

CIRCULARITY OF THE EVERY DAY

A Pattern Language for the Transition towards a
Circular Food System of the Everyday Life in Schalkwijk

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A Pattern language for the transition towards a circular food system of the Everyday life in Schalkwijk.

Final report

Master Thesis

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Figure 1
Picture by the author

PREFACE

Personal Motivation

As an urban planner I am interested in research towards applicability of the urban planners practice and role. The way it impacts our daily lives and how the results of research could tackle future challenges. I am interested in engaging conversations between stakeholders to enable a future with integrated transition towards a more liveable, socially, and equal world. As for the present it would require a systemic change.

I'm interested in complex systems, how they are interconnected, how society is changing, and the challenges that will be confronted in the future.

Urbanization and daily living are under strain due to the challenge of resource scarcity in the future (Velenturf and Purnel, 2021). It calls for a change in behaviour and rethinking. Asking how the public and private spaces, as well as their spatial reconfiguration, particularly in our day-to-day systems, might play a significant part in the co-development of more circular systems. Using community initiatives in the design of circular systems to empower individuals to act as agents for change towards a more sustainable future (Berger and Ziemer, 2017).

I would like to work on how to engage local people with their agency and values: cultural, social, economic, ecological, aesthetic (Leclercq and Smit, 2021; Velenturf and Purnel, 2021). Realizing their potential to play a crucial part in the integration of the shift to a more circularity. To do this, I want to comprehend the spatial consequences of regional organisational, economic, social, and environmental flows in what dimensions, and then design strategies for how the circularity and new neighbourhoods might be spatially transformed locally.

I want to rethink the way we currently approach systemic circularity and include material flow into our systems of everyday life.



Figure 2
Picture by the author

GLOSSARY

CBE -

„The Circular Built Environment (CBE) is a system designed for closing resource loops at different spatial-temporal levels by transitioning cultural, environmental, economic & social values towards a sustainable way of living (thus enabling society to live within the planetary boundaries) “(circular built environment hub, TU Delft, 2017)

Circularity-

to not address the whole concept of ‘circular economy’ this project mostly refers to circularity in the built environment.

Circular Systems -

The infrastructure and network of resource-efficient production, usage and storage of the resource’s food, energy, and water. Making use of close social exchange of activities and organisations to support the infrastructure maintaining this circular system.

Circular Actions -

Human and Non-human systems that are part of an urban metabolism. The human actions refer to how the system is seen and how the human activity is classified - as a consumer or resident or foundational worker

City of Haarlem -

In Dutch: Gemeente Haarlem. Which is the municipality of the city of Haarlem, the Netherlands, meaning all people working for the municipality.

Department of Urban Management -

In Dutch: Stadsbeheer. Department of the City of Haarlem who oversees public outdoor spaces. To keep it safe and clean. They are responsible for waste management and recycling.

Department of Urban Planning -

In Dutch: Stadsontwikkeling. Department of the City of Haarlem in charge of designing and planning the future city.

Foodscape-

an urban (land)-scape that is spatially connected to the food production, process and retail and consumption near people (in relation to space and people)

‘Foodscapes can be seen as a spatial construction, build upon various site-specific conditions, as a kind of palimpsest.’ ‘Foodscapes link people to food to places.’ (Bosschaart, W. 2015).

Food system -

‘the chain of activities connecting food production, processing, distribution, consumption, and waste management, as well as all the associated regulatory institutions and activities.’ (Pothukuchi K. & Kaufman J. L. (2000)

NEXUS -

part of the social-ecological system which links the interrelation of water, food, and energy systems

GFT -

In Dutch: Groente-, Fruit- en Etenresten. Translated: Vegetable, Fruit and Food waste. The organic waste, including food waste and excluding waste from the garden

Neighbourhood -

in Dutch there are two terms for the neighbourhood: wijk and buurt. This project will concentrate on the scope of a wijk - which in this case will be Boerhaavewijk - in Schalkwijk in the south of the Dutch city Haarlem in North-Holland.

In this thesis the word ‘neighbourhood’ is referring to the Dutch ‘Stadsdeel’ as it ends with the term ‘-wijk’, so it also refers to the Dutch ‘wijk’. As the Everyday life in a ‘Wijk’ is closely connected to spaces all around the ‘Stadsdeel’ in this projects case. A residential area is referred to with the Dutch word ‘Buurt’, as in the district of this projects case the referred to ‘buurts’ are mainly residential areas.

PMD -

In Dutch: Plastic verpakkingen, Metalen verpakkingen (blik) en Drankenkartons. Translated as: Plastic packaging, Metal packaging (cans) and Beverage’s cartons

PBL -

Planbureau voor de Leefomgeving
Is Dutch for the Netherlands Environmental Assessment Agency

Prosumer -

a term that combines the ‘producer’ and the ‘consumer’, so the person consuming is what the person is also producing

Glossary from the SNOWMAN Urban Soils Project for defining the various types of urban gardening, as urban gardening comes in different terms in this project:

Urban gardening -

All non-commercial types of food production in or linked with the urban environment.

Allotment -

A plot of land rented by an individual for growing vegetables or flowers.

Allotment garden -

A piece of land subdivided into a few or up to several hundred plots of land that are assigned to individuals or families.

Community garden -

A plot of land used collectively by a group of residents to develop community ties. Also called shared gardens.

Collective garden -

Garden subdivided in individual plots and common plots for cultivation or infrastructures.



Figure 3
Picture by the author

ABSTRACT

Circular neighbourhoods - Everyday Foodscape - Co-creation - Systemic approach - Post-war neighbourhoods

The current linear food system in the Netherlands has a negative impact on the environment, requiring almost ten times the biocapacity the country has to offer. The food sector plays a big role in generating this inequality - this overconsumption, and of the entire food supply chain up to a third of food waste is generated by the consumer. The linear food system contributes to environmental problems such as loss of biodiversity and wasting of food. Negative effects - such as rising vulnerability to extreme weather conditions, low urban quality, decreasing biodiversity, and higher obesity rates - can be seen in the urban built environment, especially in Dutch post-war neighbourhoods like Schalkwijk, Haarlem. Changing peoples' behaviour in their day-to-day life can be a starting point for establishing loops for food, water, and energy resources.

This project highlights a significant knowledge gap in the effective integration of circular principles into the built environment at the neighbourhood scale and underlines the importance of social and environmental integration in research.

Previous research has identified significant vulnerability to climate risks and inadequate availability of nutritious, locally grown food, resulting in high levels of obesity and vulnerability to climate extremes in the selected post-war neighbourhood. In addition, the opportunity to separate organic waste from general waste is not fully realised, resulting in the loss of recyclable organic matter, which would have a great potential for energy transformation and introducing local agriculture. However, this waste separation needs to start in our daily lives. In contrast, food production takes place in isolation from our daily lives.

This raises the question: How can the transformation of Dutch post war neighbourhoods facilitate actions of our daily life towards a circular foodscape?

The main objective of this research project is to create a pattern language as a co-design method for the transition to a circular built environment in Dutch post-war neighbourhoods.

The creation of circular networks, such as mobility, sewage, heating infrastructure, and social networks that are interconnected, are very much needed to support the transition to a holistic circular system for

everyday life in the respective neighbourhoods.

The project will use a design approach, conduct qualitative and quantitative research, and confirm the results with workshops and design development - in particular creating a pattern language. A systemic design approach will form the basis of this research and design process, as it embraces urban metabolism, co-creation and respects the diverse and complex nature of the project. The use of a pattern language as a research and design tool allows for the exchange of research and design through a co-creation approach and possible spatial implementations of a circular neighbourhood with circular actions in the everyday life of the inhabitants of Schalkwijk.

The primary outcome of this project is the design of a co-creation process, using the developed pattern language to show possible outcomes of a circular built environment. This includes bringing food production closer to our everyday lives and integrating circular systems within the local community. Urban planners have a facilitating role in presenting options for a circular future, starting processes that support the information and interest exchange of stakeholders, and providing participatory methods for shaping spatial circular strategies in post-war neighbourhoods.

The research highlights how outcomes can vary based on perspectives, interests, and needs during the co-creation process. While the study concentrates on the food system, it also recognises wider aspects of circularity within the built environment, such as water and energy supply. The unpredictable human element in the co-creation process affects workshop dynamics and results.

In short, this project aligns with the continual changes in sustainable development, participation, and circularity. It presents the pattern language as a useful tool for stakeholders working on circularity transitions, offering new opportunities for collaboration and resource efficiency at the neighbourhood scale. The findings contribute to filling existing research gaps by proposing a way to a sustainable, participatory, and circular urban development in Dutch post-war neighbourhoods.

