FARMING AS COMMON GROUND

AN AGRI-CLUSTER TO SUPPORT THE DEVELOPMENT OF VINTRIE, MALMÖ

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Examiner: Lars-Henrik Ståhl

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The entire SUDes team as well as the teachers I was lucky to work with in the elective courses, had a great impact on my work and my development, they've ensured an excellent working environment.

My classmates made this experience truly enriching, and I've gained a lot more perspective being in a group of students from different academic backgrounds and different parts of world. And to those who were always present in the studio, gathered around work, coffee, and a multitude of discussions, I'm deeply grateful.

Completing this master's program wouldn't have been possible without the Swedish Institute from whom I was awarded a scholarship to continue my studies.

I especially want to thank my parents and my brother who have always been supportive and showed me the values of working hard and staying optimistic.

Preface

This thesis marks the concluding assignment in the final semester of the Masters of Sustainable Urban Design (SUDes) at Lund University, Sweden. During the previous semesters, we conducted projects in Sweden and the Czech Republic varying in scale, context and approaches. We were also able to visit different locations in Sweden, Denmark and the Netherlands. This program has provided me with valuable education and has tangibly expanded my knowledge and sharpened my skills.

When selecting the topic I wanted to dive into, I took the time to explore the city of Malmö as a whole in order to find themes that I wanted to learn more about. Through my thesis, I wanted to continue exploring how to enhance the quality of the spaces we inhabit, where community is strengthened, productive activities can take place, and natural ecosystems thrive. Although this project focuses on site-specific solutions, it is closely linked to global issues which I kept in mind throughout the process.

During the program, every project allowed me to take the time to experiment, question and ultimately to feel more empowered in my role as an urban designer, and gain further awareness about how our work is connected to social and environmental matters, and the various questions raised by urbanization and sustainable development.

Abstract

On a global scale, the modern food supply systems enabled a consistent supply of goods thanks to the technological advances. However, the continued urban growth led to an increase in demand in terms of food supply, and the displacement of food cultivation away from the cities to rural land. The consequent production and supply systems largely contribute to several challenges like carbon imbalances, the decrease in organic land, increasing the separation between the urban fabric and the agricultural landscape, and widening the gap between the producer and the consumer.

This thesis project explores the synergies between food production and supply, landscape, and urbanity, and translating these findings into an urban design proposal. I start this thesis by presenting the characteristics of the current landscape of modern food supply and the ecosystem benefits of sustainable alternatives. I then conduct an analysis of the context of the study location, presenting a background to agriculture and food supply patterns in Skåne.

The urban design proposal presents a masterplan for a 47 ha development in Vintrie, an area adjacent to Hyllie, Malmö. It is implemented in a site that has an old farming heritage and is located in the city fringe of Malmö, acting as an interface between the city and the rural landscape. This is achieved by investigating the ecosystem services of food production, and their social, economic and environmental benefits, and analyzing the context and the site-specific characteristics.

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Framework & Scope of work

Introduction

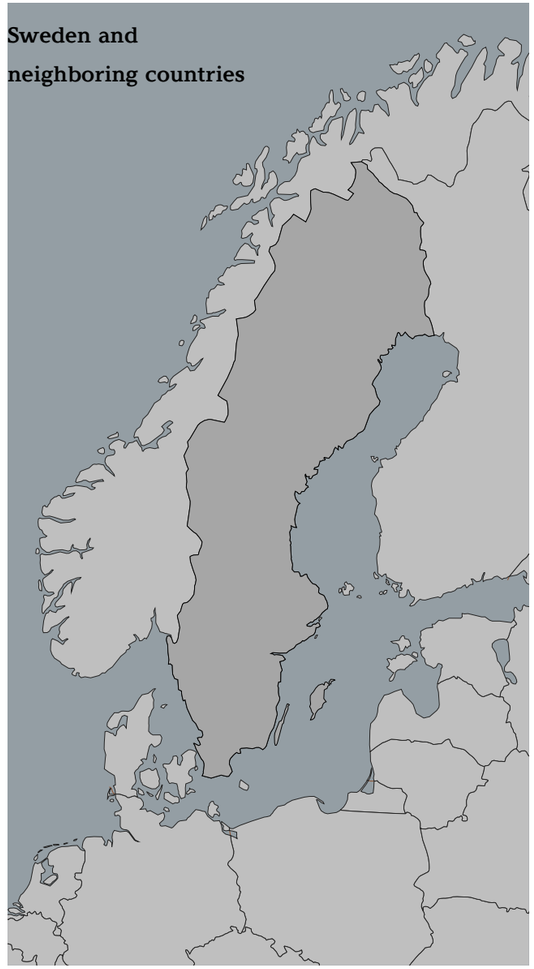
Skåne is the southern region of Sweden with an important history of agriculture, mainly linked to the quality of its soil that is highly rated by European standards. The continued urban growth led to the displacement of food cultivation away from the cities to rural land. The consequent food supply systems largely contribute to several challenges like carbon imbalances, the decrease in organic land, increasing the separation between the urban fabric and the agricultural landscape, and widening the gap between the producer and the consumer.

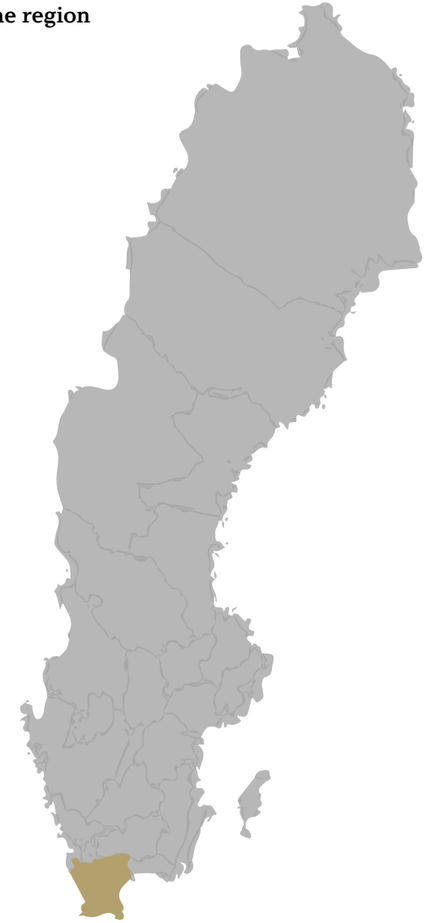
On a global scale, the modern food supply systems enabled a consistent supply of goods thanks to the technological advances, but have also led to several challenges. International organizations as well as independent experts have called attention to these challenges, urging decision-makers to take quantifiable action in order to address the disparities in the access to food, the effects of the food industry on the natural ecosystems and the challenges related to health and well-being. These factors are often addressed within contemporary frameworks in the fields of city planning and urban design, founded on a human-centered approach that aims at tackling social, economic and environmental issues.

My ambition with this thesis was to choose an interdisciplinary topic that would allow me to learn more about new subjects. Urban agriculture and food supply represented a theme that was particularly compelling to me because of the living and tangible nature of the subject, and the intersectionality in the productive systems between natural ecosystems, local climate, resources and know-how.

For my thesis, I am positioning my project within this framework. My ambition is to search for a model that reunifies the city, its dwellers and the agricultural landscape by proposing site-specific solutions. I start with exploring relevant literature and precedents as well as hands-on experiences that use urban agriculture to transform the modern landscape of food supply. The design proposal aims at presenting site-specific strategies and design solutions that are informed by the research and analysis conducted in the first phases.

Study location





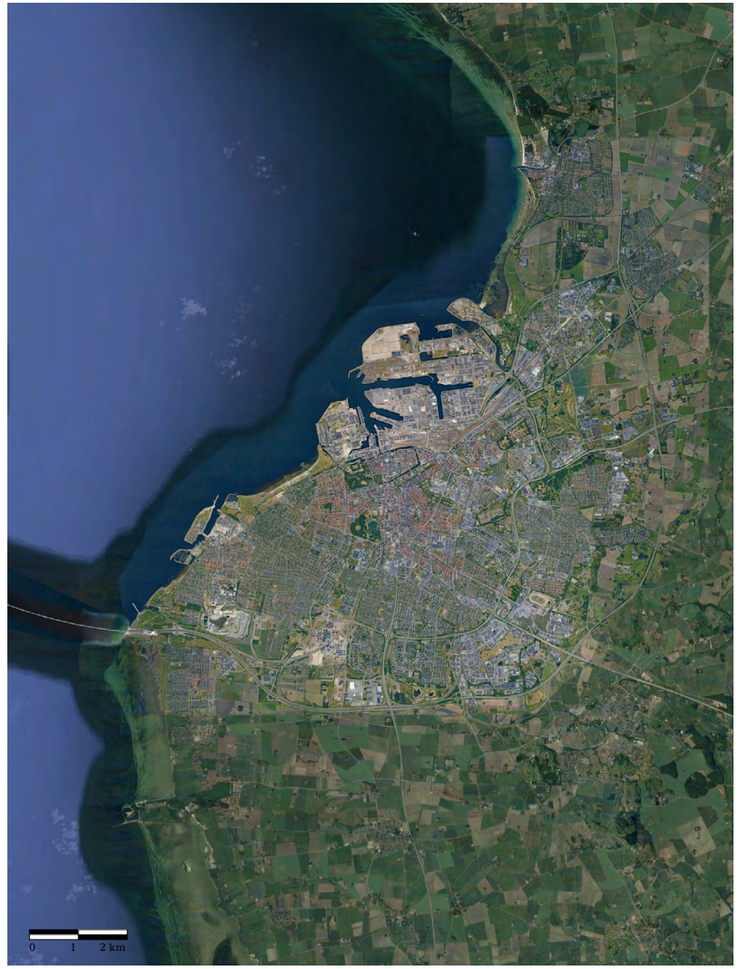
City of Malmö

Population: 344 166

Area: 332,6 km²

Density: 4,05/km²

Growth rate: 1,1 %



Motivation for research & scope of work

The aim of this Master's thesis project is to propose a new development that is centered around people, the landscape and food production. It's implemented in a site that has an old farming heritage and is located in the city fringe of Malmö, acting as an interface between the city and the rural landscape. This is achieved by investigating the ecosystem services of food production, and their social, economic and environmental benefits, and analyzing the context and the site-specific characteristics.

Thesis objectives:

- Investigate the economic, social and environmental benefits of a productive city from the lens of food production and urban agriculture.
- Present a site-specific scenario for the development of the Vintrie area in Malmö, based on strategies and design principles that bridge urbanity, landscape, food production and the people.

I begin the thesis with mapping global and regional influences on the study location; presenting a background to agriculture and food supply patterns in Skåne; and the challenges of urban growth and sustainable food supply.

The following chapters present an overall view of the current urban development in the city of Malmö, the rationale for the selection of the site where the project is implemented, and a multi-thematic analysis of the site's conditions.

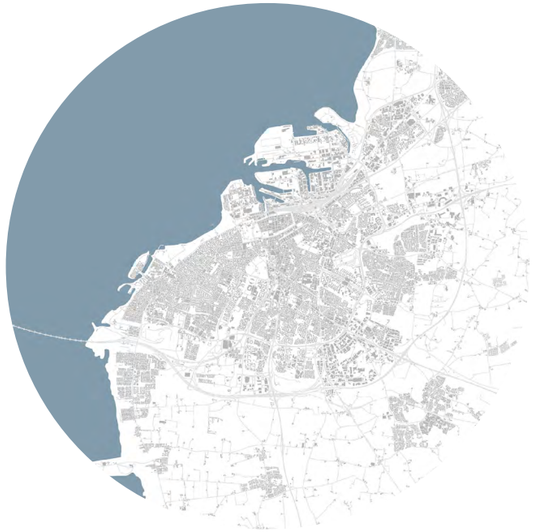
The last part of the thesis is dedicated to the design proposal , starting with design principles and the concept for the site, followed by the Masterplan and the detailed drawings.

Lastly, I would like to note that my proposal does not aim at presenting a scenario for self-sufficiency, but rather harnessing the social, economic and environmental benefits of food production in an urban environment.

Contextualizing the scope

At first, my work started off by broadening the scope and looking at food supply issues on a regional scale, gathering relevant data about food production and its impact on the urban environment, and studying literature about food production ecosystem services.

After choosing the site, my process was focused on mapping the different influences on the site, analyzing the site-specific conditions, proposing strategies and spatializing the different elements that support the values of the project.



Research questions

- How can we transform the landscape of modern food supply systems to benefit both the society and the natural environment?

- What are the qualities of places where the identity is shaped by food production, local culture and natural ecosystems?

- How to translate these qualities into urban design?

Methodology & process

Literature and resources review

Throughout the different steps of the project, I focused on literature about food production in the city, and the social and environmental impact of modern food supply systems. I also studied official reports and statistics relevant to the study location and its area of influence.

Gathering GIS data and maps

During the site selection process and site analysis, I compiled and analyzed GIS data primarily from Lantmateriet.

Semi-structured interviews

I was in contact with Malmö Municipality from whom I got digital material and information about the vision for the city, the principles of the comprehensive plan and on-going planning projects. I also conducted an interview with the former project leader of the urban agriculture project implemented in Vintrie, and visited the owner of a commercial eco-farm to get a better understanding of their work, business model, and challenges.

Site visits

I conducted bimonthly visits from December 2020 until Mars 2021 that I documented through photographs, videos and sketches, in order to analyze the spatial qualities, existing activities, noise pollution and types of usage of public space.

02 Project background

Introduction

There has been a few constant elements in the evolution of humanity, and one of the main ones is our need for food to sustain ourselves. It has significantly evolved from pioneer harvesters in Jericho around 10000 B.C. to the modern food supply systems that feed us today. Several historical documents indicate the close relationship between food and culture. Çatalhöyük in Anatolia (7000 B.C.) had a rich cultural and religious life, indicating that having a stable, reasonably predictable food source gave people the freedom to indulge[1]. In ancient Rome, “Culture” and “Cultivation” were interrelated which was extensively documented in literature, art and mythology.

The way food was sourced had a large impact on the lifestyle, as we can notice in Germanic tribes ancestors who were hunter-gatherers and lived close to where they could hunt, fish or forage their food, as well as settlements in Italy in the 12th century that were located close to the agricultural land.

With industrialization and technological advances, global food production continued to evolve, and increased by 145% during the second half of the 20th century[2].

Today the modern food supply systems largely rely on industrialization and global trade. It has generated several negative effects like over use of agricultural land, degradation of soil, and a threat to biodiversity in our ecosystems.

As the global urban population continues to grow, the pressure on agricultural land increases, as well as the necessity to feed the population and address social inequalities and environmental threats. We are dependent on natural and managed ecosystems to provide us with food. Many experts argue for the possibility to harness the ecosystem benefits of food production and explore a people and food centered approach as a catalyst for sustainable development. In her latest book *Sitopia: How food can save the world*, Carolyn Steel presents her thoughts on a “sitopian” city, a term where she merges sitos (food) with topos (place). She explains that “food shares with utopia the quality of being cross-disciplinary... capable of transforming not just landscapes, but political structures, public spaces, social relationships, cities.[3]”

Investigating how to transform food systems in our urban environments today requires an understanding of what this system entails,

and how it is linked to other activities. The food system includes all processes involved in keeping us fed: growing, harvesting, processing, packaging, transporting, marketing, consuming and disposing of food waste[4]. The impact of the system extends to the natural environment, socio-economic issues and culture.

In order to narrow the scope of this thesis, this chapter will be focused on:

- Schematic view of the modern food supply systems
- Ecosystem services of sustainable food production
- Food sector data in Sweden
- Agriculture and food supply systems in Skåne
- Regional vision and potential networks

Global food supply systems

It is estimated that the world's population will reach 9 billion inhabitants by 2050, and will have even bigger food needs considering the current patterns in volume and consumption[5]. There is a strong incentive that we continue to sustain the availability and diversity of food that we consume. However, this process must take into account the impact of the current patterns on the environment, the current inequalities that persist despite an abundance of food, and the discrepancy between the current food supply systems and the sustainability goals.

Agricultural production in the global North has witnessed a continued growth since the industrial revolution. Today, the landscape of food supply is largely globalized and highly dependent on industrial innovations and trade. The cities we live in rely on a hinterland that is located all over the world, our diets and food preferences are also becoming more globalized.

This current system relies on finite resources, mainly fossil fuels, industrial fertilizers and soils. This emphasizes structural problems that must be addressed in order to meet our goals in terms of sustainable development. The current production methods have also failed to take into consideration the fact that food is different from other commodities given that it is derived from natural and living elements[6]. Therefore, the supply chain of agricultural products is extremely interdependent which makes the current method of separating supply phases to rationalize the process very challenging. For example,the use of artificial fertilizers and antibiotics in order to optimize production is followed by a chain of consequences all the way to the consumed food and the health and well-being of the consumer. It also affects wildlife, and leads to faster contamination in case of diseases.

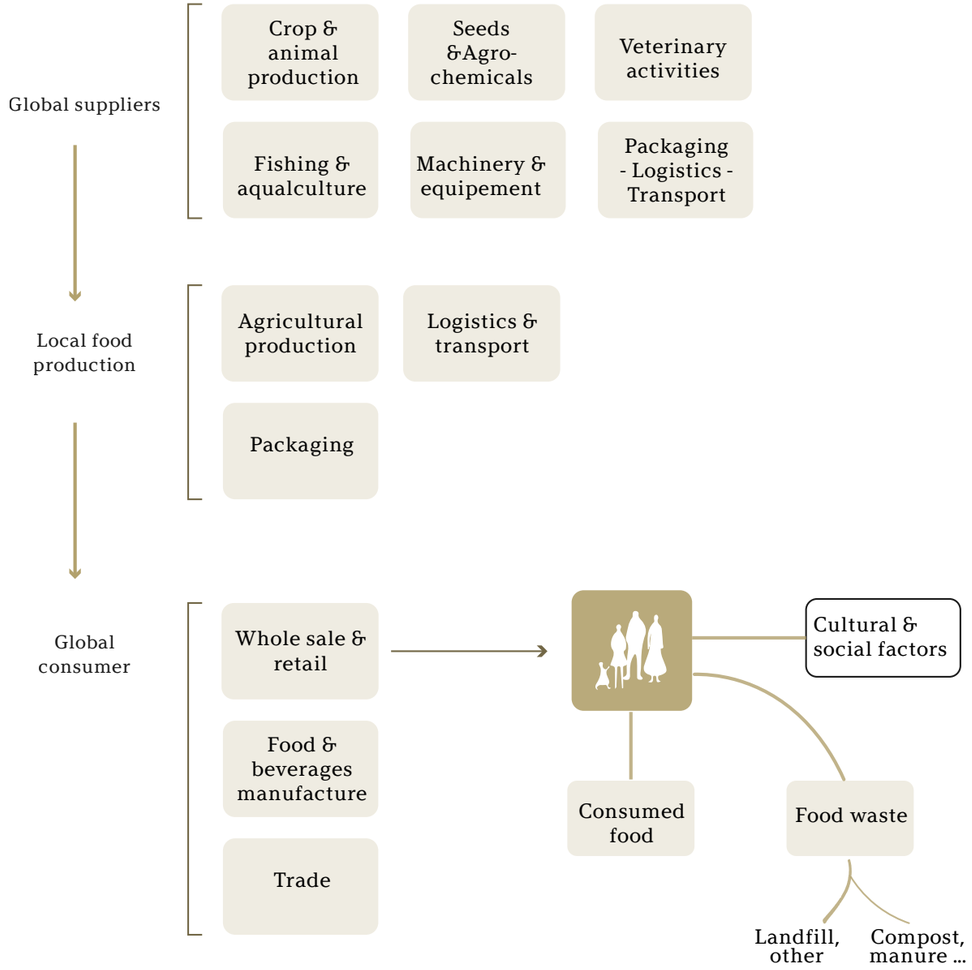
The modern landscape of food supply has also significantly shaped cities. On one hand, retail spaces have become more homogenized with chain stores taking over smaller and local producers. On the other hand, the separation between urban and rural has become more distinct. The displacement of food production from the city entails more transportation and logistics but has also deprived the city from the ecosystem benefits of agricultural activities. Although achieving self-sufficiency in terms of food supply in the city is a highly challenging goal, making food production more accessible in the city and its process more visible, will have positive impacts on the natural environment, and will help in educating and raising awareness.

"We take care of what we value;
We value what we know."[7]

Another aspect of the current food supply systems is how much we know (or don't know) about the food items we consume and what goes into their production. In the global North, consumers have access to abundant food that is available all year round. However, the complexity of these systems have made it more difficult for people to know where the food comes from and to understand and value the biological, social and technical parameters that allow this system to function[8].

The global system, schematically represented in the figure to the right, has allowed to decrease production prizes, increase the speed and frequency of distribution, and maximize land productivity. But the negative implications of this system are more difficult to grasp due to the complexity of the system and the continuously widening gap between the consumer and the producer.

An informed consumer can take better decisions that will have several positive implications, first on their own diet and health, in raising awareness on a community level, and on progressively changing policy and influencing the decisions that shape the current landscape .



Ecosystem services of sustainable food production

Agricultural ecosystems both provide and rely on ecosystem services that are defined as “the conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfill human life” [9] There are also dis-services that affect productivity, diversity and functioning of natural ecosystems. These are tightly linked to the factors discussed previously, mainly fossil fuels, artificial fertilizers, intense soil use and mono-culture in large scale production.

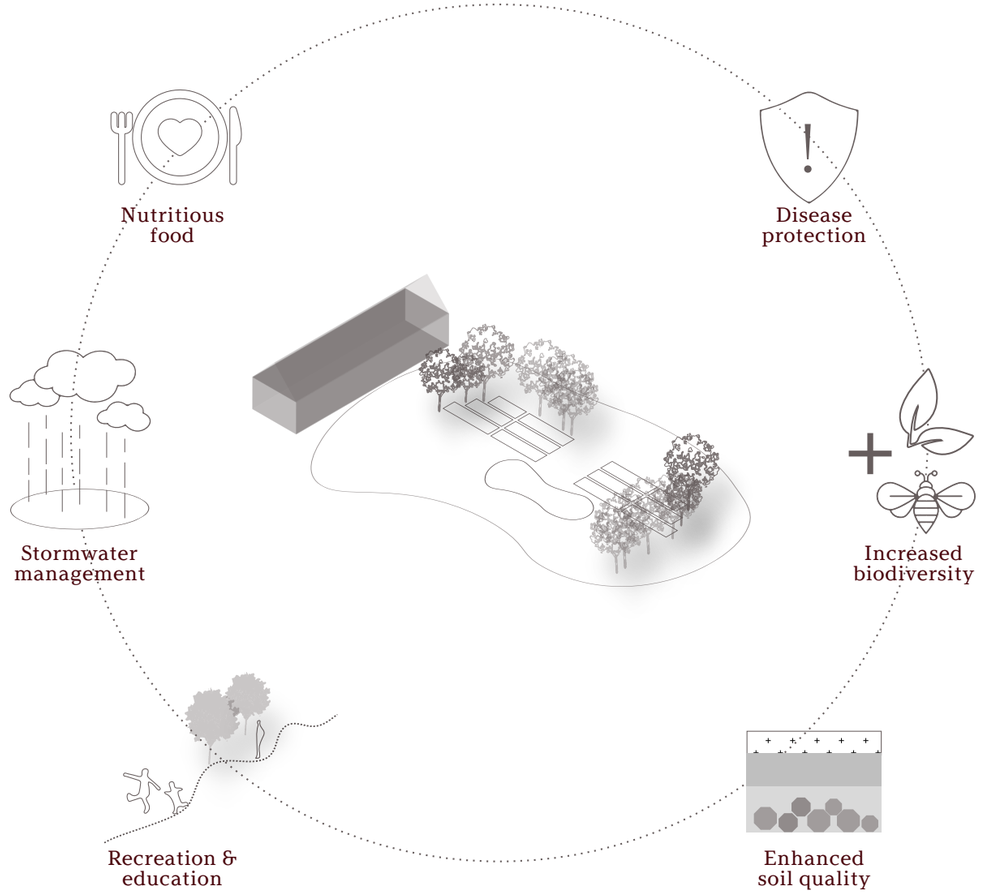
Sustainable agriculture methods and organic production are distinguished by the ecosystem services they rely on and entail. The aim of this part of the thesis is to search for measures that can be implemented within an urban context that can benefit the process of food production as well as the natural landscape.

