoting the international cooperation of students from different nationalities and fields, teaching them to work together in multidisciplinary groups to propose visionary projects that could change our living environment. Sustainability has indeed become one of the most important key words in our study programs. This is why the university is actively involved in the achievement of the 17 Sustainable Development Goals (SDGs) of the U.N. 2030.

Initiatives like the UrbanFarm Student Challenge are at the core of the university mission to impact the communities with environmental and societal changes, aiming at the diffusion of the most recent research and experimentation in the field of sustainable and healthy living. That is why the university is invested in improving the quality of teaching, financing new researches and creating proper institutional channels for the knowledge exchange. Today, schools, universities and research centers have the responsibility to transfer their knowledge to the younger generations, making students aware of the unprecedented challenges we will have to face, equipping them with the right tools and skills to be ready to be the change the global community needs. Therefore, the Alma Mater Studiorum sets its objective to shape new generations of competent professionals, but also virtuous global citizens able to face the challenges to achieve a fairer and more sustainable world.

Credits: ©Foto Schiassi

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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), the largest one 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 was recently awarded as a Department of Excellence from the Italian Ministry of Education and Research. Among the projects coordinated by the DISTAL, the EU-H2020 project Food Systems in European Cities (www.FoodE.eu) aims at fostering the growth of sustainable City/Regions Food Systems by connecting local producers and consumers and promoting a shift towards innovative sustainable food production technologies. Within the FoodE project, the first experimental vertical farm in Italy, AlmaVFarm was created within the DISTAL. AlmaVFarm embeds an important educational objective: this is a space where students can perform practical and interdisciplinary activities on the topic of indoor agriculture and innovative horticultural technologies. Students get acquainted with the state-of-the-art facilities for Controlled Environment Agriculture and acquire all the necessary skills in order to face new challenges in this evolving field.

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. 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 UrbanFarm2022 Grand Finale and were evaluated from 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. For the current edition, students could choose between two different locations, namely Le Serre dei Giardini Margherita in Bologna, Italy and the Solberga District in Stockholm, Sweden.

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.

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Francesco Orsini

Embracing multiple disciplines to shape future resilient cities: UrbanFarm student competition

by Francesco Orsini. Associate professor, Alma Mater Studiorum - University of Bologna Chair, Division on Landscape and Urban Horticulture, International Society for Horticultural Sciences (ISHS).

Coordinator, Food Systems in European Cities (H2020-862663-FoodE)

With the majority of the World's population already living in urban areas, cities are at the core of the fight against climate change. The relentless urbanization has led policy-makers, academics, and researchers to find new solutions to the challenges presented by overcrowded cites. In this scenario, urban agriculture (UA) has become a common form of land use thanks to its multiple environmental, social and economic benefits. Furthermore, UA initiatives can actively contribute to a sustainable urban food production, also considering that cities abound in vacant or under-used spaces that may find a new life through integrated food production practices. Accordingly, a great variability of UA activities may be found across different projects, making UA a multi-dimensional concept. Given its strong multifunctional connotation and sustainable potential (resulting in a blend of agricultural purposes, social cohesion and business models pursued), it is crucial to facilitate a wider uptake

of innovative UA-related policies by creating awareness on both institutional actors and the civil society.
This is the aim of the international student challenge UrbanFarm2022, which targets two strategic locations in Europe to promote a new sustainable urban regeneration by bringing together young minds from different backgrounds into interdisciplinary and innovation-oriented teams. Target contexts of this fourth edition of UrbanFarm were located the cities of Bologna (Italy) and Stockholm (Sweden), and include:

- An old plant nursery in Bologna that already started a regeneration process in 2015, thanks to the work of local NGOs like Kilowatt, and has become a central meeting point for the local community. However, part of the area was not yet renovated and will soon undergo regeneration with the primary aim of strengthening and innovating the artistic and cultural offer of the complex, also thanks to its inclusion among the pilot projects of the European project FoodE;
- A public garden of 1700 m2 in the Solberga neighborhood, located south-west of Stockholm, that needs renovation to be more inclusive and inviting for the local population.

As in previous editions, the teams had the task of bridging the latest innovations in urban farming design and technology with multifunctional planning of urban spaces. UrbanFarm2022 was thus an opportunity to show how through cross-sectoral knowledge, teamwork and intercultural dialogue it is possible to create cities that are more attractive, more liveable, more inclusive and overall more sustainable for all generations.

Beyond the challenge, an educational framework based on active involvement: examples from UrbanFarm and the AlmaVFarm projects

Since its first edition in 2019, UrbanFarm has differentiated itself from formal education systems building on the Problem Based Learning (PBL) approach, where learners are actively involved in coming up with new ideas for facing everyday challenges. Within UrbanFarm, learning is therefore no longer confined to the academic sphere, as students not only have the opportunity to engage with peers from different origin and disciplines, but also to deal with private companies, administrations and legislative frameworks.
Considering its success, the University of Bologna decided to take inspiration from UrbanFarm's active approach and extend it to the participatory design of AlmaVFarm, the first Italian experimental vertical farm, dedicated to research and dissemination activities. Within AlmaVFarm, students have the opportunity to be involved in practical activities, problem-based learning and testing and validation of innovative technologies for vertical farming. Not only, for its implementation, students (and other stakeholders) were asked to co-design the innovative and sustainable elements of these space, including details on growing systems, management of resources and educational activities to be hosted.
UrbanFarm 2022, AlmaVFarm, and similar initiatives can therefore be effective teaching tools to stimulate individual and team skills of participants and to encourage them to apply their theoretical knowledge toward a sustainable societal development.

This publication summarises the main concepts, visions and approaches that student teams brought together with passion, enthusiasm and dedication in the UrbanFarm2022 competition. While some of the project ideas and concepts contained in this book will likely take form in upcoming months in Bologna within the framework of the European project FoodE, we also hope they will further inspire urban policies and push to improve the sustainability and liveability of our cities.