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01 INTRODUCTION

This chapter introduces you to the current challenges and problems of the linear food system. It will focus on social, ecological, and spatial challenges in the daily environment. The scope of this work will be defined and introduced - why do we need an everyday foodscape?

Exploring why circular thinking is playing an important role in this thesis. Why focusing on food? What is "the everyday"? How does circular thinking, food, and the everyday life come together and why is it a relevant topic?



Figure 4
Picture by the author
Inspired by photographer Andreas Gursky

*“can you find a unifying language that cuts across age and income and culture that will help people themselves find a new way of living, see spaces around them differently, think about the resources they use differently, interact differently?
can we find that language?
the answer would appear to be yes,
and the language would appear to be food.”*

- pamela warhurst, how we can eat our landscapes,
incredible edible in todmorden, uk

‘Food is a nexus for industry, rural/urban relations, global trade relations, domestic and social life, biological health, social belonging, celebration of community, paid and unpaid work, expressions of care, abuse of power, hunger strikes, fasts, and prayer. Food is part of daily life at least as much as we are consumers and possibly more as we labor for either love or money. Food and food production are inextricably tied to our ecological systems and survival in the future.’

—Welsh and MacRae (1998, 242)

1.1. THE CURRENT FOOD SYSTEM

Why food?

The current linear food system which defines our lifestyle and dietary habits produces a significant amount of waste and consumes excessive amounts of energy, which results in a high CO2 footprint (Footprintnetwork, 2023). For instance, the food we consume often travels long distances before reaching our homes, resulting in detrimental effects on the environment. According to the newspaper Parool, the average dish in the Netherlands has travelled 30.000 km (Ivens L., 2019). This is three-quarters around the equator. This has not only an enormous negative carbon footprint - Ivens also states that not only the exotic products that we can think of come from all around the globe create this footprint, but also the fact that tomatoes grown in greenhouses in the Netherlands are exported to Spain, whereas Spanish tomatoes are sold in Dutch supermarkets (Ivens L., 2019; illustrated by figure 6).

This process is called metabolic rift - a metabolic rift occurs when the food is grown and produced spatially elsewhere from where it is consumed, and the waste nutrients are not returned to the area where it was grown (Moore, J. W., 2000). This rift especially occurs in urban areas, as the agricultural production happens spatially somewhere else, or like in the Netherlands the grown goods are exported and others are imported. This not only leads to a high use of energy and contributes to the CO2 footprint of the food system, but it also harms the environment, as the nutrients are not returned to the ecosystem that

has produced the food. This results in soil degradation and deprivation at the site of food production with the consecutive necessity of artificial soil fertilisation, contributing to the environmental challenges.

Overall, the disconnected and linear food production and food consumption in the Netherlands has a substantial environmental impact, and not only the Dutch food industry contributes significantly to this unsustainable ecological footprint.

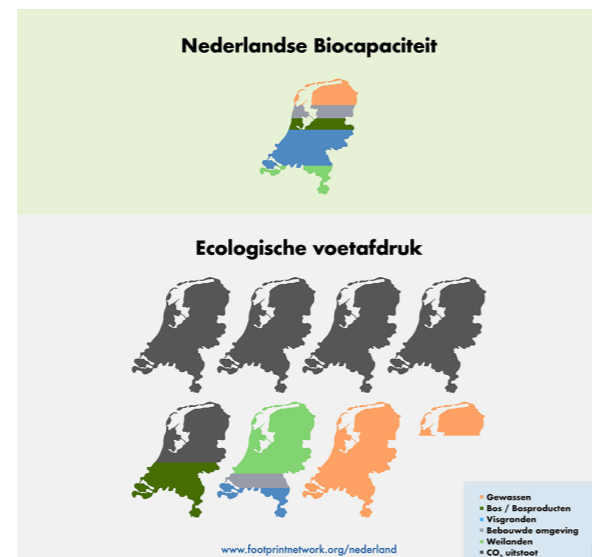


Figure 5 - www.foodprintnetwork.org/nederland

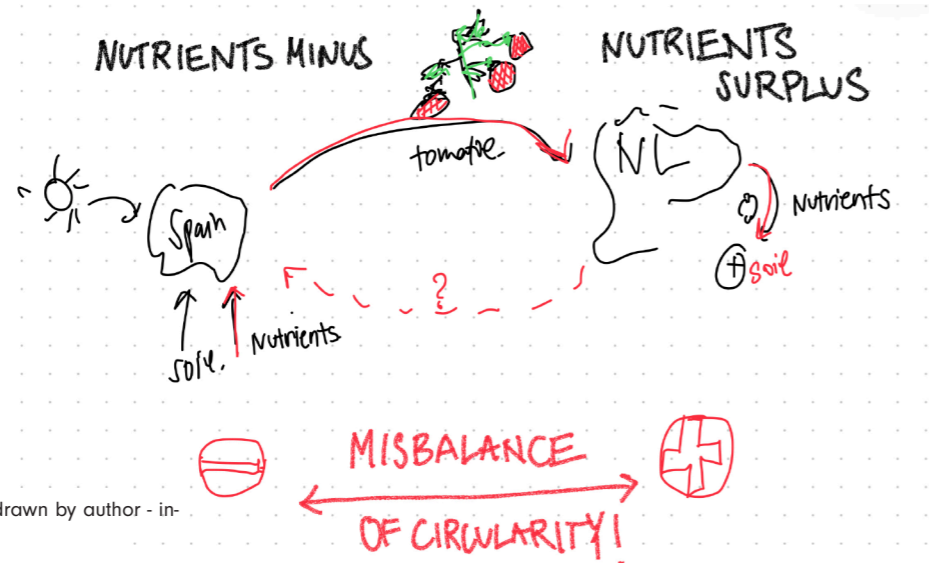


Figure 6 - Imbalance of circularity, drawn by author - interpretation of parool news article

Why does everyday life matter?

Every day, a human being eats three to five times a day. Hence, food consumption is a daily and necessary activity in our life. Every day we spend time shopping groceries and preparing and eating our food. Cooking and eating together, may also be a social activity, that brings people together. The Everyday is 'ordinary, everyday life' according to Highmore (2002).

Especially in certain cultures eating together in larger groups is part of the routine of everyday life, food belongs to all festivities and celebrations, and often business is being made during meals (J. S. C. Wiskerke & S. Verhoeven, 2018).

'Food plays an important role in our daily lives' (J. S. C. Wiskerke & S. Verhoven, 2018).

Many people work in the food supply chain: waiters, cooks, salesmen, restaurant and shop owners, gourmet critiques, farmers, and truck drivers. These are all jobs related to the food production, transportation, marketing, sales, and food service we encounter in our daily lives (J. S. C. Wiskerke & S. Verhoven, 2018). However, only very few people grow their own food, as a hobby or as a main source.

The food chain system is therefore an important part of the foundational economic system on which we rely on, every day.

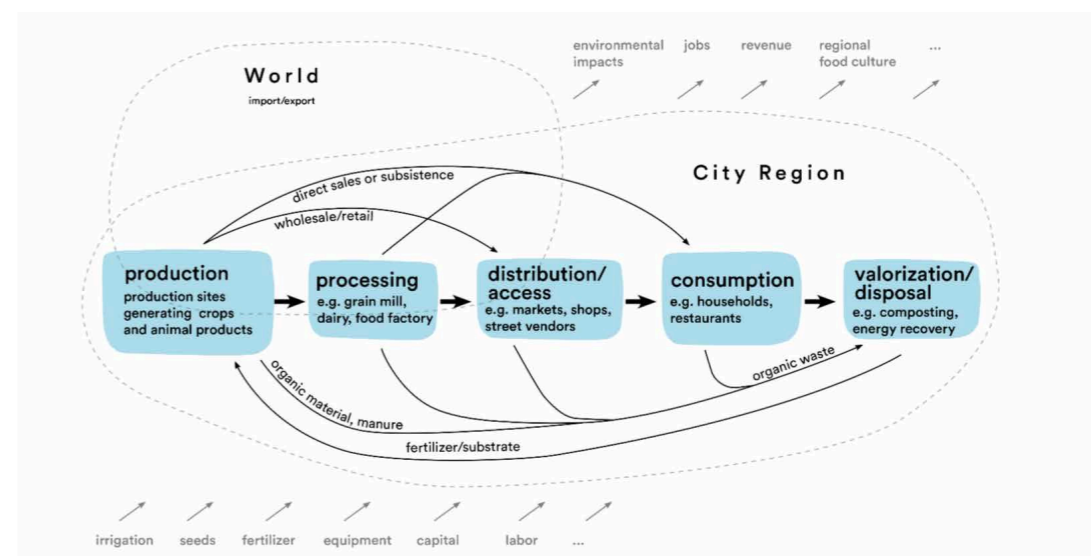


Figure 7 - Spatial components of the urban food system by Christoph Kasper, Juliane Brandt, Katharina Lindschulte & Undine Giseke (2017)