In the current context, with the continuing urban growth and increasing demand on agricultural land, many experts are arguing for the implementation of concepts that are founded on multi-functional landscapes[10] and sustainable intensification of land use. The two concepts are interrelated and can potentially protect the ecological functions related to crop production. This can be achieved by optimizing land use and agricultural practices at the same time as lowering the required inputs of fertilizers, through improved soil management, and of pesticides[11].

As part of their mission to ensure food security, the Food and Agriculture Organization (FAO) has called for “...the wise management of ecosystem services and biodiversity [that most food production hinges on] – they maintain healthy soils, enable pollination and regulate pests and disease, etc. Healthy ecosystems are the best way to ensure productive agriculture and nutritious food. These services enable the biological functions that underpin agriculture, and they should not be on the fringe of agricultural planning”[12].

Based on the data contained in the above-mentioned reports, I summarized the ecosystem benefits of sustainable food production as follows:

- Healthy soil quality
- Nutritious food
- Biodiversity and pollination
- Pest and disease protection
- Strom water management and flood alleviation
- Recreation, cultural and educational benefits



A picture of a day's worth of food according to the Planetary Health Diet. Photo credit: Sonja Vermeulen[13]

Contextualizing the scope of work:

Opportunities & challenges in the Swedish context

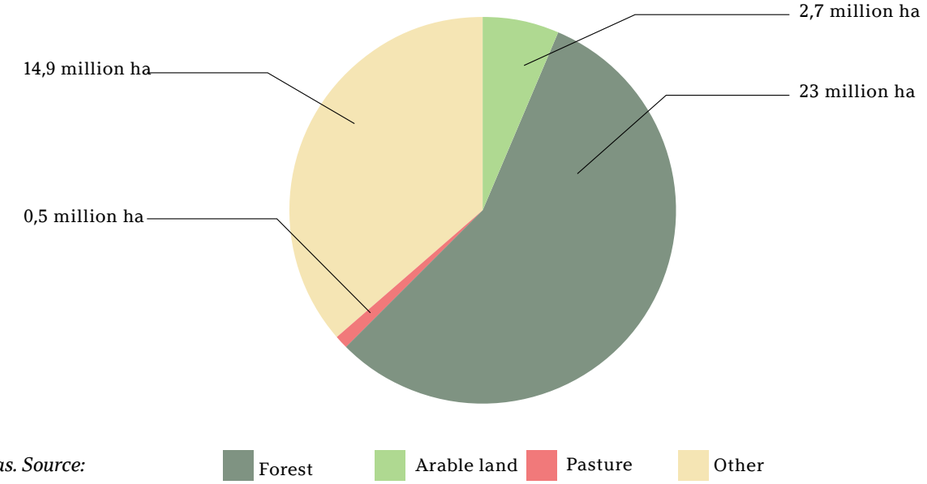
With the current challenges, there is a growing call for more sustainable alternatives in terms of food production. The sustainability in food systems is a rising priority in the Swedish context. National food authorities are increasingly providing knowledge and resources to support this agenda[14]. In Sweden, arable land represents only 6,5% of the total land area. The largest portion of this land is located in the county of Skåne that benefits from a local climate and soil characteristics that are suitable for agricultural activity.
This part of the thesis presents a background to the agricultural sector in Sweden in general and Skåne in particular.

Sweden's total land area is around 41,1 million hectares, excluding lakes and water courses. Forest coverage represents 56% of the total area, while arable land represents only 6,5%. The majority of that area is located in the southern counties which are also characterized by a climate that is suitable for agriculture.

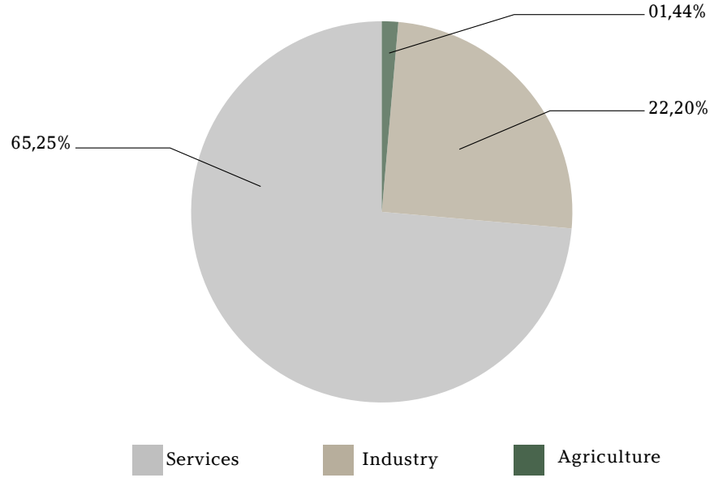
The agricultural sector has under 2% share of the national GDP, those numbers have been consistent for over a decade. Full-time employment in agriculture declined from 70600 to 65400 people from 2003 to 2007. However, the number of people actively involved in agriculture increased by 10000 people in those four years.

Population: 10,23 million inhabitants

Area: 450,295 km²



Distribution of areas. Source: Jordbruksverket



Share of GDP, 2019
Source: World bank

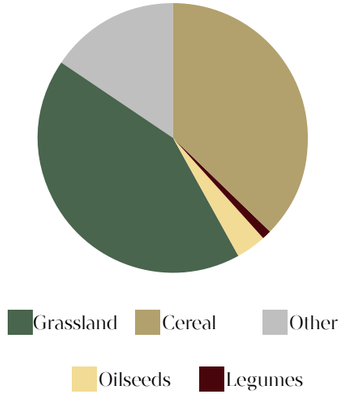
Production and consumption

Crop production

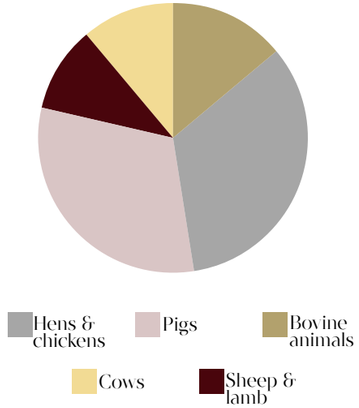
Production of cereals largely predominates crop production in Sweden, mostly barley, oats and wheat, as well as grassland. Crop production in the northern fields is dominated by forage and coarse grains. Oilseed production as well as bread grains and sugar beet is located in the of south and central Sweden.

Animal production

Livestock numbers are dominated by hens and chickens, followed by pigs and bovine animals. The decrease in milk production, which has nearly halved since the 1990s has allowed specialized beef production. Organic production has substantially increased, especially poultry and deer livestock which has doubled since the adoption of the KRAV certification.



Arable area by crop, 1 000 Ha, 2007.
Source: Jordbruksverket



Livestock numbers, 1 000 heads, 2007.
Source: Jordbruksverket

Cultivation of certain greenhouse products, m^2		
	2002	2007
Tomatoes	542 100	493 100
Cucumber	605 900	744 600
Herbs	53 300	73 900
Potted lettuce	70 800	57 800

Cultivation of certain open air products, Ha		
	2002	2007
Cucumber	279	145
Apples	1 334	1 363
Strawberries	2 209	1 843
Onion	805	1 018

Source: Jordbruksverket

Total consumption of certain goods in one year Kg or liter per person, 2007	
Flour & grouts	71,3
Meat	82,9
Drinking milk	99,5
Cheese	18
Butter	1,9
Egg	12,2
Potatoes	83,6
Vegetables (fresh+frozen)	59,1
Vegetables (prepared)	15,2
Fruit, berries (fresh+frozen)	66,2
Fruit, berries (prepared)	43,5
Sugar and syrup	38,8
Tea	0,4
Coffee	8

Organic production

Organic production hinges on local products and renewable resources. It is defined as highly self-sufficient cultivation and husbandry, where mineral fertilizers and agro-chemicals are replaced by environmental friendly alternatives.

In 2000, eleven percent of Sweden's arable land was either certified organic or was using the national support program for organic farming that was launched in 1994. In 2006 the organic arable area was 180 000 hectares; an increase from 5,7 to 6,8 per cent of total arable area compared to 2001.

Organic livestock is also increasing. The Government's aim is to increase certification of eggs, dairy, as well as meat and poultry.

Products are certified by an inspection body before being commercialized as organic.

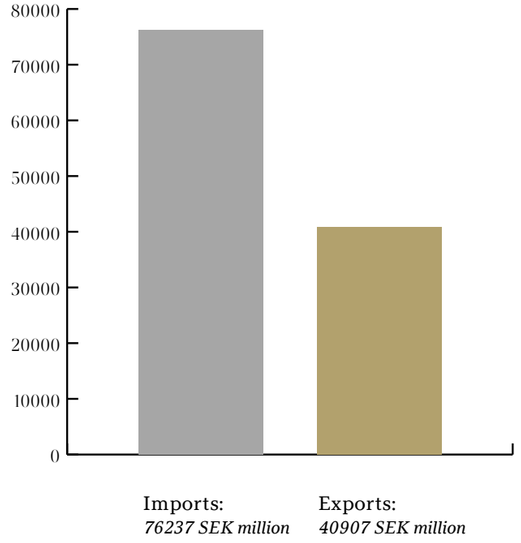
Area of organic production of some crops		
	2001	2006
Cereals	42 346	49 989
Leguminous crops	5 168	7 737
Oilseeds	1 273	3 279
Arable grass-land	64 482	77 563

Area of organic cultivation of some horticultural products		
	2001	2006
Fruit	51	88
Berries	154	199
Carrot	178	155
Beet	41	25

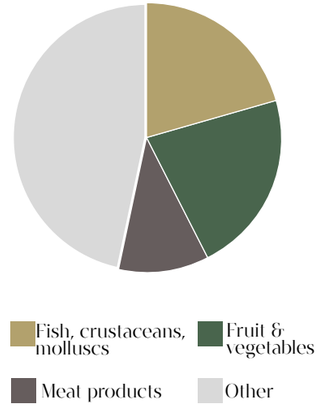
Number of livestock certified by KRAV		
	2001	2006
Bovine animals	85 804	95 736
Sheep and lambs	37 818	33 938
Pigs	27 664	26 298
Poultry	204 913	415 206

Trade

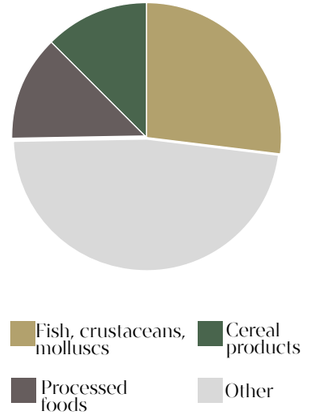
Sweden's imports are dominated by fish, meat products and fruit and vegetables that added up to 40 825 million SEK in 2007.
In the same year, over half the value of the exports was created by fish, cereal and processed foods.



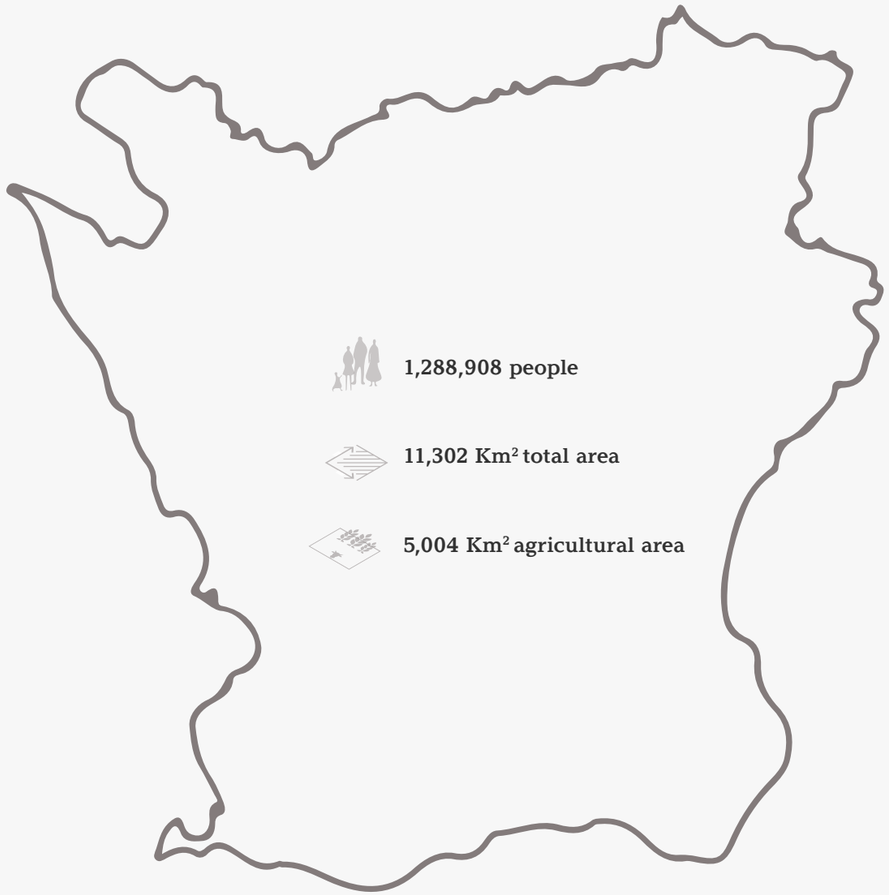
Imports and exports of agro-food products, SEK million, 2007. Source: Jordbruksverket



Top imports of agro-food products, SEK million, 2007. Source: Jordbruksverket



Top exports of agro-food products, SEK million, 2007. Source: Jordbruksverket



Skåne County

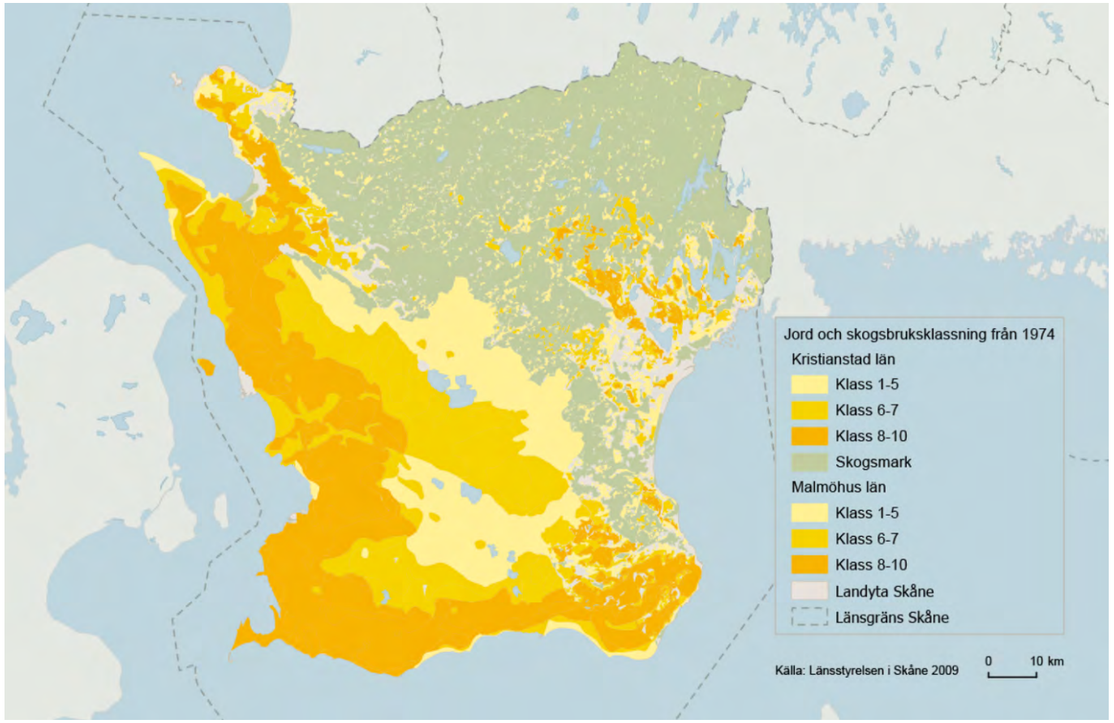
Agriculture and food supply systems in Skåne

The county of Skåne has high quality soils, rated by European standards, and most arable land in all of Sweden. Subsequently, it has a higher area of agricultural land per capita.

Based on statistical data and the research by Susanne Johansson in her doctoral dissertation *The Swedish footprint - an agroecological study of food consumption by Susanne Johansson* (2005)[15], I used an approximation of 0,5 Ha/person regarding the sufficient land to meet the food needs per capita. This number can be calculated by including direct land use in agriculture and pasture, and can increase to encompass ecosystem services related to food production and their subsequent area.

By using this approximation, it would be sufficient to support the food demand of 1,000,794 people, which is 77.7% of the current population in Skåne[16]. This emphasizes the potential and importance of the agricultural sector in the county.

Land use and soil quality



Region plan for Skåne 2022-2040, consultation document, classification of agricultural land in Skåne. Date: 24-09-2020. Source: Skåne Region[17]

The most productive agricultural land is concentrated in western and southern Skåne. The classification shown on the map was made 1974, in Kristianstad and Malmöhus, respectively.

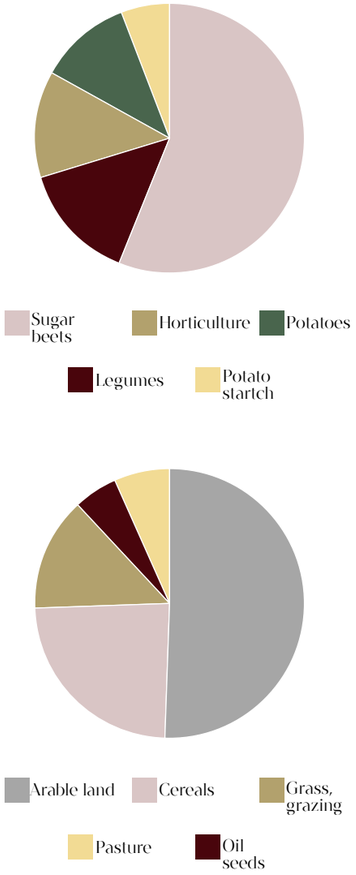
Regarding organic farming, the new development strategy plan that has been in effect since 2014 aims at reaching 20% of organic farming by the year 2020[18].

In 2013, organic farming constituted around 5% of Skåne County's total agricultural area (Swedish Board of Agriculture). We can explain this figure by the fact that the transformation has been largely implemented in non-intensive farming and pasture lands, which constitute a relatively small portion of agriculture in Skåne County.

The allocation of the land area in Skåne County, 2010	
Arable land (2013)	444 413
Pasture land (2013)	55 984
Total Agricultural land	500 397
Woodland, productive	387 000
Woodland, unproductive	20 000
Developed land	99973
Pits and mining areas	3 688
Golf courses and ski pistes	4 727
Open morass	8 942
Natural grassland	2 750
Exposed and embedded stone land, and other land	63 786
Total land area	1 096 879
Water	33 319

Source: Statistics Sweden. 2015.

Agricultural production

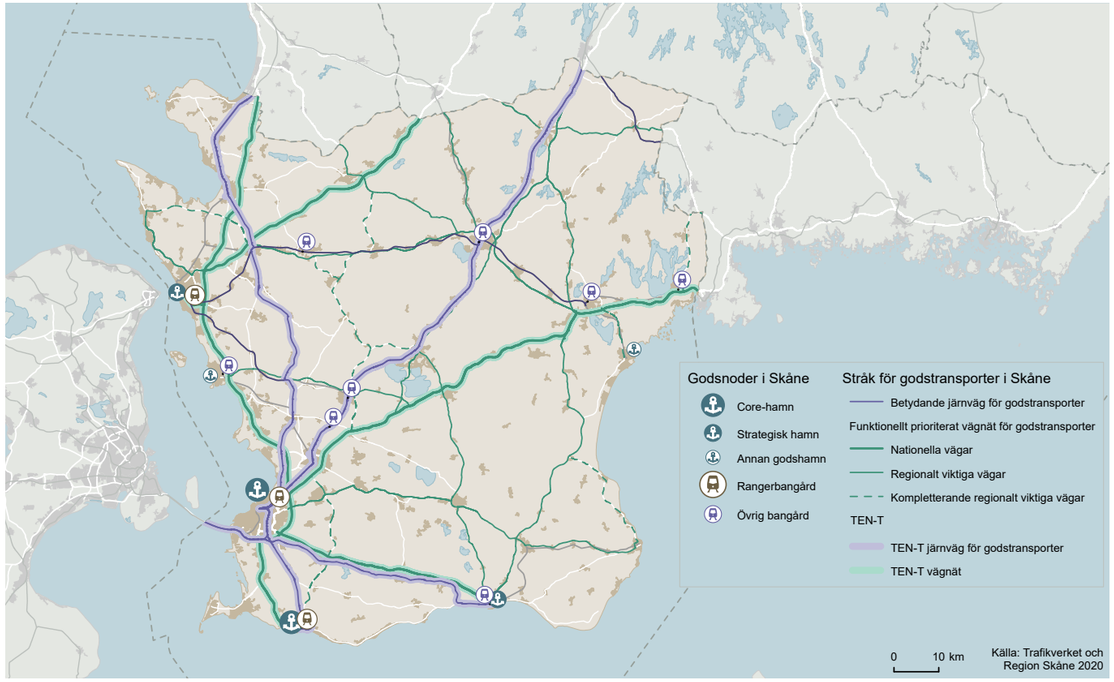


Area allocated for each crop.
Source: Swedish Board of Agriculture. 2014.

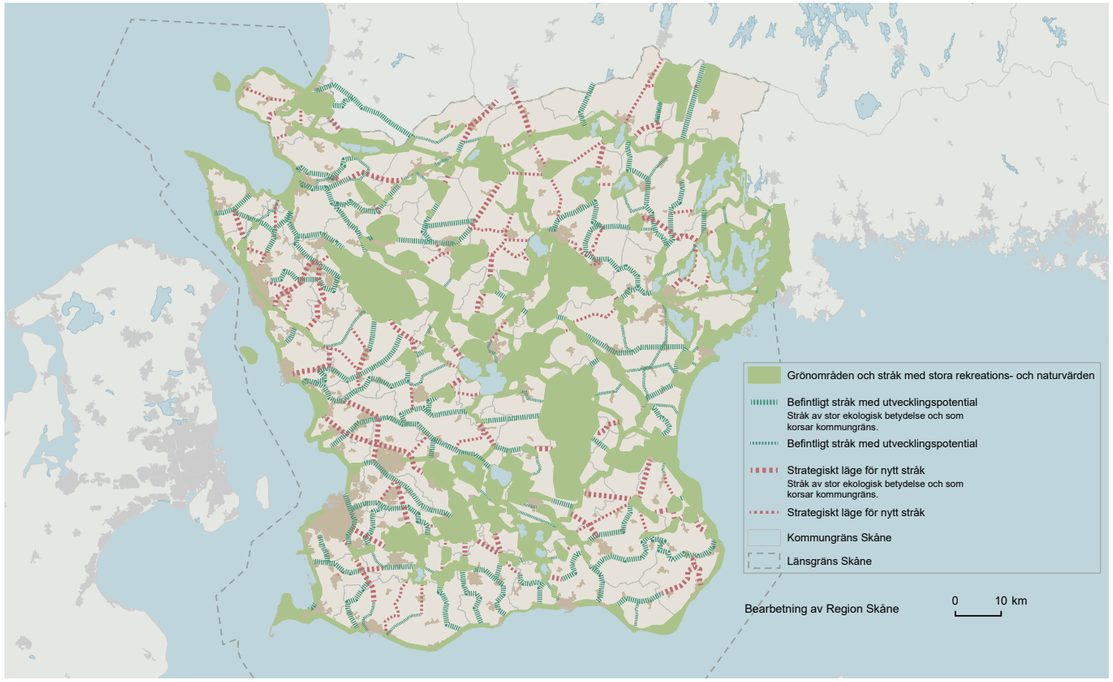
Total production in tons of each category and the percentages of each category of the total consumption measured in weight		
Category	Tons	Percentage
Sugar	348 906	24,7 %
Cereals	295 132	20,9 %
Potatoes	230 429	16,3 %
Horticulture	177 403	12,5 %
Dairy & egg	175 439	12,4 %
Meat	88 070	6,2 %
Oil seeds	43 517	3,2%
Legumes	33 287	2,4 %
Potato starch	22 434	1,6 %

Source: Swedish Board of Agriculture. 2015.