To boost urban renewal through urban agriculture, The University of Bologna Alma Mater Studiorum organized the Student Challenge, UrbanFarm2022

Young international minds teaming up to rethink urban spaces for the environmental, social and economic improvement of future communities

THE URBANFARM2022 CHALLENGE

The Challenge

The competition, involving international student teams from Agriculture, Architecture, Design, Economics, Engineering, Environmental, and Social Sciences, aimed to design innovative urban agriculture systems, combining the best architectural and newly introduced technology for food production in urban environments.

Two vacant spaces, identified in the municipalities of Bologna (Italy) and Stockholm (Sweden), were studied and redesigned by the different teams to propose the best strategies in the pillar of sustainability (economic, architecture, environmental and social). Teams were ranked based on their choices and building solutions related to growing systems and climate management and the strategies for water and mineral nutrition and integrated pest management. Interventions also had a strong social and business connotation, promoting new forms of employment for disadvantaged users. Overall, the competition involved 16 teams in its fourth edition, totalling 80 bachelor, master, and doctoral students from 16 universities in 5 different countries. An interdisciplinary jury evaluated projects made up of 5 international experts in agricultural sciences, architecture, environmental psychology, economics, and urban planning, and a scientific committee accounting for 22 members from the global scientific community.

Opportunities

Ideas and concepts embedded in the projects will be further implemented through co-design activities in the two selected European Cities, partners of the EU H2020-862663 Project: Food Systems in European Cities (FoodE), led by the University of Bologna.

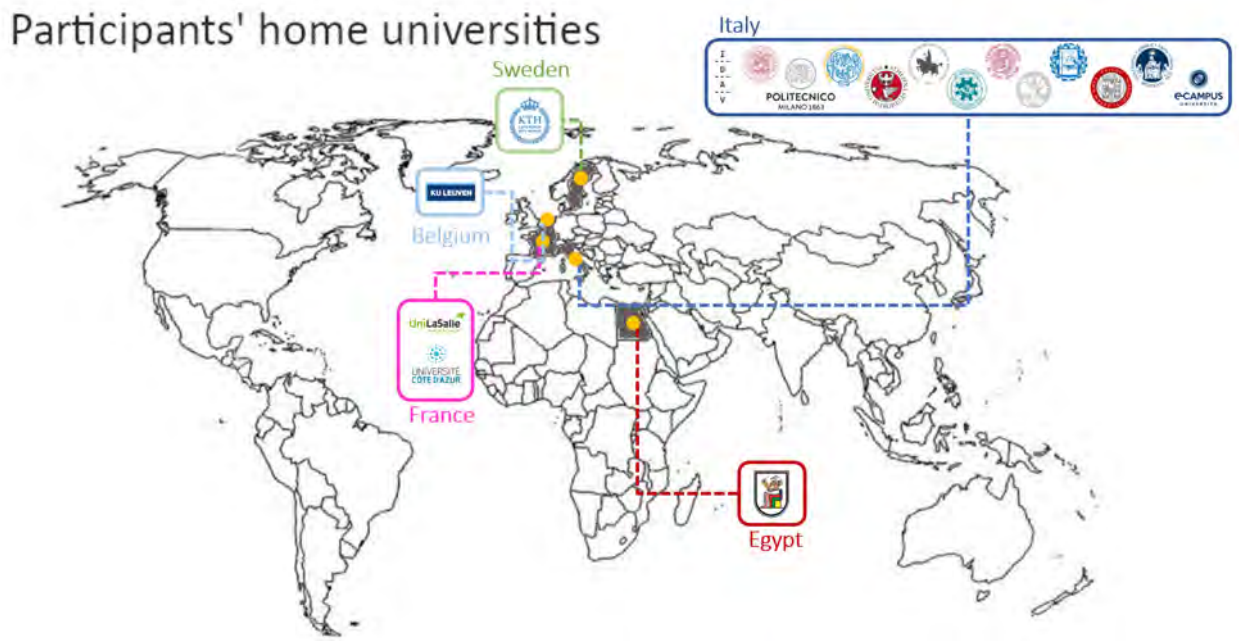
Background

The competition is organised by the Department of Agricultural and Food Sciences (DISTAL) of the University of Bologna. Activities are supported by the Municipalities of Bologna, and Stockholm.

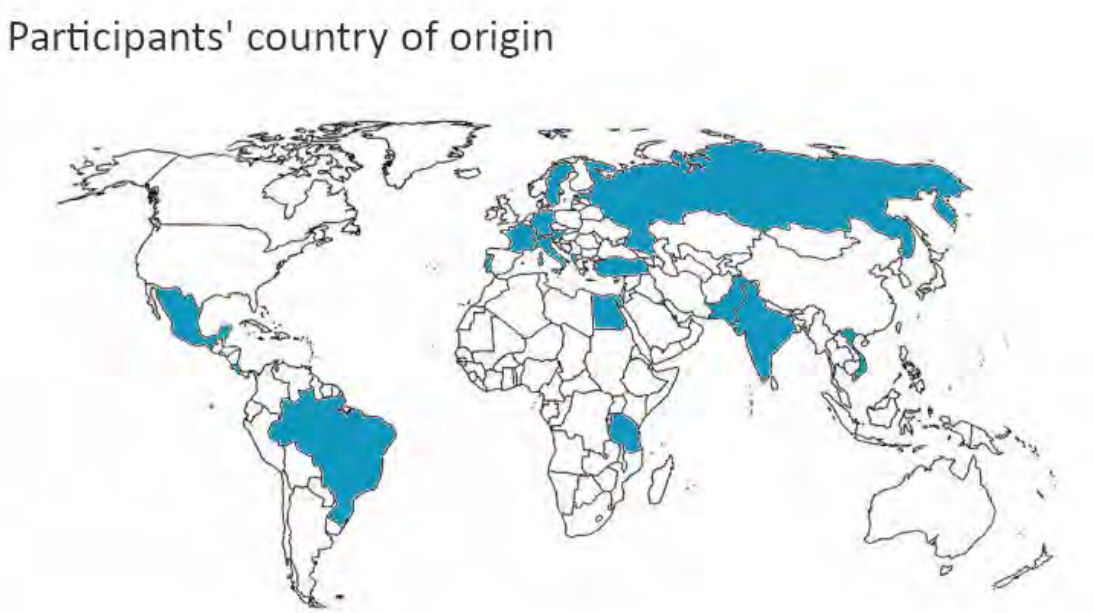
The main sponsor is Flytech Srl.

