

## **AGRI- ACTIVE NEIGHBOURHOOD**

AN EXPLORATION OF NEIGHBOURHOOD  
CULTIVATION THROUGH URBAN AGRICULTURE  
AND DEVELOPMENT STRATEGIES

### **PART I URBAN AGRICULTURE AS AN URBAN DEVELOPMENT TOOL**

MASTER THESIS

NTNU SPRING 2018

KAMRAN SURIZEHI

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## URBAN AGRICULTURE HISTORY

Historically food has been just as important to our cities as it has been for sustaining our individual bodies. In fact, one of the most important factors that contributed to forming early human civilization was agriculture. The domestication of plants and animals allowed our ancestors to settle in one area for a longer period of time and gradually, those static settlements became more permanent and evolved into cities, as we know them.

Prior to the industrial revolution, feeding cities was a major logistical concern as it was hard to preserve and transport food without it spoiling before it reached its destination. Therefore agriculture was always located in close proximity to cities. While importing food over waterways with ships was somewhat easier, transporting food over land was difficult as roads were not as smooth as they are today. Livestock could be located further away from the city, as they could be brought into the city by foot, or rather by hoof, through drovers' roads. In London, Smithfield was famously a large meat market where the cattle that were brought into the city were slaughtered on site in makeshift butcher shops. As Carolyn Steel points out in "Hungry City" published in 2008, this relationship the city had with its meat and produce source made it impossible for the citizens of London to be ignorant of where the food originated (Steel, 2008, p. 68). Steel adds that having livestock within the city comes with its own set of problems and although the idea of slaughtering animals in the middle of a city is not a pleasant image, it is a more honest approach than the out of sight and out of mind approach of today. There was essentially no distinction between urban and rural agriculture, they were just different stages of the same process. According to Steel this was the situation with most cities founded before the industrial revolution. The areas where agriculture took root were so important to its citizens that places like Smithfield remain as a market to this day.

The industrial revolution however shifted the paradigm. More sophisticated preservation methods together with transportation technologies such as railway, steam ships and later cars effectively eradi-

cated the need for any presence of food production within the city. Slowly agriculture was pushed to the periphery and was no longer a part of urban living. With railways farmers could import both produce and cattle from rural areas, allowing cities to grow regardless of their proximity to agriculture.

Although the role of agriculture was greatly reduced in cities, in times of need urban agriculture acted as a safety measure. During both the first and second world war, gardening became a sort of civic duty. Victory gardens, often called "war gardens", "food gardens of defence" or "liberty gardens" as they were called during the first world war, were patches of land in cities that were allocated to farming. Victory gardens were planted on private and public land in an effort to reduce the pressure on public food supply in addition to act as a moral boost (Lawson, 2005). In Norway similar gardens were initiated on public land, vacant lots and parks. At one point even the park surrounding the royal palace was used to grow potatoes. These gardens were methods that people at home could indirectly support the war effort, but as the wars ended the interest and the initial drive behind the gardens faded.

In 1905, journalist and writer Marie Jørstad pioneered the first educational gardens in Oslo with the aim of getting working class children out in the open air where they could learn through gardening (NBL, 2018). Jørstad saw agriculture as a learning tool that could allow children to become familiar with how food is produced, work ethic, physical activity and in the end enjoy the fruits of their own labour. The school gardens that Jørstad initiated were private, but soon the municipality of Oslo saw the benefit of educational gardens and implemented them in 80 out of 88 school plots around Oslo (Skolehager i Oslo og Akershus, 2012, own translation). In 1909 "Geitmyra Skolehage" was officially opened and remains to this day as Oslo's biggest educational garden. "Geitmyra Skolehage" aside the number of educational gardens in Oslo has been greatly reduced. At their peak, Oslo municipality had 120 part time teachers, 4 year-round gardeners and a supervisor specifically working

with educational gardens. Today, 60 % of the original educational gardens have been allocated to other purposes and the number of employees working with educational gardens has been reduced to one that oversees all of the educational gardens in Oslo. This is due to the city's growth and the constant pressure on green structures around the city, but also negligence during summer as the children are on summer vacation (Skolehager i Oslo og Akershus, 2012, own translation).



Figure 1 Potato farming during World War II in the park surrounding the Royal Castle in Norway (digitalmuseum.no)

## MOVEMENTS

The idea of a better society is nothing new. Countless philosophers, architects and scholars have imagined better societies and often, agriculture is thought of as an integral part of their visions. Some of the most recognised movements and ideas are:

Sir Thomar More, *Utopia*, 1516  
Johann Heinrich Von Thünen, *The Isolated State*, 1826  
Sir Ebenezer Howard, *Garden Cities of To- Morrow*, 1902  
Bruno Taut, *The Dissolution Of Cities*, 1920  
Frank Lloyd Wright, *The Disappearing City*, 1932  
William McDonough and Michael Braungart, *Cradle to Cradle*, 2002  
Carolyn Steel, *Sitopia*, 2008

Most notably the garden city movement was one of the most agriculture- centered movements. In 1898, as the world was becoming industrialized, Sir Ebenezer Howard envisioned in his book "Tomorrow: A Peaceful Path To Social Reform" an ideal society that would bridge the gap between the countryside and the city. Howard republished his vision in 1902 as "Garden Cities of To- Morrow" in which his detailed concepts encompassed everything from physical scale, zoning, ownership and economy. Howard's vision consisted of a series of smaller city-states distributed around a larger central city with a limited population of 60 000 inhabitants. The cities that in total would occupy 1000 acres were to be interconnected by railway in a 5000-acre agrarian landscape. It was a response not only to the rapid, uncontrolled growth of cities, but also to the demand of a higher quality of urban life.

Only a limited version of Sir Ebenezer Howard's actual vision was ever built, with little success. Instead Howard had an immense impact on town planning known as the garden city movement that Carolyn Steel in the book "Hungry City" published in 2009 describes as a misinterpretation of his vision (Steel, 2008, p. 299). The semi-independent cities that were distributed in a way that both the individual and the city benefitted from nature were instead misinterpreted into suburbs. A hybrid that was realized because of transportation technologies that allowed the occupants to live and work in separate areas.

The societies envisioned by those such as Sir Ebenezer Howard are often seen as utopias, defined by the Oxford Dictionary as "an imagined place or state of things in which everything is perfect" (Oxford Dictionaries, 2018). Carolyn Steel argues in "Hungry City" that the problem with utopias lies in the nature of utopia itself. Sir Thomas More, who coined the term in 1516 in "Utopia", deliberately used the word since it has a double meaning. The term is derived from Greek and can either be interpreted as a "good place" or a "no place".

"That way lies delusion; the belief that human existence can be manipulated as easily as, say, cars at a roundabout" (Steel, 2008, p. 306).

Instead Steel suggests the term "Sitopia". A term derived from the Greek word *sitos* (food) and *topos* (place), meaning "Food Place" (Steel, 2008, p. 307). Rather than something that is on the periphery of urban life, Steel suggests to use food actively as a tool to shape our cities. At its heart, sitopia consists of concepts that we are already familiar with. Cooking with our family. Buying groceries at our local shops. Educating children about food so that they can trust their senses instead of stickers on a packet. Growing our own food, or at least parts of it, within our cities with urban agriculture. And most importantly, how we all need to take more responsibility for the way we sustain ourselves not just for the sake of the environment, but so that cities can continue to be healthy places for people to live.

"A city designed through food, in its ideal form, is clearly utopia. But we don't have to aim at perfection. By just seeing through food, we can go a long way. Sitopia is utopia grounded in reality" (Steel, 2009, p. 322).





## CHARACTERISTICS OF URBAN AGRICULTURE TODAY & FUTURE PLANS

In recent years urban agriculture has experienced a world wide resurgence brought on by a rising awareness of climate change. People are getting more aware of the impact their lifestyle can have on their surroundings and so are looking for better and more sustainable methods of feeding themselves. This has sparked the beginning of a growing trend that has taken many shapes and sizes. Ranging from small private gardens, to collective farming in urban spaces and even large- scale industrial food production. Urban agricultural initiatives around the world have different focuses that go beyond that of just environmental sustainability, such as social integration, food safety, urban renewal and commerce. For the past few years the city of Detroit has famously experienced a vitalization through urban agriculture. The vacant buildings, cheap plot, rising unemployment, low income, lack of fresh food and an abundance of fast food are some of the factors that has lead the citizens of Detroit to reclaim their city. These pockets of urban agriculture in Detroit have become social hubs that allow the users to collectively provide and support each other.

“The general perception of urban agriculture is the idea of herbs in a flowerpot or something edible in a box that you can put on a real estate brochure, and that is it. But our approach to urban agriculture, and what really is the driving force and the potential of urban agriculture are environmental, social and economical dimensions that go along with it. Without having realized what it really is about, it might at first glance seem like urban agriculture is purely an environmental initiative, but there is a lot of work and potential in the social aspect of urban agriculture”

- Anniken Jøssund, Bymiljøetaten, 26.01.18

In Norway urban agriculture is still a fairly unexplored theme compared to our neighbouring countries. Although it is a continuously growing and evolving movement, the urban agriculture of Oslo is characterized by mostly private initiatives and little variation. Anniken Jøssund and Romy Ortiz from Bymiljøetaten are some of the people that are actively working

with changing that paradigm. For the past two years the municipality of Oslo has distributed two million kroner in grants towards urban agricultural projects. The grant is mainly aimed at housing co- operatives and co- ownerships that wish to start an agricultural project, on of the only requirements being that the project needs to have a social focus and cannot be only for aesthetics.

Norway is also participating in “Horizon 2020”, an international EU research and innovation programme with nearly 80 billion euros of funding aimed at securing Europe’s global competitiveness (EC, 2018). One of the projects financed by “Horizon 2020” is a 5- year project called “EdiCitNet” (Edible City Networks). EdiCitNet aims to answer the “Horizon 2020” brief through nature based innovation and research methods. The Norwegian partners of EdiCitNet are the municipality of Oslo, NIBIO, OsloMet and Nabolagshager that are focusing, among other things, on starting a series of urban agricultural activities and circular food projects in Oslo. The initiatives started by the municipality of Oslo are part of a strategy that will run from 2017-2020 called “Spirende Oslo” (Flourishing Oslo) that has parallel goals with EdiCitNet (Jøssund, Ortiz, 2018, own translation). The main goals of “Spirende Oslo” are firstly to develop Oslo into a greener city with a more diverse range of public spaces with greenery, activities and edible produce. Secondly the strategy aims to offer a more inclusive city where green city nodes are created through urban agriculture (Spirende Oslo, Bymiljøetaten, 2017).

