

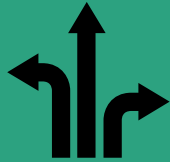
HUNGRY ECOCITIES

A S+T+ARTS RESIDENCIES PROJECT

First Open Call

01.03.2023 – 15.05.2023

starts.eu/hungryecocities



3 DIRECTIONS BOOKLET

STUDIO VISIONS AND FIELDS OF INVESTIGATION

**THIS BOOKLET DESCRIBES THE
VISIONS ON THE FUTURE OF FOOD
AS DEVELOPED BY THE THREE
RESIDENCY HOSTING PARTNERS,
ALSO KNOWN AS HOSTING STUDIOS
IN HUNGRY ECOCITIES, IN
COLLABORATION WITH THE
OTHER PROJECT PARTNERS.**

As an applicant, you are requested to **direct your proposal in response to one of the three directions**. It is not possible to direct one proposal to multiple visions. It is possible to develop distinct applications for different directions, thereby submitting more than one proposal to this call (with a maximum of one proposal per direction – hence, max. 3 separate applications).

Each direction has been broken down into **several fields of investigation**. You are requested to position your proposal within the scope of at least one of the fields of investigation which are part of the studio direction. Your proposal can fully focus on one of the fields, or it can touch upon parts of multiple fields of investigation, that is up to you.

By choosing one of the visions to base your project proposal upon, you automatically apply for one of the residency project positions with that particular **hosting studio**.

HUNGRY ECOCITIES

A S+T+ARTS RESIDENCIES PROJECT

THERE ARE THREE HOSTING STUDIOS IN HUNGRY ECOCITIES:

**Studio
Other
Spaces**

BASED IN BERLIN



Studio Other Spaces (SOS) was founded by artist Olafur Eliasson and architect Sebastian Behmann in Berlin in 2014. Their shared interest in spatial experimentation led them to the holistic approach that defines Studio Other Spaces.

**CARLO
RATTI
ASSOCIATI®**

BASED IN TURIN



CRA - Carlo Ratti Associati is an international design and innovation office based between Turin and New York City. Founded by MIT professor Carlo Ratti, CRA explores the intersections between the natural and the artificial in the built environment, often tapping into digital technologies to develop projects on every scale of intervention. The office has a long history of putting forward experimental visions for the future of food systems.

**eat
this.**

BASED IN THE NETHERLANDS



EatThis is an international network and movement bringing together over 40 companies from the food sector in a joint mission to realize a sustainable and healthy food system for all. EatThis has a double role in Hungry EcoCities, feeding the project from the industry as well as functioning as a studio headed by Stephan Petermann and Rem Koolhaas, founder of OMA. Rem and Stephan are involved in the project on a personal title.



Direction

LOCAL CONDITIONS

by Studio Other Spaces



LOCAL CONDITIONS

by Studio Other Spaces

FOOD IS CULTURAL

Everyone has a right to food. But food is not only about mere subsistence. Food is culturally defined – what we produce and grow, how we grow it, what we eat, who we cook for and eat with, who we trade with, and what we throw away. Food is a phenomenon **shaped by the different cultures, climates, and geopolitical contexts** we live in. It is an expression of millennia of experimentation, innovation, and refinement.

CHANGING FOOD SYSTEMS

Since the 1950s, the landscapes of food production in the modern world have changed dramatically. The **industrialisation of agriculture and animal farming** has proliferated toxic pesticides, soil degradation, air and water pollution, and deforestation over many decades. It has been predicated on the relentless extraction of material resources, of human labour, and of non-human lives. Factory farming of livestock has accelerated the evolution of antibiotic resistance, and the ubiquity of cheap, ultra-processed foods has resulted in a surge of chronic illnesses in

humans. Industrialisation has meant that large populations in wealthy countries have become disconnected from farming processes in their day-to-day lives, while mass exploitation of low-income migrant workers has become a normalised convention of contemporary agricultural methods. It has also meant that large, often multinational corporations have, in many places, taken over where more sustainable family- and community-led farms once stood.