The main aim of the UrbanFarm2022 challenge is to design innovative urban agriculture systems and promote multidisciplinary and international cooperation between universities worldwide.

Home universities of students involved in the challenge



Countries of origin of students involved in the challenge



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URBANFARM AT GLANCE

Visions and impression from former participants

Francesco Lombardo, Luca Settanni e Gian Marco Tamborra
University of Bologna, Italy
Team ReGeniusLoci - Aquaponic Social Garden (Bologna) - UrbanFarm2019

Team RGL, UF2019

"From the experience of UrbanFarm2019 we have learned a lot, especially: how to work in multidisciplinary teams bringing home excellent results. Surely it is an experience that we feel to promote and in which we believe as it gives students of any sector the opportunity to face a first experience of innovative design with high social and environmental impact. For us at Aquaponic Design it was the first project together and we always remember it with happiness because it was ***thanks to UrbanFarm2019 that we realized how much fun we would have working together to transform the city of Bologna*** *into the first Urban Farming hub in Italy."*

Ricardo Souza

Montepellier SupAgro, France
Team Phoenix – L'Azienda Zanussi (Conegliano) - UrbanFarm2019
Team GreenID – Green Cycle Urban Farm (Galliera) - UrbanFarm2020

Team Phoenix, UF2019

*"**I was part of UrbanFarm for three years!** I started as an undergraduate student in 2019 in Brazil. We did fundraising so one of our team could represent us during the final in Pordenone (Italy). A few days before the Final Event, we got the money we needed, and my colleague took a 23h flight to Italy. **This award and the participation in an international student challenge fitted well in my application for a scholarship in a European Master.**"*

Andrea D'Aprile

University of Bologna, Italy
Team FENICE - Green Symphony project (Lanuvio) - UrbanFarm2020

Team Phoenix, UF2019

"*If I have to explain this experience in few words I could use: cooperation, challenge and future. **Urban Farm 2020 has been the start point of my experience inside the incredible world of international research and cooperation.***"

Team The Wanderers, UF2019

Haidy Takieldin Adel Ali Mousa

Cairo University, Egypt
Team The Wanderers – GILGAMESH (Conegliano) - UrbanFarm2019

"I am Haidy Mousa, an award-winning architect. ***UrbanFarm created a transition point in my life, as it was a great starting point to find a solution to return life to the city.*** *"*

Elisa Apolloni

University of Bologna, Italy
Team Future-A - DolomiNet (Belluno) - UrbanFarm2019

Team Future-A, UF2019

"The experience of ***Urban Farm represented an opportunity to test myself concerning organizational skills, design and management of a multidisciplinary project****. In addition, thanks to the competition, I was able to deepen a theme of great interest to me: indoor and vertical agriculture. Now I'm currently doing a PhD and collaborating with the research group Rescue-AB, organizer of the Urban Farm contest."*

Emanuele Durante

University of Bologna, Italy

Team Hop-E –SIEPE (Sustainability-Inclusion-Energy Production-Environment), UrbanFarm2020

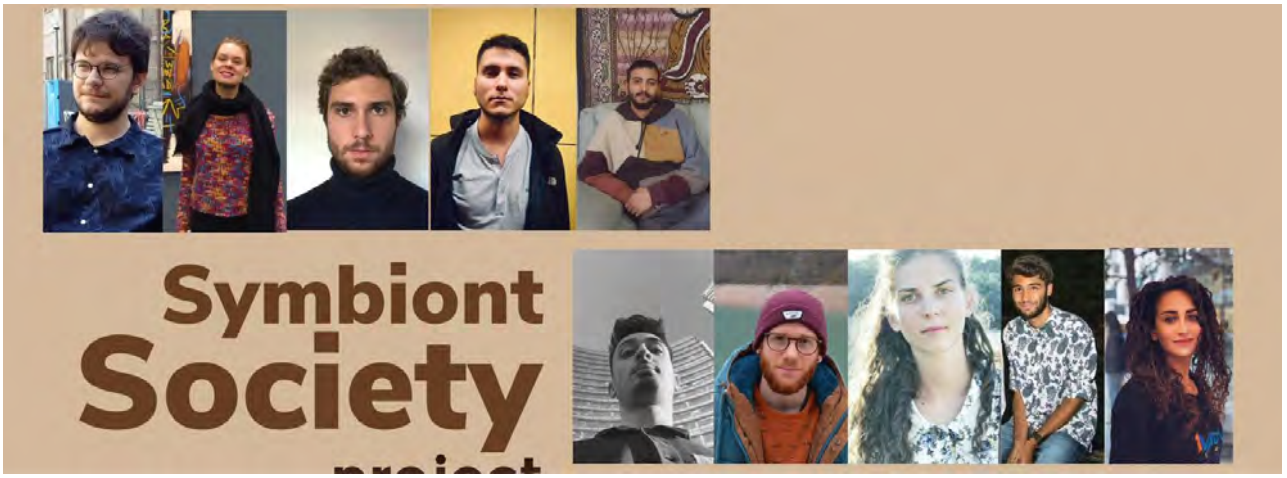
Team Hop-E, UF2020

*"A year after I can definitely say that **UrbanFarm had an important role in my recent life**. My team and I continued working on the project, which got also accepted for the World Renewable Energy Congress in Lisbon. We are still in contact with the municipality of Galliera, which is willing to implement a lot of the aspects we proposed for the site."*

Matteo Landolfo

University of Bologna, Italy

Team Symbiont Society - Ecological, environmental, energy and food challenge of the world's northernmost city (Longyearbyen) - UrbanFarm2020