1.2. PROBLEM FIELD

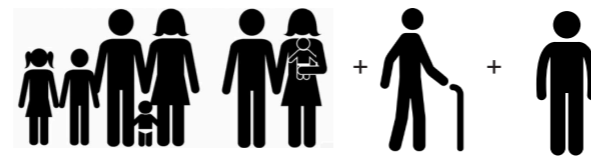
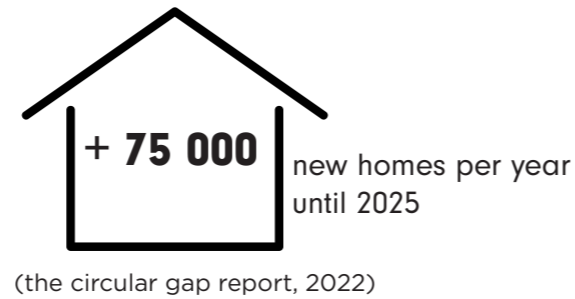
A growing problem

We are living in a world that is thriving for growth. This growth is part of the linear economy in the capitalist economic system.

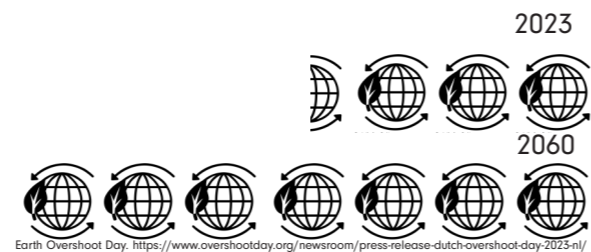
The Dutch economy is one of the strongest economies globally and second largest agricultural produce exporter globally (Government of the Netherlands). The Dutch economy is continuously expanding and the expected recession this year has been avoided (NOS, 2023), which demonstrates that Dutch households continue to accumulate capital. The Netherlands has a robust economy, and rising consumption is a sign of a thriving economy (OCED, 2023). However, this comes with a cost. To compensate for the consumption, the Netherlands would require 3.5 of earth's resources, if everyone on this planet lived like the Dutch (footprintnetwork, 2023).

Currently, in 2023, the world population reached over 8 billion people (estimation by the U.N. Estimates). All these people are consuming resources. Cities around the world face huge difficulties due to rapid urbanization and population expansion. As cities become drivers for change and innovation, they also face significant consequences, including the climate crisis, scarcity of natural resources, economic instability, and social inequality (Miazzo et al., 2017). This means that cities are the areas where inequality is most pronounced and visible. At the same time there is a lot of potential for change due to the high population density and innovation.

The population of the Netherlands, currently approx. 18 million, is expected to grow in the upcoming years mainly due to migration and an increasing lifespan. By 2070, 20,6 million residents are expected in the Netherlands (CBS, 2023). This means more accommodations and resources will be needed. Therefore, the Netherlands needs to adapt to this growth. According to recent research, "The Circular Gap Report", 75,000 new dwellings must be built in the Netherlands per year until 2025 in addition to infrastructural improvements, public areas, and commercial structures, to facilitate this growth (2022). Moreover, the Netherlands Environmental Assessment Agency (PBL, 2023) predicts a doubling of global resource demand by 2060, going hand in hand with this growth.



2070: 20,6 million residents in NL due to migration & increasing lifespans
CBS. (2023, April 11)



The environmental challenges in the Netherlands

In the Netherlands urban systems and cities continue to grow, and so does consumption. In 2023, the Dutch Overshoot Day was already on April 12th. This means that from the mid of April onwards, the Dutch consume more than the earth can provide in terms of resources. Food accounts for a third of the total consumption in the Netherlands (footprintnetwork.org). This overconsumption also leads to a large amount of waste due to the linear economic system. This is especially true for the linear food chain. For example, an average Dutch households throws away 34,3 kg of the 377 kg solid food (Voedingscentrum, 2020). This means that 9.5% of food purchased in the Netherlands is wasted (Voedingscentrum, 2020). This results in 589 million kg of solid food being wasted in whole of Netherlands every year by consumers. Overall, households are responsible for up to 23 - 32 % share of the food that is wasted in the entire food supply chain. Which makes the consumers wasting the most (Voedingscentrum, 2020).

In the Netherlands, the biocapacity of the soil is exceeded 7.5 times. Figure 9 shows the CO2 footprint by consumption sector, with the food sector having the largest footprint.

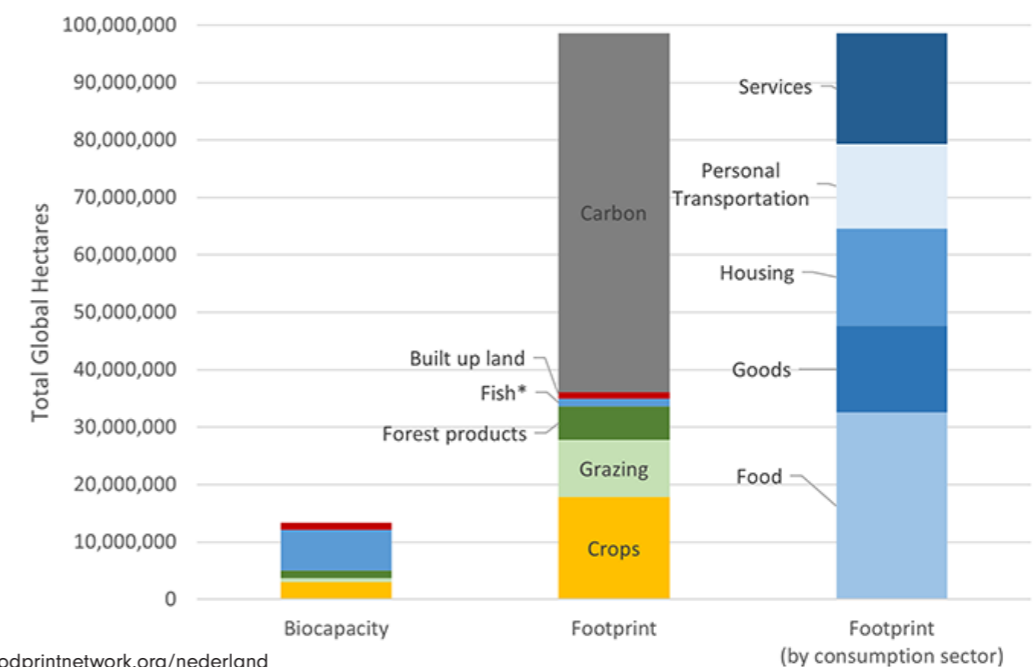


Figure 9 - www.footprintnetwork.org/nederland

The ecological challenges globally

We are currently experiencing an ecological crisis: destruction of the agricultural ecosystem due to soil degradation because of current land use practices and the climate change, the resource crisis, the unsolved waste problem, political and socioeconomic instability, and the insecurity in access to food and a healthy environment such as healthy air for the entire world population. The global situation, shown in Figure 8, demonstrates that in the Netherlands and most parts of Europe, soils are severely degraded. In addition, the food system is the largest contributor to the global loss of biodiversity (Eva G et al. Metabolic, 2017).

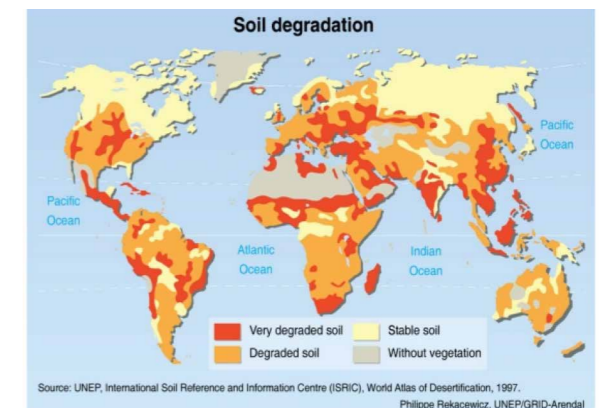


Figure 8 -Soil degradation (Gomiero, T, 2016)

Spatial challenges in the Netherlands

It is crucial for the Netherlands to make intelligent use of its 41,543 km² of land, as it is a relatively small country in spatial terms, but densely populated in certain areas with a current population of 17,897,051 (Netherlands: Country data and statistics, end of August 2023).