Regional vision & potential networks



Region plan for Skåne 2022-2040, consultation document, Freight transport in Skåne. Date: 24-09-2020. Source: Skåne Region[19]



Region plan for Skåne 2022-2040, consultation document,
Blue & green infrastructure in Skåne. Date: 24-09-2020. Source: Skåne Region[20]

Conclusions

According to the current patterns, urban growth will continue in Skåne which will lead on one hand to an increase in demand on infrastructure, amenities, and food, and on the other hand to an impact on the natural ecosystems.

The planning documents for Skåne region envision a cross municipalities green and blue infrastructure that provides the basis for important corridors and links between the natural ecosystems. The region plan also identifies freight transport lines which can strengthen poly-centric development in the region by providing a robust network for the transport of goods.

Based on this vision, and considering the characteristics of the land, the region could form a food production cluster, building off its position in the Oresund region, and the existing research facilities, innovation centers, specialized productions holdings and network of organic farms.

03

Local context & site selection

Local context: city of Malmö

Malmö is the third largest city in Sweden, located in the county of Skåne. It has a central position in the Oresund region, and is very well connected to the surrounding cities.

Through its comprehensive plan[21], the city of Malmö defines clear priorities for its development:
- Mixed-function dense, green and close city;
- A regional generator of green growth and employment;
- The city as a cultural and democratic arena.

The main development strategies hinge on an inwards growth with urban concentration around public transport nodes, a mixed-use urban fabric and densified green systems. The comprehensive plan highlights the link between these strategies and United Nations development goals.

Today, the periphery of the city represents a unique opportunity to densify the city, address its interface with the peripheral landscape and explore development models that meet the current urbanization needs while preserving the natural environment and the ecosystems.

Malmö - Lund region.
Source: Malmö stad[23]

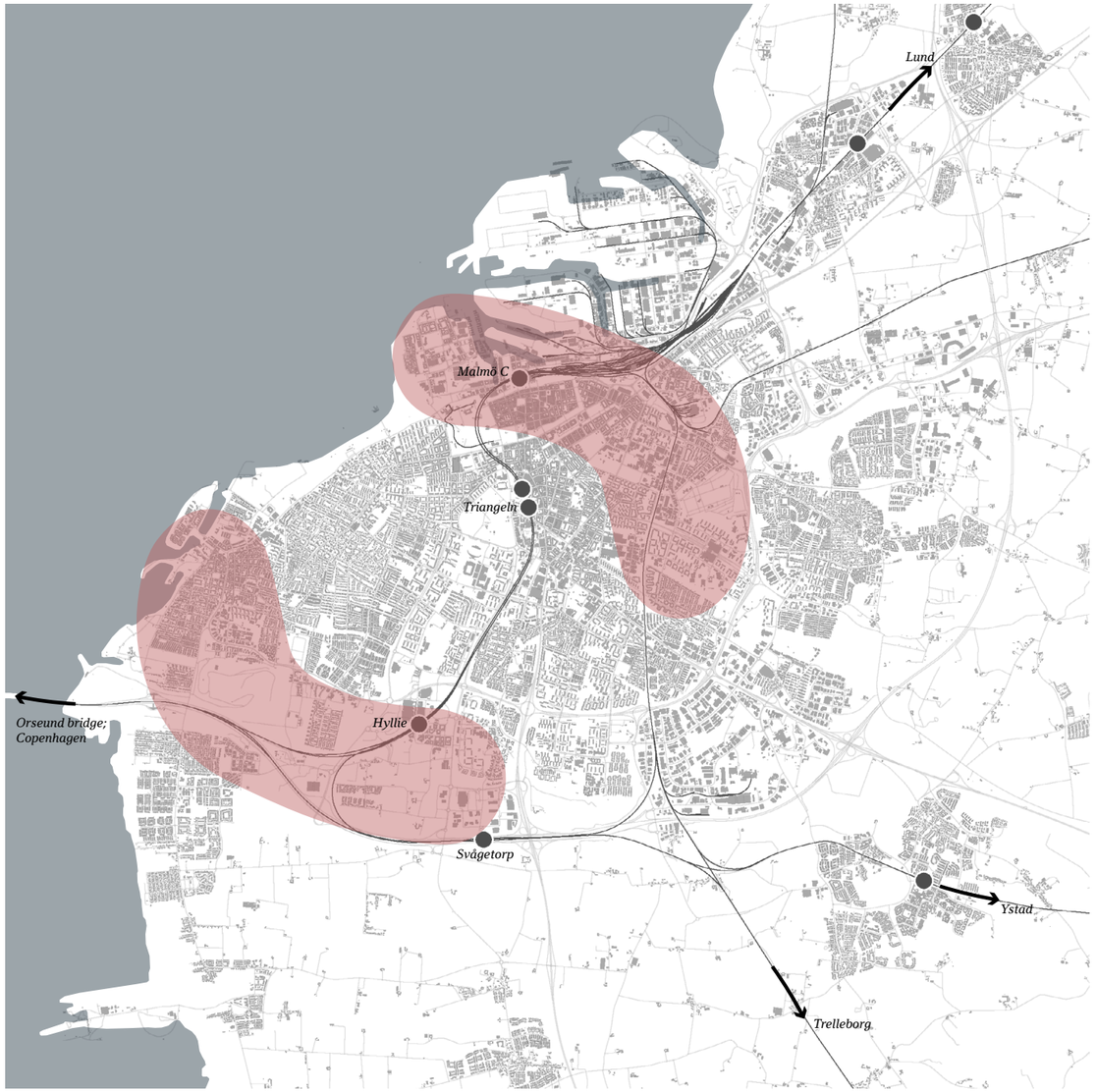
UN sustainable development goals[22]

Site selection: the local context

For this project, my aim was to choose a site in the city fringe for three main reasons:

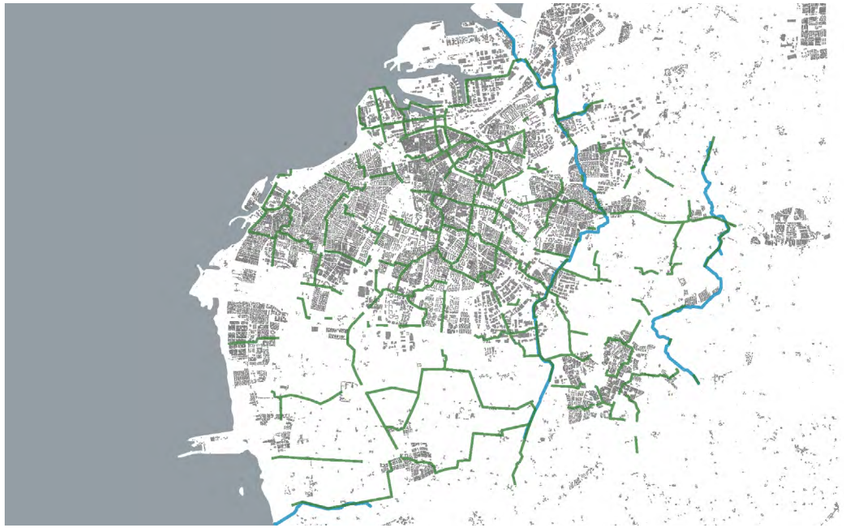
- To explore the interface between the urban environment and the surrounding landscape;
- The city fringe benefits from its proximity to major connections and freight transport lines that could potentially connect the site to the regional network;
- It encompasses under utilized spaces that can be developed or densified.

I based my site selection on the analysis of GIS data and some the guidelines of Malmö's comprehensive plan. In the following graphics, I highlight the prioritized areas of development defined by the comprehensive plan, the main green and blue systems and connections and the main arable land in the periphery of the city.



Prioritized areas of development in Malmö's comprehensive plan.

Mixed use urban fabric



Green connections and water courses

Main green corridors

Agricultural land

Site selection

The city fringe was the main focus area where I searched for a site that is suitable for the objectives of the thesis. After the research that I've conducted regarding requirements for urban agriculture and food production, I defined four main criteria to choose a site.

The site selection rationale is based on the following 4 criteria:

1. **City fringe defined by the built form and the infrastructure**
2. **Soil quality and resources**
3. **Future planning documents & existing activities**
4. **Public transport & accessibility**

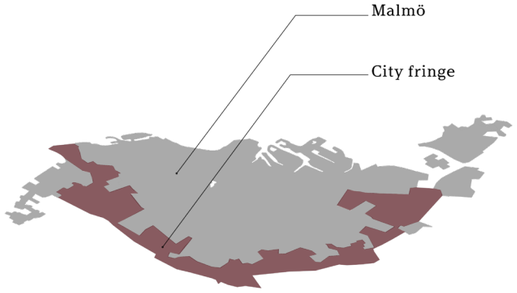
First, I defined the area that is located at the current outer limits of the city fabric, limited by the outer ring road. One of the goals of the comprehensive plan is to limit the urban sprawl especially on farmlands outside the ring road. Therefore, this criteria will allow to select a site within the city limits.

Secondly, I studied the quality of the soil by looking at geological deposits and soil composition, the water capacity in the bedrock and in the top soil layers, and ground stability. This step revealed that the defined area is relatively homogeneous and generally has a good disposition for agriculture.

The third criteria is focused on the type of activities in the area, as well as the vision of on-going planning documents. This helped understand the different functions in the city fringe and the possible mix of uses that are compatible with the project's aim.

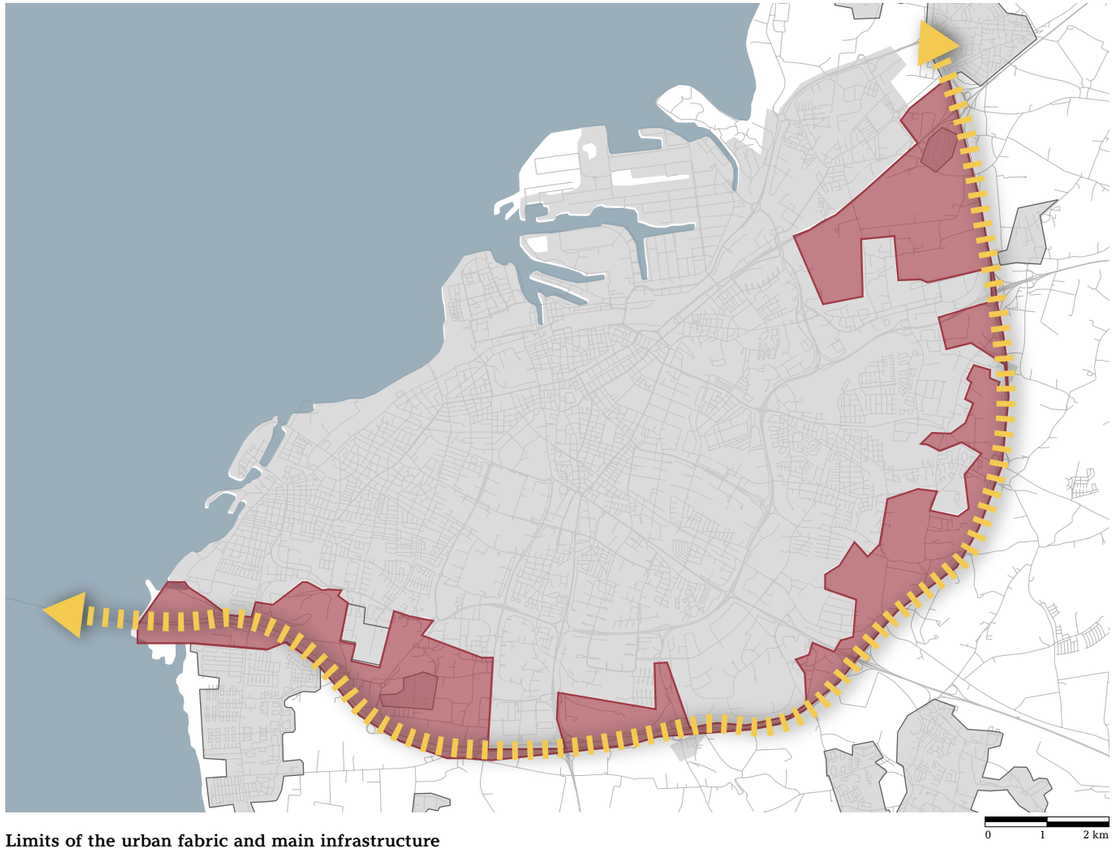
Finally, I analyzed the accessibility of the area in terms of public transport and railway services. Connectivity both to the city and to freight transport lines is a key factor for this project.

The site selected at the end of this process fills all these criteria. The soil in that site is suitable for agriculture and is adjacent to farming activities. It's located near two main train stations, Hyllie and Svågetorp.



The focus area in the site selection phase.

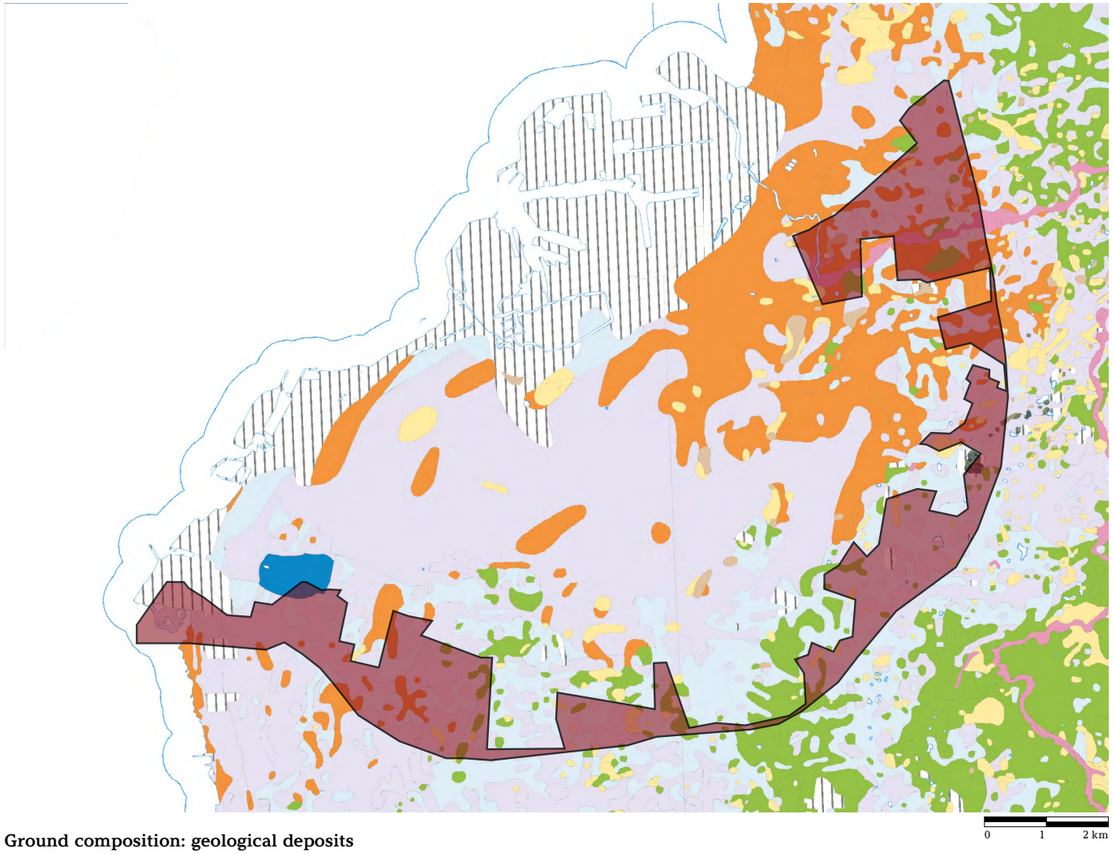
1. City fringe



Limits of the urban fabric and main infrastructure

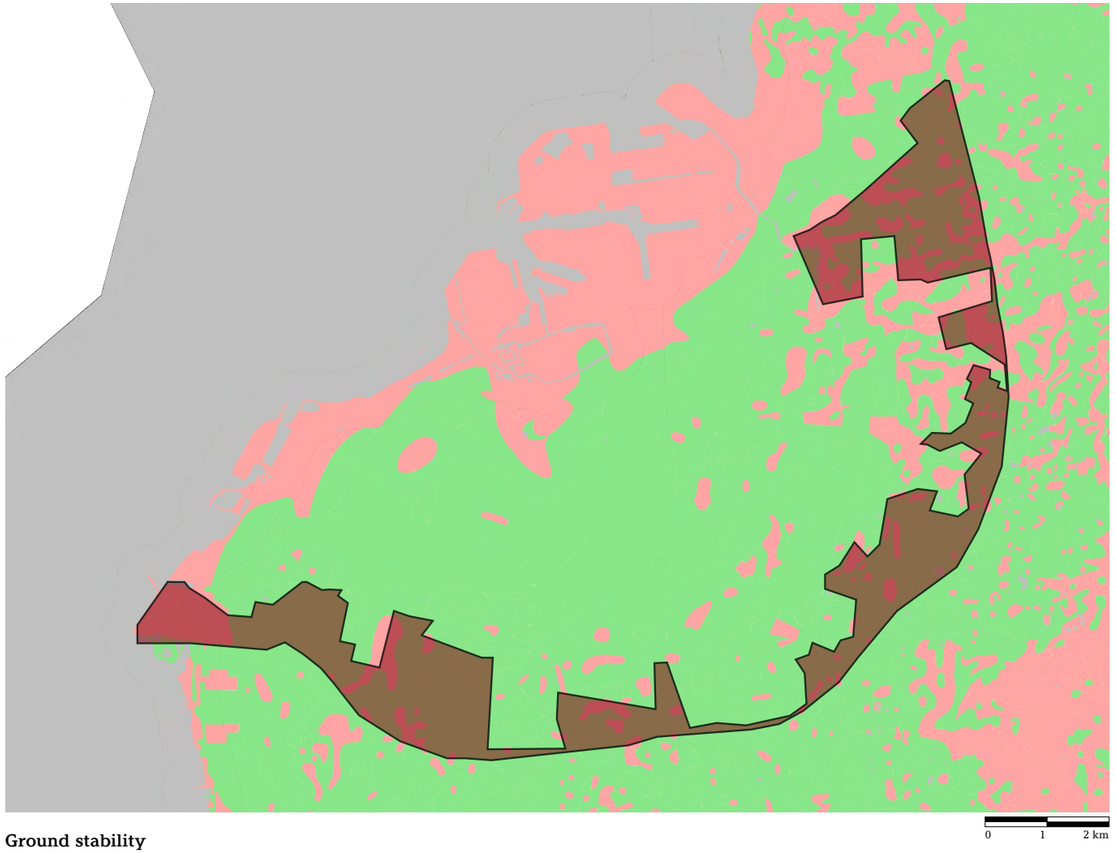
Outer ring road

2. Soil quality & natural resources



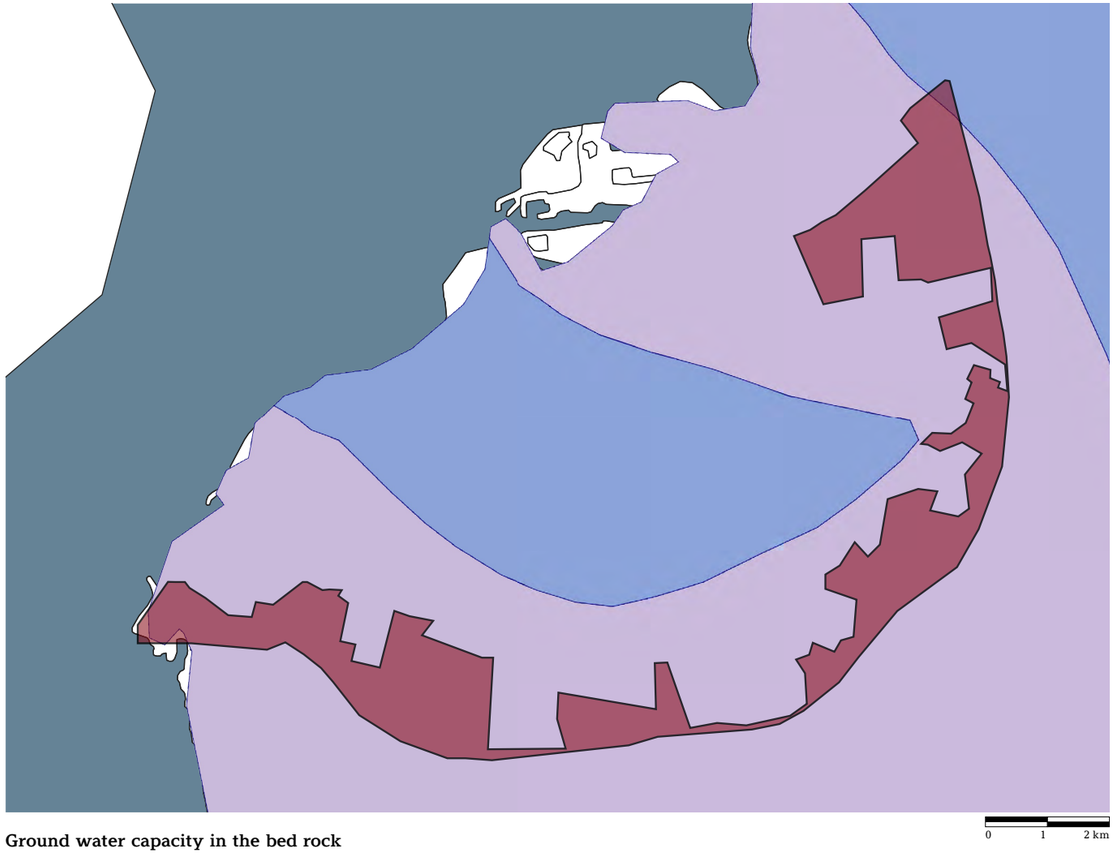
Ground composition: geological deposits

- *Moraine clay*
- *Moraine soil*
- *Swimming sediment*
- *Post glacial sand gravel*
- *Glacial sediment*
- *Sedimentary rock*