Team Symbiont Society, UF2020

*"**UrbanFarm is not just a challenge, but an all around experience** that combines the educational, professional and personal experience of the participants in the competition and especially the members of my team."*

The International Jury

MOHSEN ABOULNAGA
Professor of Sustainable Built Environments, Cairo University (CU), Egypt

RUNRID FOX-KÄMPER
Head of research group on Built Environment, ILS-Research Institute for Regional and Urban Development, Germany

MICHAEL ALAN MARTIN
Senior Researcher in the field of Life Cycle Assessment and Environmental Management, at the IVL Swedish Environmental Research Institute, Sweden

ANNA MARÍA PÁLSDÓTTIR
Senior lecturer (assistant professor) in environmental psychology at the Swedish University of Agricultural Sciences (SLU) at the Department of People and Society, Sweden

MATTEO VITTUARI
Associate professor in agricultural and food policy and agricultural policy evaluation at the Department of Agricultural and Food Sciences (DISTAL) of the University of Bologna, Italy

COMUNE DI
BOLOGNA

BOLOGNA, ITALY
Le Serre dei Giardini Margherita

Le Serre dei Giardini Margherita is a metropolitan HUB devoted to innovation and promotion of entrepreneurial culture. The space is in the hands of the Municipality of Bologna, but since 2014 it has been managed by a network of organisations made up of: Kilowatt Soc. Coop, Kilowatt APS, Fondazione Marino Golinelli and ASTER Società Consortile.

After a redevelopment process, Kilowatt Soc. Coop implemented a series of services for the local community: a coworking area with electrical outlets and wifi, free drinking water (both still and sparkling), experimental educational service for 0-6 year olds, a vegetarian restaurant, spaces for exhibitions, training, events and cultural aggregation.The space is therefore attractive to many people of different ages, citizens and tourists.

In 2020 Kilowatt also obtained the management of the Serra Madre complex (two greenhouses of 300 square metres each plus 1,500 square metres of outdoor space). This space will soon undergo regeneration with the primary aim of strengthening and innovating the artistic and cultural offer of the complex. The aim is to create a centre of virtuous dialogue between the worlds of research (scientific and humanistic), business and art on the great challenges of our time: sustainability and climate change. The combination of academic approach and artistic creativity is an essential mix to read these challenges in their complexity, rework them and make them explorable from several point of view.

Teams

BYOSHARE

ENTOLOOP

GREEN SOUL

GREEN SPOT

KOMOREBI

URBAN TRANSFORMERS

ZERO-PONIC

Antonio Amoruso, Mauro Amoruso, Valerio Bellarte, Andrea Miriana Ferro, Silvia Mastromarino, Stefano Minervini, Adalberto Occhinegro, Francesca Netti, Andrea Rosselli

BYOSHARE

Abstract

The project BYOSHARE refers to Le Serre dei Giardini Margherita in Bologna, and strives to donate a modern and sustainable place where citizens can learn, share and feel part of a community. A holistic approach has been crucial for achieving these goals. Therefore, we have built a multidisciplinary team capable of analysing the complexity of the problems related to food system sustainability and finding solutions that can also consider environmental, economic, and social issues.

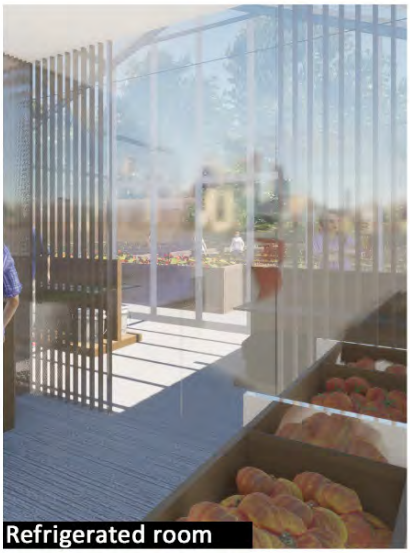
The project embraces the concepts of "retrofitting" and "prosumerism" in order to shed light on all the possible functions and qualities of the space and allow the users to produce local and 0km food to be consumed or shared right after.

This system ensures food supply for the urban context, but it also offers citizens the chance to achieve economic and social objectives. As a result, the users will contribute positively to the preservation of traditions and local identity; they will be educated to respect nature and think resiliently about the looming climate change. The project attempts to fight global warming through its modern production systems, paying attention to the used materials and resources and quantifying emissions.

It also aims to overthrow the current trend of increasing land use and deforestation: our team has indeed considered the Sustainable Development Goals (SDGs) to draft a project that can reflect the spirit of the international community, trying to promote and apply the main goals in a small-scale context.

The whole experience of the place will be empowered by the app BYOSPACE, which will allow learning, discussing, buying, supervising the production, and participating in online and offline events. The space distribution, the control on the spot, and the tracking functionality of the app will also be in line with the current COVID-19 regulations. The final result is a 360-degrees project that focuses on sustainability and considers the place's social, cultural, and economic potential, committing to fully expressing it.

Byostore



Refrigerated room

Cooking workshop

Vertical farms

Productive greenhouse part

Ludovico Dalla Pozza, Leonardo Della Canonica, Aya Akrm Ahmed Hassanin Elmarakby, Norein Karar, Marco Mazzella, Ameera Hussameldin Sayed Mohamed, Giacomo Pala, Luca Rasi, Michele Trevisan