The regimes of extraction, and the subsequent maximizing of crop and livestock yields, are somewhat of a double-edged sword: over the last century, breakthroughs in synthetic fertilisers and advancements in global distribution networks have meant **continued improvement in nutrition and an increase in the average human standard of living in many parts of the world. But at what cost?** It is also true that the very systems that increase this food accessibility and quality of life continue to subjugate many vulnerable populations, to eliminate non-industrial ways of living, to decimate more-than-human habitats and biodiversity, and to short-circuit cycles of resource renewability.

Meanwhile, the industrialisation of food production since the last century has been built upon and continues to rely heavily on fossil fuels, as well as exploitation of the planet's ecosystems that favours economic efficiency over holistic approaches to agriculture and consumption. It is undeniable that, from a sustainability perspective, the world's dominant industrial food systems are drivers of climate breakdown and are fundamentally broken.

For Hungry EcoCities, Studio Other Spaces - supported by State Studio - are focusing on **making visible and communicating** the challenges surrounding various types of industrialised food production and the viable adaptations and alternatives that we want to see grow. SOS places particular emphasis on **vocational and civic education** as a means of understanding food heritages and of creating changes in food systems and cultures. Also of high priority in this project are the **modes of storytelling and examples of best practices** needed to shift habits and expectations around food consumption and enjoyment.



LOCAL CONDITIONS

by Studio Other Spaces

LOCAL CONDITIONS, GLOBAL CONNECTIONS

Despite the numerous challenges posed by our broken food systems, there are as **many reasons to be optimistic**. Through Hungry EcoCities, we – initiators and project participants – have the capacity, and the privilege, to imagine our way into another mode of living, into an altogether different status quo. It starts with telling ourselves **a different story about how food can and should be produced and consumed, and by whom**. And we don't have to reinvent the wheel here: people all over the world – from indigenous societies to urban homesteaders – have long been doing the hard work of developing sustainable farming and permaculture techniques particular to their cultural and geographical contexts. In order to re-engage the larger publics in urban and urban-rural areas with agriculture, and in order to generate knowledge about contemporary food cultures and make it communicable, we must understand the local conditions of a particular area and its potential for the production, processing, and storage of food. Equally important to consider are the environmental limitations of a given location. **Many lessons are already available to us via the existing expertise of knowledgeable communities, while other lessons await our serious attention and care.**

We must shift our thinking from global, catch-all (non-)solutions to local, situated practices. We must radically rethink food production and scalability. The key relationships that define local food cultures are inevitably entangled with national and global food systems – from traditions and trading to lobbying, policy-making, and economic incentives, from energy distribution to the climatic conditions of specific geographies. While some of the insights and solutions that Studio Other Spaces hope to generate through Hungry EcoCities may have global applications, many best-practice cases and prototypes for innovation with regard to food will be different across cities with various geographies, climates, population densities, and cultural contexts, as well as with food systems defined by diverse food policies and political ideologies.

In light of its vast resources, the EU is positioned to lead projects that pioneer more sustainable and socially responsible food systems. **Through the Hungry EcoCities project, we hope to make a contribution not only to Germany and Europe, but also to the international community.** Our experiments and models will benefit greatly from the diverse knowledges of countries and communities around the globe, so we are

developing this project **in the spirit of sharing across borders and emphasising decolonial approaches.**

FOOD AND NEW TECHNOLOGIES

The impact of digital technology on food cultures extends from personal habits to collective norms when it comes to consumption. At the consumer level, technology influences food trends, helps invent new tastes and recipes, analyses and delegates diets, and can assist in the planning and preparation of meals.

Today, **artificial intelligence (AI) is poised to radically transform not only our food cultures, but also our food systems.** AI, and the neural networks behind it, will likely alter how food is grown and processed in many countries, in addition to how societies think about and talk about food. Just as established technologies already do, AI will further inform what, when, and where we eat, what we buy, and how we cook. AI also has the potential to offer new insights into and tools for producing and processing nutritious food for our growing global population, which currently exceeds 8 billion people.