Another research project commissioned by the Research Council of Norway in 2016 is “Cultivating Public Spaces: urban agriculture as a basis for human flourishing and sustainability transitioning in Norwegian cities”. “Cultivating Public Spaces” is a cross disciplinary NMBU (Norwegian University of Life Sciences) project exploring how urban agriculture can improve quality of life in dense cities and how urban agriculture can systematically be integrated in public spaces. In this project NMBU is cooperating with Vitenskapsparken Ås, Eriksen & Skajaa Arkitekter, University of Copenhagen, London Metropolitan University, Fylkesmannen I

Oslo og Akershus, the municipality of Oslo, Nabolagshager and Norges Bondelag. Although the project has only just started, it is a promising step towards finding new ways for local communities to influence their surroundings (NMBU, 2018).

In addition to initiatives mentioned earlier, Oslo has been selected as the environmental capital of 2019. As cities around Europe are attempting to reduce their impact on the climate, the European Commission uses the European Green Capital Award as way of promoting and encourage the efforts made to achieve more environmentally friendly cities (EC EGPA, 2018).

The award is given to cities that:

- Has a consistent record of achieving high environmental standards
- Is committed to on- going and ambitious goals for further environmental improvements and sustainable development
- Can act as a role model to inspire and promote best practices to all other European cities

Oslo was chosen as the environmental capital of 2019 partly due to its commitment to cut emissions by 50 % by 2020 and the strategy of how the city treats its waterways (EC EGCA, 2018). This has served as an extra motivation for the city to emphasize and showcase the green and blue structures of the city.

## URBAN AGRICULTURE IN OSLO AND ABROAD

Following are examples of urban agriculture projects in Oslo and abroad. These examples have given us some ideas on planning, organization forms and how they are funded. One of the key factors during our first visit to Oslo, was the importance of how to organise and plan urban agriculture projects.

Depending on the scale of the projects, one of the challenges was a lack of people working with the projects or funds to run the projects. Especially long term projects with only volunteers. Another challenge was residents who often changed housing location in the city centre, resulting in less ownership of the area and the community engagement. At this point we wanted to understand how we could use these ideas to develop an area with urban agriculture.

### EXAMPLES FROM OSLO

#### Nabolagshager

Nabolagshager is an Oslo-based center for urban agriculture, eco-innovation and green community initiatives. Since 2013, Nabolagshager have been involved in many projects, it is a social entrepreneurship company, working within the following areas:

- KNOWLEDGE FOR RESILIENCE
- GARDENING FOR URBAN REGENERATION AND PLACEMAKING
- GROWING GREEN EMPLOYMENT

We have chosen one project as a case study to showcase the importance of placemaking and organisations skill.

Sjakkplassen - which regenerated an underused public space considered unsafe, by inviting in immigrant seniors, local businesses and tourists alike for shared experiences with outdoor chess and gardening (Nabolagshager.no).

The project was funded by the municipality in Oslo, to revitalize Vaterlandsplassen in Grønland. The area is known for drug dealers and crime related activities. For centuries authorities has tried to fix the problem by using power and force, with no luck.

#### Process:

First stage was to invite Tagtomat , which is urban agriculture firm from Denmark. Tagtomat had great experience making outdoor furnitures with plants that could work very well in public space with low maintenance. Meanwhile, they invited people on Facebook, handed out posters and talked to local people of the transformation of Vaterlandsparken. The idea was to transform the area with volunteers and local people. However, Nabolagshager had already created a core group of 6-8 people who was always at Vaterlandsparken, helping out and making conversations.

One of the main factors for the team was to talk to everyone, despite ethnicity and social status. At the same time creating intimate spaces with the furnitures, set up outdoor activities and organise the event. Food was also an important tool to bring people together and used as an ice breaker. Their focus group were elderly people.

We liked this project very well. Despite the simplicity of the project, it had a great effect and managed to bring people together. After the project period between august to winter, Nabolagshager got access to a report done by local guards twice a day. The findings were surprising, before the project there were many arrests and vandalism registered. When the project was running and being used the crime rate registered lowered increasingly.

## Key facts

What:	Sjakkplassen
Why:	Revitalize public space
Funded by:	Oslo Municipality
Partners :	Tagtomat,
Firm:	Nabolagshager
Organisations structure:	Social entrepreneurship



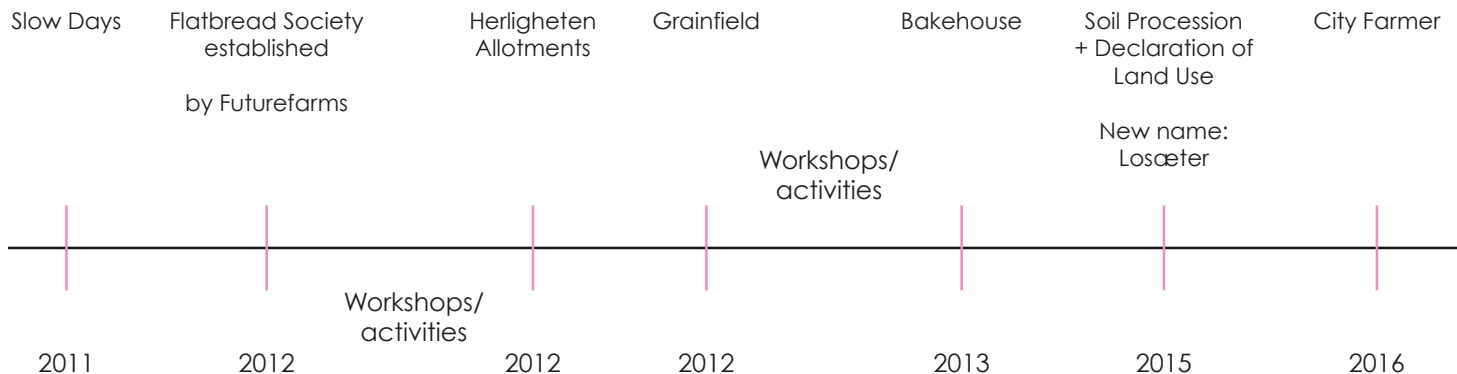
## Loscæter:

Loscæter is a great project showcasing both multidisciplinary collaboration and an interesting process. The idea was to use art and urban farming to programme an area with different activities for the public. The process was also an experiment called the organic process. They did not know how the area was going to end up, they only had an idea, to plan the unplanned.

“Loscæter is a new cultural institution on a common along the waterfront in Bjørvika dedicated to a range of activities related to art and urban food production. It includes Flatbread Society, Herligheten allotment community, an ancient grain field, a bakehouse and Oslo's first City farmer. Loscæter is a space in constant organic development. This unconventional use of a common area was initiated by the art collective Future farmers, with Amy Franceschini (US) as the lead artist”  
([www.Loscæter.no](http://www.Loscæter.no)).

Loscæter is a result of an initiative by Bjørvika Utvikling, a private developer based in Oslo. Together with the artist Amy Franceschini, they started Flatbread Society.

### The Organic process



## Key facts

What: Art and Urban farming, Allotment, Bakehouse, Grainfield

Why: Educational, Social, Food awareness

Funded by: Statens vegvesen Region øst,  
Partners : Food studio, GrowLab, Herligheten, Kompass og Co, Oslo Aviary and Apiary, Spire og UngOslo.

Firm: Bjørvika Utvikling,

Organisation structure: Private, Mix,



## Parkens Grøde

Parkens Grøde is a volunteering organisation in bydel Sagene working to raise awareness of sustainable values and sustainable choices through different activities of urban agriculture. Their goal is to transform parks in Sagene into a positive meeting place by using permaculture. They also have a their own area called the “kitchen garden“ were they produce vegetables and herbs for everyone to pick. Started as a neighbouring initiative in 2013 with Oslo municipality. It is now funded both privately and by Bydel Gamle Oslo.





**Key facts:**

What: Permaculture

Why: Social and educational

Funded by: Det Norske Hage Selskap,  
Bydel Gamle Oslo,  
Sprebankstiftelsen,  
Olaf Billes Legat

Organisation structure:

Union / Non profit organization  
/ Membershipfee

## URBAN AGRICULTURE IN OSLO & ABROAD

### Examples from Abroad

#### Prags Have - Copenhagen

Prags started as a temporarily experimental project by young active people who wanted change. The production of food was not important, but the quality of having a place nearby to meet and engage with your neighbours was their main focus. Their vision was an open structure, with no organisation formats, no private allotments, but rather share everything. Open every Wednesday and Sunday were people can harvest, cultivate and eat. Due to popularity and many participant, they had to establish a union. However, the goal was still to have no private allotments and encouraged experimentation. They also wanted people to come up with ideas and experiment with mix of other urban agriculture activities.

**Established:**  
2011

**Area of harvest:**  
230 m<sup>2</sup>, 140 shared cultivating boxes

**People:**  
Started by 10 people, used by 50 – 80 people, families, couples,

**Organisation structure:**  
From a temporary project to union

**Plot owner:**  
Private, rented out for 1260 kr. a month, during summer and 625 kr. during winter.

**Funded by:**  
Amager Øst Lokaludvalg & The municipality

#### Beboerhaven på Enghave Plads

Situated in Vestbro, Copenhagen, Enghave Plads became a meeting place for all kinds of people. Skaters, café guests, beer lovers, and urban agriculture lovers. This community garden was initiated by local people in response to an urban development project, started by the municipality. The neighbours' vision was to create Enghave Plads to an ecological garden and was approved by the government.

**Established:**  
1994

**Area of harvest:**  
400 m<sup>2</sup>, 12 allotments & a community garden

**People:**  
12 permanent user, mostly families and young couples.

**Organisation structure:**  
Union

**Plot owner:**  
Municipality

**Funded by:**  
Municipality

Hulme Community Garden Centre, Manchester.

Hulme Community Garden Center was established in 1998 by five local enthusiasts who wanted to create a social change by introducing a green public space for local residents. Since the opening, it has played an important role in the cities development. Offering activities, workshops and educating local residents.

**Established:**  
1998

**Area of harvest:**  
2000 m2, divided into a plantcenter, community garden, workshops, greenhouse, office and kitchen.  
No private plots.