Entoloop

Abstract

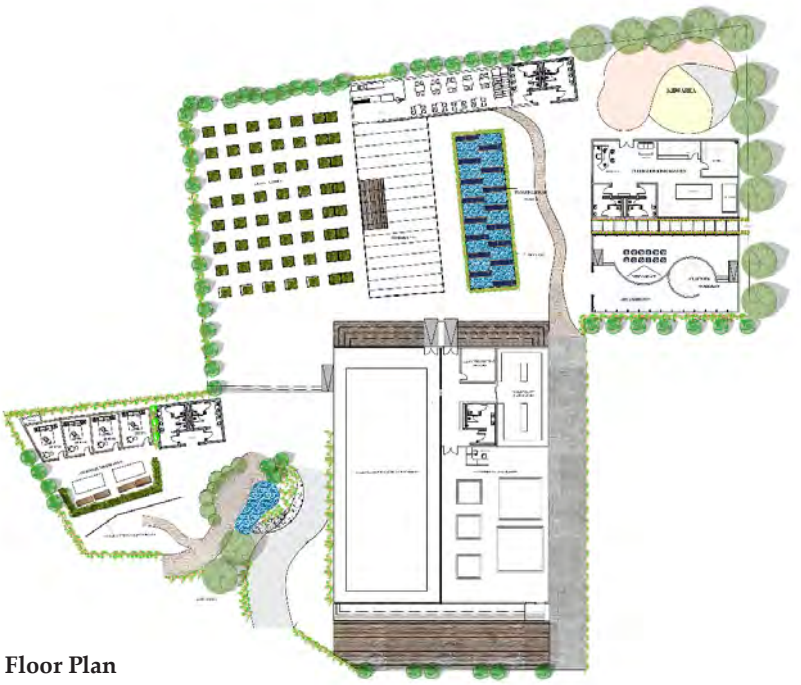
Our project aims to redevelop the greenhouses, nearby structures, and landscape inside Le Serre dei Giardini Margherita in Bologna, which is 1.4 kilometres from Piazza Maggiore (the city's main square). Giardini Margherita is a pivotal spot and a focal destination to diverse age groups, citizens, and tourists; in other words, it highly hosts pluralism. The park has a double role: social cohesion spot and green area. Accordingly, these roles offer a strong plural base to work on, including the two greenhouses and public outdoor spaces with opportunities to afford services and social needs. The project's main objective is to create a self-sufficient place where productivity, environment, and education are connected, promoting the circular economy and viability of the area.

The two greenhouses will be redesigned with different purposes: one of them will be used as an experimental production site for both vegetables (tomatoes and bell peppers) and insects (Tenebrio molitor). The strategy embraces the new concept of “Entomoponics” where the rearing of the insect is done in boxes situated below the soilless cultivation of the chosen crops, exploiting the same space for the production of both T. molitor and vegetables. Moreover, the greenhouse will hold workshops and experimental trials involving researchers of the University of Bologna. The second greenhouse will present a permanent exposition of different vertical farm methodologies and concepts, including vertical towers, vertical green walls, NFT systems; the designed multipurpose spaces will allow holding workshops, lessons, and business meetings. This greenhouse will host different temporary exhibitions, including arts, music, and cultural events. The focus here will be to create a comfortable and pleasant environment, furnished with the assets necessary for the activities such as a projector for meetings or movies, a WI-FI connection, chairs, and speakers.

The outdoor space of the project will be focused on the environmental, social, and educational spheres. A social aroma garden will serve as horticultural therapy for elders and people with special needs. A recreational space for kids and younger people will be designed where organise gardening courses. Officinalis/medical species are planted in raised beds to guarantee functionality for those with reduced mobility. The goal here is to create an outdoor space to host activities for all ages, focusing on minorities.

From the environmental point of view, a bio-lake will be created to collect rainwater. The constructed wetlands will depurate the water, making it usable in other areas (e.g., greenhouses). The chosen plants with a high phytodepuration ability will purify water through physical, chemical, and biological processes trapping most of the pollutants. Moreover, floating solar panels on water surfaces will be implemented to produce part of the energy needed for the available facilities. The remaining outdoor space will be organized and designed to enhance users' experience, making the context more natural and viable as possible and educating people about the circular economy, environmental sustainability, and social interaction.

Project visualizations



Floor Plan

Interior renders of one of the artists'rooms

Luis Alberto Bartolomeu, Alejandro Cartin, Zoe Carolina Ferrari, Giulia Prefumo

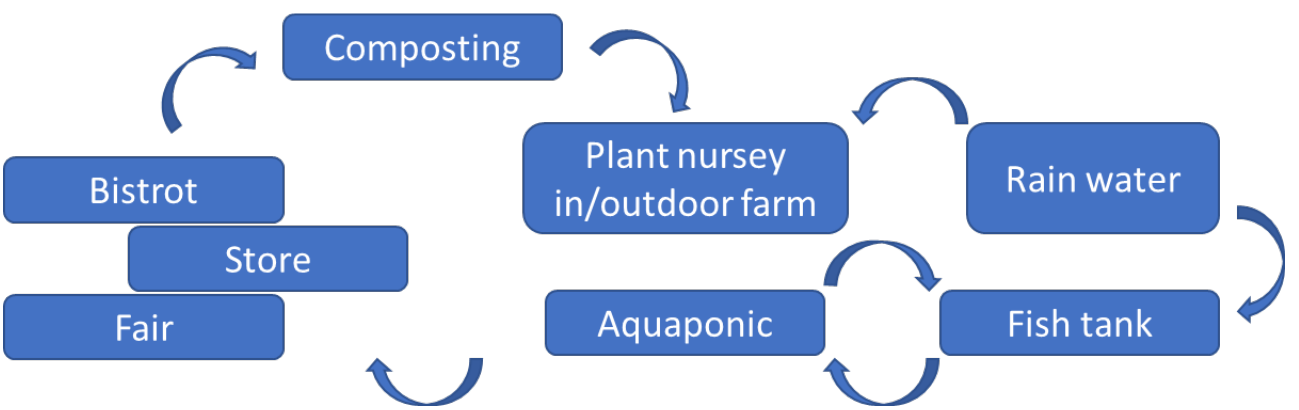
Green Soul

Abstract

We are glad to present our project to redesign Le Serre dei Giardini Margherita. Welcome to a unique place in Bologna, where community and nature come together harmoniously, providing a safe and vibrant environment for leisure, community integration, food & art production, and social inclusion, leading to people and nature empowerment.