LOCAL CONDITIONS

by Studio Other Spaces

At larger scales, AI can be deployed in tandem with sustainability initiatives to help minimise food waste and increase food security in ecologically and socially responsible ways. Studies have shown promise that AI-powered optimisations may also be able to help minimise our dependence on fossil fuels, for example in the handling of food waste, and to increase local environmental health, and hence the well-being of the planet.

At Studio Other Spaces, we want to engage **projects in Hungry EcoCities that think critically about the potential of AI and take a holistic approach to assessing where AI can offer insights and solutions.** We are also interested in exploring how AI and underlying neural networks can incorporate traditional knowledges – ways of farming, cooking, and working with the land that certain (industrialised) communities have lost touch with, and to which other contemporary communities, often indigenous, are already deeply committed.

STUDIO OTHER SPACES AND WORK CULTURE

The work of Studio Other Spaces is collaborative at its core.

Our research considers spatial, historical, ecological, social, cultural, and emotional aspects of a site and its users. A key part of our collaborative approach is our **focus on diversity and inclusion.** This entails actively encouraging diversity with regard to the selection of project partners, planning for the needs of diverse users and visitors, and representing diversity in project communications and presentation materials, with both images and texts.

Within HungryEcoCities, SOS encourages successful S+T+ARTS applicants to prioritise inclusive solutions in all decisions concerning the realisation of their project and to make each art-driven experiment accessible to the most diverse audience possible.

PROJECTS FOR RADICAL CHANGE

Studio Other Spaces will focus on food cultures and investigate how they must reflect the needs of our bodies, of our communities, and of the planet. Cooking and sharing food is an activity that ties habitats, communities, and individuals closely together. **Reducing energy consumption in food production and fostering biodiversity are key goals for us throughout this project.**

We believe that conscious awareness of the role of food cultures for our diets, health, and relationships with the environment can lead to more sustainable and resilient practices for the production, distribution, and consumption of food. Our hope is that widespread awareness and collaborative momentum can catalyse novel solutions for feeding the growing global population while respecting planetary boundaries.

Today, lighthouse projects already exist in, for instance, regenerative agriculture and circular food systems. **How do we scale smaller, experimental projects of this kind that value regeneration, resilience, and fairness?** Studio Other Spaces wishes to support projects that contribute to solving this challenge. *Can learning about our food systems and telling new stories lead to innovation in, development of, and scaling up regenerative and integrative agricultural practices? Can it help reconnect people living in urban, peri-urban, and rural communities? Can it radically reimagine sustainable markets and modes of distribution of farm goods? To that end, through outreach and a different kind of storytelling about food systems, can agriculture become a vocational calling for the people who perhaps least expect it?*



LOCAL CONDITIONS by Studio Other Spaces

SUPPORTED FIELDS OF INVESTIGATION ←

1. Making food cultures explicit and communicable

At Studio Other Spaces, we find it urgent to study and make visible local food cultures and their entanglement with global food systems in order to envisage new ways to grow, distribute, and consume sustainable and nourishing food at local and global scales. The Hungry EcoCities prototypes and projects that we will support will engage people in reflections on ecologically and

socially responsible farming, on food systems and food security, and, ultimately, on food as it intersects with climate justice. Making existing food cultures and their networked roots perceivable, communicable, and known is a first step toward creating change in terms of both behaviour and policies.