In 2015, half of the country was used for agriculture and a third for nature, including open waters. Up to 15% of the Netherlands' land is built on. The built environment consumes 50% of all resources and generates 40% of all waste in the country. In view of this, a circular built environment (CBE) is an essential starting point for systemic change (The Circularity Gap report, 2022).

Focusing on the sustainability of the built environment is crucial, as currently only 8% of the materials used in the Dutch built environment come from secondary sources (Ministry of Infrastructure and the Environment, 2015). To be fully circular, 100% would

have to be achieved.

The built environment is a key area for putting circularity ideas into practice, as it accounts for a large proportion of resource consumption and waste generation. The Netherlands could pave the way for a systemic change that promotes sustainability, resource efficiency, and a fair future for the coming generations by focussing on the circular built environment and promoting sustainable practices.

However, the Netherlands is also the second largest vegetable exporter in the world (Van Lohuizen/NOOR, 2022). This shows that the agricultural land use of the Netherlands, which supplies the exported resources, is valuable.

At the same time, some of the Netherlands' area is below sea level. Due to the climate change and its associated sea level rise, the agricultural and urban areas in the west of the country are additionally threatened.

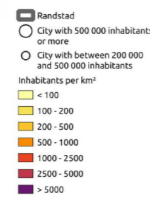
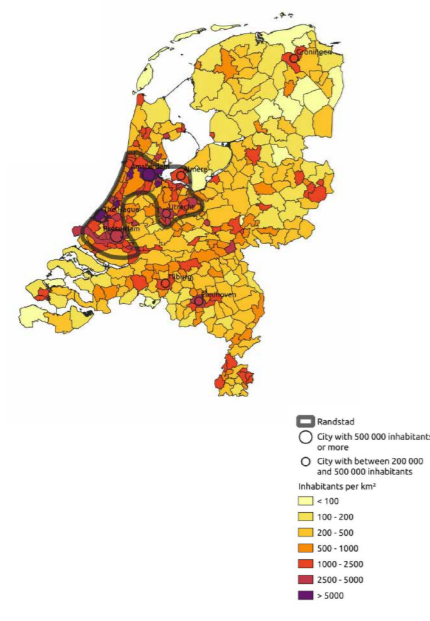


Figure 10 - Population of the Netherlands - World in Maps, 2022

Figure 11 - Land Use in the Netherlands, 2015 | Environmental Data Compendium

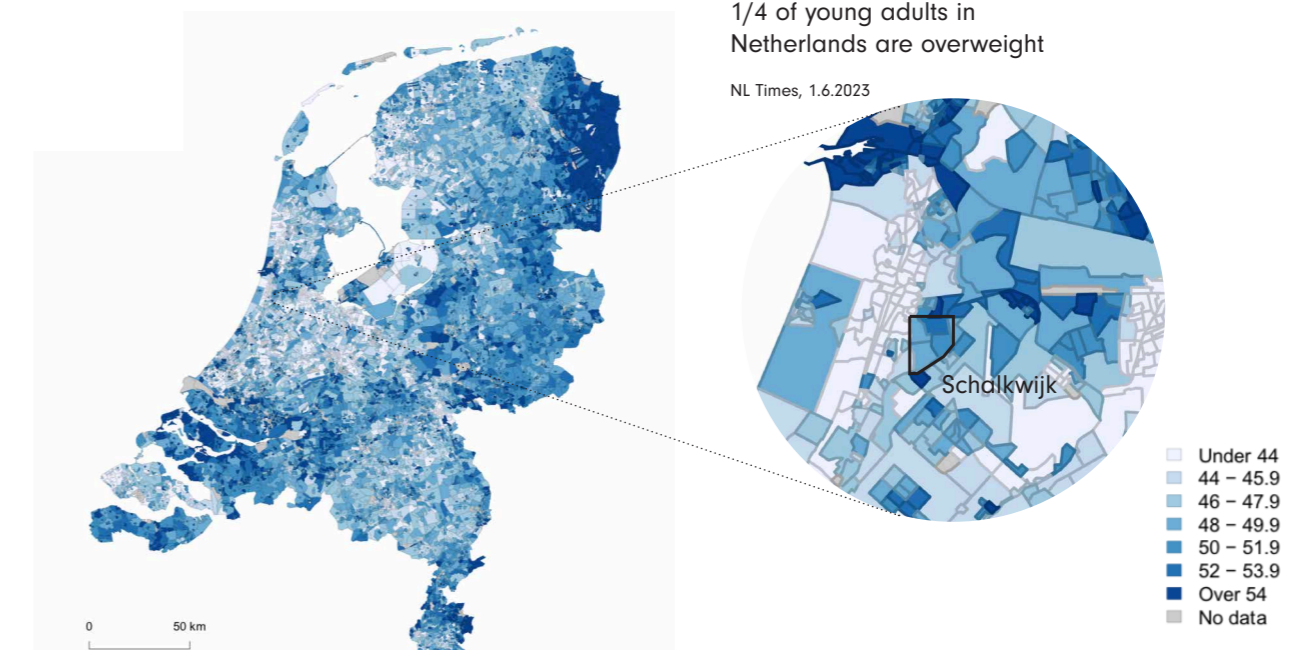
Figure 12 - Below Sea Level, rws-environemnt.eu

Social cultural challenges

One of the most important issues of our time is obesity, which has an impact on our public health (Lake, A. 2018). This health problem can be linked to the poor quality of the built environment and limited access to green spaces and healthy food, as this also affects the most vulnerable groups in the country. Therefore, the inequalities related to the built environment and accessibility to basic infrastructure has an impact on the social aspects of life, and may result in obesity.

Obesity is a multi-factorial challenge connected to the food environment (Lake A., 2017). Moreover, obesity is a global problem due to the global food system that produces processed, energy-dense, affordable, and well-marketed food, leading to passive overconsumption as the global market supports consumption-based growth (Swinburn, B. An et al 2011). In the Netherlands, one in four young adults is overweight, as shown in Figure 13 (NL Times, 2023).

The next chapter looks at post-war neighbourhoods, as these are currently the hotspots facing health-, social- and climate problems, requiring a shift towards housing and energy renovation. Supported by the Dutch government, these neighbourhoods need to improve now, which will lead to a transition. It is precisely these neighbourhoods that will be the focus of this work.



1/4 of young adults in Netherlands are overweight

NL Times, 1.6.2023

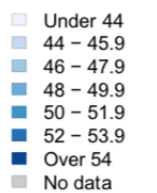


Figure 13 - Map of the estimated overweight prevalence in percentages at neighbourhood scale in The Netherlands, van de Kasstelee et al. int J Health Geogr (2017) 16:23

1.3. URBAN RELEVANCE

Why do we need a circular built environment especially in urban areas?

The current challenges manifest themselves mainly in cities, as urban systems are the most vulnerable to climate, socioeconomic, and political change. Cities they are not resilient themselves, as their urban ecosystems are degraded and their neighbourhoods in general are home to more people than the land itself can support. Urbanised areas are therefore prone to instability. This is particularly true for energy production and food supply.

The Circular Society

The idea of the 'circular society' is an umbrella concept that unites and socially supports the visions and perspectives of circularity (Calisto Friant, M. et al. 2023). This concept puts the society in the centre of our attention and allows us to understand the need for a shift towards circularity, in this concept with a focus on circular economic activities. It considers the social-ecological cycles by including the demographic constellation of the society into the transition. It includes factors such as culture, environment, resource scarcity, class, gender, race, health, education, colonialism, power, technology, politics, governance, etc. (Calisto Friant, M. et al. 2023).

Urgency of the resource problem and the need for a radical system change

The existing economic structure is mainly linear, with a strong emphasis on individual consumption, an exaggerated waste production, and extractive operations. The substantial problems that are posed by this unsustainable system have harmful effects on the environment and creates inequality for future generations. The idea of a circularity, however, shows promise as a substitute strategy. The Dutch government intends to move to a 100% circular economy by 2050 in recognition of the need for change.

By 2030 the consumption of primary raw materials should have been reduced by half (Ministerie van Infrastructuur en Waterstaat, 2022). Despite this dedication, the Planbureau voor de Leefomgevingreports (PBL) results and presents trends showing little progress (Integrale Circulaire Economie Rapportage, 2023). Therefore, it is crucial to implement a dramatic systemic shift towards a circular society supported by a special emphasis on the circular built environment (CBE).

The linear economic system is defined by a „take-make-waste“ model, where resources are extracted, transformed into products, and eventually wasted. Resource depletion, significant waste creation, and environmental damage are all consequences of this linear strategy. These issues are made worse by the capitalistic system concentrating on individual consumption, which has a negative impact on the environment and increases social inequality.