Bologna's Green Soul is based on the high exploitation of all the spaces and amenities of the new Le Serre. The project has the power to put together community, nature, and entrepreneurship in an atmosphere that combines productivity, leisure, teaching, conscious shop, and a sustainable urban farm using technologies and best practices. It guarantees a great potential to revitalize the city landscape, deliver inclusive growth and drive positive change to the community.

The 4in1 Strategy, inspired by the 17 Sustainable Development Goals of the UN, is based on maximizing the reuse of natural and limited resources to produce more while consuming less. This will be possible by circularly connecting all the systems:



The production system needs to be completely integrated into the social environment to reach its maximum power of transformation; doing so, it is fundamental to involve all the stakeholders. This challenging and powerful environment will be possible by developing the strategy into four main pillars that will be detailed ahead on this paper:

Main building exterior view

Main building exterior view 2

Abdelrahman Mohamed Abdalla, Chiara Cappucci, Pietro Duratini, Giuseppe Muliere, Simone Prospero, Lamyaa Gamal Helmy Rayhan, Rana Samir

Green Spot - 1st RANK

Abstract

Le Serre dei Giardini Margherita is a Green Spot in the grey of the city and a place that people visit temporarily to move away from everyday life and the urban chaos. The project aims to attract a large audience, people from different backgrounds, interests, and ages, and create a place to raise people awareness about everyday life sustainability through workshops, transformation laboratories, and other engaging activities.

Green Spot is a response to the context of Le Serre dei Giardini Margherita and to people who live in the surrounding area. It will be a green social hub that will host cultural events, educational workshops, innovative cultivation systems, and coworking spaces to work and study.

Vision

Green Spot would like to create a place where people can approach learning new things about biodiversity, innovative cultivation methods, and sustainability getting directly in contact with them. Le Serre dei Giardini Margherita will be a place to share ideas and experiences that can help people have a more sustainable lifestyle by putting into practice simple everyday tricks. In addition, Le Serre will be even more a place of aggregation that will allow people to immerse in a Green Spot and get in touch with nature without getting away from the city.

Concept

Green Spot aims to rethink the two greenhouses of La Serra Madre and the aquaponic greenhouses. The former will be used as recreational and social space, while the latter will serve for production. Each component of the project will work and be used in sync with the others to minimize the environmental impact of the place:

- a biolake will gather rainwater collected from the rooftops of the greenhouses.

- the collected water will irrigate the plants in the NFT and Vertical Farm cultivations.

- the agricultural products will be both cooked in Vetro restaurant and used as material for the workshops that will be held in La Serra Madre.

Therefore, Green Spot will represent a model of circular economy and sustainability, in which the waste production will be reduced at its minimum, and every product and material will be valued as much as possible.
Green Spot concept is to link mind (represented by the coworking space for smart working and the workshop area), soul (represented by the cultural hub for art and concerts), and body (represented by the yoga classes and outdoor activities) together.
The project aims to tackle nine goals of "Sustainable Development Goals" (SDGs), determined by the United Nations General Assembly as part of the 2030 Agenda, by implementing the main three pillars of sustainability: economic, environmental, and social sustainability.

Main entrance to greenhouses

Vision of the above ground biolake area

Francesca **Masi**

Ginevra **Fabrizio**

Ginevra Fabrizio, Francesca Masi

Komorebi

Abstract

This project wants to design a fun playground where kids play a key role in creating a sustainable energy source. Given that the already existing plan aims to build a "KW Playground", this would be an excellent opportunity to create a new and green playground for kids.

The energy created by the playground can be stored and used in different ways, which opens up several possibilities for Le Serre dei Giardini Margherita; for example, the collected energy can be used to light up the greenhouse to grow vegetables used as primary source from the restaurants inside Le Serre.

Four kinds of structures are considered, but the number varies if the opportunity calls for it:

- a normal swing that stores the energy produced;
- a merry-go-round similar to a carousel, but has to be manually spun by a person;
- two stationary bikes are positioned near each other collecting the energy with a simple dynamo. In an arcade-similar way, the two cyclists using the bikes engage in a 'race' with each other: whoever goes faster will win. Speed information will be gathered through the bikes;
- tree-merry-go-round has a tree-like structure, and kids can grab its ends and spin it around. The movement will then generate electricity.

The playground aims to be designed understandably for its users through visual panels or The playground aims to be designed understandably for its users through graphic panels or interactive videos to highlight the contributions children are giving by simply playing; in this way, children will know that they actively contribute to the growth of the space where they spend the most time.

Hi My Tuyen Bui, Selin Cengiz, Jonas Clotten, Jahnvi Duggal, Adriano Marchi, Luca Parolin

Urban Transformers

Abstract

We decided to introduce our project proposal "Serre-nità", which talks about sustainability, ecosystems, nature, and communities by referring to a model probably not expected in this context: The "Golden Circle".

The concept, introduced by British-American author Simon Sinek and mainly used in the economic field, explains how the most successful business organizations in the world neither start with the product/service they are offering ("What") nor with the necessary steps to offer it ("How"). Instead, everything starts by defining the reasons for providing the specific product/service. Specifically, it can be said that every successful organization/idea/vision begins by answering a simple question: Why?

This introduction will start by investigating and answering the Why of "Serre-nità" - the reasons, the intrinsic values, and the vision we followed to create everything presented in the following pages. After that, we will also try to answer the How and What of the project.

Why?

The "boiled-down-to-the-essence" answer of this question is the following: to solve problems. Problems seem to surround us in every aspect of life and seem to become more complex and irreversible with every new year: overconsumption, food security, inequality, urban sprawl, biodiversity loss, pollution.

Those are enormous and unbelievably complex challenges of humanity that cannot be solved by a single community, a single city, a single country, or even a single continent – the whole global community needs to tackle them together. As international cooperation seems as distant as ever before (see outcomes of Cop26), our team believes that change has to start from small and local communities.

Dennis Meadows, one of the earliest and most famous environmental scientists (author of the book "Limits to Growth"), came to the following sobering conclusion in 2012: "It is too late for sustainable development, you have to prepare for shocks and urgently build small resilient systems."