Ground stability

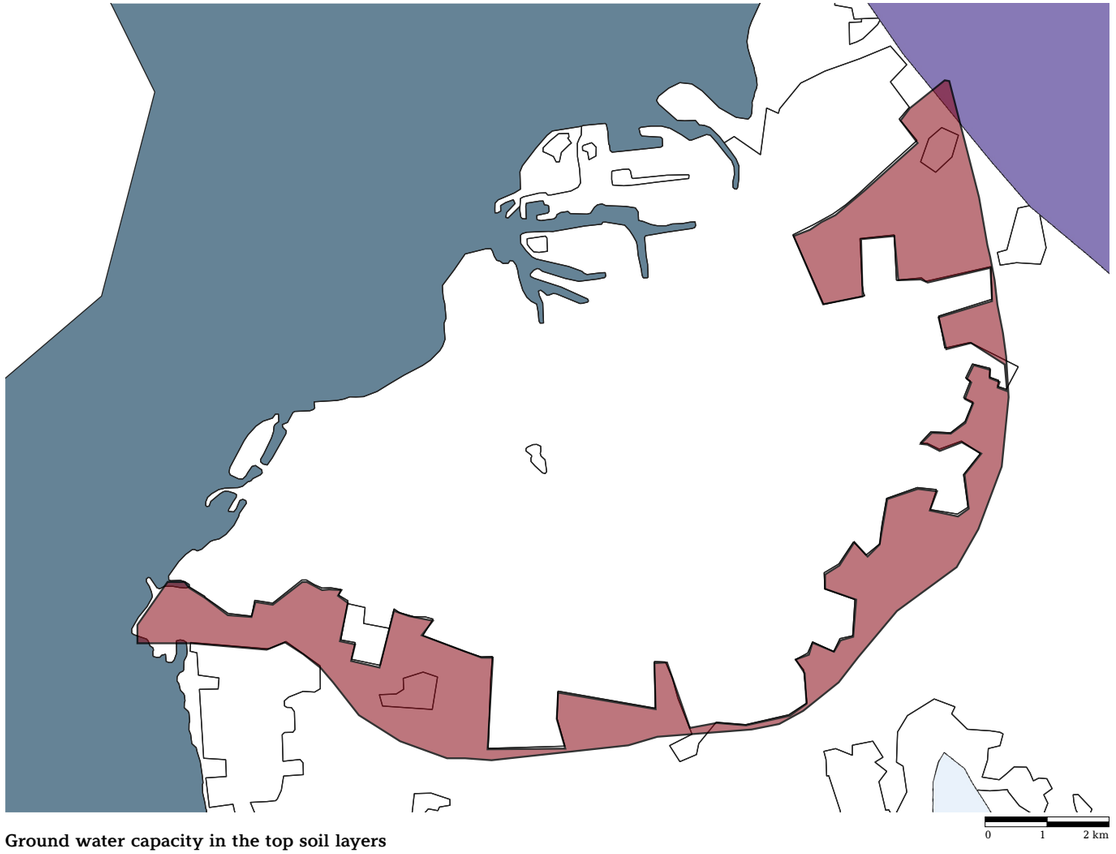
- *Stable ground*
- *Less stable*



Ground water capacity in the bed rock

6 - 20 thousand l/h

20 - 60 thousand l/h

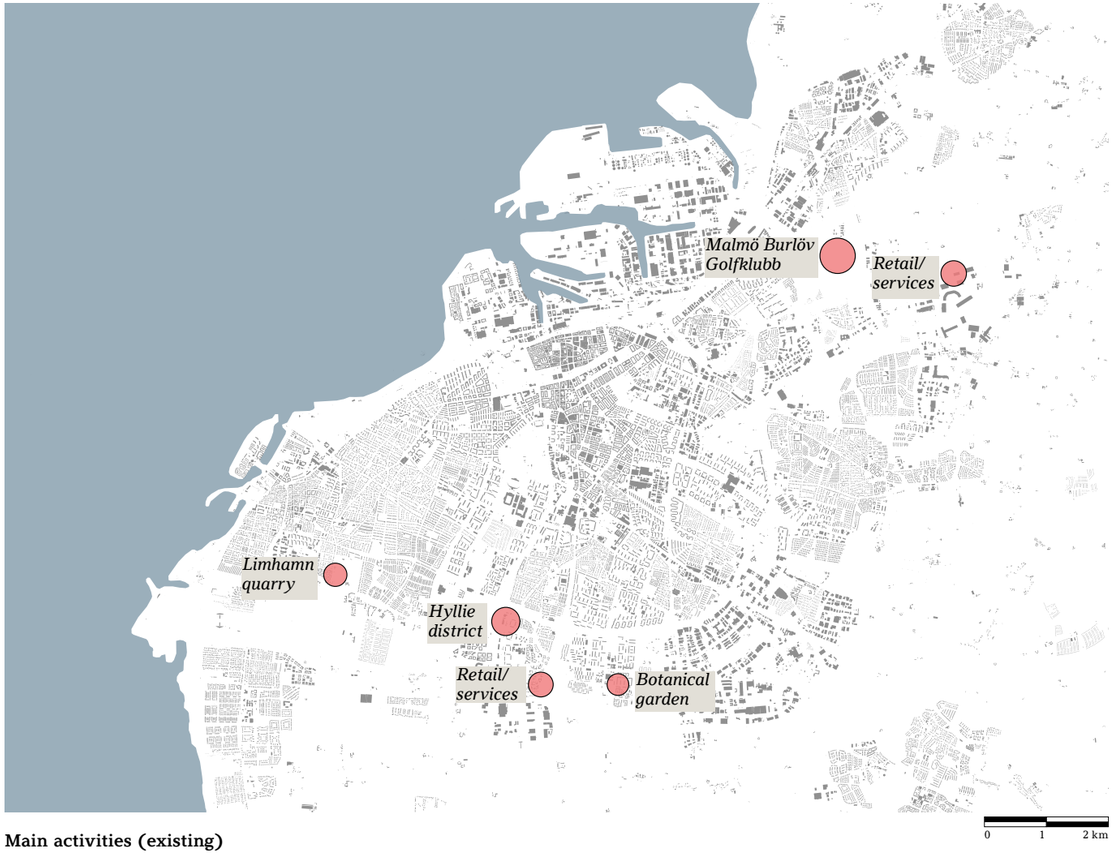


Ground water capacity in the top soil layers

Over 125 l/s

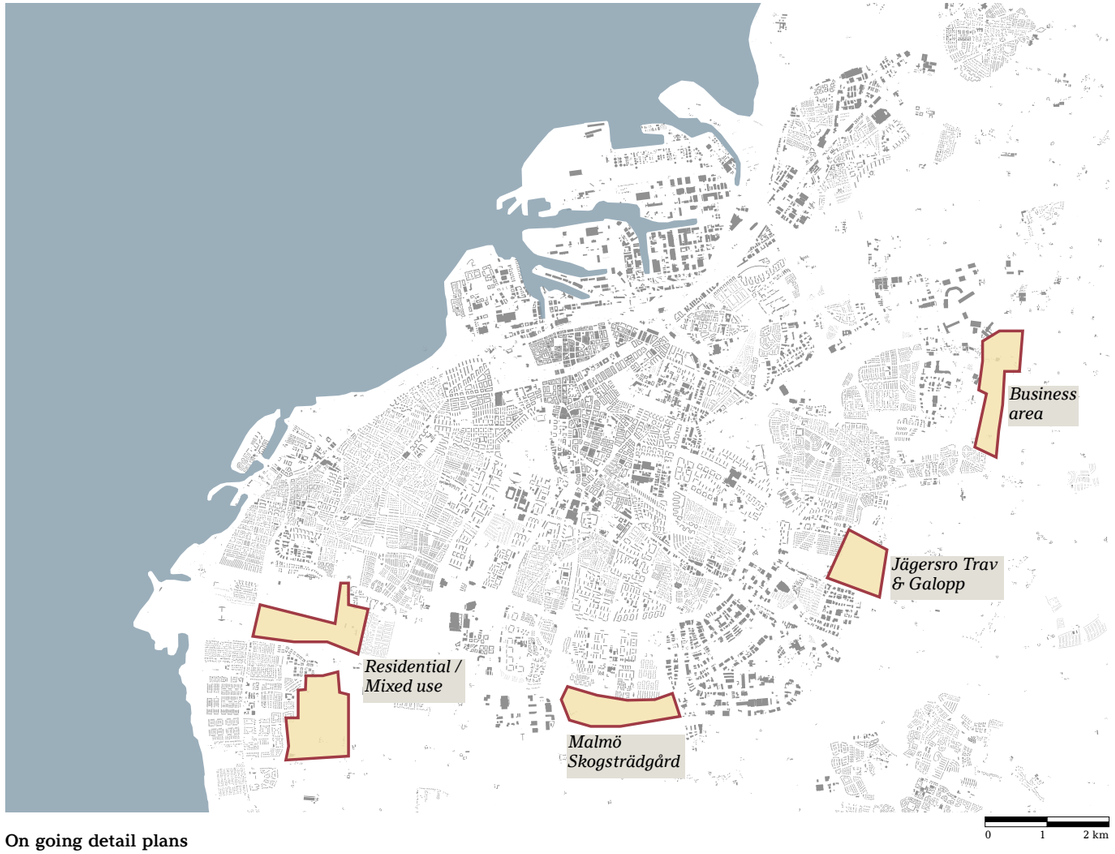
0 - 5 l/s

3. Existing activities and future planning documents



Main activities (existing)

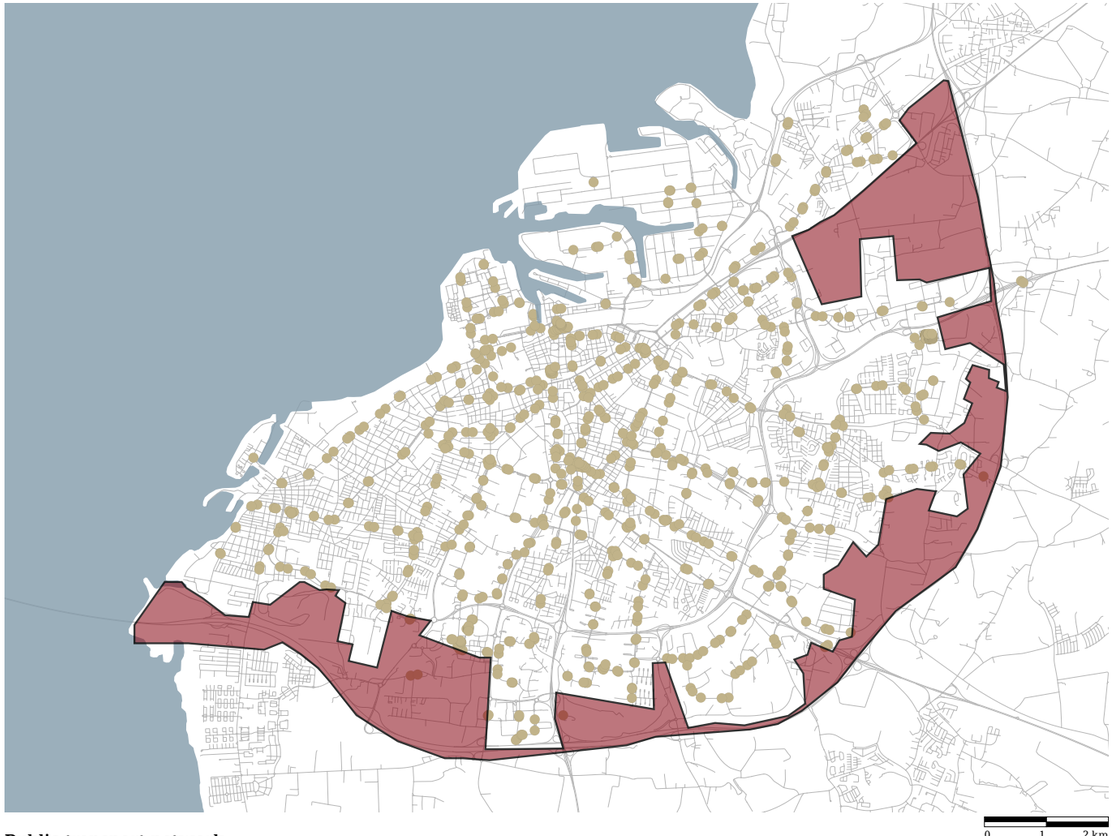
Location of activity



On going detail plans

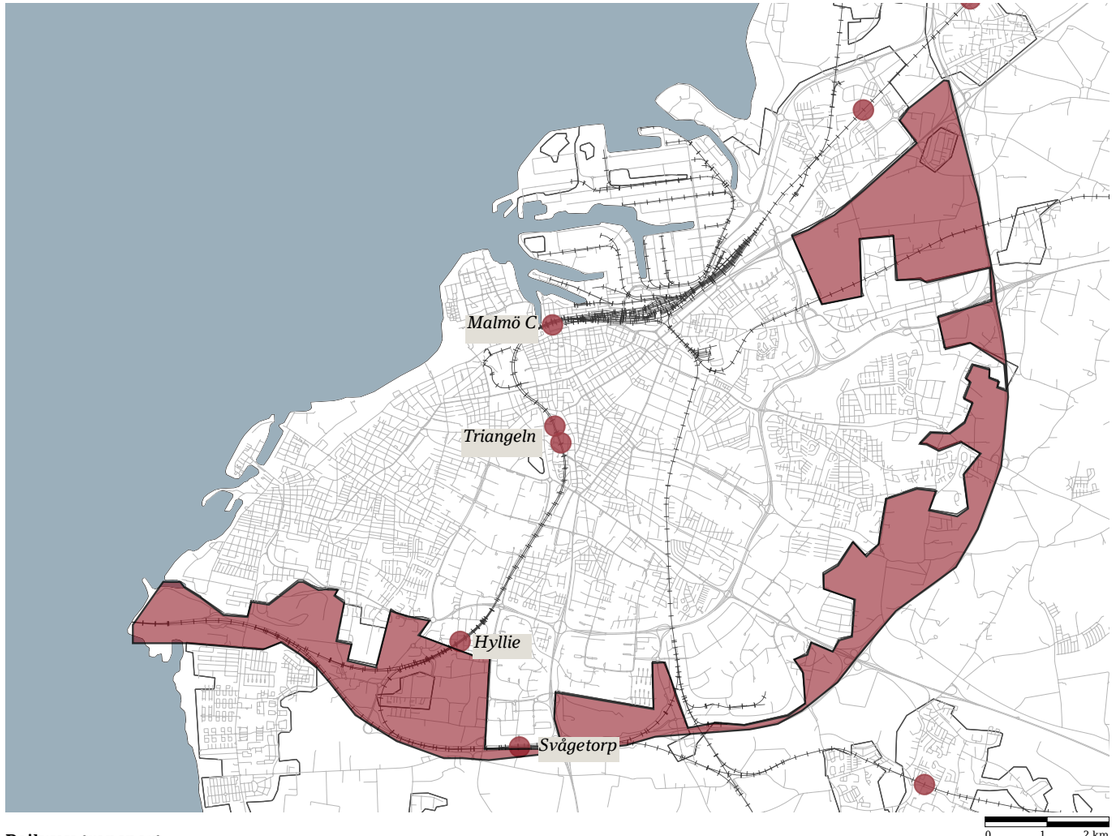
Approximative limits of the detail plan

4. Accessibility & public transport



Public transport network

Bus stops



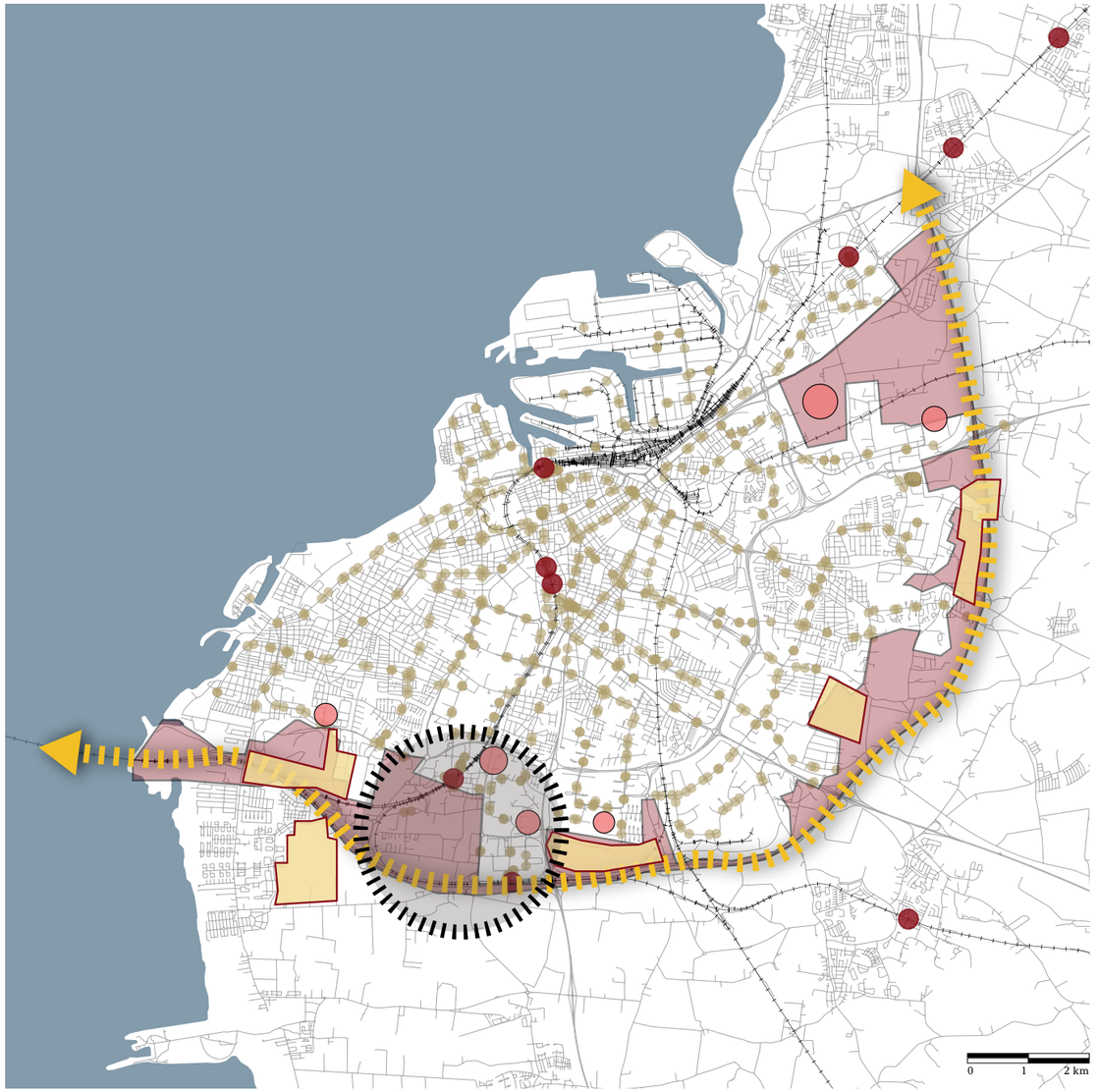
Railway transport

Train stations

Site selection outcomes

The chosen site is located in **Vintrie**, South of the city of Malmö and 1,5 Km from Hyllie station. It is bordered to the North by the new Hyllie development, South by the outer ring road, East by commercial farms (specialized in organic farming) and West by Vintrie village.

When looking at the site today, the land use is predominantly agricultural but it is progressively shifting especially in areas that are immediately adjacent to the site, namely Hyllie and Svågertorp. Therefore, the project will take into account the integration to its surroundings, and enhance the existing connections. It will also address the necessity to meet the needs of future urban growth by proposing a diverse housing offer and a public realm that binds together the elements of the development and their surrounding environment.



04
Site Analysis

Site location

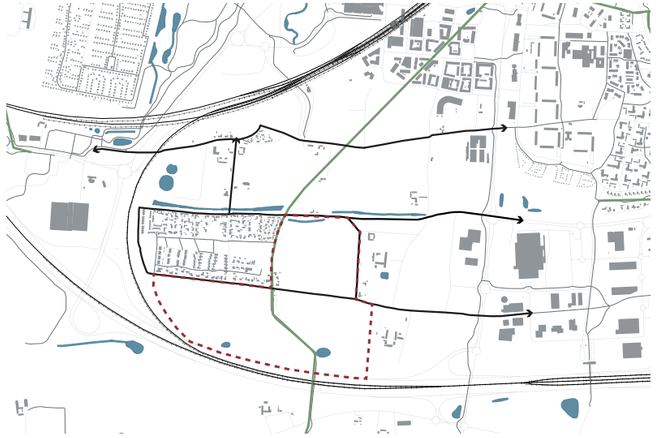
Site limits and adjacent areas.

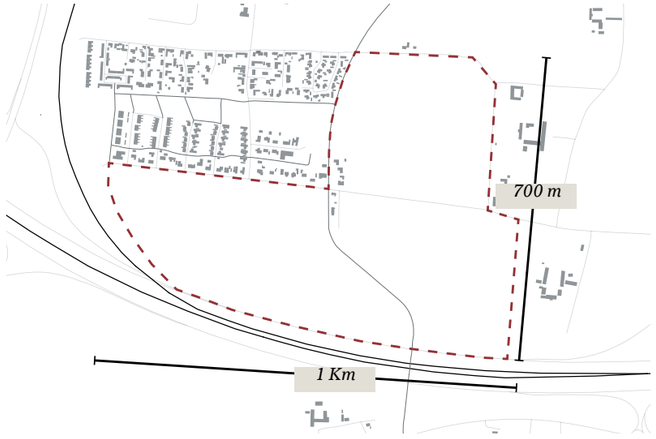
Site limits and dimensions

The site is accessible via two main connecting roads. It is limited to the North by storm water management systems, to the South by the outer ring road and the railway, East by farms and West by Vintrie village (residential area). A tree lined path connects the site to Hyllie, following the old train tracks.

The site is 47 hectares comprised mainly of fields and grass paths.

As previously shown in the third chapter, the entire area is identified in the comprehensive plan as an area for mixed use development, and contains two main green corridors that connects it to the surrounding natural landscape.



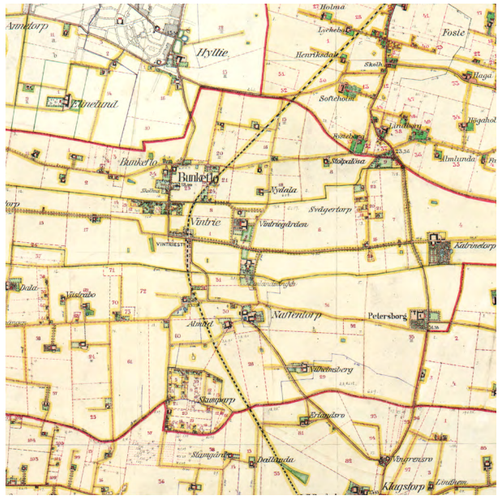


Historical heritage

The area where the site is located today was mainly consisting of farmland and was serviced by a railway. The station was located in Vintrie, while the main services (school and church) were located in Bunkerflo.

The old train tracks were transformed into a tree lined path today, connecting the site to Hyllie. Also, some of the grass paths separating the properties are still existing.