**People:**  
11 employes, 160 volunteers og Hulme Community Garden Center , 150 000 visitors in 2010

**Organisation structure:** Social entrepreneurship,  
150 000 visitors in 2010

**Plot owner:** The Municipality, rented out for a symbolic amount.

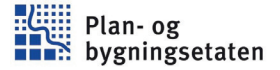
**Funded by:**  
Public and private

Source: Dyrk din by (Jensen, Pedersen, Hansen, & Hauxner, 2012)

## ORGANISATIONS IN OSLO

This list represents the different urban agriculture organisations and firms related to urban agriculture. It is crucial to emphasize the importance of interdisciplinary collaborations between the companies and other businesses.

Government



Based on our research there are few companies collaborating in this way. A great concept would be a platform for all the urban agriculture companies in one place.

For example on a webpage explaining their visions and sharing their knowledge.

Non-profit



Private



Knowledge | Advice | Activitycenter |



S  
Norge



Food | Restaurants | Distribute



Festivals | Events

## FOUR COMMON TYPES OF ORGANISATION STRUCTURES

According to the report "Dyrk din by", community gardens can be divided in four common types of organizations. (Jensen, Pedersen, Hansen, & Hauxner, 2012). Even though these types are related to community gardens it can be applied to other urban agriculture organizations.

Based on the previous examples we can categorize them in the following examples.

### Gardengroup

The garden group is particularly suitable for start-up and establishment of a joint citygarden. It is important that the organisational form makes room for the energy and the desire to get started (Jensen, Pedersen, Hansen, & Hauxner, 2012).

### Network

The network has the potential to reach broader and grab more than just those who live in the neighborhood of a particular garden. In Copenhagen there is a network like DYRK Nørrebro established a garden on the roof of Blågård School, but the goal is to establish many gardens elsewhere in the district. ByhaveNetværket has helped establish a long number of townspeople, including Beboerhaven at Enghave Square. This type of network provides good opportunities for transferring experience from one project to the next (Jensen, Pedersen, Hansen, & Hauxner, 2012).

### Social entrepreneurship

The city port as a social economy pursues a social or charitable purpose through sales of crops or services. The examples from London, Manchester and Berlin show that social economy companies can act as one flexible and sustainable framework for gardening. First of all, there is a city garden that run as an enterprise, the ability to create revenue rather than depend on financial support (Jensen, Pedersen, Hansen, & Hauxner, 2012).

### Committee

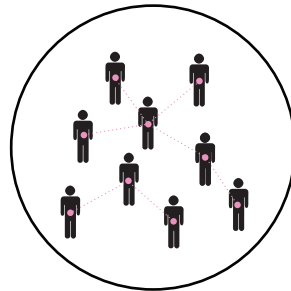
Associations can act as a legal entity. There is a clear advantage in the cooperation with municipalities and other authorities. At the same time, an association can provide a robustness and some clear rules for the community, responsibilities and cultivation methods, as is the case in Fælleshaven in Beder in Aarhus. But it can be difficult to get members to engage in the administrative work of an association (Jensen, Pedersen, Hansen, & Hauxner, 2012).

Gardengroup

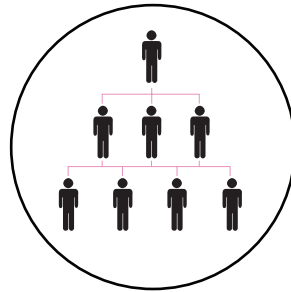


Prags Have - Copenhagen

Network

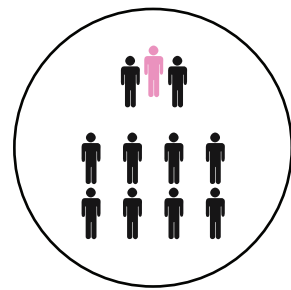


Social entrepreneurship



Hulme Community Garden Center,  
Manchester  
Nabolagshager  
Losæter

Committee/Union



Beboerhaven på Enghave Plads  
Parkens Grøde

Dyrk din by (Jensen, Pedersen, Hansen, & Hauxner,  
2012)

## CPUL CITY ACTIONS

We were very fascinated by the CPUL City concept described in the book "Second Nature Urban Agriculture by André Viljen and Katrin Bohn, 2014. The concept is broken down to four distinct "actions" describing interdisciplinary tools relevant for architectural, urban design and planning professions for a long term urban food system. (Bohn and Viljoen, 2014). It gave us some guidelines to consider and adapt for future reference.

Action VIS = Visualisation Consequences: The visualisation of urban agriculture's contributions to urban life.

Action IUC = Inventory of Urban Capacity: The careful study of each sites's capacities and opportunities

Action U+D = Bottom Up + Top Down: Cooperation between food growers, local councils and neighbourhoods.

Action R = Researching for Change: Constant research for best practice and the adaptation to changing context.

All of the four actions was valid for us, however we wanted to focus on **Action U+D = Bottom Up + Top Down.**

As we learned about the matter we understood there was many organisations in Oslo that worked with urban agriculture. However, very few were related to urban development projects. This does not imply that developments or housing projects should have some sort of urban agriculture program. We want to emphasis that Oslo needs a more accurate policy regarding urban development projects and the use of urban agriculture.

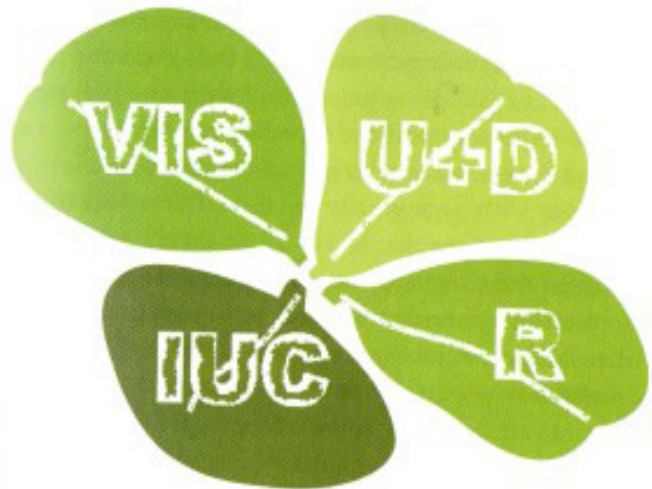


Figure 1: The CPUL City Clover. Four joint actions enable the successful implementation of productive urban landscapes.



This concept could also be applied in urban development projects. Below is a list of 6 exciting projects with similar approach. What we liked with these projects was the unique development approach and Bottom Up + Top Down initiatives.

Pilestredet, Oslo Norway.

Vulkan, Oslo, Norway.

Svartlamon, Trondheim, Norway.

Vindmøllebakken, Stavanger Norway.

Smart Strijp-S, Strijp-S, Eindhoven, Nederland

Wallisblok, Rotterdam, Netherlands

## IMPACT OF URBAN AGRICULTURE

Depending on the scale, longevity, type, model and goal of specific initiatives, urban agricultural can have a wide range of impacts on people and their surroundings. In general the different impacts of urban agriculture can be divided into four categories: economic, environmental, social and health and wellbeing. It is also important to remember that urban agriculture is fluid and the effect of each project often overlaps multiple categories.

### Environmental impacts

The most tangible impact of urban agriculture is the produce itself. According to SSB (Statistisk Sentralbyrå), the arable land area of Norway accumulates to only 3- 4 % of the total land area (SSB, 2015). Additionally Norway is just shy of 50 % self sufficient in terms of the energy that is consumed through food nation wide (NLS, 2018). By providing locally grown food, urban agriculture can directly ease the need to import goods and effectively reduces the emission caused by one of agriculture's most polluting aspect, transportation. Additionally it can be an alternative to the limited arable land in Norway. Through composting or soilless farming methods, the arable area can be expanded into the city.

Urban agriculture can also be a diversifying tool and create inviting places, not just for people, but also other living creatures. As cities continue to grow, urban agriculture can be an additional measure in order to ensure bio diverse cities that reduce the risk of eradicating other creatures' habitats. Air quality, noise reduction and counteracting city's heat island effect are some of the other areas urban agriculture can affect, such as projects like "GreenCity Tree" aims to do (Green City Solutions, 2018).

According to the Food and Agriculture Organization of the UN, up to one third of all food produced worldwide is discarded or spoiled before it is consumed (FAO, 2018). By implementing alternative systems, the concept of waste can be erased as Michael Braungart and William McDonough presented in "Cradle to Cradle: Remaking the way we make things" pub-

lished in 2002. Waste can become nutrition or recycled into another material. Additionally urban agriculture can reduce the need for packaging.

### Economic impacts

The medium age of the Norwegian farmer was as of 2017, 54 years (Aftenposten, 2017). With only 10 % of the farmers in Norway being under 40 years old, increasing opportunities to work with agriculture in cities may be one way to motivate younger people to join the field.

According to a report published by the University of California Davis in 2013, there has been conducted very little research into the actual economic benefit of urban agriculture (UC Davis, 2013). The potential of urban agriculture as it stands today, is in job creation. However farming technologies are in a constant state of improvement and are employed in new and innovative ways every day. Different iterations of urban agriculture implement technology and business models in different ways exploring the potential of economic gains. For instance the urban agriculture movement has an impressive power in mobilising volunteers and unemployed participants.

### Social impacts

"Sjakkplassen" initiative by Nabolagshager in 2015 perfectly encompasses the social benefits of urban agriculture. The project was a temporary initiative situated in Vaterlandsparken, a public square in an area of Oslo that has historically been characterized by criminal activity and social challenges. Through public workshops, urban gardening, benches and games, the local area gained the opportunity to reclaim the area. The urban gardening acted as an icebreaker, creating a social and inclusive area (Gallis, 2018). Such projects can be a great tool in building communities, platforms of social integration across generations and ethnicities and even increase the perceived safety of an area by local populations having a presence in their area.

## ECONOMIC

Job Creation, Training, and Business Incubation  
Market Expansion for Farmers  
Economic Savings on Food  
Savings for Municipal Agencies  
Increased Home Values



## ENVIRONMENTAL

Improved Soil Quality  
Reduction of Stormwater Runoff  
Improved Air Quality  
Increased Biodiversity  
Reduced Carbon Emissions  
Waste Reduction

## SOCIAL

Creating Safe Places/ Reducing Blight  
Access to Land  
Community Development/Building Social Capital  
Education and Youth Development Opportunities  
Cross-Generational and Cultural Integration  
Creation of art, recreation, and/or neighborhood meeting places

## HEALTH

Food Access and Security  
Increased Fruit and Vegetable Consumption  
Food and Health Literacy  
General Well-Being (Mental Health and Phys Activity)

## Health impacts

The therapeutic aspect of working with agriculture is often thought of as the main health benefit of urban agriculture. Urban agriculture is an activity where the invested time, labour and energy is rewarded in a tangible result. If engaged in correctly and moderately, urban agriculture can increase physical activity.