2. Incorporating sustainable food vocational and public education systems

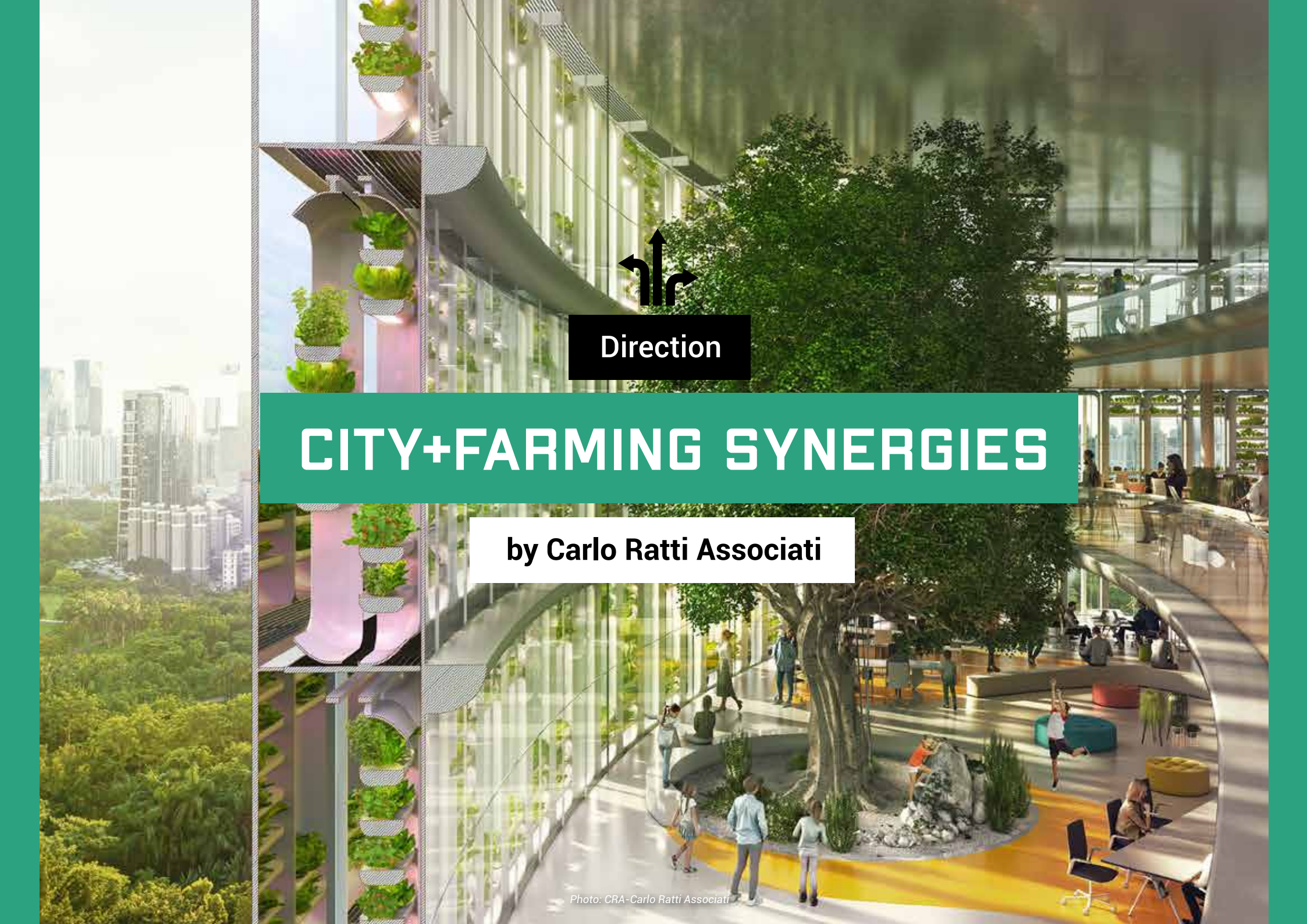
For projects in the Studio Other Spaces Knowledge Hub, it is absolutely critical to foster the incorporation of pedagogy around sustainable food cultures into both vocational and public education curricula and programming, with an emphasis on the technological and career opportunities possible within them. We will support projects that centre on education about the complexities of the intersecting fields of agriculture, health, food security, economics, and social and climate justice; projects that support alternatives to fossil fuel dependence in agriculture; projects that confront challenges of gender, race, and income

inequality and how they modulate accessibility to and engagement in food systems; projects that explore, critique, and rethink how food travels from field to table, through our bodies and back into the world; projects that promote literacy for the different kinds of food processing, as well as for the ecological and health consequences of producing and consuming ultra-processed foods.