Vintrie station, 1910. Source: Järnvägsmuseet[26]

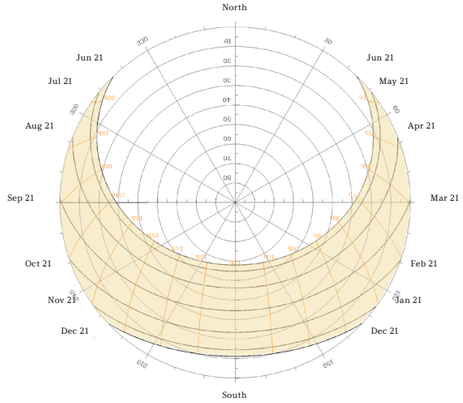


Historic map 1910-1915. Source:© Lantmäteriet[24]

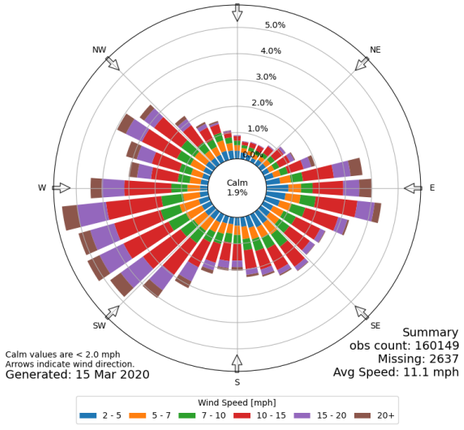
Historic ortho-photo 1960. Source:© Lantmäteriet[25]

Micro-climate conditions

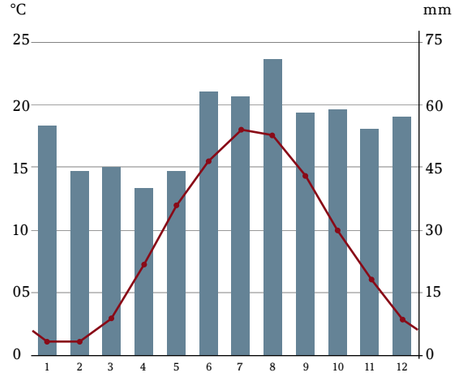
The following data will help identify climate conscious design strategies in the upcoming phase. Both daylight exposure and wind are a key factors in defining a comfortable urban micro-climate and livable spaces. Rain fall can be harnessed and managed to be integrated into the landscape via nature-based solutions, and stored for agricultural usage.



Sun path chart between solstices in Malmö.[29]

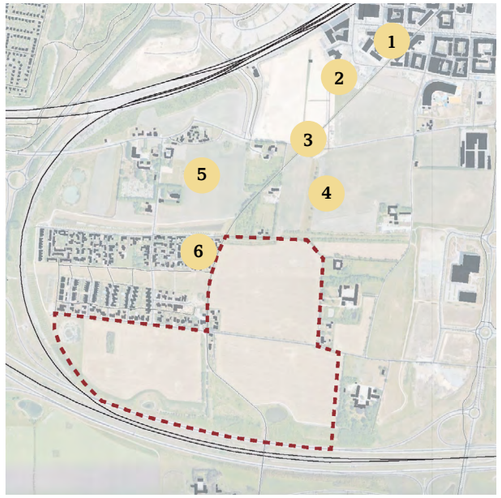


Prevailing winds in Malmö.[27]



Yearly rain fall and average temperatures in Malmö.[28]

Site pictures



1. Hyllie development project.

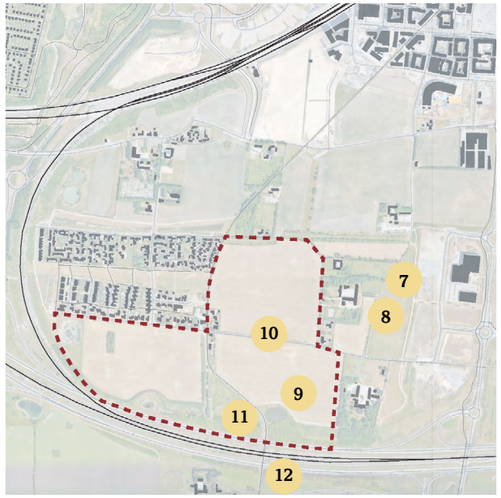
2. End of the path in direction to Hyllie train station.

3. Tree lined path (former railway).

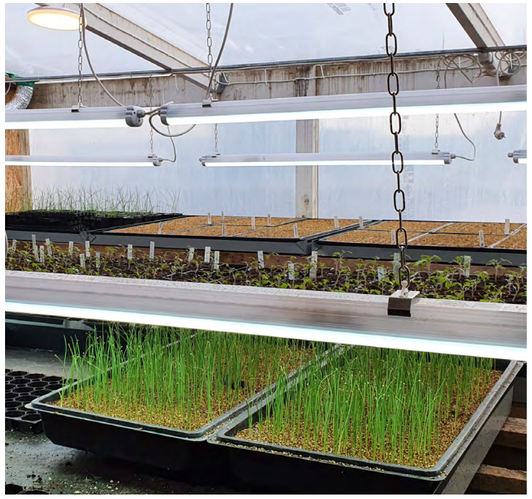
4. Plots adjacent to current Hyllie development projects.

5. Bunkerflo church.

6. Vintrie (residential area with detached houses).



7. Commercial farm specialized in organic farming.



8. Year round greenhouse production.

9. Water retention pond.

10. Agricultural fields (extensive farming).

11. Outer ring road and sound buffers (hills).

12. Underpass towards farmland located in the South.

Site conditions:

Main infrastructures

- Site limits
- Train stations
- Underpass & bridge
- Arterial roads and main connections
- Connecting roads
- Pedestrian paths and secondary roads

Public transport network

- Site limits
- Train stations
- 5 min walking radius (500m)
- Bus stops
- Bus lines

Main functions & on-going planning projects

- Site limits
- Commercial and recreational
- Educational institutions
- On-going detail plans
- Services & retail
- Historical heritage buildings
- Organic farming small businesses

Green and blue elements in the landscape

- Site limits
- Water ways and retentions points
- Topography lines
- Farmland & recreational green space
- Green connections

Conclusions

Vintrie has a great potential to be an attractive urban development thanks to its close proximity to Hyllie and Svågetorp, and to further strengthen the connections between the city and the peripheral landscape. The on-going development around the site is an opportunity to densify more and add more functions in order to enhance the attractiveness of the area.

The site is characterized by core elements that must be taken into account in the design proposal:

- The farming heritage and the importance of preserving the activity for cultural and environmental reasons.

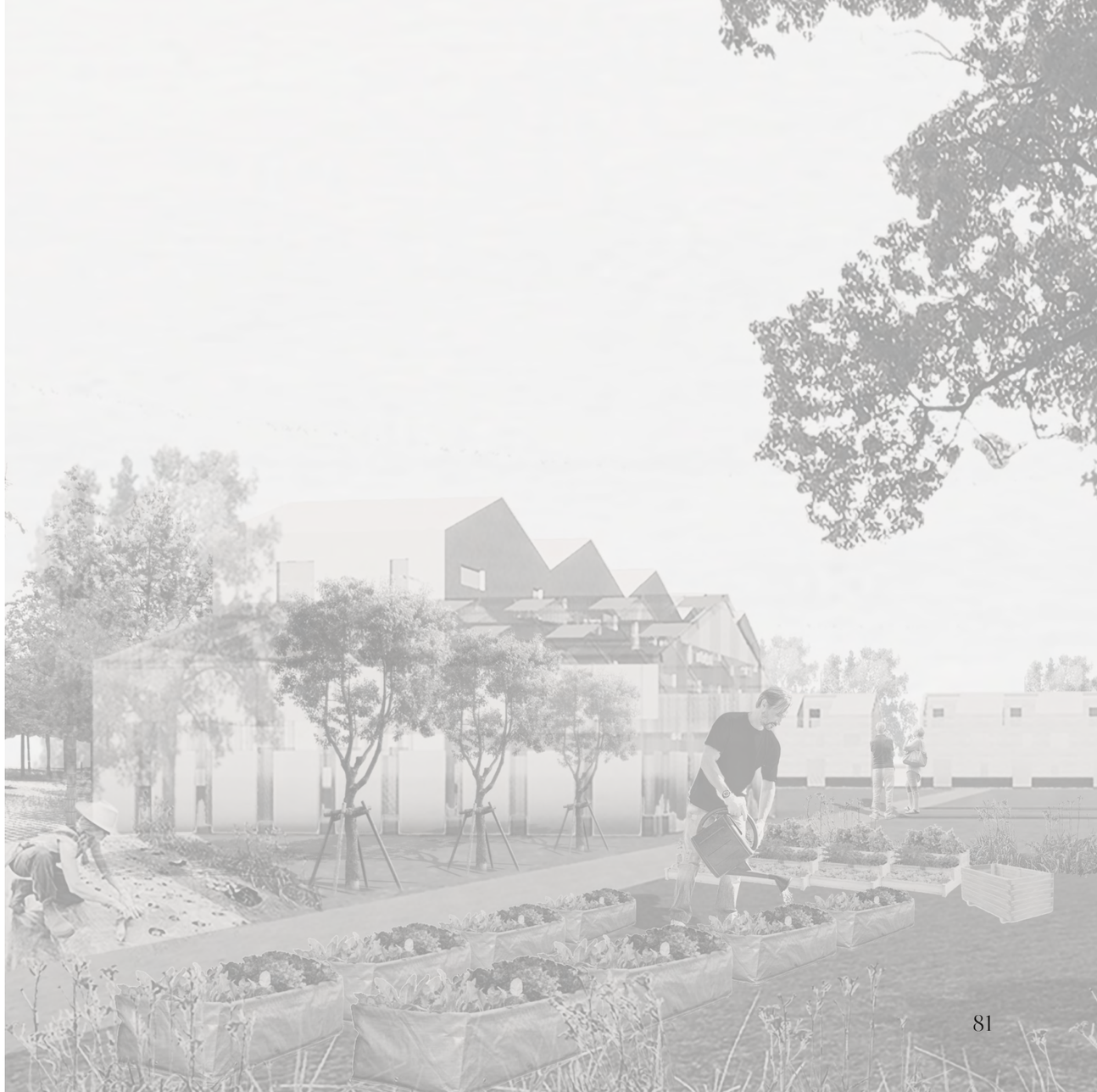
- The connectivity nodes and the opportunity to build off the exiting network and enhance the missing connections.

- The landscape features (green connections and water courses or ponds) that create a base that structures the site.

- The surroundings built fabric that varies in scale and function and that should be taken into account for the integration of the new fabric.

- The micro-climate conditions are important design guides in order to provide spaces that are comfortable, suitable for different activities, and solutions that mitigate and use the natural elements like storm water, wind and daylight.

05
Design proposal



Vision

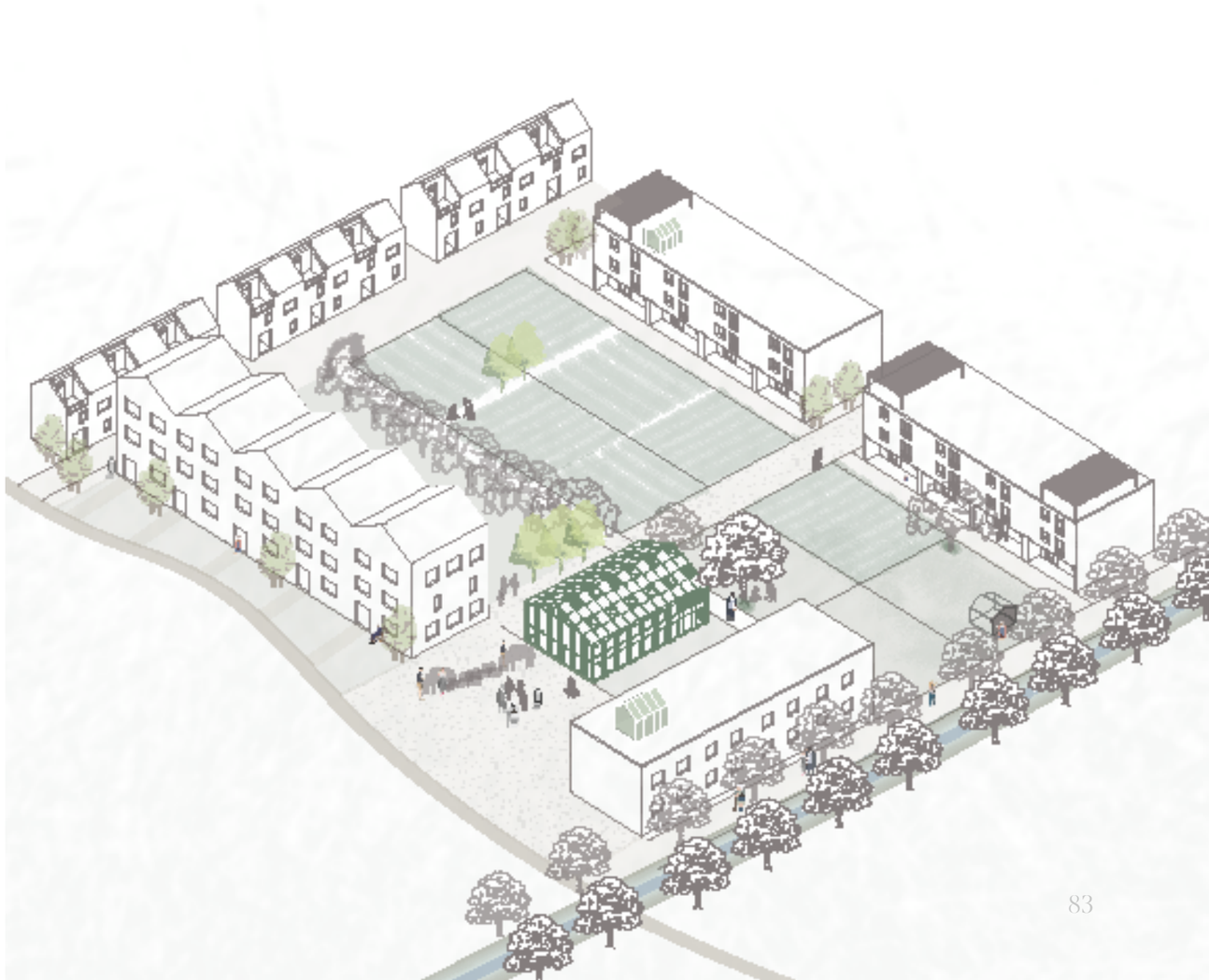
The principal aim of the project is to harness the social, economic and environmental benefits of a productive city. This is achieved though exploring food supply systems through the lens of urban agriculture as a catalyst for sustainable growth.

The vision for the project is to develop a district connected to the city of Malmö by building off the proximity to Hyllie and Svågetorp, with a productive landscape integrated within the new urban fabric, and services that promote local living.

The main driver of the project is the Agri-cluster; an ecosystem for food bio-economy that provides a space and a framework for a sustainable food economy, from resource, to fork, to waste.

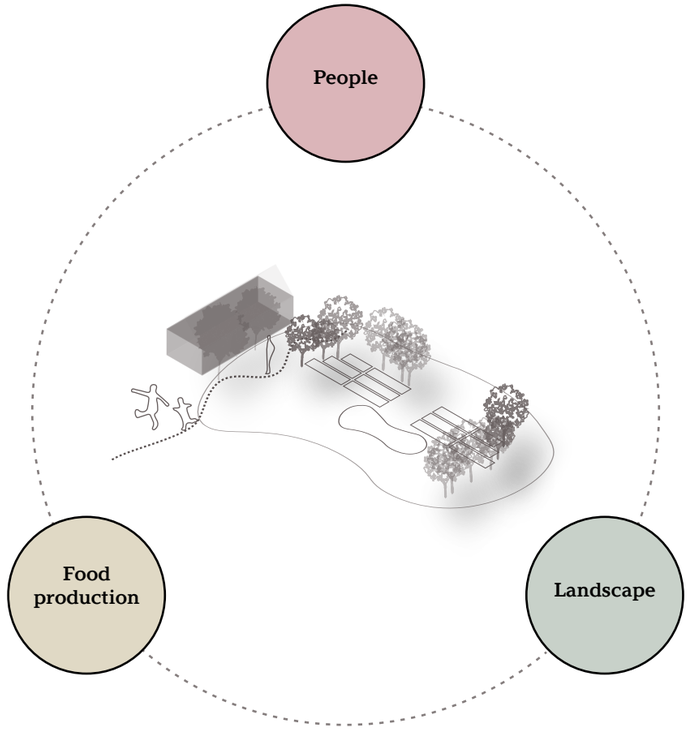
The ecosystem encompasses growing, processing, packaging, it also produces nutrients, processes waste and generates energy. It provides facilities for research and experimenting, commercial activities, and social generators.

The Agri-cluster is the driver for a new development in Vintrie:
It supports public life, local living, and ecological systems.



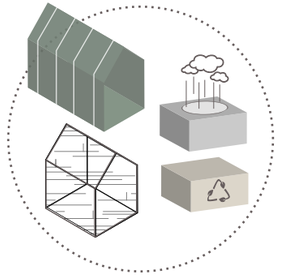
Urban design objectives

1. Create a productive cluster for food bio-economy : the Agri-cluster
2. Promote local living and public life connected to the landscape
3. Strengthen natural ecosystems and biodiversity

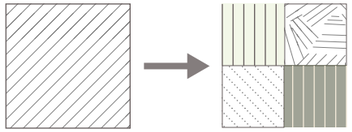


Strategies

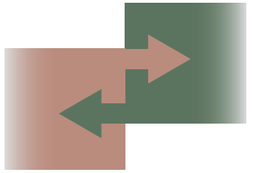
More yields with optimized footprint



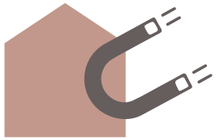
Shared resources and farming space



From mono-culture to bio-diverse environment



Productive landscape integrated in the urban fabric



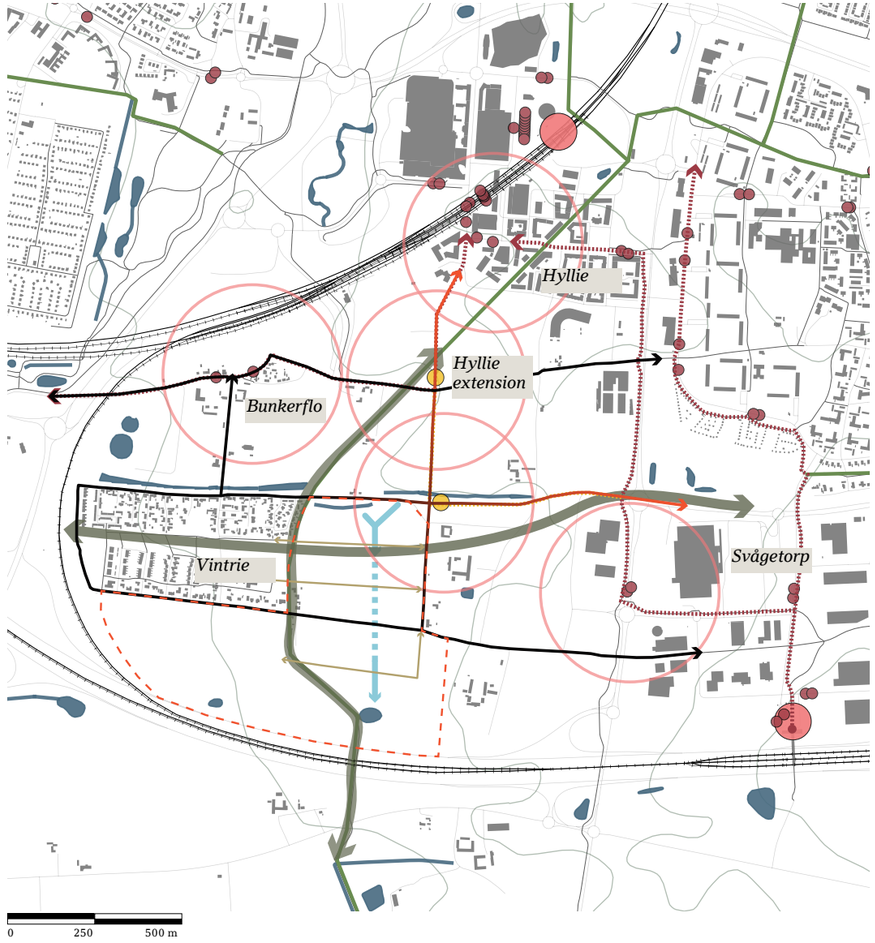
Production facilities as urban generators

Diversity of housing typologies and public spaces

Macro-scale strategies: integration of the site

The project aims at strengthening the connections between the site and its surroundings. I use 3 main interventions to promote these connections:

- Enhancing the green connections by creating corridors that link the site with the surrounding landscape. This is achieved by following the existing landscape features and taking into account the green corridors identified in Malmö's comprehensive plan. Also, the project implements nature-based solutions for storm water management, creating water courses and swales that follow the topography of the site.
- Extending the street network by widening the main roads and connecting them to the arterial roads that connect the site to the rest of the city.
- Adding bus stops along the routes of two existing lines, and adding a segment to the line that links Hyllie and Svågetorp. This will promote multi-modal mobility, and further enhance the pedestrian and cycling connections with Hyllie.



Site concept

The site's structure is created by building off the existing blue and green systems, the infrastructure, and the surroundings.

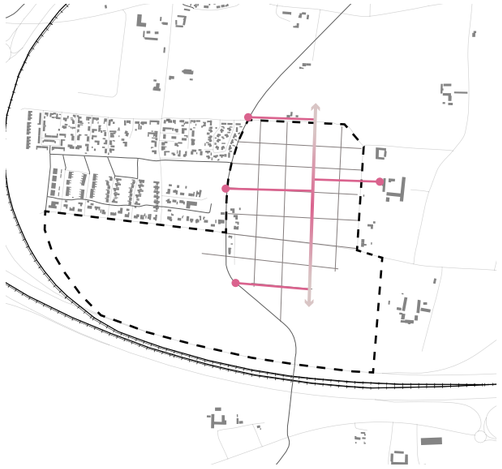
1. Green & blue connections: The new water courses and swales for storm water management creates a North-South axis that will serve as a focal point in the design. The East-West corridors allows to connects the existing green spaces, mainly the long stretch in Vintrie village located to the West, and the farms to the East. The pedestrian path that connects Hyllie to the underpass located South is enhanced.

2. Enhanced network: The two main exiting connections are Vintrievägen (East-West, connects to Svågetorp) and Vintriegårdsvägen (North-South, connects to Hyllie). The first one is widened in the proposal to create bike lanes and accommodate the new functions. The second is widened and extended to join the current extension of Hyllie.

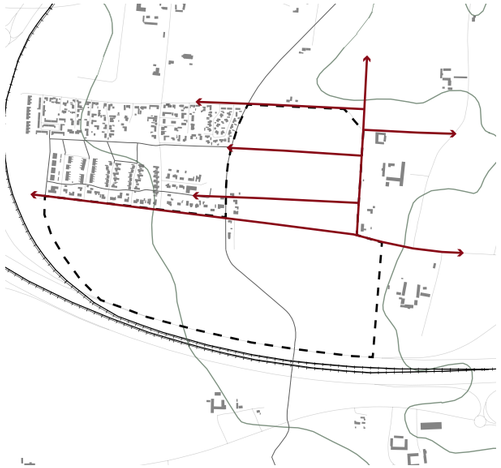
3. Key places: The principal axis in the project proposal is the North-South connection that will contain a swale path with tree lines streets, it's a shared road for pedestrians and cyclists that has an at-grade intersection with Vintrievägen street. Key places are proposed on the edges of the site in order to create an interface with the surroundings.

4. The overall structure weaves together the landscape elements, main connections and key places. This constitutes the main base for the Masterplan.

1. Green & blue connections structuring the site.



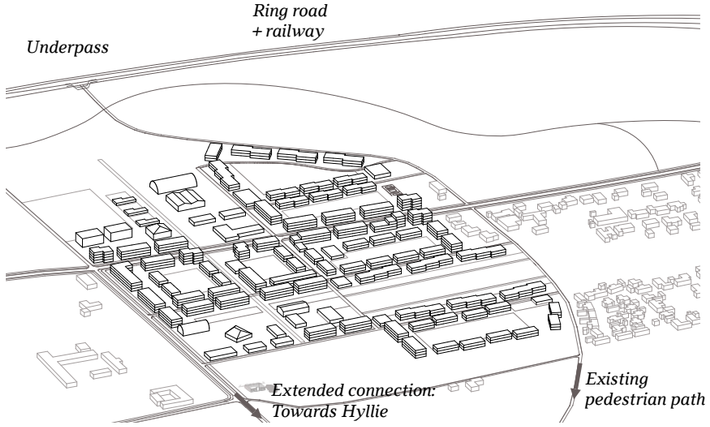
3. A structure building off the proportions of the surrounding, and key places to connect the main North-South connection with the surroundings.