Urban agriculture can increase the access to fresh, locally grown food. It can offer alternative sources of food and in so inspire healthier diets. It can also increase food security, especially in economically challenged areas (FAO, 2018).

The following is an overview of determinants of health as the World Health Organization has described them. In green are the factors in which urban agriculture can have an impact.

### BIOLOGICAL D.O.H.

GENETICS  
BODY STRUCTURE  
BODY FUNCTIONING  
GENDER

### PHYSICAL D.O.H

WATER QUALITY  
AIR QUALITY  
CLIMATE  
MATERIAL/ CHEMICAL HAZARDS  
NOISE  
FOOD SAFETY  
FOOD QUALITY  
LAND/ SOIL QUALITY

BUILT ENVIRONMENT  
TRANSPORT  
PUBLIC OPEN SPACES  
HOUSING QUALITY  
INFRASTRUCTURE (HEALTH CARE SERVICES)

## DETERMINANTS OF HEALTH

### BEHAVIOURAL D.O.H

DIET  
HYGIENE  
DRUG/ PHARMACEUTICAL USE  
IMMUNISATION  
PHYSICAL ACTIVITY  
PROTECTIVE CLOTHING USE  
SEXUAL ACTIVITY  
SUN EXPOSURE

### SOCIAL D.O.H

COMMUNITY INVOLVEMENT  
CULTURE  
SAFETY  
SPIRITUALITY  
TRUST

### ECONOMIC D.O.H

EDUCATION  
OCCUPATION  
EMPLOYMENT STATUS  
FINANCIAL RESOURCES  
LIVING STANDARDS

Between 2010 and 2014,† the number of people in allotment garden waiting lists more than doubled, from 400 to 1000 (Aftenposten, 2014). The individuals in the waiting list probably have their own reasons and motivations for participating in urban agricultural activities. Everyone can benefit from urban agriculture in one way or another, but children, teenagers, elderly, newly arrived immigrants and economically disadvantaged are groups of people that can benefit from urban agriculture the most.

### Children and Teenagers

Educational gardens have proven that agriculture can be a great learning tool. Urban agriculture can increase food literacy and educate healthier diets in addition to offer alternative work experiences within the city.

### Economically Disadvantaged

Urban agriculture can be a great aid in increasing food security. Additionally urban agriculture can offer alternative volunteering opportunities to idle or unemployed citizens.

### Elderly

The therapeutic aspect of agriculture is suited well for elderly and can be a great hobby. It can increase physical activity as long as it is not too labour intensive. Urban agriculture can also act as a cross-generational icebreaker. By having platforms where elderly can interact with other groups of people, they can stay socially integrated.

## CHALLENGES & NEGATIVE SIDES

One of the challenges facing urban agriculture is the lack of policies and planning. According to Anniken Jøssund and Romy Ortiz from Bymiljøetaten, there has been a significant interest and public engagement when it comes to urban agriculture in Oslo, but there has been a lack of proper municipal channel to pursue these requests. Now bymiljøetaten is working with establishing such channels that make it easier for the general public to enquire about urban agriculture (Bymiljøetaten, 2018).

A challenging aspect of urban agriculture is the knowledge base required to have a successful project. A lack of knowledge can lead to an unsuccessful initiative that does not benefit anyone and instead is often left visibly unused. Therefore it is important to collaborate with more experience farmers in order to ensure a productive urban farm. It is also important to have a structure or business model that takes advantage of multiple methods of supporting the farm. For instance mobilising volunteers can be an useful resource, but relying solely on volunteers is challenging as the amount of interest and available volunteers can be unreliable.

Although urban agriculture in public spaces is generally used as means to encourage more diversity, it can at times lead to the exact opposite and cause displacement. The presence of urban farms is often associated with improved aesthetics, reduced crime and community cohesion, resulting in rise in the neighbourhood property values (Vox, 2016). In itself, that is a positive consequence of urban agriculture, but measures should be taken to ensure that the people the projects are aimed at do not get priced out of their neighbourhoods.

According to a report published by the county governor in Oslo and Akershus in 2014, there are a lot of conditions that need to be met in order to have a successful project. However, having a visible and accessible project can be an easy measure to ensure that people actually benefit from urban agriculture (Fylkesmannen I Oslo og Akershus, 2014). That way, the success of the project is not measured only by the

amount of produced food.

One of the major concerns with urban agriculture is pollution. A prerequisite for any urban agricultural endeavour is that the produce is not damaging to anyone's health. Although there is little research conducted on the topic, there is no definite data suggesting that farming in urban environments is any more dangerous than in rural areas. However it is important to take measures and properly investigate the soil or any other factor that might be a risk.

No policies in planning process

Lack of knowledge

Need for infrastructure

Finance issues and a sustainable organizations models

Shortage of volunteers over time

Few variations of urban agriculture activities

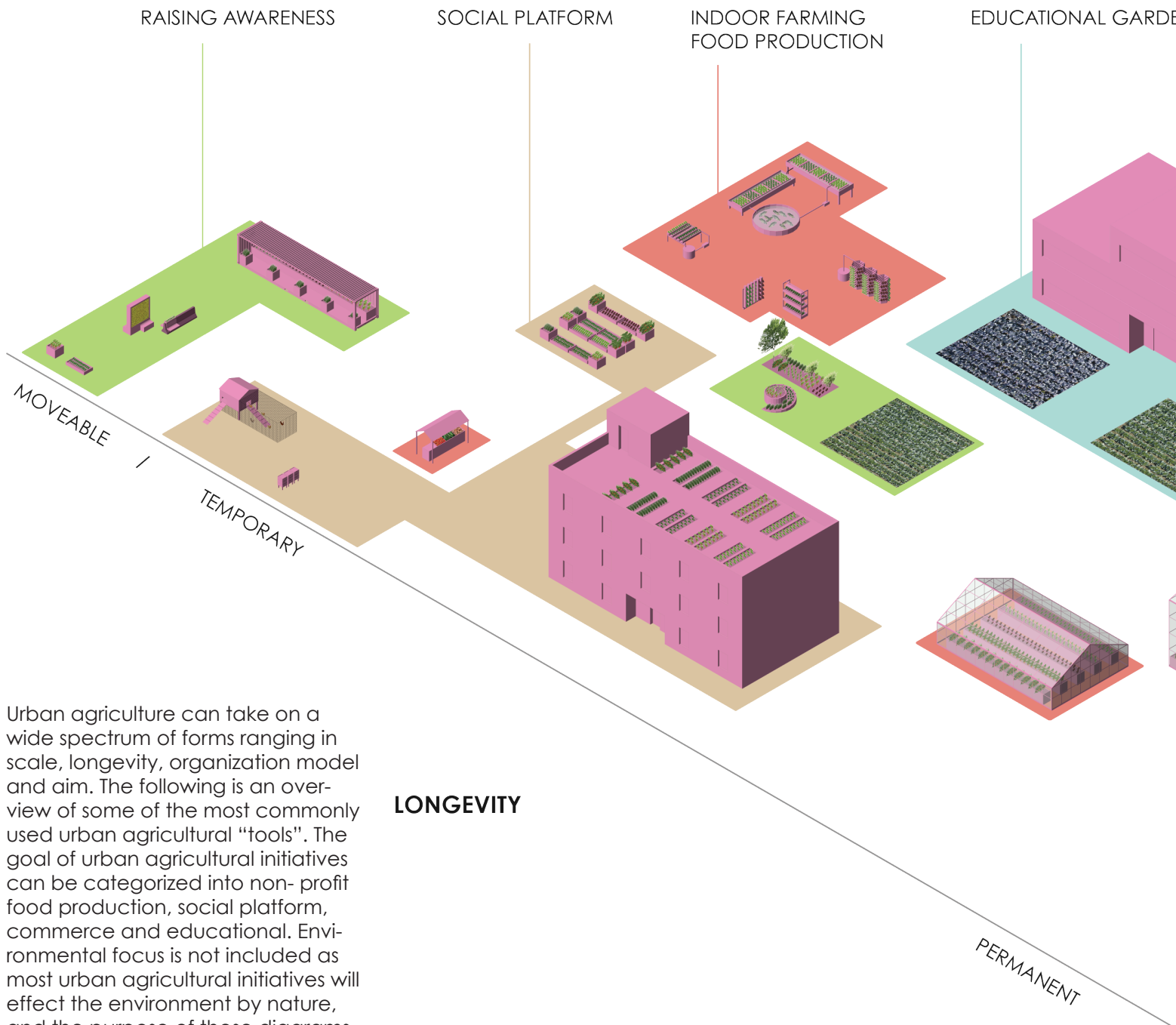
Lack of collective overview of U.A organizations in Oslo

Theft and injuries

Can lead to gentrification



# URBAN AGRICULTURE TOOLS



Urban agriculture can take on a wide spectrum of forms ranging in scale, longevity, organization model and aim. The following is an overview of some of the most commonly used urban agricultural "tools". The goal of urban agricultural initiatives can be categorized into non-profit food production, social platform, commerce and educational. Environmental focus is not included as most urban agricultural initiatives will effect the environment by nature, and the purpose of these diagrams is to explore other focuses of urban agriculture.