These educational goals are intended for primary, secondary, technical, and vocational schools, but can also be designed for workplaces, scientific and cultural institutions, and health and caregiving facilities. They can also be implemented and shared via the media and open online sources.

3. Focusing on the aesthetic aspects and enjoyment of food

At Studio Other Spaces, it is imperative that we take seriously the aesthetic aspects and enjoyment of food preparation and sharing. Aesthetics can unfold the potential for engaging large groups of people in defining new ways of purchasing, preparing, and taking pleasure in sustainable food. We are looking for projects that communicate the knowledge that is embedded in seasonal cooking; that communicate how to be creative about what to cook, for whom, and how; that meld the joys of making and sharing food with an awareness of the health of the planet and our local environments. We seek projects that dare to think of this fundamental sea change as an attainable, mainstream aspiration – one that can be implemented in schools, hospitals, public offices, and cultural institutions, as well as restaurants, private companies, and households.



Direction

CITY+FARMING SYNERGIES

by Carlo Ratti Associati

Photo: CRA-Carlo Ratti Associati



CITY+FARMING SYNERGIES

by Carlo Ratti Associati

FOOD & THE CITY: A DEMOGRAPHIC CHALLENGE

If the UN's demographic forecasts hold true, an extra 2.5 billion individuals will join the global dinner table by 2050. Considering this trend, today's discourse on the future of food is often tied to how we can optimize or maximize food production. But the industry is hardly monolithic: within the European Union alone our food comes from a wide variety of geographical, environmental, and social circumstances. The paradigm of optimization might be well-suited to the relatively straightforward economics of farming in rural areas with low population density. However, it would showcase substantial shortcomings when applied to urban or peri-urban contexts, where many human variables get into the picture.

The evolution of farming techniques in the last few decades - often fueled by the advancement of digital technologies and the Internet of Things - means that the sheer quantity of food cultivated in cities will probably increase in the next few years. Yet, it would be misplaced to believe that cities could or should supplant the countryside

as humanity's main sites of food production. While rural areas might be ideal places to achieve exponential growth in yield rates, especially by leveraging Artificial Intelligence and other new tools, the roles of cities in future food scenarios will have to be multifaceted.

BETWEEN EFFICIENCY AND SOCIAL RELATIONS: MAKING FOOD PRODUCTION AS ONE

The connection between humanity and the food it cultivates is rich, and the city is where its many social, cultural, and relational implications take shape. Today, **we have the chance to bring food production itself into the urban core.** A more efficient, technologically-advanced urban and peri-urban agriculture can help feed the planet's growing population (much of whom will live in urban areas). On the other hand, urbanism cannot only be driven by efficiency. Even countries that had been focusing for years on maximizing output and productivity are now shifting their priorities toward a more balanced relationship between agriculture, society, and the environment. Cities should retain their role as the loci of

food-driven relationships that sustain local identities, improve community relations, and strengthen the ties between humans and plants. In the framework of the HEC-Hungry EcoCities project, we focus our research on innovative farming in urban and peri-urban areas - whether they occur in the open air or closed environments - because these are the places where we can both improve overall output and the social value of food production at the same time.

CAN URBAN FARMING HELP TO BRIDGE THE CITY-NATURE DIVIDE?

The rift between city and countryside has been widening in Europe for centuries. This dualism, which has contributed to the climate crisis, must be overcome. One way to do so is to **bring the natural environment back to the city through urban farming.** Our research will delve into several food production scenarios, touching upon ways in which new technologies, big data, local and international food cultures, urbanism, art and design can allow for stronger relations to be enhanced in cities across the European Union.