The circular economy offers a viable alternative to the linear model by promoting resource efficiency, waste reduction, and the re-utilization of materials. It envisions a closed-loop system where resources are continuously cycled, minimizing waste, and maximizing the value of any given resource. By transitioning to circularity, governments, businesses, and society can mitigate the negative environmental impacts, enhance resource security, and foster sustainable economic development.

This project will concentrate on a certain part of the Circular Economy (CE), the circular built environment (CBE). This is defined by the Circular built environment hub of the TU Delft.

Definition of the CBE

„ The Circular Built Environment (CBE) is a system designed for closing resource loops at different spatial-temporal levels by transitioning cultural, environmental, economic & social values towards a sustainable way of living (thus enabling society to live within the planetary boundaries) “ (Circular built environment hub, TU Delft, 2017).

Location of the built environment

As this thesis is built upon a place-based approach, the following introductory pages will refer to a Dutch post war neighbourhood in Haarlem, Schalkwijk in 2023. The case will be further introduced in the methodology chapter 3.

Opportunities to rethink the system

The shift to circularity has more benefits than just the economic value. The social benefits of the circular economy have not yet received sufficient consideration, and the spatial aspects are still ambiguous (Calisto Friant, M., et al, 2023).

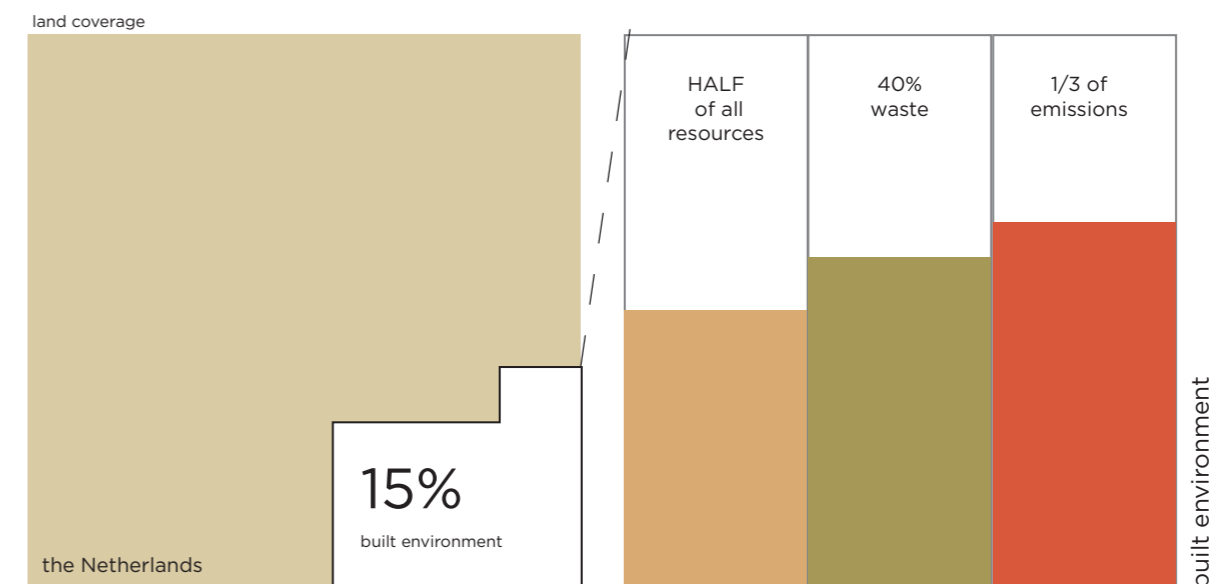


Figure 16
Graphic made by author based on the
The Circularity Gap report, 2022

SUMMARY OF CURRENT RELEVANCE

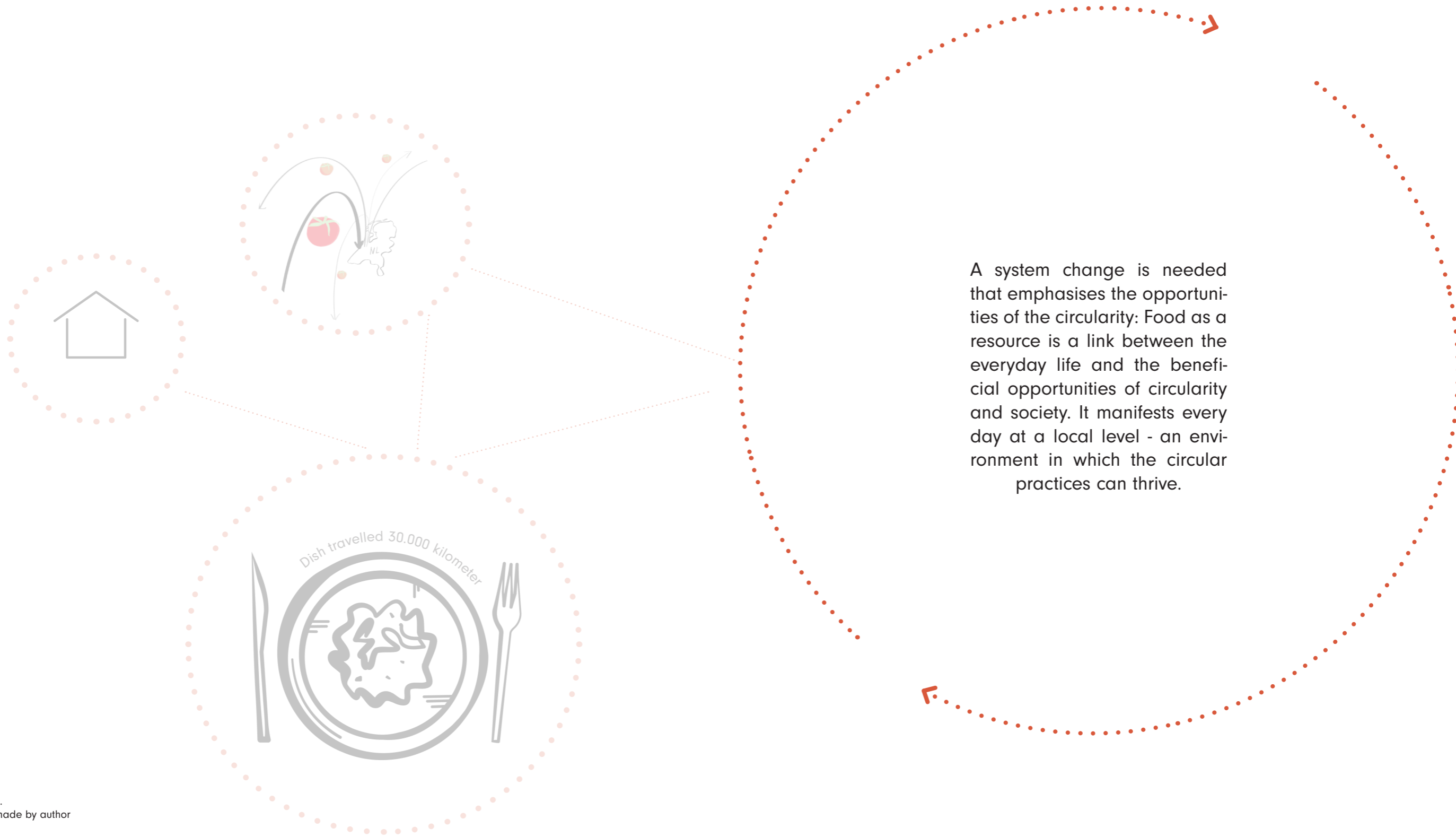
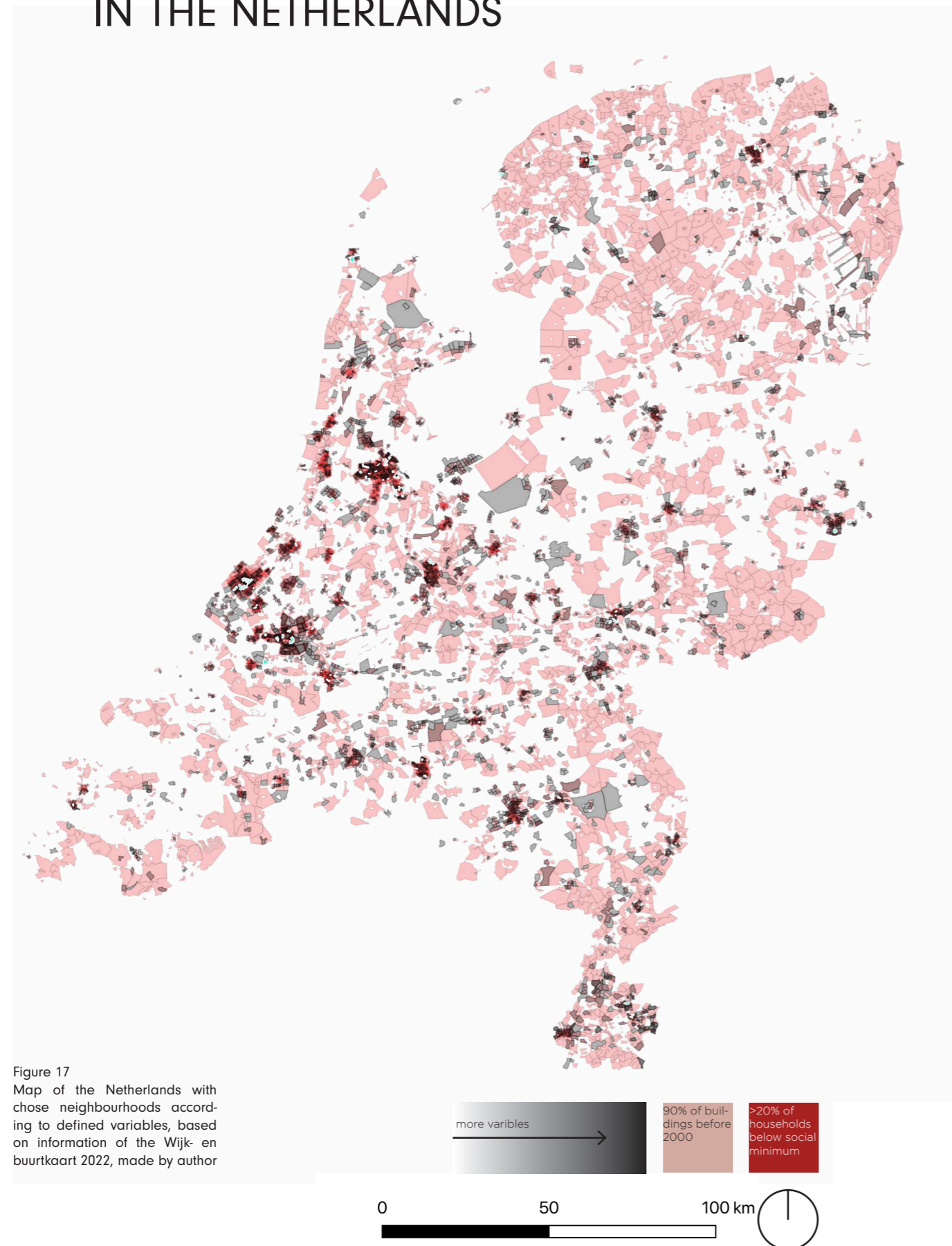