How?
How are we tackling these enormous global challenges in a limited urban space? How do we build a "small resilient system" in a previously abandoned area?
Promoting innovation, inclusion, collaboration, education, and sustainable development; starting from a project that can create a domino effect spreading to other cities, countries, and continents; sharing the vision of a different world.
Certainly, such concepts seem rather vague at first – yet, they will become much clearer throughout the course of this paper. .

What?
It is important to keep in mind that Le Serre dei Giardini Margherita constitutes an already existing social, environmental and economic context that combines a restaurant, bar, kindergarten, and open coworking space with a wide range of cultural events and activities.
In the abstract provided in the first round of UF22, we had presented a first idea of how we intended to seamlessly integrate "Serre-nità" with the existing and planned facilities of the area – in this second round, we continued to follow this approach and tried to work out a proposal that is as implementable and coherent with reality as possible.
If, for example, Kilowatt and its collaborators already have a clear idea about a specific area (e.g., using the space next to the metal structure as a bio-lake), it makes more sense to work out ideas including the bio-lake instead of proposing a completely different use for that specific area.
Consequently, we tried to create a project proposal that perfectly accommodates the given circumstances and harmonizes with the existing vision and spirit of the area.

"Serre-nità" is an ecosystem that thrives on technology, community, and innovation, in which persons of all ages, cultures, and professions can coexist to create synergies with nature. Education, science, culture, and art will blend to create a positive and sustainable impact encompassing social, economic, and environmental spheres. Enjoy the journey!

Elevation / Section 1

Elevation / Section 2

Serra Madre - Coworking area

Butterfly room

Giorgio Fioretti, Verdiana Palumbo Grandinetti, Federica Ghini, Francesco Mattoscio, Francesco Monaca, Bianca Sambuco

Zero-Ponic

Abstract

Our idea is to create a balanced environment, able to generate positive externalities in terms of ecological services, to produce the energy and the food necessary for the functioning of the whole area, and to provide a multidisciplinary space that ranges between art and agriculture, as a complete and closed sustainable system. To do it, we worked on Le Serre dei Giardini Margherita in Bologna, a place that we know and we often attend. The idea is to realize a complete agriculture cycle, from the seed to the final products, growing our plants before in the nursery and later in the greenhouses. The aquaponic system avoids chemicals, building a functional symbiosis between fish and crops. The photovoltaic implant covers the production, the bar, and the co-working area energy requirements, giving birth to a zero-impact project. We aim to design this place in the already existing environments, choosing sustainable materials, such as wood and lime hemp, and crops traditionally present in Bologna. All our environmental choices are based on the agroecology principles of sustainability and the importance of biodiversity.

We choose to provide different ecological infrastructures, such as shrubs and hedges, able to attract beneficial insects to increase the natural equilibrium of the area and offer indirect advantages for the people who live in the town. The second goal is to create an unconventional co-working space surrounded by nature. All the activities we imagined for this multidisciplinary space are proposed in the app we designed, making them always available for people who want to be involved in Le Serre projects. What we tried to bring is based on three main interconnected principles, such as the idea of social sustainability, which concerns the right of a person to live in an environmental and socio-economic context that allows him to express his individuality. For this reason, we would like to work on people's sensibilization: creating an environment for children and adults, boosting the common positive perception of plants' role in the urban ecosystem, and teaching practical classes to transform raw materials produced in loco.

The second main principle is environmental sustainability, which cannot be neglected if we want to provide a healthy environment and healthy food. We projected two productive greenhouses

with different production systems to have a wide variety of fruits and vegetables available for the restaurant and the online market. The outdoor plants choice promotes the traditionally local species and creates a synergistic garden, able to increase the positive plants' interactions and the insect's biodiversity. All these ideas can be implemented inside a sustainable economic scheme: energy production covers most of the costs of the productive and social area, while the agronomic choices reduce the use of external inputs. All these conditions are the basis for creating a small oasis in Bologna; that would be an example of the circular economy, in which, optimizing its life cycle, each element is reused.

Interior Rendering

Le serre dei Giardini Margherita

Participating students

BYOSHARE

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Green Soul

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Green Spot

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Komorebi

Ginevra Fabrizio (University of Bologna), Francesca Masi (University of Bologna)

Urban Transormers

Hi My Tuyen Bui (University of Bologna), Selin Cengiz (University of Bologna), Jonas Clotten (University of Bologna), Jahnvi Duggal (University of Bologna), Adriano Marchi (University of Bologna), Luca Parolin (IUAV University of Venice)

Zero-Ponic

Giorgio Fioretti (University of Bologna), Verdiana Palumbo Grandinetti (E-Campus University), Federica Ghini (University of Bologna), Francesco Mattoscio (University of Bologna), Francesco Monaca (University of Bologna), Bianca Sambuco (University of Bologna)

Stockholmshem

STOCKOLM, SWEDEN
Solberga

The Solberga area is located south-west of Stockholm and is managed by Stockholmshem, a public housing company. It can be reached by public transport via metro+bus or commuter train+bus. However, not being directly connected by either metro or train has made the area generally unexplored by people unfamiliar with it.

Solberga was mainly built in the 1950s and 1960s (and new housing is still being developed). It consists of several public housing buildings, but also contains villas and townhouses.The garden space to be redeveloped is approximately 1700 square metres. It is currently composed of grass, bushes, trees, paved areas and flowerbeds. It is an important place for the residents who live there as it is a meeting space with beautiful trees that create a calm atmosphere and a well-used children's play area. However, the garden is not as welcoming as Stockholmshem would like it to be. It is quite worn out and needs some work, not being inviting for people, especially considering that it becomes dark and cold during the winter.