CITY+FARMING SYNERGIES by Carlo Ratti Associati

SUPPORTED FIELDS OF INVESTIGATION ←

1. Innovating Architecture through the Incorporation of Urban Farming Elements and Digital Technology: Prototyping Facades of a “Farmscraper”

In the 20th century, architects looked to the industrial world as a source of inspiration as they designed all sorts of non-industrial buildings: from houses to offices to hospitals and schools.

In the 21st century, how can we draw from advances in digital technologies and agriculture? We want to investigate how skyscrapers could evolve into farm-scrappers: urban towers that seamlessly integrate farming technologies into architecture. *What could a farmscraper be? How could the facades of such buildings invite food production? How could AI support in the mission to create them? What other benefits and opportunities could they entail - from improving air quality, to increasing urban biodiversity?*

2. Leveraging Innovative Farming as an Urban Planning Tool to Bridge the City-Nature Divide and Fight Climate Change

For centuries, farming has been pushed further and further out from the city walls until it became almost invisible to urban dwellers. In the early 20th century, planners imagined a “garden city” that would expand outwards and reincorporate nature into urban life. In reality, their dreams often gave way to a car-centric suburban sprawl that pushed cities and the countryside even further apart. Today, we should aspire to bring nature into the city with a focus on agriculture. *How can we include technologically-augmented farming in the urban planning toolbox? Can we bring nature back to the urban core, while at the same time*

mending the damage inflicted by sprawl? How can large-scale farming be scaled down to fit within urban contexts, and how would that impact urban ecology - the entire ecosystem of the “more-than-human city?” Finally, how can we balance openness and transparency in urban farming with matters of health and hygiene? How would urban security issues change if tech-augmented food production, relocated to cities, could be “hacked?” This field of investigation aims to explore ways of technologically augmented farming in more-than-human cities.

3. Rethinking Food Retail and Food Supply Infrastructure - From Local Street Markets to Big Supermarket Outlets

The local street market and the big supermarket might be seen as opposites - the former prioritizing community and the latter maximizing efficiency and scale. We envision a future in which urban farming technologies can both make the street market more efficient and the retail chain more relational, all while increasing people's awareness of and connection to their food sources. In this sense, *how can supermarkets be redesigned to facilitate greater engagement and new*

relationships between food producers and consumers? What could be the meaning of food markets in future cities? Can street markets enable more people to access urban farming, strengthening a sense of domesticity while establishing a crowd-sourced, non-corporate way to grow food using contemporary techniques? Can AI align demand with supply to reduce energy and waste, and assist in the “traceability” of the food cycle?



Direction

MEGA SCALE

by EatThis + Rem Koolhaas & Stephan Petermann



MEGA SCALE

by EatThis + Rem Koolhaas & Stephan Petermann

One of the major complicating factors of the food system is that it isn't a system.

A system, textbook definition suggests, is a regularly interacting group of items forming a unified whole. In the case of the food system you can question whether 'a whole' exists, but it's blatantly clear that it is not unified. The immense layering of centuries of technical and cultural innovations and built-up practices of food production built around the globe would be more accurately depicted as **an entropic collage that miraculously manages to feed us at an unfathomable scale.**