Figure 16.1.
Graphics made by author

1.4. SOCIO-SPATIAL CHALLENGES IN THE NETHERLANDS



Social infrastructure

As described above, there are spatially interrelated socio-cultural and environmental challenges to overcome in the Netherlands. The map in Figure 17 shows all neighbourhoods in the Netherlands that belong to the socially vulnerable neighbourhoods. They are characterised by low income, a low social status, a low level of education, and a high level of cultural diversity (via the Buurt and Wijk Kaart). Looking at the social infrastructure, inequality of opportunities already depends on the household you are born into (OECD, 2023). However, it is not only the educational and financial background of the parents that influences social opportunities, but also the environment in which one grows up. Even in a wealthy country like the Netherlands, children growing up in poorer neighbourhoods earn 6% less than the national average (OECD, 2023). This spatial inequality in access to social infrastructure affects the overall accessibility of resources, which requires a bottom-up reform by engaging society and empowering the most vulnerable citizens of our society. Building on the values of our society – *liberté, égalité, fraternité* – we have to reduce the inequality of opportunities through education, inclusion, innovation, and social initiatives. Implementing circularity and society also will help to achieve this goal. The neighbourhood and its food environment influence individual food choices (Lake A., 2017). This phenomenon can also be supported by so called 'choice architecture'. Choice architecture involves strategic changes to the environment that aim to change people's behaviour by not prohibiting certain actions but encouraging others by adapting the environment to make it easier and more accessible to act in a certain way, e.g. by promoting healthier food options (Bucher T, Collins C, Rollo ME et al. 2016). Their research has shown that manipulating proximity to certain products can influence food choices (Bucher T, Collins C, Rollo ME et al. 2016). This implies that by designing the food environment in neighbourhoods, individual consumption behav-

our could be adapted to a more circular and local food system.

However, the concept of access to the food environment encompasses five dimensions: Availability, accessibility, affordability, acceptability, and attainability (Penchansky, R., & Thomas, J. W. 1981). This thesis is focussing on the accessibility and proximity of the food system at the neighbourhood scale.

There is some correlation between low-income areas and takeaways and fast-food outlets clustering in these areas, known as the 'concentration effect', leading to a nutrient-poor and energy-dense diet, which in turn leads to obesity trends (Lake A., 2017).

The spatial housing conditions of these low-income areas are defined by an older structure of the built environment (pre-2000), making it easier to identify post-war neighbourhoods in the Netherlands with this mapping. Only high-density urban areas were selected, as these carry a strong capacity for action by their residents, sufficient human manpower, and an inclusive and adaptable open social system.

Open and heterogeneous urban systems with a high degree of diversity have a better chance of surviving different types of socio-economic crises than closed/homogeneous systems.

In the map shown in Figure 17, the neighbourhoods which are highly urbanised were chosen. With only 31%, the percentage of organic waste separated is lowest in very highly urbanised areas, whereas rural areas have a higher percentage of separating waste (CBS, 2017).

1.5. SCOPE

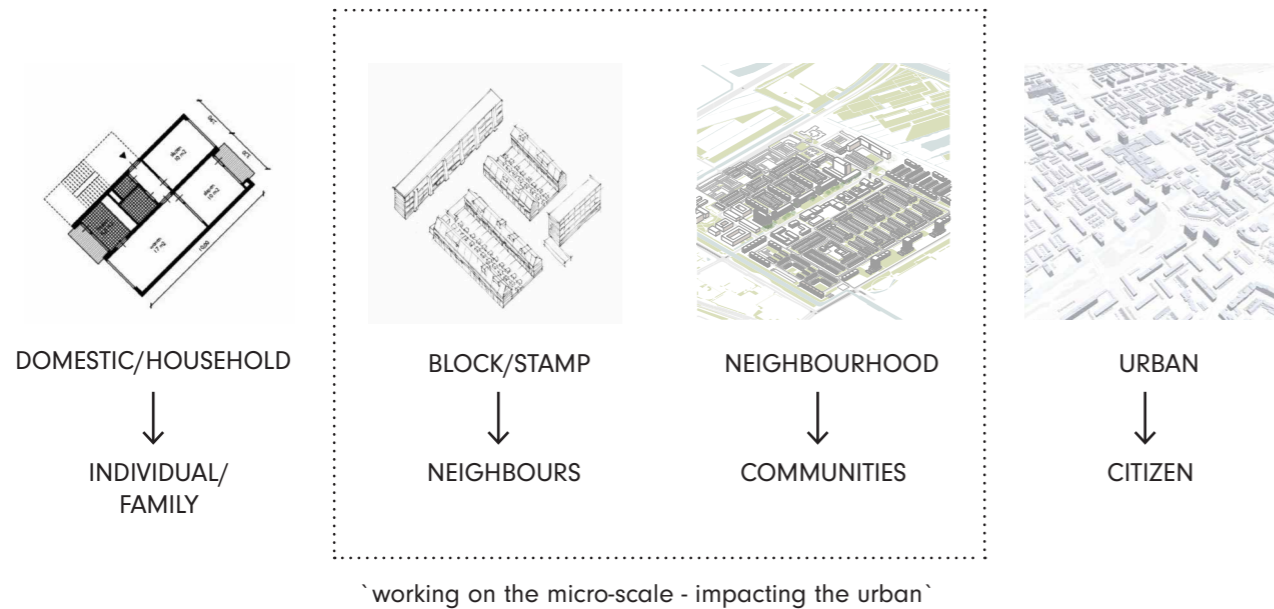


Figure 18
Defining the Scale, by author, inspired by the Yalla Project with drawings from Max Meijer (2017) and 3D.bag Data

Choosing the neighbourhood as the suitable scale to approach circularity in the urban environment

This project focuses on the neighbourhood scale. Certain names of neighbourhoods – such as Kreuzberg, Soho, Manhattan, Castro – are familiar to everyone. They define a kind of locality and a sense of belonging. Neighbourhoods play a crucial role in fostering a circular transition (Codoban & Kennedy, 2008). Neighbourhood is not a place - it is a state of mind (Sim, 2019). Functions such as co-operation, local resource management, and community engagement provide economic opportunities due to the sense of identity (Sim, 2019). By living together as 'neighbours', collaboration in organising, producing and learning is more present at the neighbourhood scale. The 'neighbour' is a term that means you know someone, so sharing and support might be easier in terms of circular actions.