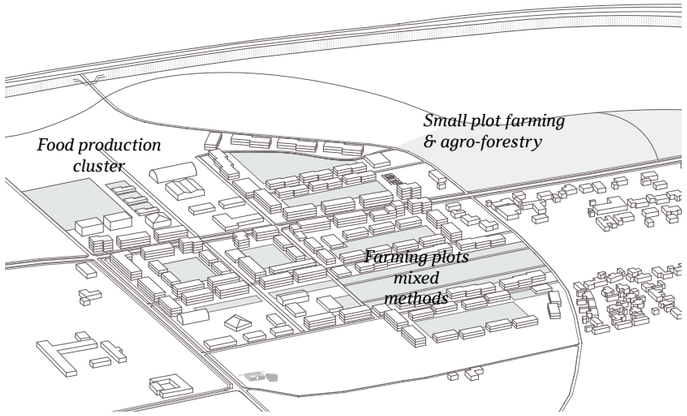


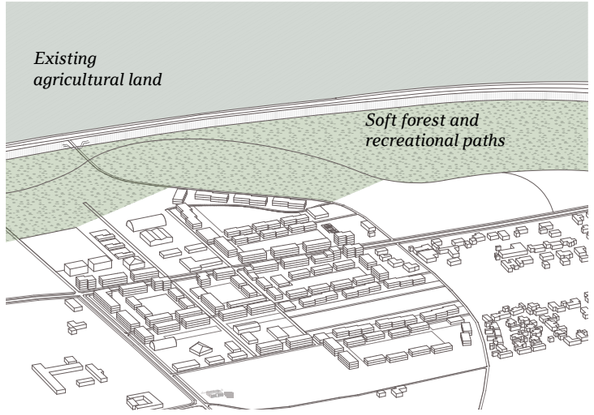
2. Building off the existing network and strengthening the North-South connection with Hyllie.

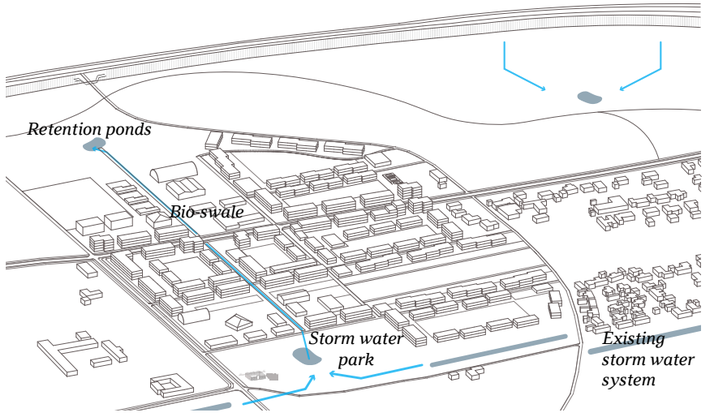
4. Weaving together the main elements to define the structure of the site.

Overall structure









Masterplan

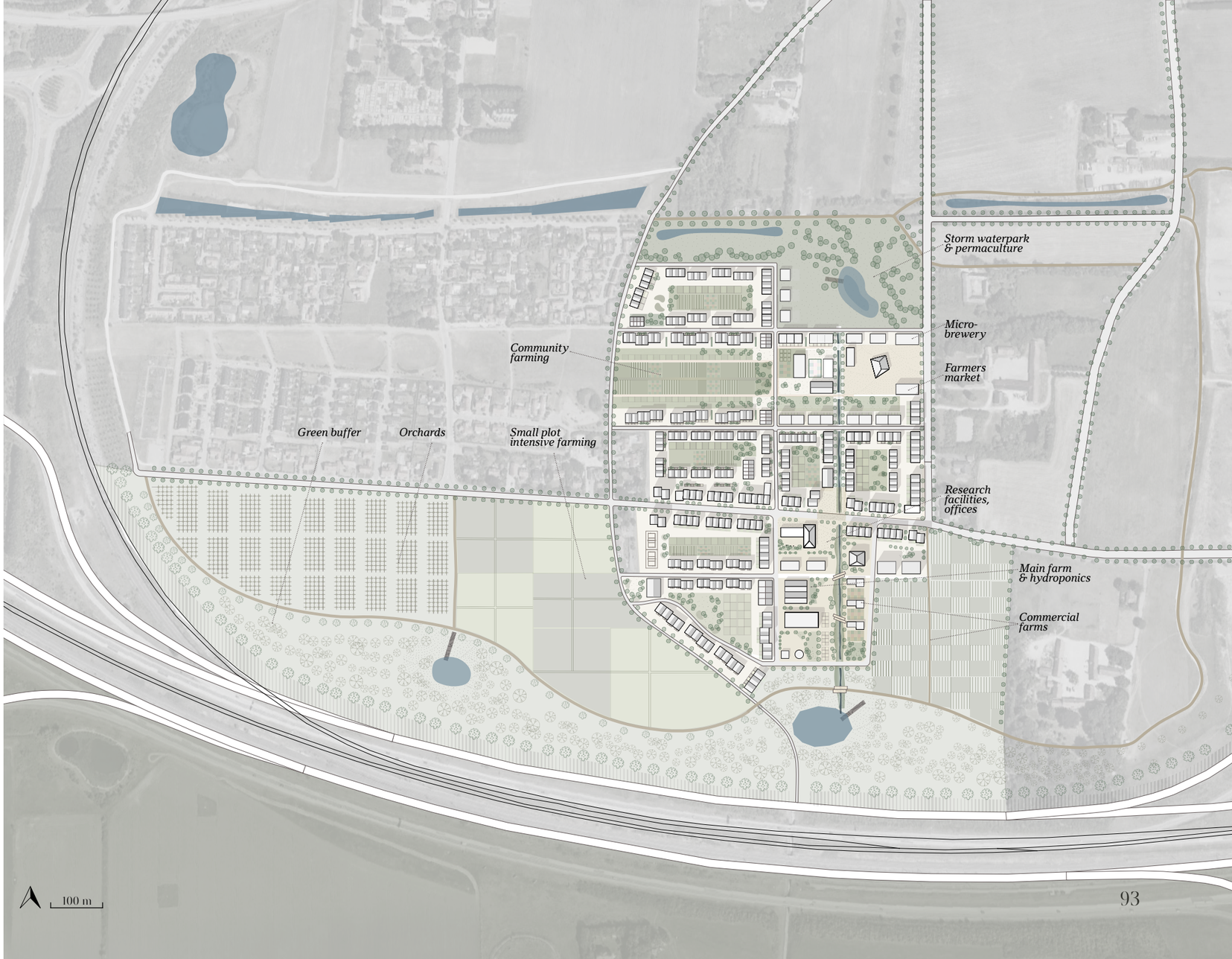
The masterplan proposal consists of a development area of 47 hectares. It contains a productive area, referred to with the term Agri-cluster, public facilities, offices and workshops for processing and food related activities and businesses. The residential spaces are built around agricultural plots that are community owned.

The Agri-cluster is located in the southern part of the site in proximity to the main infrastructure in order to facilitate transport and logistics. This location was also chosen according to the scale of the buildings and logistics area that is needed around them.

Towards the North, a storm water park and permaculture gardens are located where the main retention ponds are. It is accessible via the recreational paths as well as the main streets, and creates a soft entrance to the site.

In the South-West, an agricultural area of 11 hectares is proposed, containing intensive small plot farming and orchards. It's bordered by a green buffer that allows on one hand to control the S-W prevailing wind as well as the noise pollution from the ring road, and on the other hand to create a landscape continuity across the ring road through the farmlands located in the South. Smaller recreational spaces are created around the retention ponds, and are enhanced with varied vegetation to benefit biodiversity and wildlife.

Public spaces and key generators are connected via the main network and primarily through the swale path that creates a North-South promenade that guides the inhabitants and visitors throughout the site.



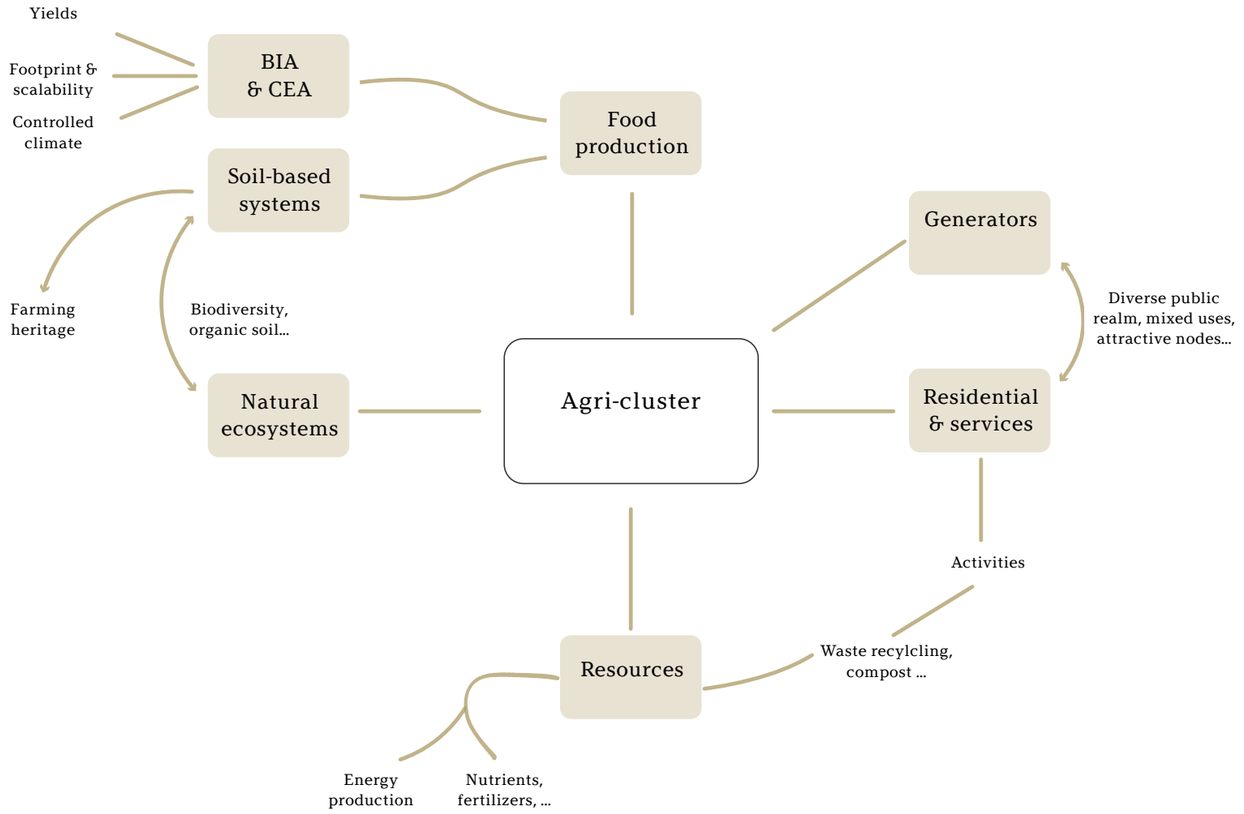
Food supply activities:
General ecosystem

The Agri-cluster is the main driver of the project. It gathers production activities, research, production related activities and businesses and public functions that act as urban generators.

The aim is to create a holistic system that hinges on a circular model that uses resources available on site as well as waste in producing the food and generating energy. The agricultural systems that are implemented serve two primary goals:

- The soil-based agriculture contributes to building organic soil, enhancing biodiversity, and preserving the farming heritage of the area.
- The Building-integrated and Controlled-environment agriculture systems aim at increasing the yields with a minimal footprint. This model also allows to provide a controlled climate in order to grow food all year round.

The agricultural spaces are integrated within the new urban fabric, creating community spaces and a continuous landscape.

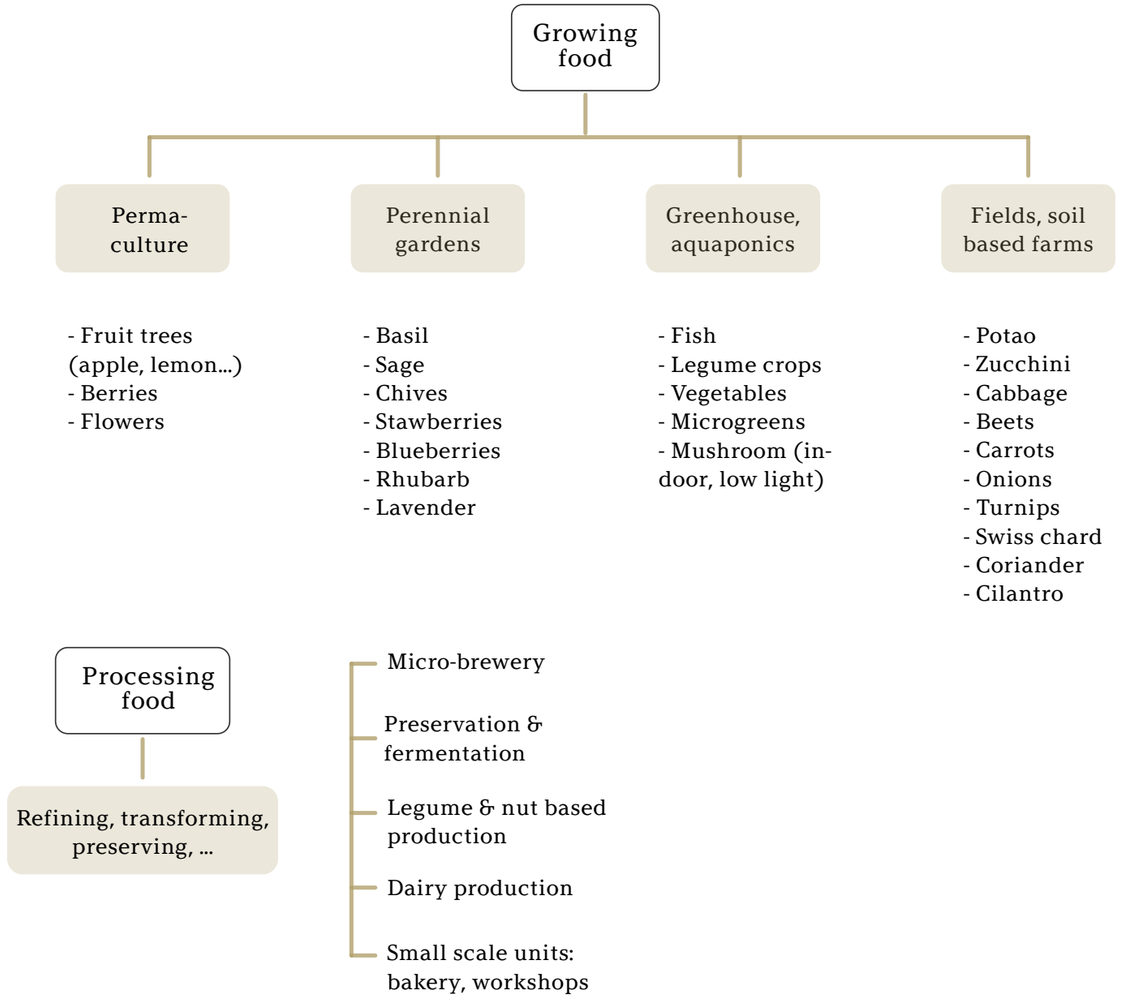


Food supply activities: Growing & processing

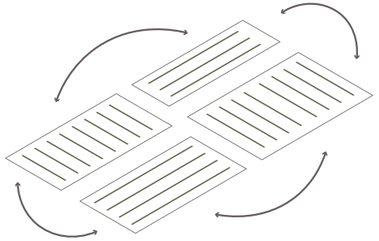
The Agri-cluster specializes in a diversity of crops that were chosen based on the local climate, soil disposition, and by researching the crops produced today in the adjacent areas. A group of crops is added to this selection and is grown in controlled-environment systems, mainly fish, legume crops, and vegetables in order to maximize the yields and optimize the productivity.

A site visit conducted to one of the farms and an interview with the owner helped identify the suitable crops and refine the selection made in the research phase.

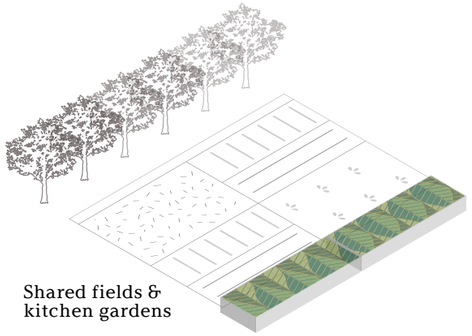
In the processing unit, food is transformed, processed or refined, like in the micro-brewery, workshops for preservation and fermentation and dairy production.



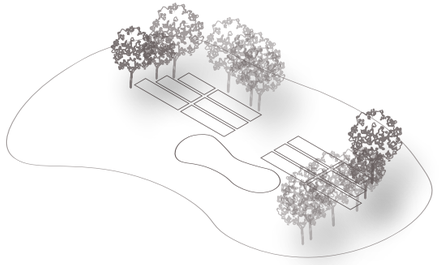
Soil based agricultural systems



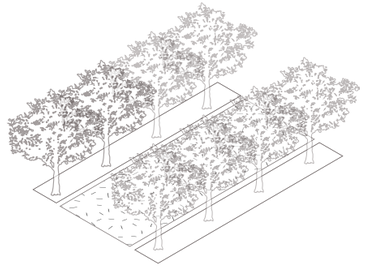
SPIN: small plot intensive farming



Shared fields & kitchen gardens

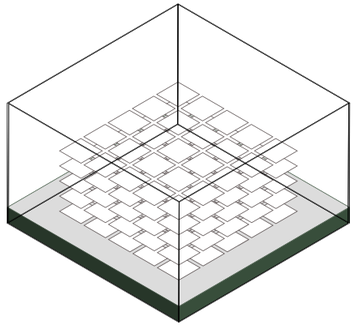


Permaculture

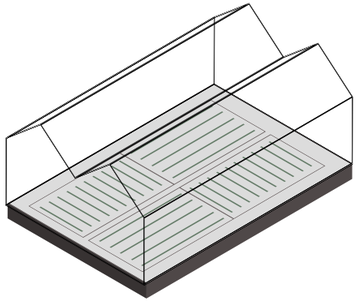


Agro-forestry

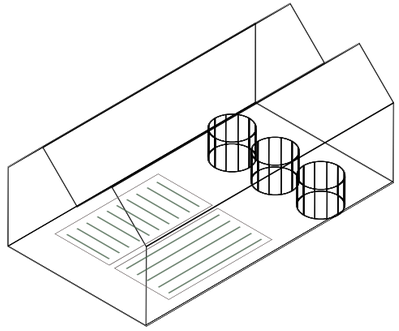
Building integrated and controlled environment agriculture



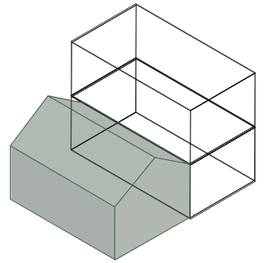
Multi story vertical farm



Greenhouse (rooftop as well)



Aquaponics farm

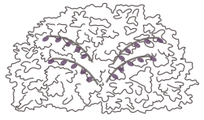


Greenhouse attached to housing

Fruit trees

Suitable species: Apple, pear, cherries

Agro-forestry, permaculture garden
Yield per area: 250 trees per hectare, 10 tons per year at peak production.



Berries

Blueberries, ligon berry, cranberry

Permaculture garden.
Yields 8kg per square meter.
In greenhouses, up to 10 plants can be grown per square meter.

Edible & wild flowers

Eldeflower, hibiscus, dandelions

Permaculture garden, and flower meadow.

Herbs

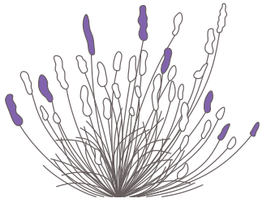
Parsley, dill, sage, basil

Perennial garden, greenhouse
Yield per area: 1 Kg per sqm, is densified in greenhouses.

Garlic

White garlic, can be preserved and fermented

Perennial garden
Yield per area: 60 bulbs per sqm.



Lavender

Munstead and hidicote are suitable for cold climate.

Permaculture and perennial garden.

Fish & mollusc

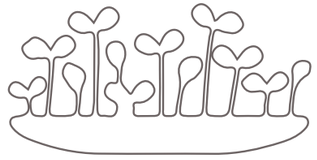
Tilapia, carop, koi

Aquaponics
Yield per area: 50 tons per 1000 sqm, by using stacked layers in aquaponics farm.

Leguminous crops

String beans, romano beans, haricots verts

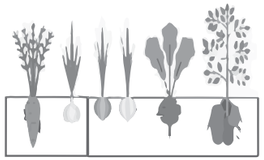
Aquaponics, greenhosue
Yield per area: 2 kg per sqm.



Micro-greens

Sunflower, radish, arugula, cilantro, micro onions

Green house, container farming
Bi monthly yield per growing tray.



Root vegetables & allium

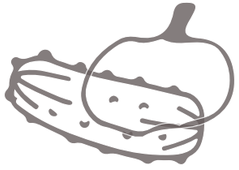
Potato, onion

Small plot farming, greenhouse
Yield per area: 3 tons per 1000 square meter with small plot intensive farming

Cruciferous

cabbage, cauliflower, brussel sprouts, broccoli

Small plot farming.
Yield per area: 3 tons per 1000 square meter.



Marrow vegetables

Pumpkin, zucchini, cucmber

Small plot farming, greenhouse.
Yield per area: 3 tons per 1000 square meter.

Street network

Connecting roads

Shared streets (soft mobility prioritized)

Existing pedestrian path

Existing condition

The proposed street network builds off the existing, and uses the existing features like the tree lined paths as a tool for way-finding.