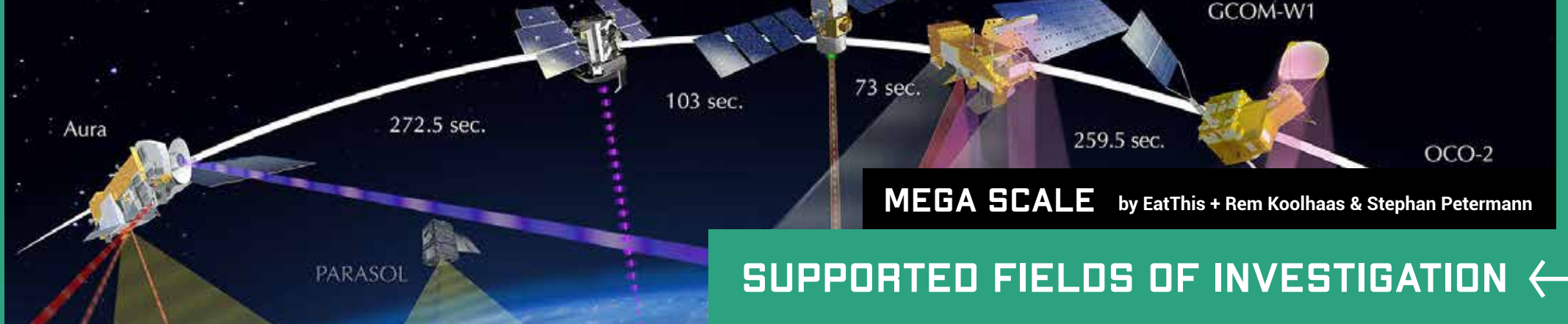
Architects and planners have been notably absent from the functioning of 'the food system'. Only a handful of urban planners considered food production in their plans. From those who tried, even the 'famed' ones like Frank Lloyd Wright in *Broadacre City* (1932), Le Corbusier in *Le Village Radieux* (1930s) and even the popular but hardly realized *Garden Cities* (1898) by Ebenezer Howard, came out short. It was never 'our' terrain, there was no 'agency' for design.

Whether that was a good or a bad thing is one of the key challenges in this project. It needed a researcher, Carolyn Steel, in 2011 with her book *Hungry City*, to first put the role of food and the city on the public agenda. According to Steel the proposal for her book got rejected by publishers multiple times as they considered it a non-topic.

An explanation of this disinterest is the relative **spatial and cultural distance we built between food production and the city**: society considered food production as something that didn't require serious cultural attention, while it prioritized cheaper and easier access. How and where it was made or grown wasn't of great interest. This left production in the hands of a purely industrial rationale, a relentless yet arguably successful form of modernism, and transformed it into a black box not to be seen by society. The role of society was mainly the consumption of its output. Food marketeers were tasked to make up the space in between with faux-idyllic romanticism which were accepted against one's better judgement.

We want to explore these challenges in three fields of investigation; trying to find an interface where 'our' intelligence matters and can provoke new considerations and thoughts.

At a **planetary level**, we are interested in the logic of production site locations (*Where to grow?*), including how the **urban level** seeks to address the opposition between the scale of production needed and urban space available (*Gigafactory for Food*). On a **cultural level**, we are interested to explore how trying to fuse hi-tech and alternative food growing cultures can lead to alternative futures. In each one the role of a specific form of growing, namely **Controlled Environmental Agriculture** (CEA), is taken as a starting point.



1. Where to grow in a warming and more volatile world?

We know that by 2050, there will be at least 2.5 billion additional planet inhabitants who will also want to eat (more) vegetables. We also know that climate change is already having a profound impact on production conditions, an impact that will only exacerbate. How do we accommodate the additional vegetable production and where should it be located in a warming world?

In most cases large scale controlled environmental agriculture¹ production is the result of a relatively random set of conditions: money, available (flat) land, infrastructure, and political will. Other important factors like the availability of (sustainable) energy resources, labor, cultural and environmental factors only come second. This disjunction means production is largely removed from local conditions, and creates massive imbalances between production and energy, and prevents a direct connection to other societal needs and connections.

We want to turn the existing logic inside out by exploring different data sets that can help understand where CEA actually makes sense. The objective is to explore where and how CEA and nature can achieve a form of symbiosis. By using newly available satellite sensing technology, we can improve our understanding of current production, and also combine them with (sustainable) energy conditions, integrating climatic and demographic factors.

Potential questions to consider could be: How do we improve our understanding of the hectares of controlled environmental agriculture (CEA) currently active and what should we strive for as a planet? How can we calculate this and what form would CEA production most likely take? Temperate climates have been the basis for developing CEA growing. What if these climates become more volatile? Would that reduce the plausibility of CEA? When considering this would it be possible to also factor societal, and social

concerns related to CEA? Would new distribution patterns, sizes, and roles for greenhouses in a larger context emerge? Could we use this to improve our current planning practices? Would we be able to use satellite data and artificial intelligence to guide us through finding where we should grow?