Jane Jacobs wrote that big cities are different from suburbs because cities are full of strangers (1961), and that urban neighbourhoods are diverse (open/heterogeneous system).

Richard Sennet defines two entities in the urban environment: the 'ville' (built form), which refers to the comprehensively planned city with top-down plans and policies, and the 'cité' (social fabric) as a collection of fine-grained human places that people value as an experience (2018).

This sense of belonging to a specific place or home that identifies an individual with his/her/their neighbourhood is used in this project to address the complex system of circularity. In this project, a way is found to make spatial design/strategic interventions feasible and understandable for local people. The aim is to initiate conversations and develop new ideas with the stakeholders/actors and people involved.

What are the current circular economy frameworks at neighbourhood scale?

In general, there are several circular economy frameworks that have been developed to transform our current linear system into a circular system. But there is still no framework for circular neighbourhoods. The most used concept is the Ellen McArthur Foundation's "Resolve Concept". This approach to circular economy focuses mainly on circular practices in businesses and industry, while less attention is paid to the application of the circular economy at city scale. For example, the Ellen MacArthur Foundation's Resolve concept is not suitable for application to a city, as it ignores the complexity of resource flows at different scales (Williams, 2019). This means that the spatial and social impacts at the neighbourhood scale have also not been considered.

This narrow focus on specific sectors or industries limits the potential for a holistic and integrated approach to circular economy (Leclercq & Smit, 2023). The concepts of circular economy go far beyond the benefits of businesses, which would still be part of the linear system, as current business systems are mainly focused on growth. The social and cultural benefits of a transition to a circular system are underestimated and not considered in current circular concepts. This thesis attempts to identify the social and cultural benefits of circularity in a local and spatially translated context by focusing on the neighbourhood and the daily lives of residents. This thesis focuses on a local context and seeks to understand the spatial implications of residents' daily lives in relation to the circular systems that provide us with the resources for our daily consumption. Even though neighbourhoods offer great potential for closing resource loops (Codoban and Kennedy 2008; Engel-Yan et al. 2005; Pomponi & Moncester 2017).

Therefore, the value flower developed by Leclercq, and Smit is used in my thesis to make the resource flows in our neighbourhoods more understandable and to look at the value creation and added value of circular systems on a smaller scale (2023). However, the value flower focuses mainly on the spatial structures of circular communities located in specific neighbourhoods. However, my thesis also focuses on the structures around the communities and learns from these smaller structures as there is a lack of frameworks for circular transitions at the neighbourhood scale.

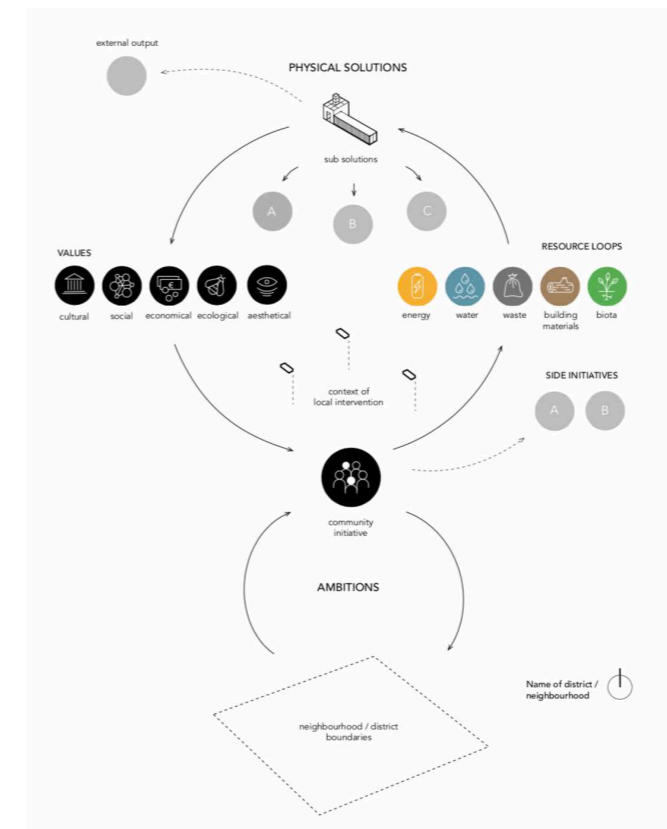


Figure 19
source: Circular Communities: The circular value flower as a design method for collectively closing resource flows (2023) by Leclercq & Smit

Manifestation of circularity in the built environment

The circular built environment hub of TU Delft located the neighbourhood scale in-between the city and the metropolitan area. This can be seen in Figure 20. According to the Circular Built Environment Hub, the neighbourhood is deemed to be the best organisational level for the “current manifestation of the circular economy”. The neighbourhood shows how the circularity manifests itself in specific areas. The location context is therefore important for circularity at this scale. The neighbourhood acts as the mediator between the whole city and its metabolism and the buildings where the materials are stored.

The resource flows of everyday life are currently associated to the scale of the city, as these are the resource flows that flow in and out of the urban environment every day (TU Delft’s Circular Built Environment Hub).

A circular neighbourhood in this context would encompass several key aspects that contribute to the unique functions available and accessible at this scale. The neighbourhood is the space in which resource flows are consumed by the residents. It is therefore a consumption scale and thus a system in which the consumption function and food environment can be analysed.

In terms of social structure, the neighbourhood is a scale in which identification with this specific place plays a role (Sim, 2019). Sociability is also an important aspect that can be found in neighbourhoods. There are many social initiatives that focus on social cohesion, support, and the development of more stable and circular products at the neighbourhood scale. The NEXUS resource flow of water, food and energy plays an important role at this scale (Ulgianti and Zucaro 2019). The circularity at the neighbourhood scale is characterised by a diverse environment of stakeholders, social interaction, and a sharing community. This allows CBE to incorporate circular practices and emphasising quality of life for the whole area and not just for one building.