1 Vintrievägen: connects Vintrie to Svågetorp

2 Vintriegårdsvägen: connects Vintrie to Hyllie

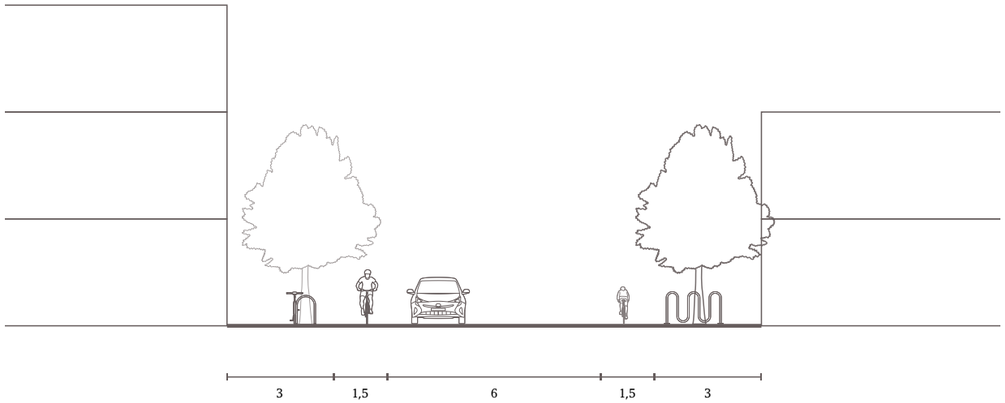
3 Existing grass paths

4 Tree lined path.

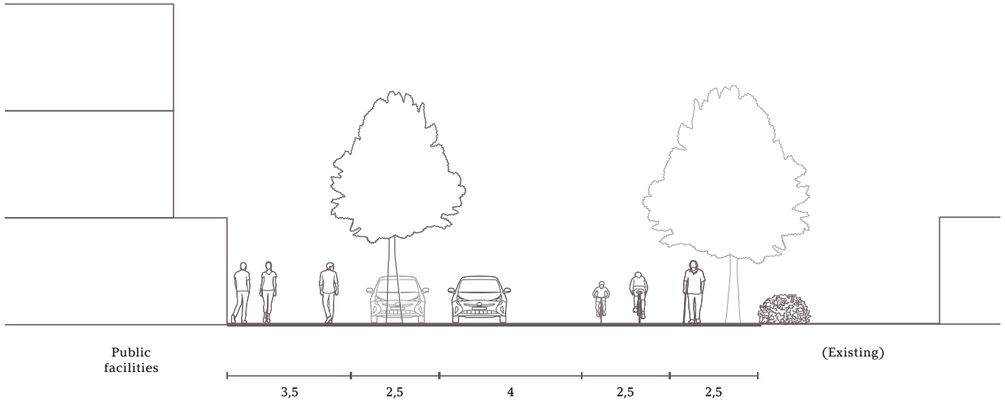
5 Tree lined pedestrian path: from Hyllie to underpass

6 Ditches for storm water management

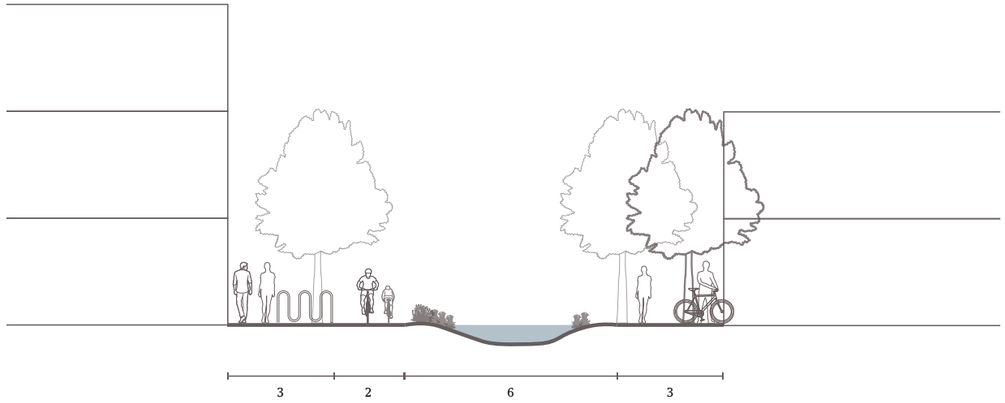
Streetscape



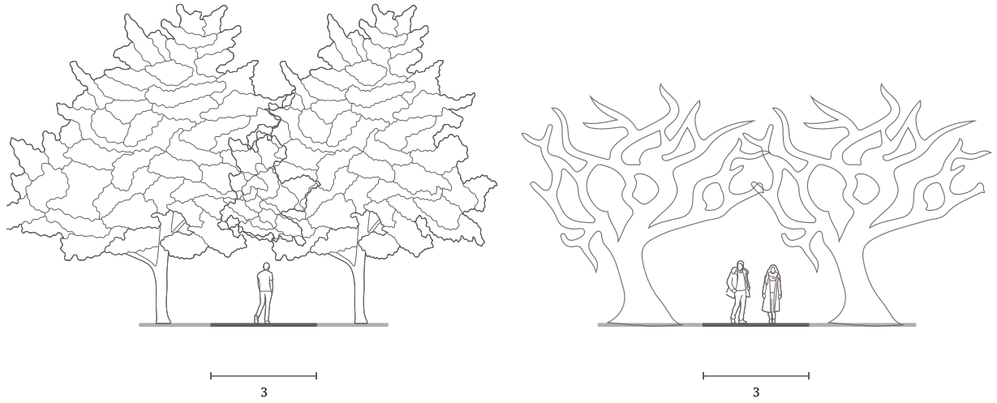
Arterial road
Vintrievägen (East West connection)



Connecting street
Vintriegårdsvägen (North South connection)

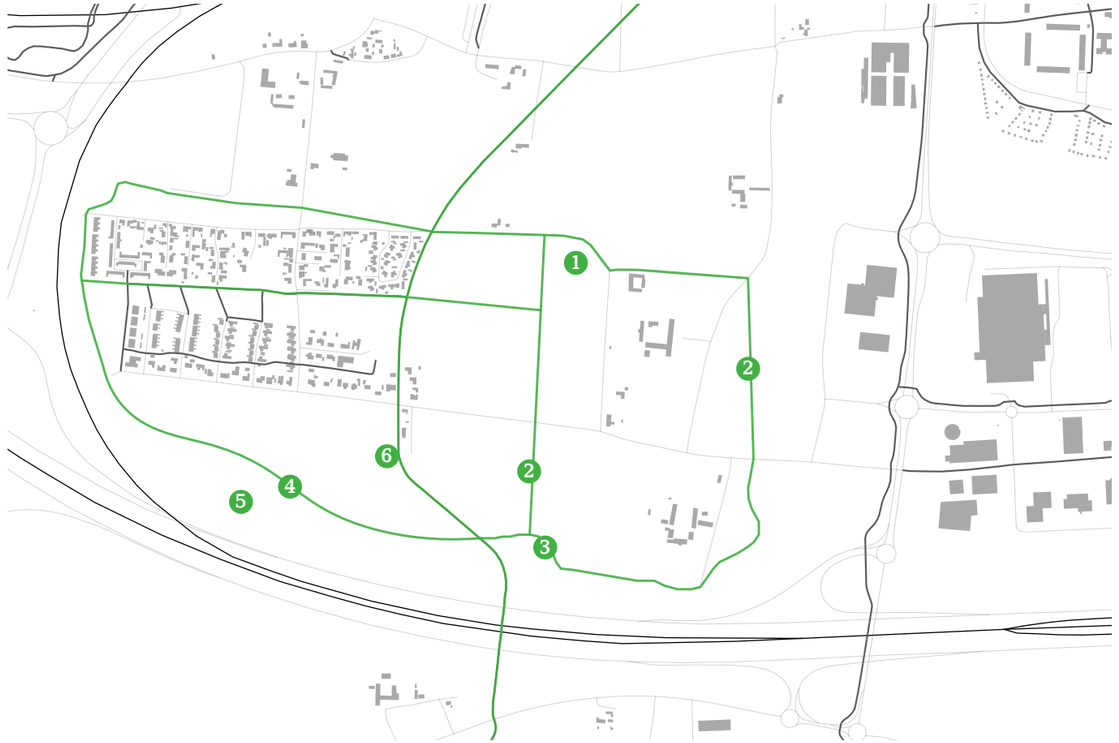


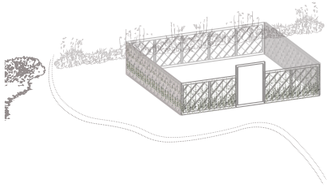
Shared street
New North South connection



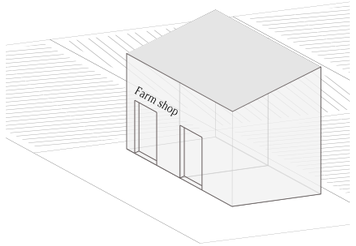
Recreational path (Varying : 2 - 4 m)

Recreational paths network

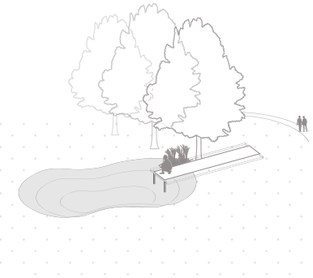




1 Stormwater park and flower garden



2 Commercial farms



3 Retention ponds

4 Soft forest and paths

5 Forest garden

6 Small plot farming

Landscape features in the green buffer

Populus trees can be used in the outer edge of the site, close to the highway. They can grow up to 2m per year, also constituting windbreakers.

Soil cover containing dead organic material that offer nutrients, protect the soil, and control evaporation.

Fruit trees can be part of forest gardens and offer a canopy for low trees and shrubs.

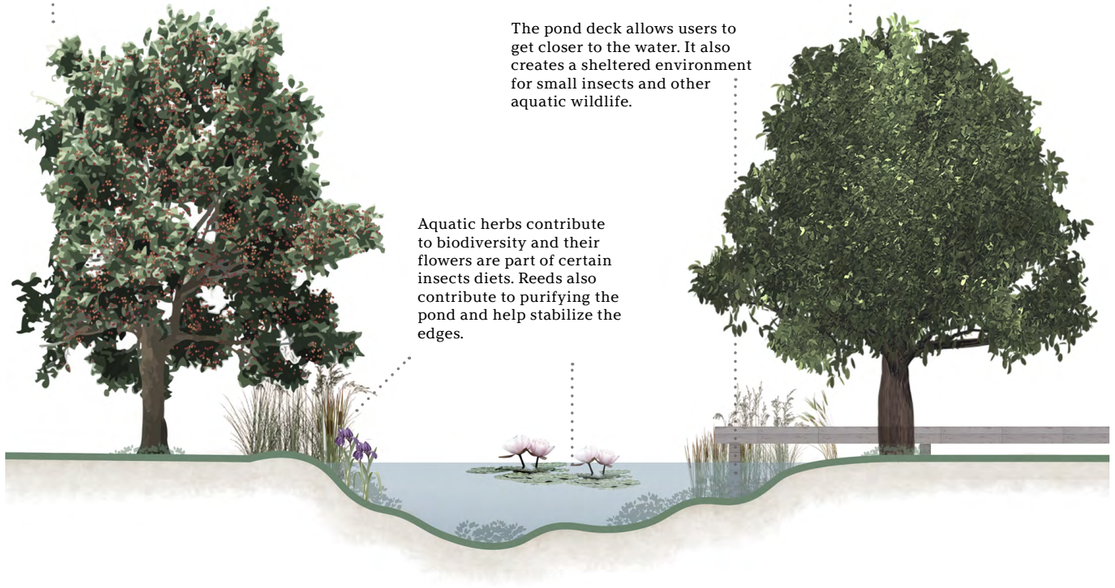
Hawthorn shrubs and berries shrubs can be planted on the edges.

Rowan trees have berries that are widely consumed by migrating birds and other wildlife.

Chestnut trees are deciduous trees that can be found in the region. They contribute to CO2 absorption, as well as creating shade and recreational spaces.

The pond deck allows users to get closer to the water. It also creates a sheltered environment for small insects and other aquatic wildlife.

Aquatic herbs contribute to biodiversity and their flowers are part of certain insects diets. Reeds also contribute to purifying the pond and help stabilize the edges.



Typologies

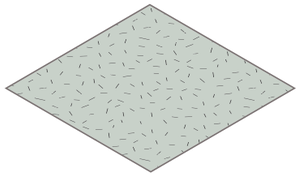
Street edge

Front yard farming

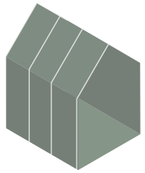
Courtyard farming
(Semi-open layout)

Block concept

1 Module: 50x50 m or 70x70 m



Tools shed



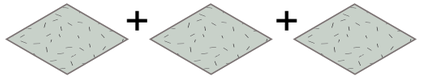
Greenhouse

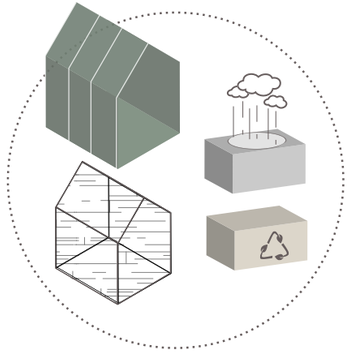
Storm water
collector

Compost &
recycling

Joigning the modules and commoning shared commodities

Large module: 50x150 m or 70x210 m





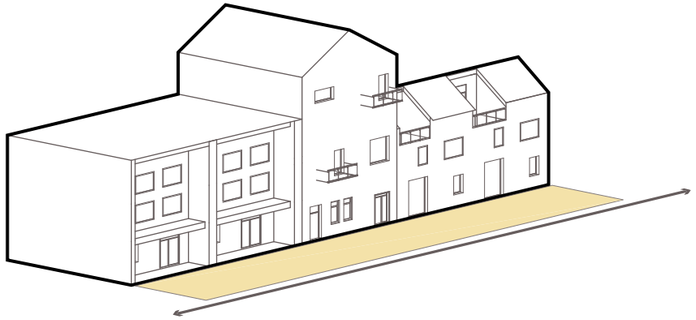
- Less footprint

- More growing space

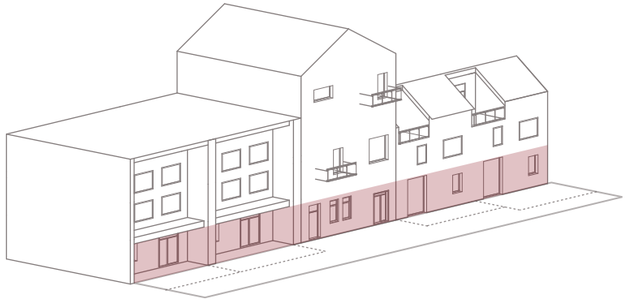
- More space for social
activities

Street edge

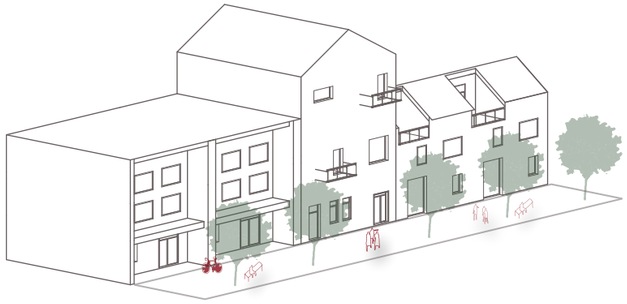
Variation in the built form



Public functions in
the ground floors

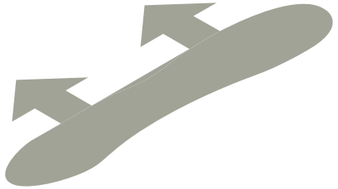


Space to walk and sit



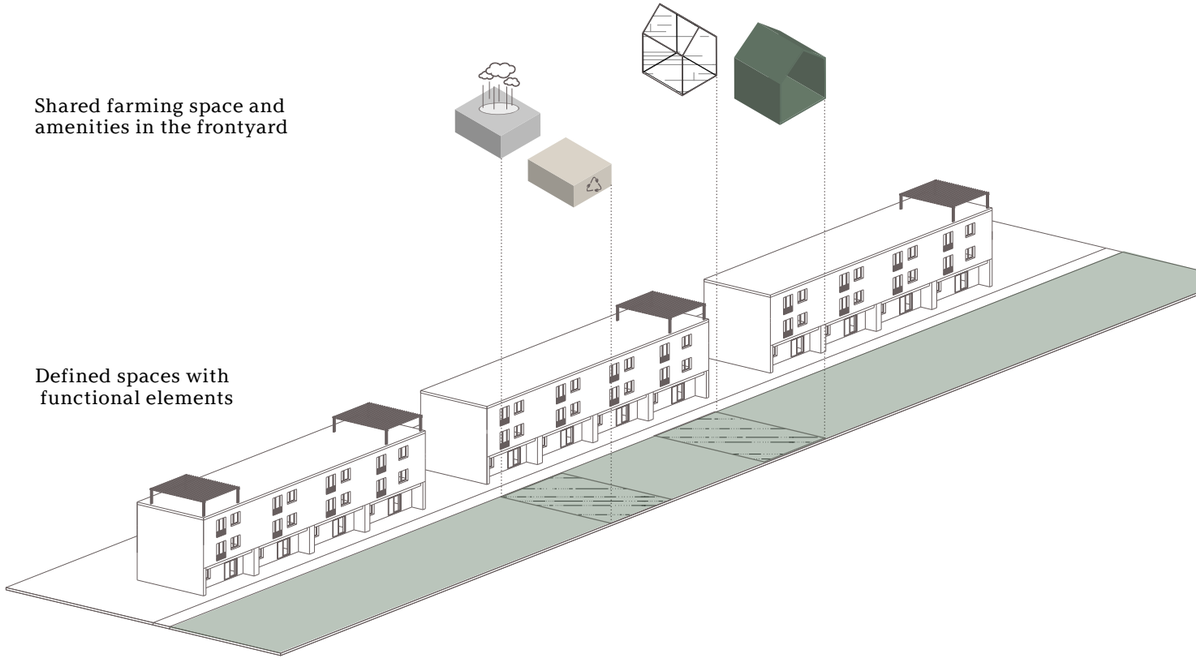
Front yard layout

Permeability and
green connections



Shared farming space and
amenities in the frontyard

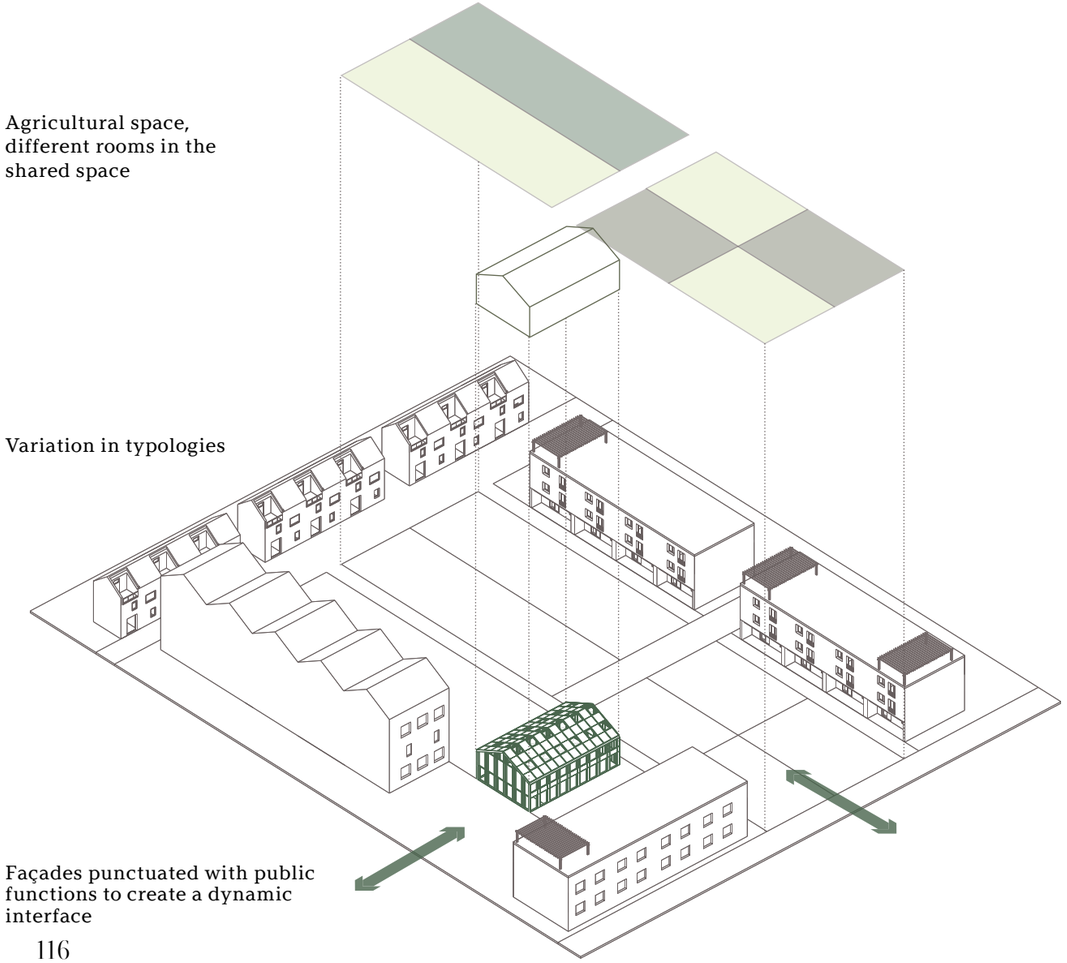
Defined spaces with
functional elements



Courtyard farming
(Semi-open layout)

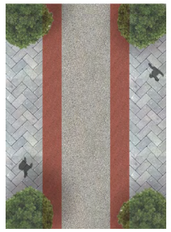
Agricultural space, different rooms in the shared space

Variation in typologies



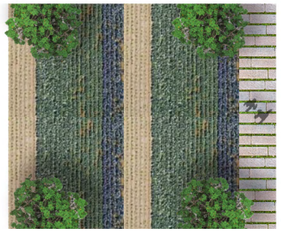
Façades punctuated with public functions to create a dynamic interface

Materiality



Bike lanes distinct with red paving

Public space with vegetation and permeable surfaces



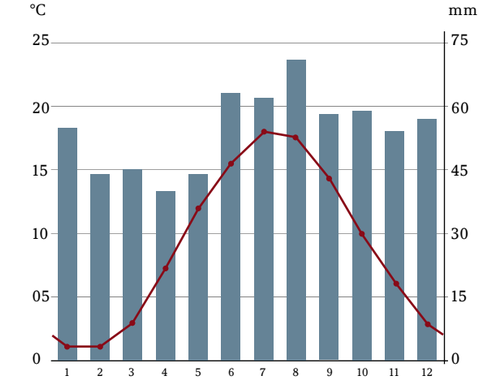
Farming plots

Climate adaptation

The urban design proposal uses principles to address and mitigate the different climate conditions.

The swale path channels the water from the storm water park in the North all the way to the retention pond in the South. The topography of the site has a slight slope down towards the South which is used to channel the water. In the swale paths, the streets are slightly inclined in order to manage run-off and keep storm water away from the entrances. The sides of the swale are vegetated and mark the highest level of the plain.

Also, the built form is designed in a way that allows daylight exposure and provides sheltered spaces from the prevailing winds. This is achieved through buildings heights and set-backs as well as the use of trees and other types of vegetation.



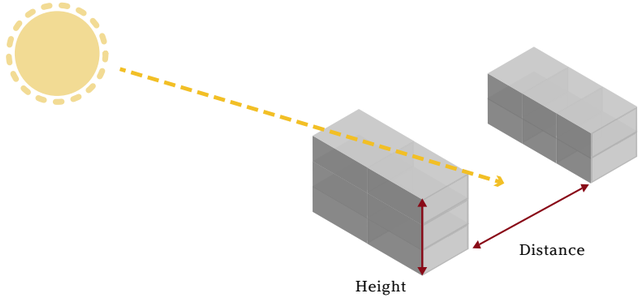
Yearly rain fall and average temperatures in Malmö.

The swale path is a way finding tool that guides through the site.

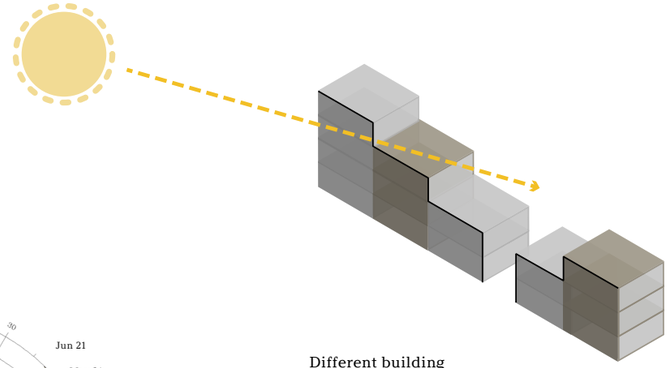
The swale manages run-off water and channels it towards the pond.