2. The Gigafactory for Food

On an average day a large 3.5 million habitant city like Berlin consumes more than 950 tons of vegetables, 730.000 eggs, 860.000 liters of milk, 8.500 pigs, and almost 100.000 chickens. Only a fraction of this consumption is generally produced within the boundaries of the city or the region. COVID-19 revealed the fragility of the (food) supply chains catering cities and created a wide spread call for self-sufficiency for food, specifically by cities.

These cities started developing programs and drafting ambitions to become less dependent on the non-urban areas for food production, The 30 by 30 vision by the Singapore Food Agency (SFA) included a prospect of generating 30% of its caloric needs within the city state and is probably the most ambitious urban food program to date. Other cities translated their ambitions also into reports showing flashy renders of green towers packed with robots picking vertically grown greens, collages of buzzing community gardens with kids picking their own apples. They receive praise in TEDx like conferences and summits, and declared 'The future' in magazine and newspaper articles. But then...

For some time now the political ambitions however largely seem to get stuck and the predicted future remains a persistent prospect. Built prototypes of indoor farms that have materialized in cities are showing clear signs of fatigue. Billions of market investments in these startups are evaporating as we speak, as the reality of production in the city is more challenging than anticipated. Too small, limited in their produce types, high in energy and capital costs, are some of the reasons for their failures. We have to take into account that the expected techno-optimist riposte pointing at the potentially positive effects of 'scaling' and reducing costs over time and innovation acceptance curves just might be wrong.

It seems improbable that the current form of urban farming with its well-intended roof farms, balconies and community gardens will ever seriously meet the dietary needs of a city. Unless we try to develop something radically new... maybe what is needed is a new building typology.

Elon Musk's Tesla Gigafactory in Nevada consolidates car manufacturing at the largest scale possible into a mile long box-shaped structure totaling 143 soccer fields. According to Wageningen University, a vertical farm the size of 36 soccer fields could produce enough vegetables to feed the 3.5million inhabitant city.

Could we use the model of the Gigafactory to consider urban food production? How could we effectively think of this as a building? Could it also integrate different types of crop and livestock production and even cross fertilize? Could it be a public interface that encourages caring more about the production of our food? Can we think of the gigafactory as a city in a city? How can artificial, human and non-human intelligence have a place in this new typology of controlled environment agriculture? What are the conditions this would spatially require in a city?

In this field of investigation we are equally interested in proposals that consider the whole (think of projects dealing with analysis or systems anatomy) as in proposals that zoom in on a specific part of such a system (think of projects looking at specific crops or species).

3. The eco-modernism / alternative food production systems standoff

In the 2022 documentary The Future of Food eco-modernist Hidde Boersma and advocate for more traditional nature inclusive inspired food production practices Joris Lohman challenges the dichotomies that are between them. Boersma and Lohman represent a large societal standoff between

those who believe in tech driven innovation in agriculture (Boersma) and those who reject the influence of modern technology and advocate living in closer harmony with nature by i.e., adhering to the principles of i.e. permaculture (Lohman). The documentary shows how this (Western) standoff is preventing the change in the food system, and that there are things to gain if we listen more to each other.

Both 'camps' claim they are the true admirers of Nature: the eco-modernist by trying to perfect nature, the perm culturalists by complete submission to nature. It begs the question whether both viewpoints are at odds with each other or if an ecomodernist permaculture or a permacultural eco-modernist garden would be feasible? *Could we explore if a hybrid model could have benefits? What would a food forest inside a greenhouse look like? What additional streams/ functionalities can be supported by the greenhouse? Can greenhouses become more nature/ biodiversity enhancing spaces? How could recent biome research in biosciences be introduced into CEA systems? What type of data models would be necessary to support it? But also the opposite direction could be explored: What would adding more control to alternative practices like biological or regenerative farming yield? How would the AI models used in CEA respond to a poly-organized production area?*

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