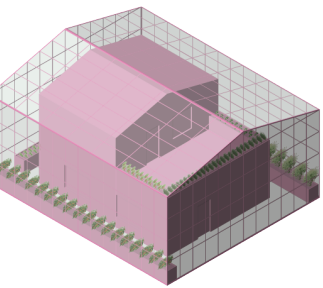
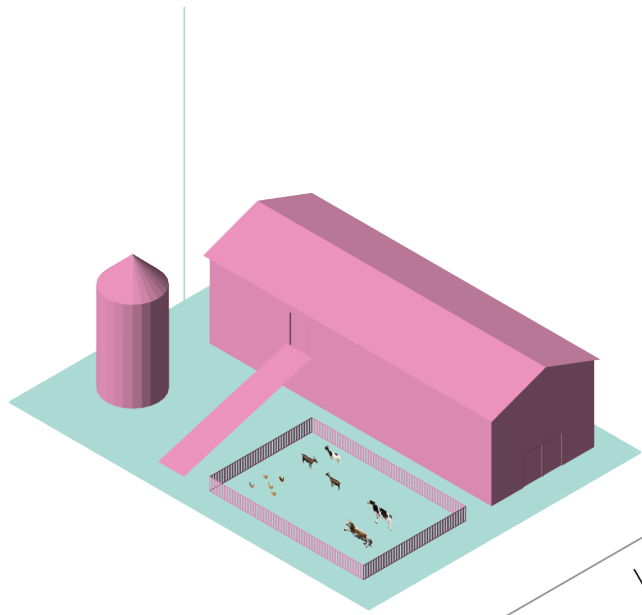
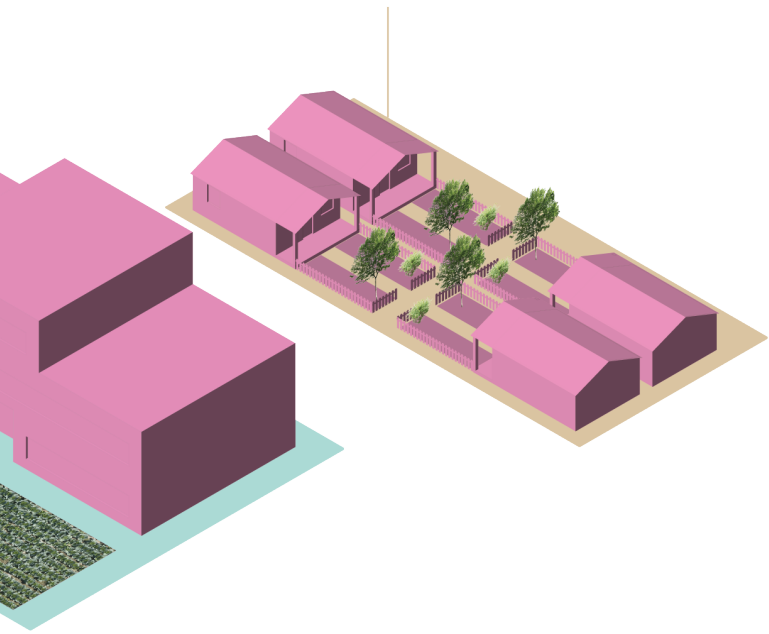
## LONGEVITY



EN

PRIVATE GARDENING

LEISURE FARM

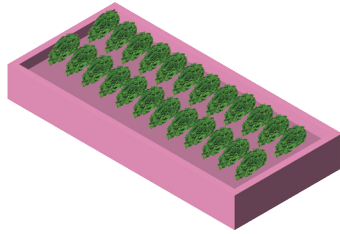
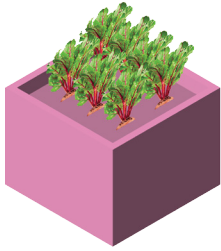


SMALL

MEDIUM

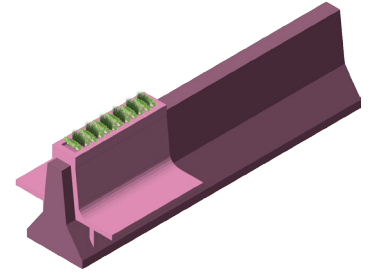
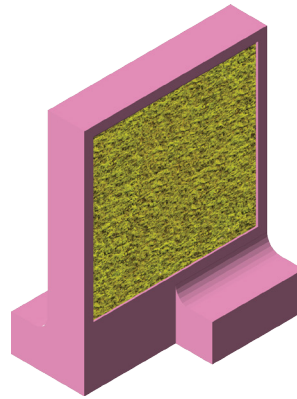
LARGE

SCALE



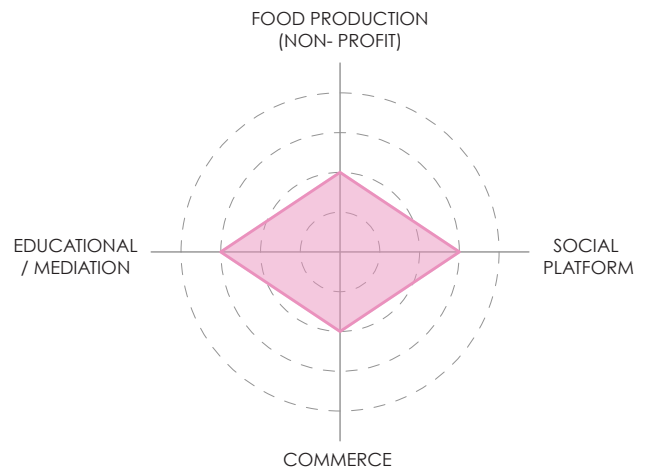
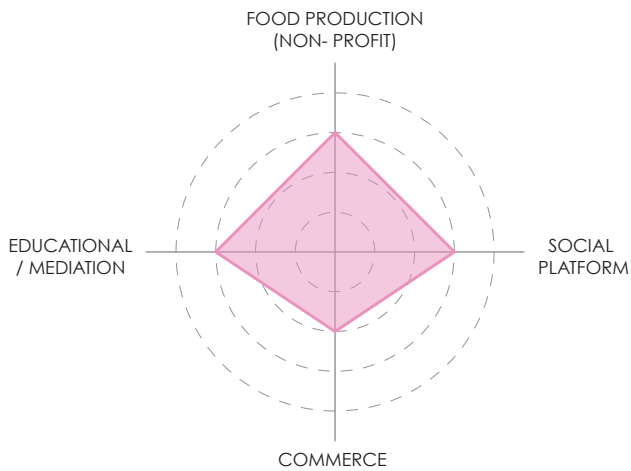
Raised garden beds

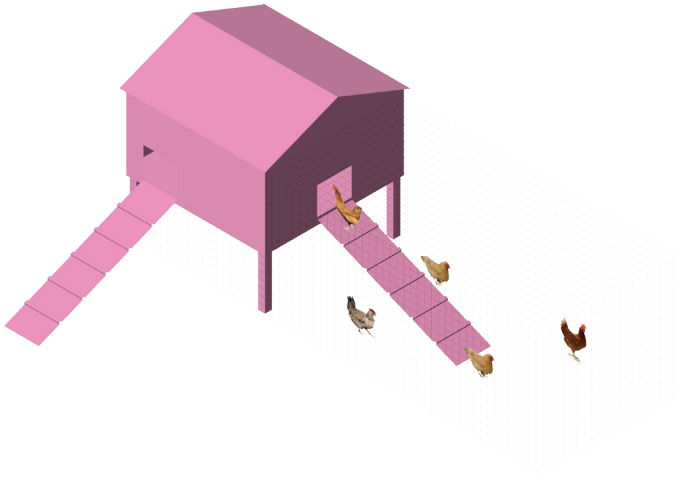
Raised garden beds are the staple ingredients in most urban farms. They can be moveable, physically easier to work with and are less permanent than urban farms planted directly into the ground. Additionally they can be used in areas where the soil is not arable.



UA + object

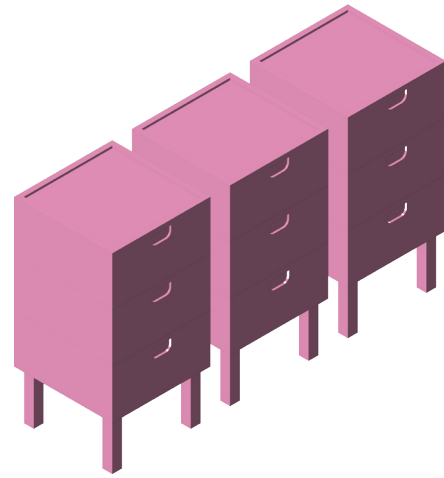
Urban agriculture is often coupled with other city functions. The result can be wide range of products that can create more exciting solutions for everyday objects or even be educational by raising awareness.





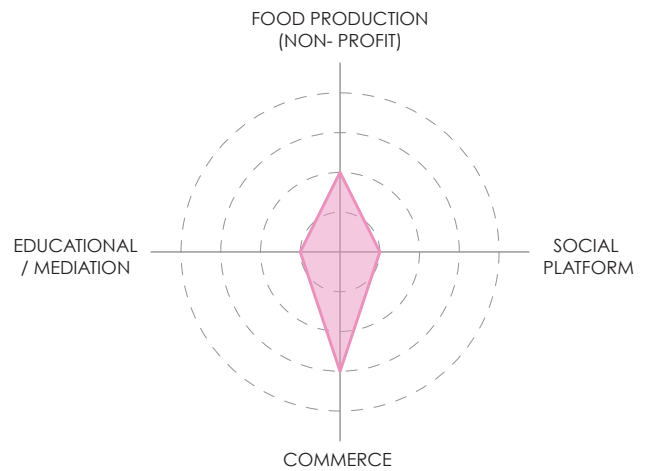
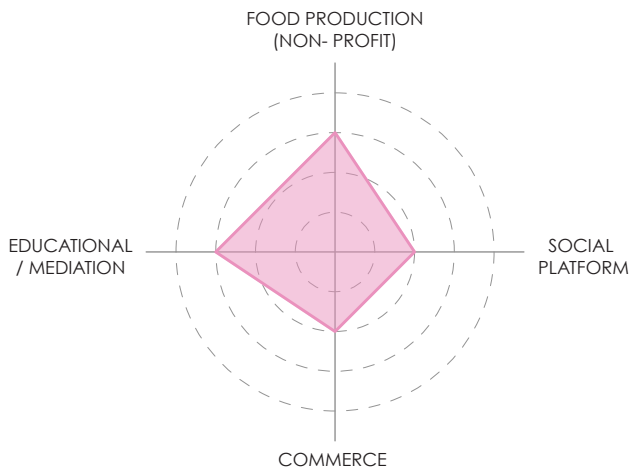
### Backyard animals

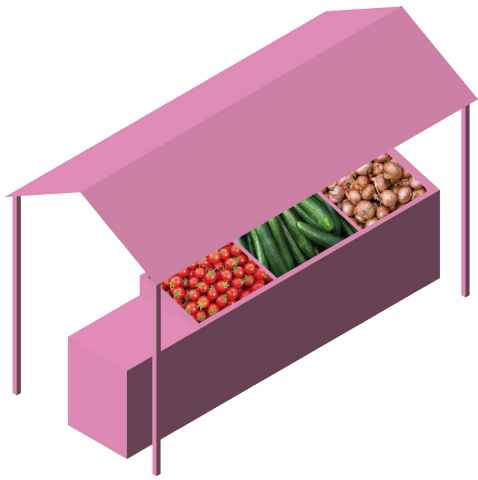
Raising of backyard animals such as chickens can be a great initiative that helps food security. Provided that the animals have enough space and are kept in good condition, they can even contribute to waste reduction and composting.