Teams

GREENIUS

KOMOREBI

URBAN TRANSFORMERS

Monica Perez Bocardo, Girot Emma, Lukas Madl, Gonçalo Martins, Felix Schachenmayr

Greenius - 1st RANK

Abstract

Proposing a design concept for a site you have never been to is quite tricky, but we embraced the challenge with the right mindset. How to adapt a project to the Genius Loci when you cannot see the site with your own eyes? When you cannot speak to the local stakeholders and feel the site's dynamics with your senses? These doubts gave the team a lot to think about since we all are convinced that a project, a site transformation, or a design implementation can only be successful if adapted to future users' needs. In the end, it is not a designer's or planner's self-esteem that counts, but if the work is accepted and approved by the people who will use it. The team thoroughly analysed the Pliggvägen site and its surroundings and the Solberga neighbourhood in general. Official documents were examined, and reviews of former projects that have been conducted in this area or of similar projects that took place in the Stockholm area were scrutinised. Potential stakeholders were identified, together with local initiatives and communication canals. If we could not visit the site ourselves, we considered it essential to talk with those who knew the area and its surroundings by heart. Despite general data protection regulations, we managed to contact some of the tenants and other local stakeholders, which enabled us to get deep and detailed insights on Pliggvägen and Solberga. An achievement that we did not think possible a few months ago. We had a base to work with, which was a pillar to spark new ideas. As a budget was not defined in the assignment, our approach was to create a flexible concept with core elements and additional options, adaptable to the budget allocated and the preferences of citizens and users. This approach corresponds to our original wish to create a place where the attendees will accept and appreciate it.

We are proud of the result: a multifunctional, adaptable space that welcomes people of all ages and cultures. Furthermore, another primary focus of our project is to provide a space for biodiversity to thrive and where local species can flourish: an area that integrates into the neighbourhood, creating links between various habitats in the surroundings.

Protecting the environment and creating spaces that prosper with life benefit plants, animals, and the people who will use the site.

We want to show off these mutual benefits provided by the ecosystem services, creating a link between people, plant, and animal communities. Grön Gård, therefore, revolves around three core principles that are a recurrent theme along with the following proposal: 1- embed the concept into the local social and environmental context; 2- suggest a step-based, feasible idea that is adaptable to reduced budgets and residents needs 3- protect, create and use environmental services and benefits Including architects, engineers, biologists, and environmental scientists, the team tackled this multifaceted approach from different perspectives, ensuring that all aspects were considered.

Floorplan & Section

Section -Geodesic urban farm & permaculture area

Francesca
Masi

Ginevra
Fabrizio

Ginevra Fabrizio, Francesca Masi

Komorebi

Abstract

The project wants to create a fun playground where kids play a key role in creating a sustainable energy source. Given the scarce illumination and need for renewal of Solberga Park, this playground will be replacing the old one and generating light simply by using it, similar to how a dynamo on a bike works.
The energy created by the playground can be stored and used in different ways, which opens up several possibilities for the people of Solberga park.
Four kinds of structures are considered, but the number varies if the opportunity calls for it:

- a normal swing that stores the energy produced;
- a merry-go-round similar to a carousel, but has to be manually spun by a person;
- two stationary bikes are positioned near each other collecting the energy with a simple dynamo. In an arcade-similar way, the two cyclists using the bikes engage in a 'race' with each other: whoever goes faster will win. Speed information will be gathered through the bikes;
- tree-merry-go-round has a tree-like structure, and kids can grab its ends and spin it around. The movement will then generate electricity.

The playground aims to be designed understandably for its users through graphic panels or interactive videos to highlight the contributions children are giving by simply playing; in this way, children will know that they actively contribute to the growth of the space where they spend the most time.

Hi My Tuyen Bui, Selin Cengiz, Jonas Clotten, Jahnvi Duggal, Adriano Marchi, Luca Parolin

Urban Transformers

Abstract

"*One of the first conditions of happiness is that the link between man and nature shall not be broken.*"
Leo Tolstoy

In the current times, digitalisation has captured minds. Everyone is "alone together". Technology has made us slowly unaware and paralysed of what goes on around us; expediting daily chores online (shopping, take-away, networking) only results in having more time to surf the internet. Adding value becomes imperative in this changing world. There must be a focus to redesign spaces to enjoy the nature around us, feel the warmth of community living, and the solace nature is willing to provide.

Solberga is a project that embodies the initiative by the community to redevelop an existing space and tailor it to meet the demographic, social, and climatic realities, triggering innovation in the garden area of the residents in Pliggvägen 51.

Our project, Solberga-unity, aims to promote the aspects mentioned above. It seeks to unite people within the residential area and further unite the residents with the city-goers. On the other hand, we aim to connect the digital and natural environments where men don't work against nature but cooperate.

We have focused on complementing the existing facilities (trees, asphalt platform, play hill) with modern spaces such as a barbecue area, covered seating, bio-lake, bar, and storage facilities throughout the project. A permaculture approach was chosen for food production (ensuring nothing leaves the ecosystem) - vegetables that are particularly suited to the climatic conditions were selected. We considered the potential use of the enclosed spaces and targeted ways to ensure a self-sustaining heating and irrigation model. The proposed social activities would target families, engaging the elderly and children alike, being suitable also for couples and friends. While each section is developed with many possible spaces uses and ideas, we have endeavoured to reduce construction costs and choose optimal, cost-efficient resources. The project will aim to be financially independent by opening bar activities to visitors and gardening communities and fundraising events to provide technology upgrades.

It was essential for the initial planning stages to include the efforts in place in Solberga, reflecting an environmentally conscious approach to harbour social values.
The most challenging part related to the production was understanding how to grow vegetables throughout the year, considering the prolonged dark period in the winter and the temperature variations, ranging from +30° to -10° over the year. We also focus on transforming unused spaces, providing new functions, and creating spaces that welcome all.
We aimed to build environmental, social, and economic sustainability, realizing with excitement that once sought, change and innovation go unrestricted. Our purpose with this proposal is to realise our ideas that would transform Solberga.

Artificial hill

Architectural Render

Tunnel Seatings

Solberga

Participating students

Greenius

Monica Perez Bocardo (UniLaSalle), Girot Emma (UniLaSalle), Lukas Madl (UniLaSalle), Gonçalo Martins (UniLaSalle), Felix Schachenmayr (UniLaSalle)

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