Daylight

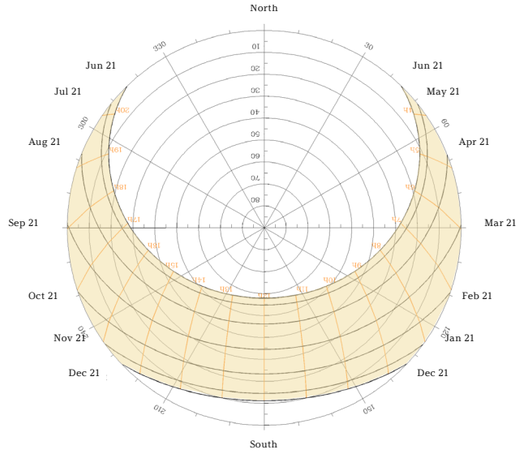
The buildings are placed in way that allows the ground floors to be exposed to daylight, the distance depends on the building heights.



Certain blocks have varying building heights in order to maximize sun exposure in adjacent buildings as well as the public spaces.



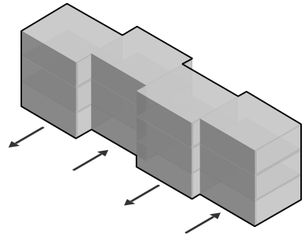
Different building heights



Sun path chart between solstices in Malmö.

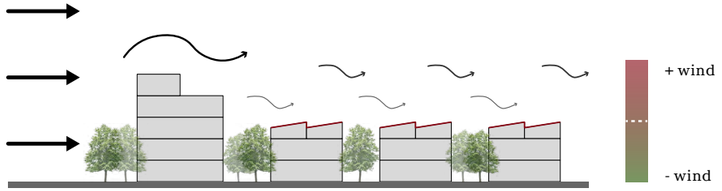
Wind mitigation

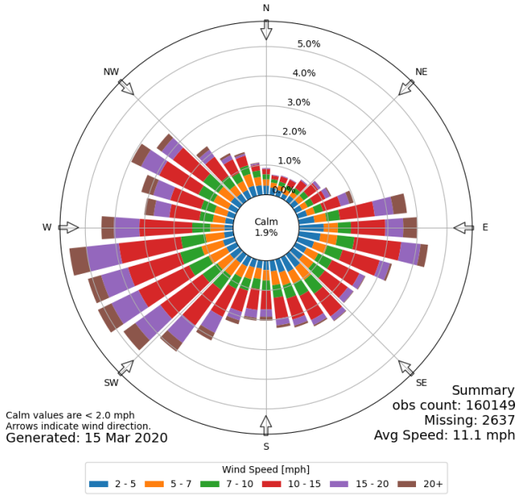
Varying directions in the facades and chamfered corners allow to keep the wind away from the facades. The set backs allow to create smaller sheltered spaces.



Facades set-backs

Skimming wind flow achieved by placing tallest building towards prevailing winds and preserve similar height for the other buildings.





Prevailing winds in Malmö.

Programming

Public facilities

Mixed use

Food production facilities

Active ground floors

Food production and public facilities

1 Hydroponic farm (2 stories, footprint: 800 m²)

2 indoor vertical farms (3 stories, footprint: 1260 m²)

6 small scale greenhouses

Farmers market (400 m²)

1 pedagogical garden

Community center

Sports facilities

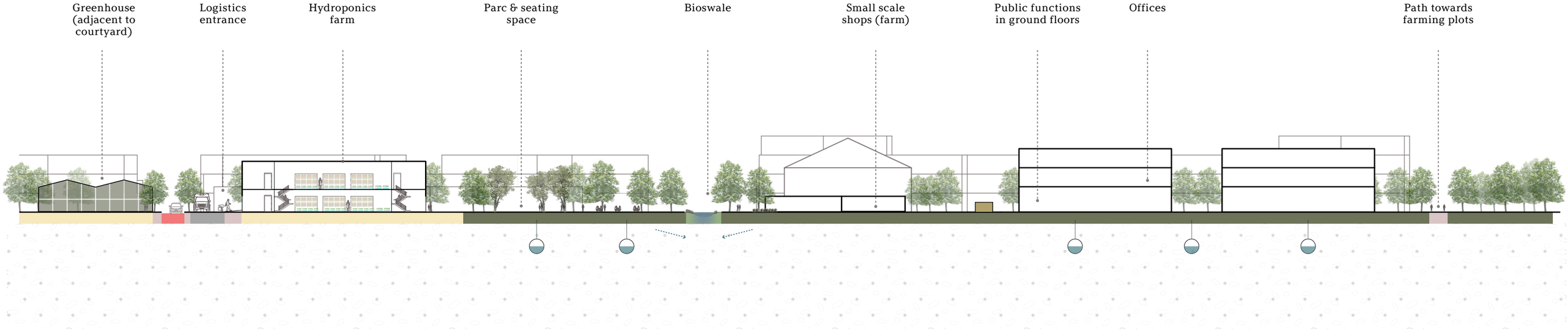
Visitor's center

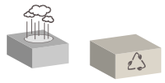
Micro-brewery

Research facilities

Bio-gas plant

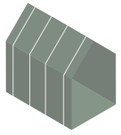
6 small scale farms


Greenhouse (adjacent to courtyard)
Logistics entrance
Hydroponics farm
Parc & seating space
Bioswale
Small scale shops (farm)
Public functions in ground floors
Offices
Path towards farming plots

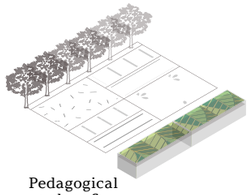


Water storage, compost, biogas production

Community farming; SPIN farming



Greenhouse



Pedagogical gardens & kitchen gardens

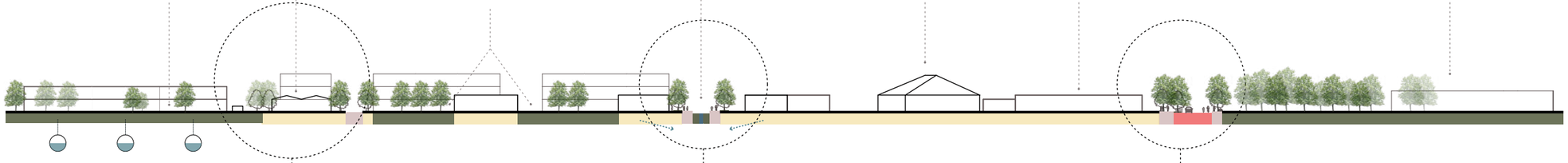
Swale path (main green connection)

Visitors center & workshops

Micro-brewery

Existing

Historical heritage farm

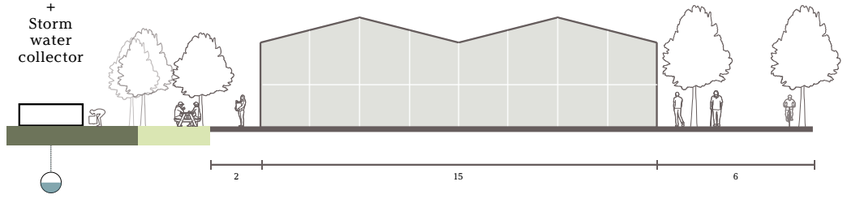


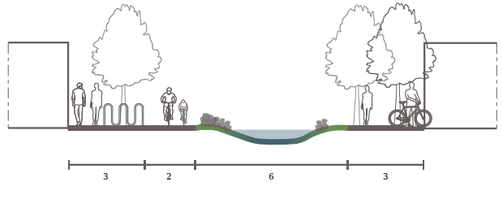
Greenhouse and small scale farming

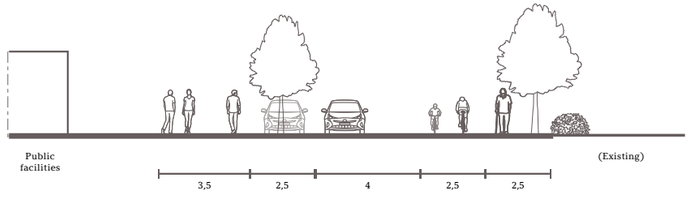
Swale path

Connecting road (towards Hyllie)

Bio-gas plant + Storm water collector







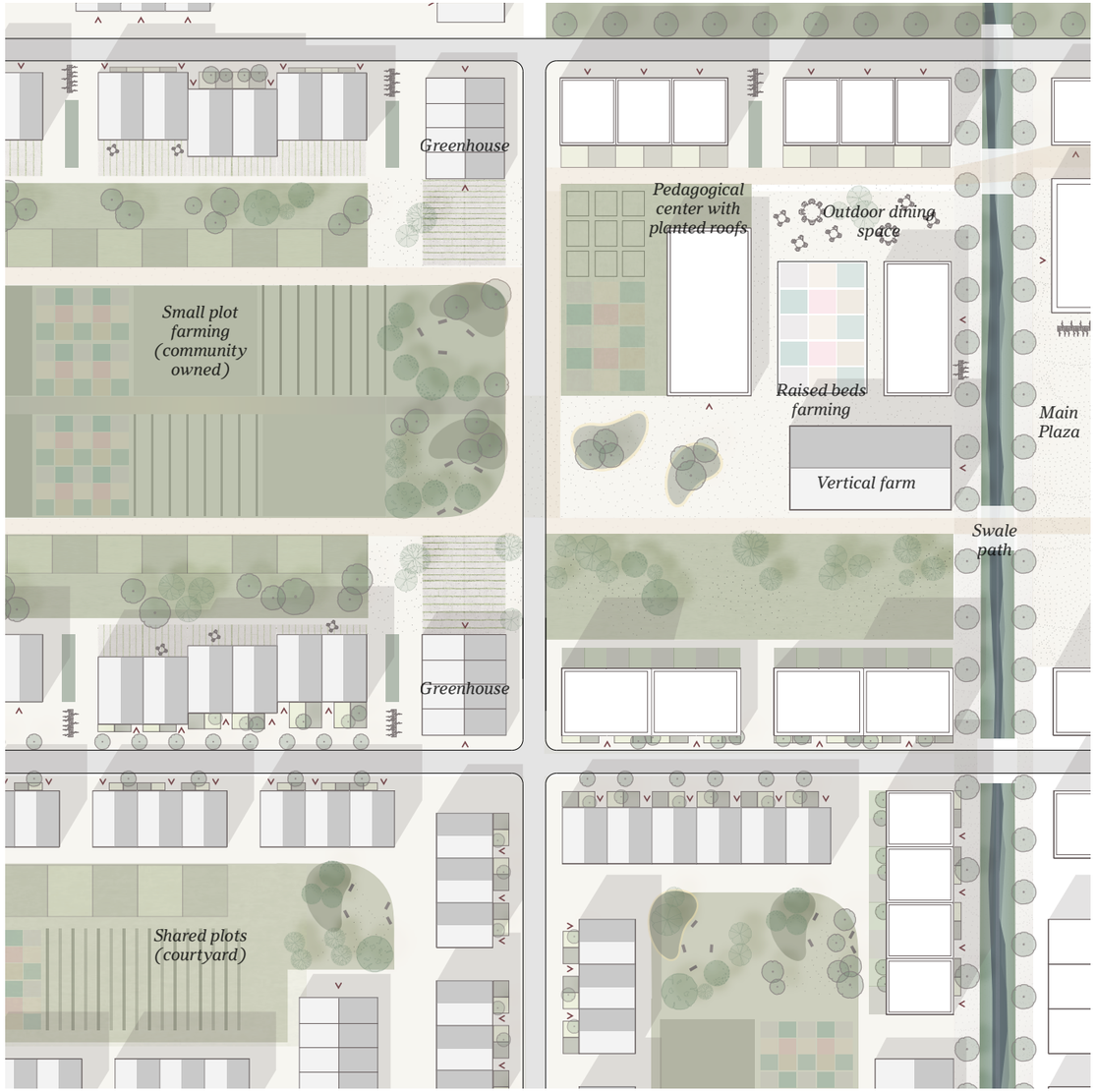
Detailed plan: Agri-cluster

The Agri-cluster is located in the southern area of the site and is primarily serviced by the East-West road (Vintrievägen). It consists of a hydroponics farm, the main indoor vertical farm, research facilities, as well as offices and workshops. There are six small scale farms that have shops along the green connection and offer an interface between the farmers and consumers.

The main public spaces are centered around the swale path, and the tree lined streets recreates the same character of the existing paths. The path leads to the retention ponds and towards the recreational paths.

Detailed plan: community farming

The main community farming plots are located in the long stretch and amount to 1,6 hectares of farming space. They're surrounded by greenhouses and sheds for tools, compost, and other technical requirements. The row houses located North and South of the plots have farming spaces in the front yard, the aim is to make the gardening activities and social gathering more visible to create life along the streets and pathways. The apartment buildings located to the East offer more diverse housing typologies and benefit from the proximity to the public facilities like the brewery and the farmers market (not included in the detailed plan). The ground floors can be used for public functions for more active street edges.
The main community amenities and pedagogical spaces are clustered to create sheltered space, their layout allows to preserve site lines.




WORKSHOP
CAFÉ

Phasing

Phase 1 consists of building the Agri-cluster containing the main production and research facilities.

Phase 2 entails a residential development along with community farming, as well as public facilities mainly the micro-brewery and the farmers market.

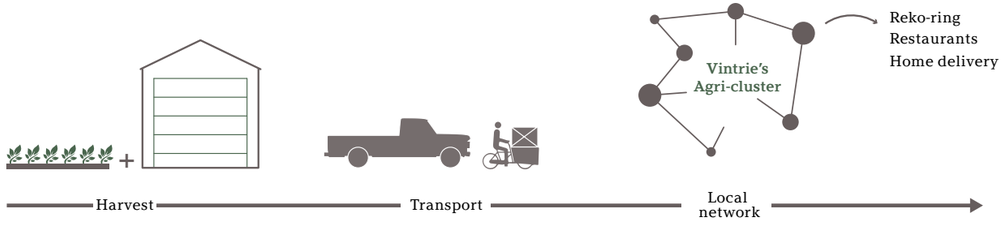
Phase 3 is an extension of the previous phase along the main streets to create a dynamic edge and increase the density.

Phase 4 aims at densifying the southern area and adding functions, thus mixing residential space with the productive facilities.

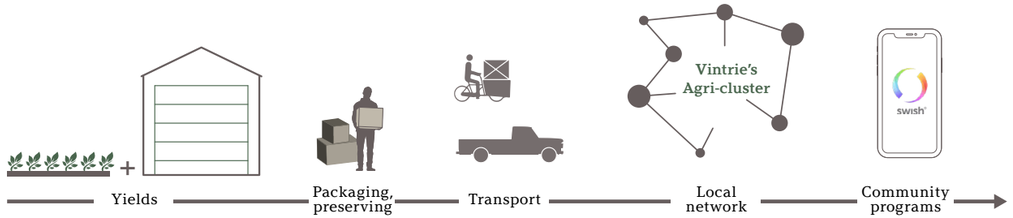
Phasing of Vintrie's Agri-cluster

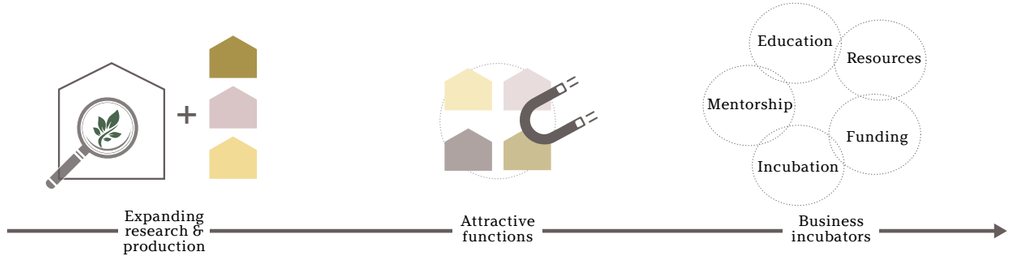
Phase 01

Phase 02

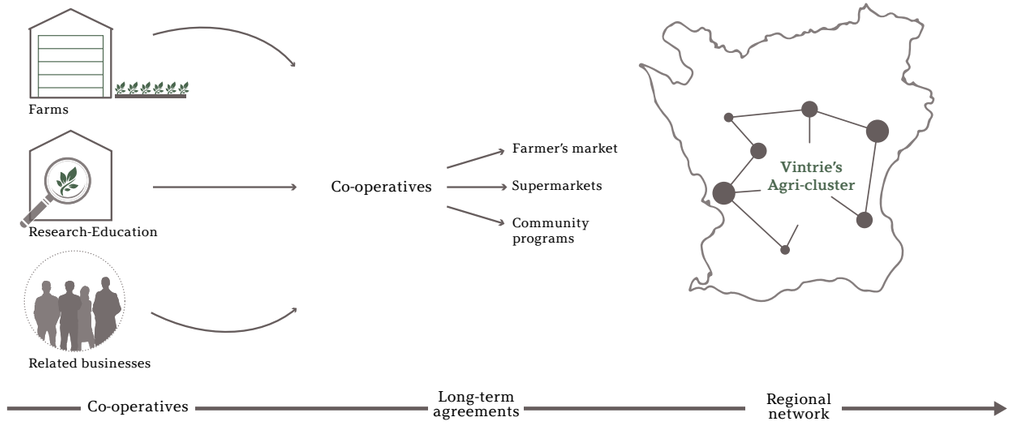


Phase 03





Phase 04



Phasing of Vintrie's Agri-cluster

The projects envisions an incremental development of agricultural activities in the Agri-cluster, to set up research and innovation programs, develop human and technical resources, set up a community program and widen the network.

In **phase 1**, the proposal aims at establishing a direct producer-consumer relationship and relying mostly on soil-based agricultural systems. In parallel, research programs are set up and start using test beds both in soil based farming and indoor farming to test crops.

Phase 2 consists a key phase in starting production in building integrated and controlled environment systems and enlarging the network by focusing on key partners in the Malmö area like restaurants, farmers market (Reko ring), and individuals. The research facilities can target and collaborate with more stakeholders in food related businesses in order to develop a holistic approach to the food supply in the cluster from the packaging, to the methods of preserving and transporting, as well as the funding and business models.

In **phase 3**, the proposal introduces community supported programs that are added to the community farming activities where people do their own gardening. This allows inhabitants and people from the rest of the city to financially support the program and having long-term agreements with the farmers. This is also an alternative for people who do not necessarily want to take part in the farming.

In **phase 4**, co-operatives are created gathering several farms in the network as well as related businesses and institutional programs in research and education. The co-operative will also allow sharing resources and knowledge. This builds off the existing network in the county and can strengthen Skåne's position as a regional food industry cluster.

Project in figures

Agricultural area: 176 500 m²

Inhabitants: 1064 (average of 2 people per dwelling)

Recreational area (includes storm water park, permaculture gardens, and soft forest): 140 000 m²

Office, workshop spaces: 4880 m²

Program:

1 Hydroponic farm
(2 stories, footprint: 800 m²)

2 indoor vertical farms
(3 stories, footprint: 1260 m²)

6 small scale greenhouses

Farmers market (400 m²)

1 pedagogical garden

Community center

Sports facilities

Visitor's center

Micro-brewery

Research facilities

Bio-gas plant

6 small scale farms

Concluding remarks

This proposal is specific to the site in Vintrie, and aims at addressing its own characteristics. However, the design principles, related to food production in particular, can be adapted to different contexts within the region. On a macro scale, the project can be embedded in a regional food web bringing together infrastructures, individuals, food related businesses, farms, NGOs, to grow, process, and consume food in a way that focuses on local, seasonal, and climate friendly. This network can strengthen Skåne as a food industry cluster, as it already has a strong presence of research and education institutions, industrial infrastructure and suitable natural resources like the climate and soil.

Exploring the potential of productive landscapes as a driver for an urban development was an important tool for me to understand the general ecosystem that production hinges on and services it both requires and creates. Urban agriculture has certainly gained in popularity in recent years as a way to produce food locally, and diversify the natural landscapes in the city. Within the same framework, my aim with this project is to use it as a tool to increase productivity and biodiversity, but also in order to redefine the interface between the city fringe and the peripheral farmlands, and design an urban fabric with an integrated productive landscape.

Productive and diverse landscapes play an important role in ensuring biodiversity, building organic soil, benefiting wildlife, and producing nutritious and organic crops. However, access to land is limited within the city, which makes achieving self-sufficiency or creating a large scale economy a challenge with the current methods and resources. Despite the current limitations, there is a strong incentive for making cities more inclusive for crop production and allowing the urban environment to gain from the ecosystems services of sustainable food production systems.

Reflections

During the final presentation of this thesis, very important questions were highlighted and encouraged me to reflect more on the strengths of this work and its limitations.

First, I deem it necessary to continue the discussion on finding a sustainable compromise between preserving high quality soils and urban developments on these soils. This issue is particularly important in the Skåne context where planning authorities have the mission to both preserve the natural and ecological assets of the region and preserve the resources for the future, while addressing urban growth and the need for more housing, the creation of employment opportunities, and making space for industry and other activities. I based my decision to build on agricultural land on three main factors. First, the land is currently used for limited crops and is not used all year round. This results in a mono-cultural landscape that does not contribute to biodiversity. By introducing new agricultural methods like intensive small plot farming or permaculture, and implementing ecological methods of food production that does not rely on pesticides and artificial fertilizers, the project can contribute to enhancing the biodiversity of the site and building organic soil. The second factor is the combination of soil-based methods with controlled environment agriculture which increases the productivity of the land with a lesser footprint. These methods can also help create more employment opportunities in the future, depending on the business model that would be chosen, as they require important human resources to manage the full productive ecosystem. Lastly, the site is located today in a dynamic area, adjacent to sites that are witnessing major urban development, mainly Hyllie. Therefore, it is predicted that the city would eventually grow and expand on that site. My vision is to combine the urban growth needs with strategies to preserve the biodiversity of the ecosystem, enhance agricultural production, and create an urban environment where productive landscapes are integrated in everyday life and contribute to a better quality of life in the city.

Based on the new agricultural methods and the available scientific findings, it would possible to develop specific guidelines that would reconcile urban growth and soil preservation. This is a factor that I will continue to think about and take into account in my future projects.

In regards to the design, there is an opportunity for the project to be strengthened by exploring typologies on a more detailed level to show how the urban form can adapt and interact with productive landscapes, create green corridors and allow pollination and movement of wildlife. I think these elements were skillfully explored in some other thesis project like “Urban foodprint - exploring a design that merges urban landscape and local food production[30]” by David Einarsson. In this thesis, several typologies are used showing several scenarios for the integration of food production in the built form. Some thesis projects focused on enhancing biodiversity in a more rural environment. In their thesis “A Landscape In Common: Biodiversity as a strategic design tool for village development[31]” by Lise Rask, the author implements landscape-based strategies working with the natural features of the site. Working on a more detailed level with architectural and landscape components can enhance even more the qualities of the project. However, these elements didn’t fit in the scope and time-frame of this thesis.

Lastly, the positive feedback on the methodology and the site selection parameters further solidify my belief in approaching a project with a robust framework. I learned a lot both from developing those parameters, trying them out and from implementing them and studying the outcomes. Through this thesis, I allowed myself to experiment more and be open to themes that I hadn’t delved into before, which made this learning experience extremely valuable.

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FARMING AS COMMON GROUND
AN AGRI-CLUSTER TO SUPPORT THE DEVELOPMENT OF VINTRIE, MALMÖ

Master thesis booklet
Sustainable Urban Design Master's program
ASBM 01
May 2021
Lund University, Sweden
Faculty of Engineering, Lund Institute of Technology
Department of architecture and the built environment

Master's candidate: Nada Dhaiba

Supervisor: Louise Lövenstierne

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