### Apiary & other insects

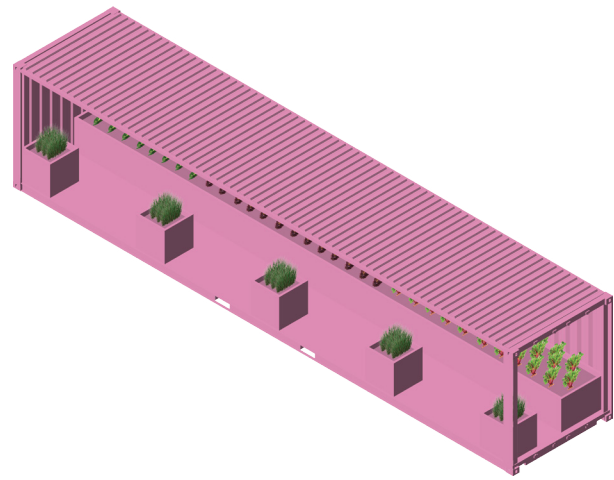
Urban apiaries can be a great initiative that results in a delicious product, but that can also help the surrounding area. By keeping bees in backyards or on rooftops, small-scale honeybee colonies can help pollinate the surrounding gardens. There has also been urban agriculture projects that focus on other insects such as crickets. Exploring alternative sources of obtaining protein is a great initiative in reducing meat consumption.





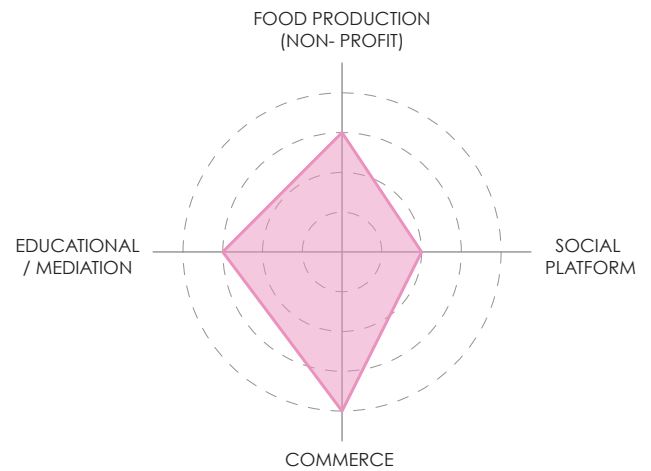
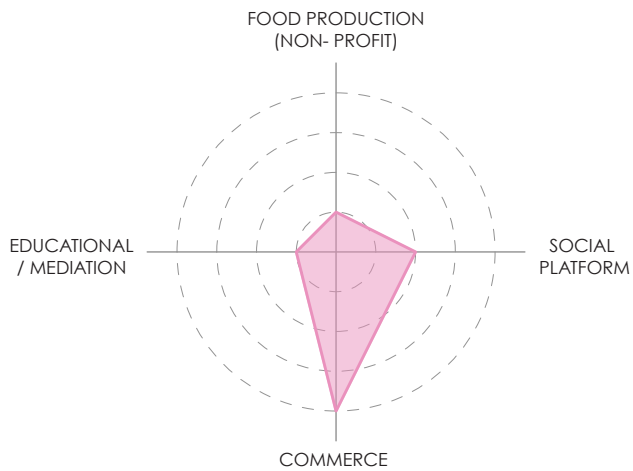
Farmers market

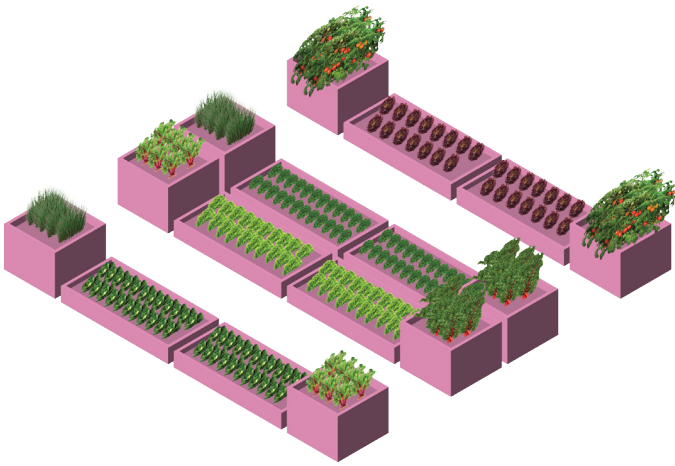
Temporary or pop up markets can act as a market extension for farmers. It can bring the farmer and the consumer closer to each other and cut out the middleman in addition to making grocery shopping into a more personal and social activity.



Container farms

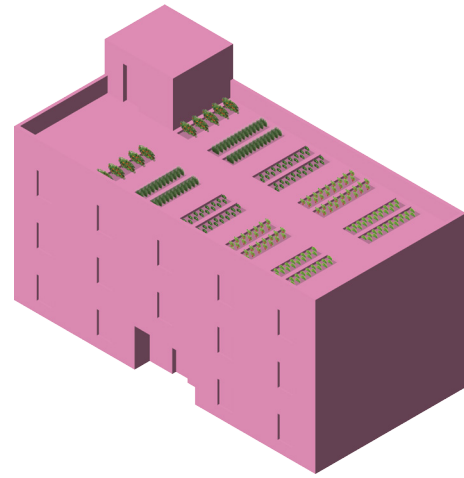
By having agriculture within the flexible structure of a container, the potential of container farms become endless. It is suited for both commercial and public purposes as it is a scalable system and can be moveable and prefabricated.





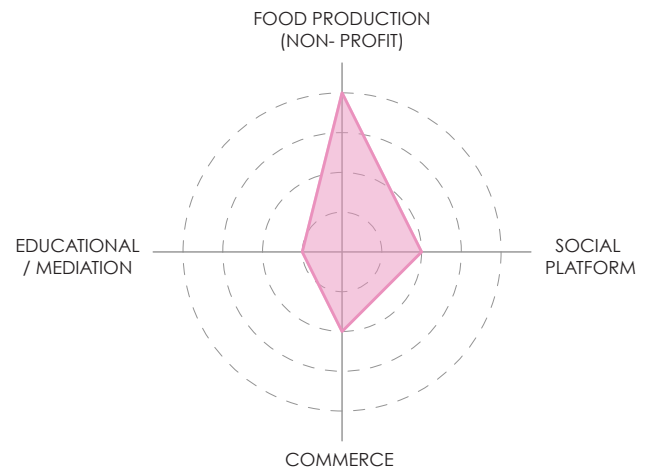
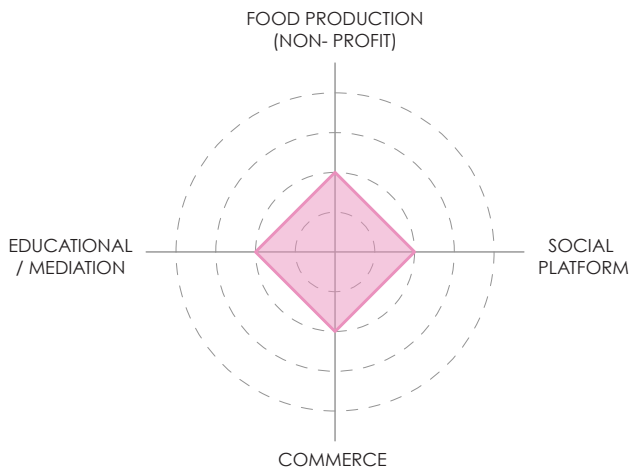
Allotment garden

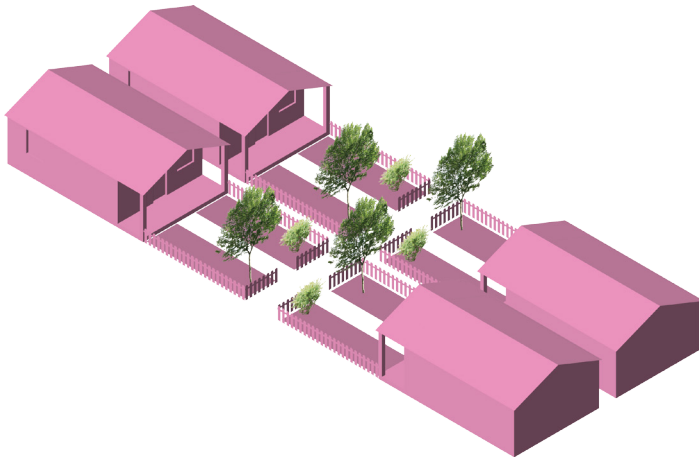
A small piece of land in or just outside a city that a person rents for growing produce. One of the most common types of urban agriculture that allows people living in cities that do not have access to own gardens to grow vegetables.



Rooftop garden

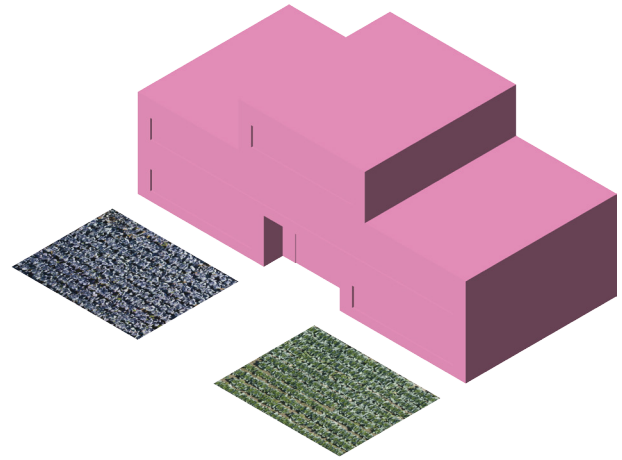
Similar to allotment garden, a rooftop garden is an opportunity for the resident of an urban block to grow fruits and vegetables with their neighbours on their roof.





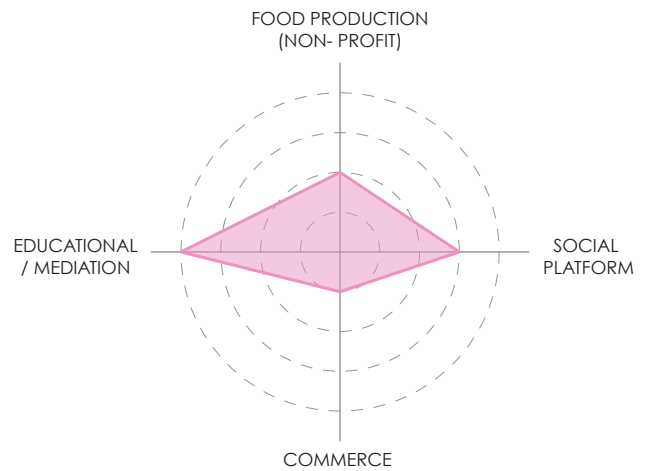
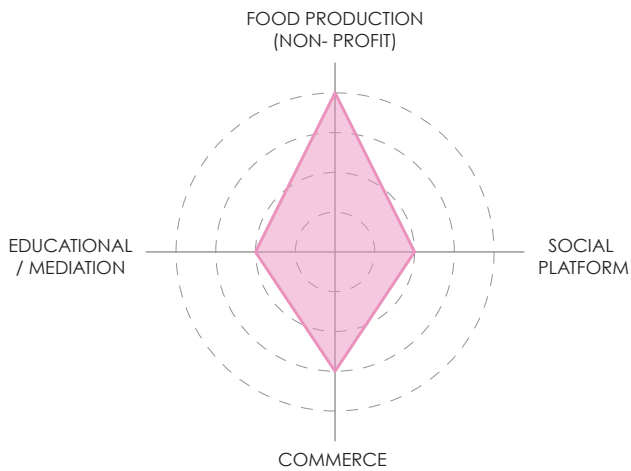
### Allotment co- operative

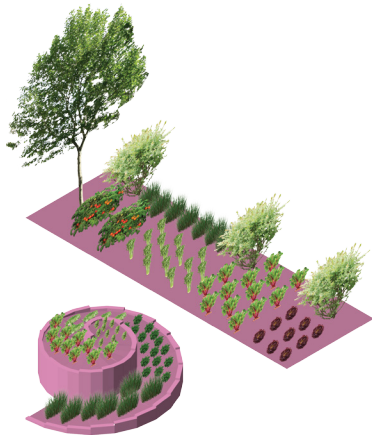
A collection of allotment gardens in addition to housing or cabins. The residents run and maintain the gardens privately within the rules of the co- operative. Allotment co- operatives are in a way rural or sub urban patches of lifestyles within the city.



### Educational garden

Marie Jørstad who pioneered the school gardens in Oslo in 1905 saw agriculture as learning tool that could allow children to become familiar with how food is produced, work ethic, physical activity and in the end enjoy the fruits of their own labour (NBL, 2018).

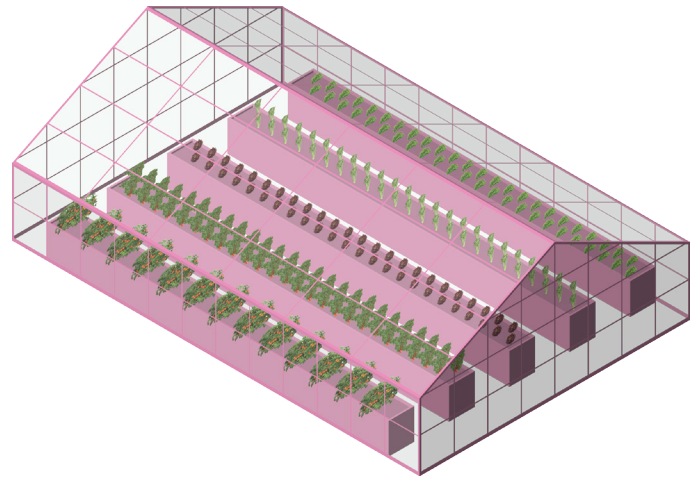




## Permaculture

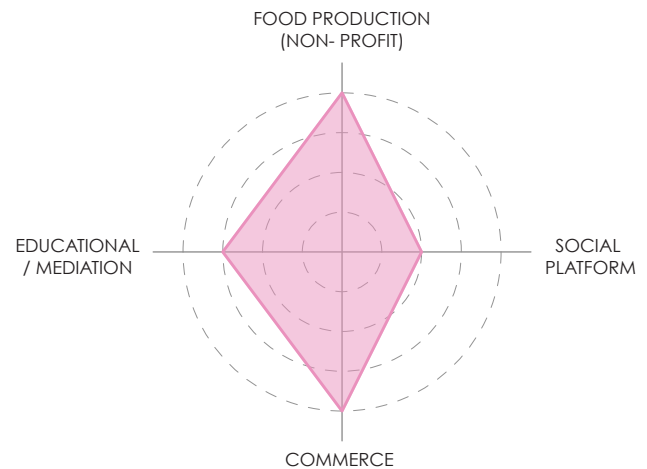
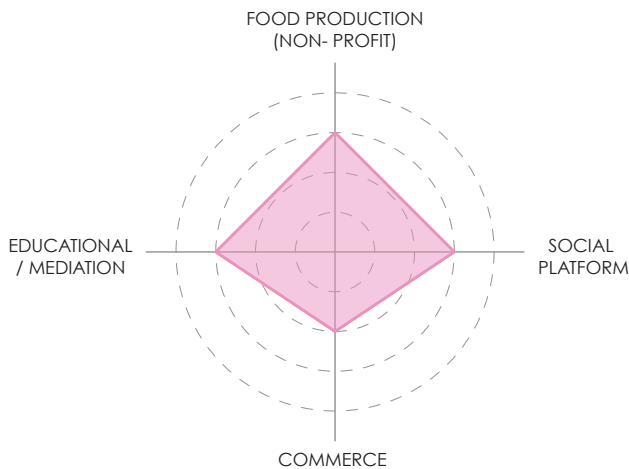
An approach to agriculture that is based on mimicking natural processes and patterns. It is based on 12 principles that are meant to work with nature and that can be extended to many other fields than just agriculture (Holmgren 2018).

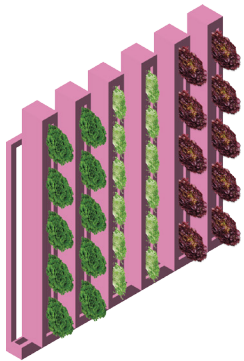
- |  |  |
|--|--|
| 1 - Observe and react                              | 7- Design from pattern to detail         |
| 2 - Catch and store energy                         | 8- Integrate rather than segregate       |
| 3 - Obtain a yield                                 | 9- Use Small and slow solutions          |
| 4 - Apply self- regulating and respond to feedback | 10- Use and value diversity              |
| 5 - Use renewable resources                        | 11- Use the edges                        |
| 6 - Produce no waste                               | 12- Creatively use and respond to change |



## Greenhouse

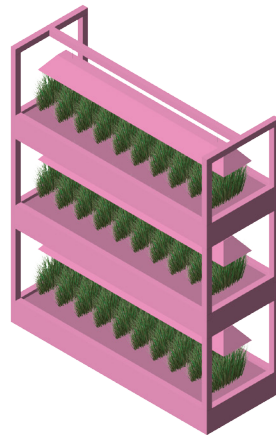
Greenhouses are excellent ways to trap heat but still let the light through. They can extend the growing season, protect the plants from the elements and potentially protect plants from insects. They can also be a great way to physically protect plants from passers-by.



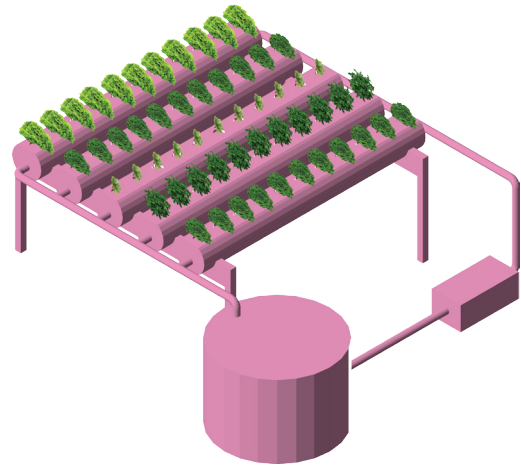


Vertical farm

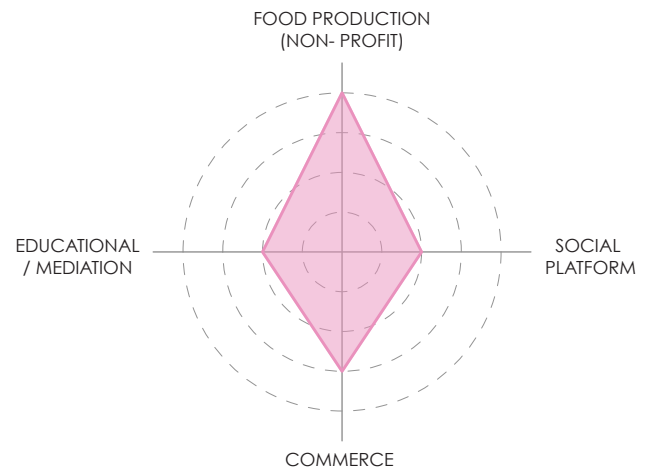
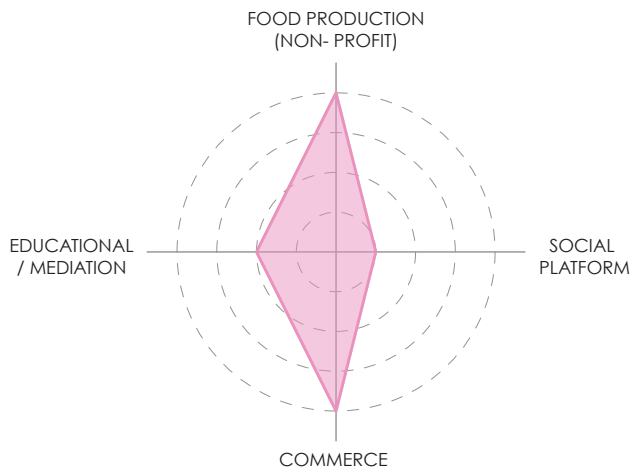
Vertical farms have in recent years become particularly popular as they are more compact and allow farmers to increase their yield. They can be implemented in greenhouses or indoor with the help of UV lights.



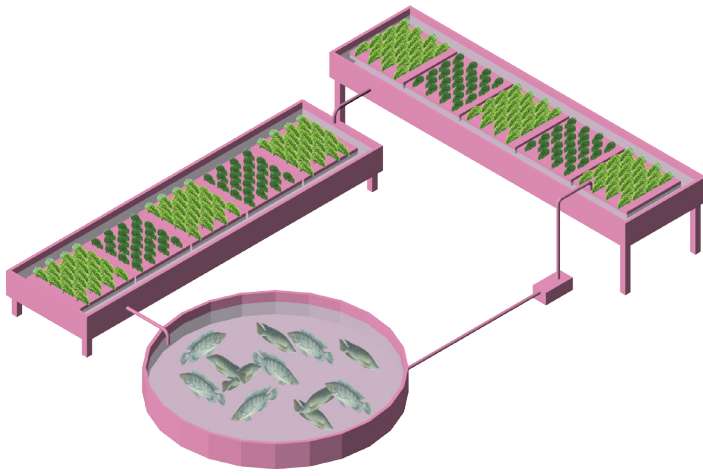
Hydroponic farm



Hydroponic systems are effectively soilless farms where the plants are grown in water instead of traditional soil. Nutrients are added to a water supply creating a water efficient system and minimising the need for pesticides.

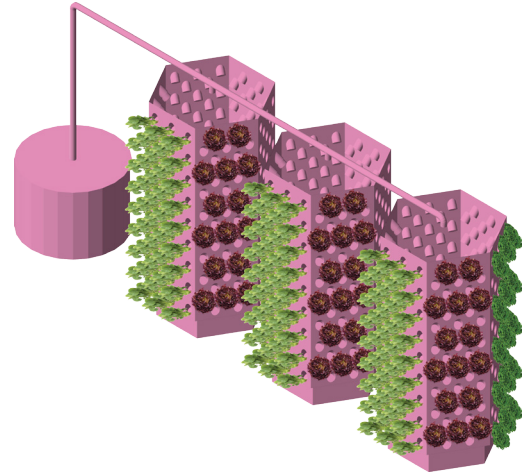






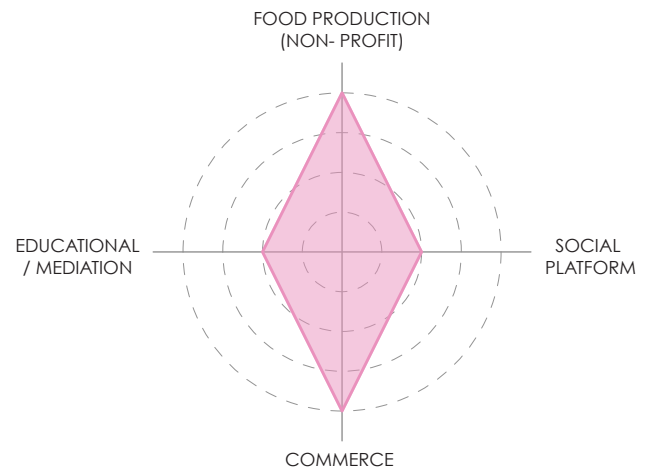
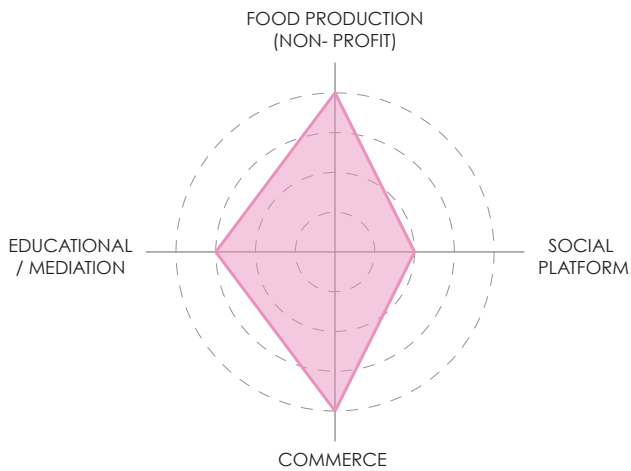
Aquaponic farm

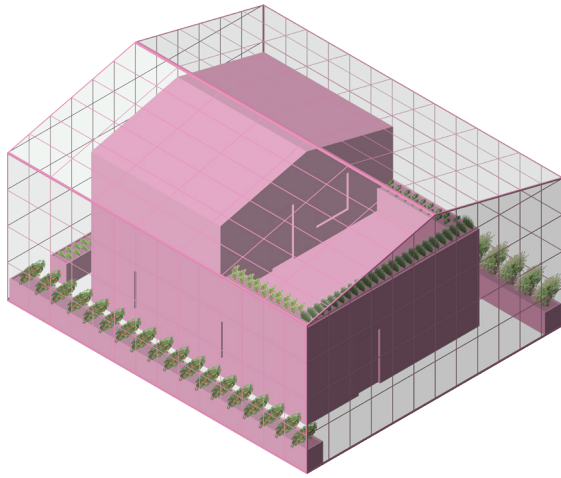
Aquaponic systems are similar to hydroponic systems, except there are no nutrients added to feed the plants. Instead fish are utilized in order to create a closed loop ecosystem. Microbes and worms convert the waste produced by the fish into fertilizer for the plants, which in turn filter the water that gets pumped back into the fish tank.



Aeroponic farm

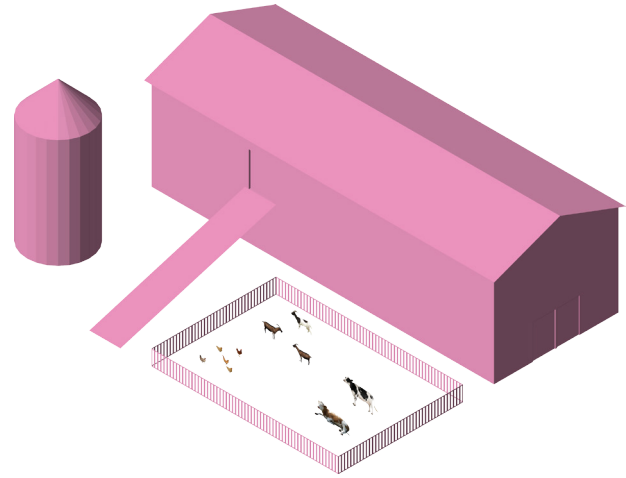
Another form of vertical farming that does not require soil or water. Instead the plants are grown in "air", or rather a fine mist. By suspending plant roots in air and sprayed regularly with water mixed with nutrients the amount of water needed is drastically reduced.





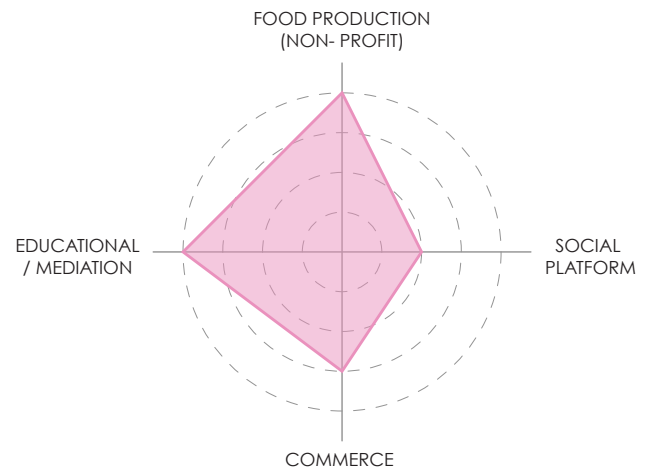
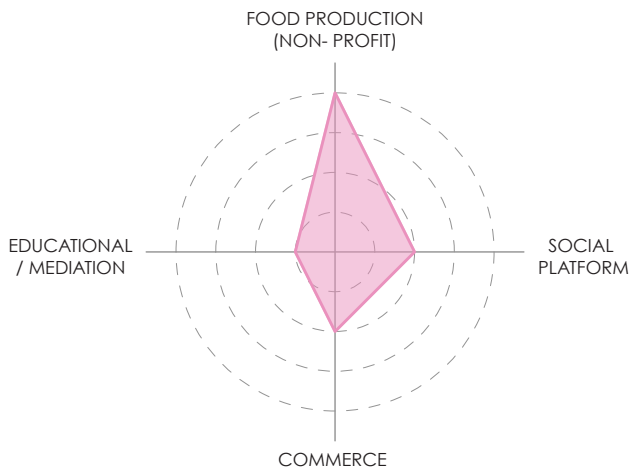
Nature house

The nature house is based on the principle of having a house within a greenhouse. It is found in more peri-urban or rural areas and can be a great energy saving measure if implemented correctly.



Leisure farm

Leisure farm is a facility originally intended for traditional agriculture with the primary intention of showcasing a variety of animals. It revolves around a continuous offer to the public (Mattilsynet, 18)





## CONCLUSION

Urban agriculture is an asset that has the potential to affect many different aspects of city living, but as the situation is today, the greatest potential is in what people get out of it. At first glance one might presume that urban agriculture is purely an environmental initiative, but the effectiveness of urban agriculture's ability to reduce the impact on the environment is arguable, as traditional industrial farms have had centuries to perfect their techniques. Until urban agricultural technologies reach a point that surpass today's efficiency, the contribution of urban farms will be in the people it brings together, communities it builds, the public spaces it vitalizes, the alternative activities it offers and the alternative education methods it presents.

Additionally the organizational model of urban agricultural initiatives has proven to be crucial. There are people who are sceptical towards urban agriculture and it is important to have a solid plan in order to prevent projects from being abandoned. A network or a group of people that are willing to fail and most importantly keep trying can be the difference between a fading trend and a thriving community.

The purpose of this booklet was to explore urban agriculture's potential as a tool in urban development. We wanted to make an overview that would inspire primarily ourselves, and act as fodder for the rest of the project. We hope that this booklet can make urban agriculture a bit more clear for others just as it did for us.

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