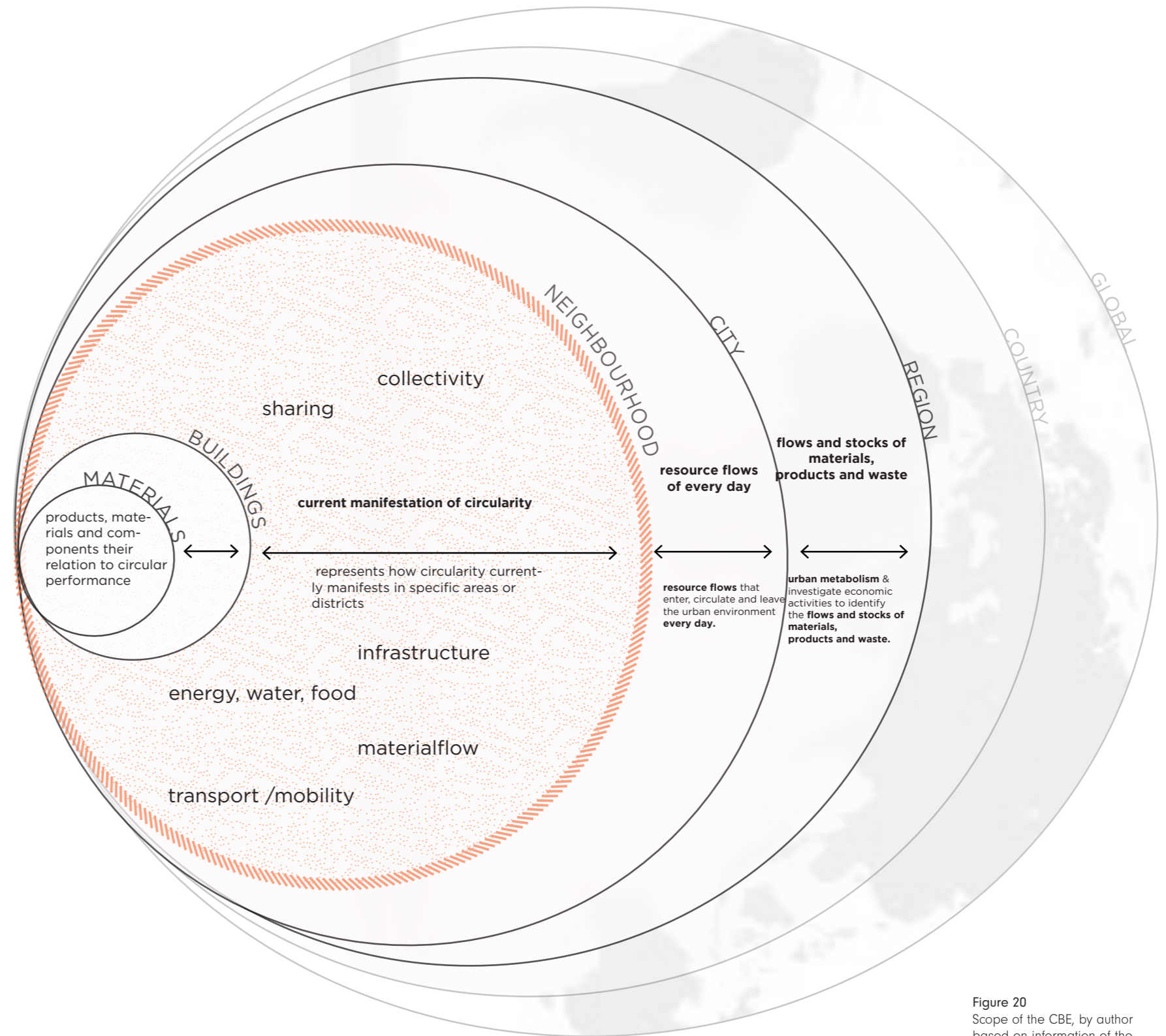
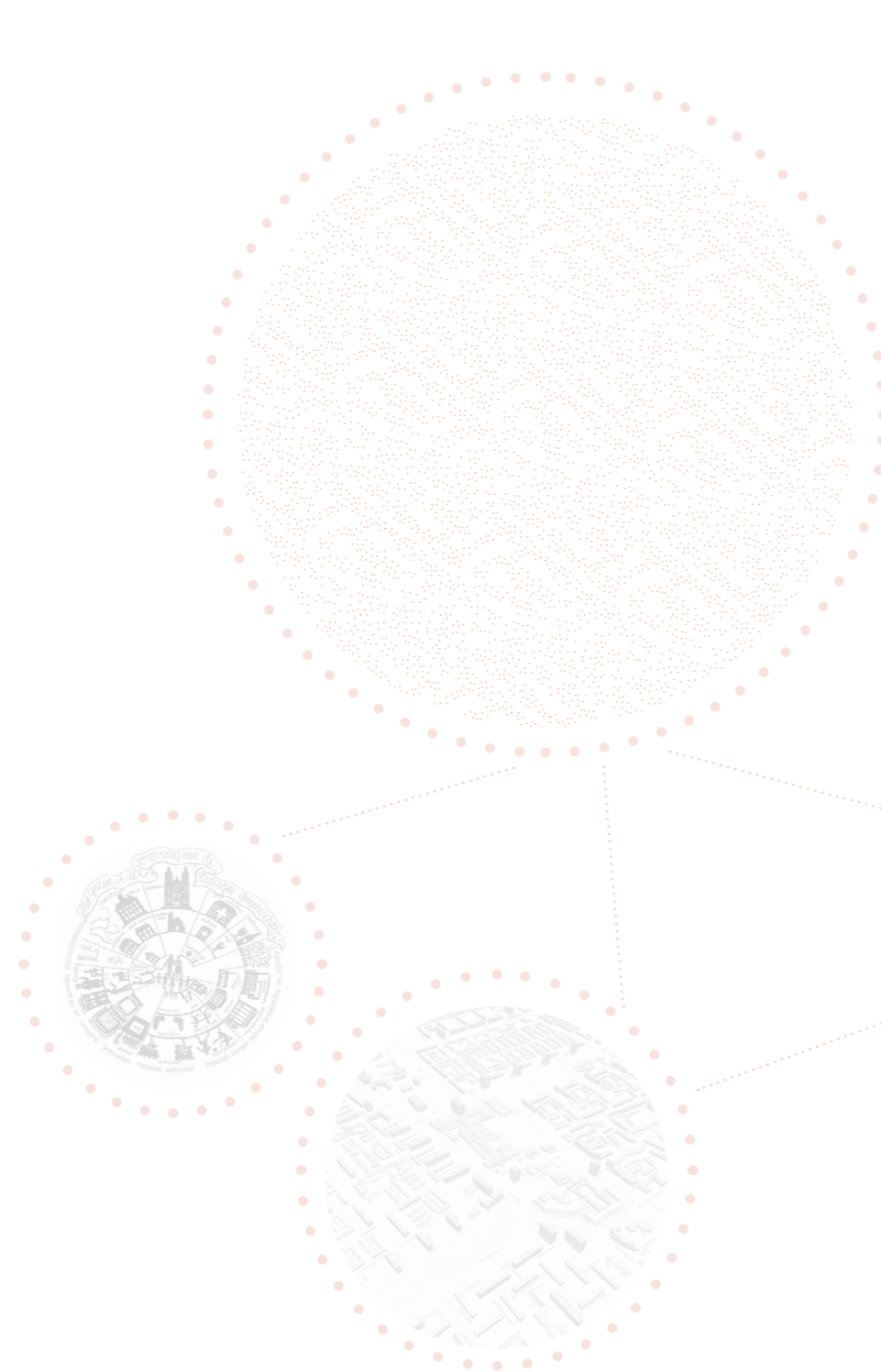


Figure 20
Scope of the CBE, by author based on information of the CBE hub, TU Delft

SUMMARY OF THE SCOPE



Towards a daily circular foodscape

The contemporary challenges which we are facing as a society, require a rethinking towards alternate socio-economic living. Moving away from the current linear patterns of production, consumption, and discharging towards a circular system, in which all used products feed into new production chains. Circularity is the only solution to enable a fair and prosperous living for the many people living on earth, within our planetary boundaries.

Focussing on the food chain system in our everyday lives could be a big step creating awareness how not only the agricultural and industrial landscape could shift spatially to a circular system, but what our daily lives could contribute to such a circular system.

Figures are sourced in the previous pages

1.6. PROBLEM STATEMENT

Why this project is crucial for a systemic shift towards a circular food system on the neighbourhood scale?

The wasteful use of key resources when producing and consuming is uneconomical and leads to societal and financial problems, including climate change, loss of biodiversity and pollution of water, air, and soil (PBL 2023). Consequently, the government of the Netherlands has committed to attaining a 100% circular economy by 2050 (Government of the Netherlands, 2016). The severity of the resource crisis has increased, and this goal cannot be achieved without a radical systemic shift (PBL 2023). It is predicted that global resource use will double by the year 2060 if current policies are not changed (PBL, 2023). At present, the industrial sector (macro) and the materials sector (micro) are undergoing policy changes and implementing improvement strategies (Bakker et al., 2014; Brocken et al., 2015). Nevertheless, there is an unresolved issue regarding the role, the possible contribution, and the impact of neighbourhoods in fast-tracking the shift toward a circular economy (United Nations Environment Programme), as neighbourhoods may have a great potential to effectively close the loops (Codoban and Kennedy 2008; Engel-Yan et al. 2005; Pomponi & Moncester 2017).

The current approach to circularity focuses on economy, advising circular practices in business and industry, but the concept of circularity must also include ecological and social aspects. According to Williams, the Ellen McArthur Foundation's Resolve concept, which focuses on improving circularity in businesses and industries and is a widely used approach to implement circularity, is not suitable to be applied to cities, as it disregards the larger scales at which resources flow (Williams, 2019). Moreover, van der Leer et al. states that socio-technical systems need to be better integrated into the socio-ecological planning of urban development.

There is a lack of horizontal sub systems that provide the transition towards circularity (2018). However, building upon communities with their local environments may create new opportunities for the planning and design of horizontal and vertical urban circular systems (van der Leer et al., 2018). By implementing circularity on the neighbourhood scale – but in balance with the urban metabolism – functioning of the ecosystem and human well-being can be maximised, as economic processes are linked to the socio-ecological well-being (Murray et al. (2015, p. 377).

The current linear consumption pattern is based on individual consumption, which is unsustainable in the current situation (Bärnthaler et al., 2021). There is a lack of public policies that enable a secure supply of basic goods and services (Bärnthaler et al., 2021).

When implementing circularity on the neighbourhood scale, an important aspect to consider is that the people living in the respective neighbourhood must be involved. Hence implementing a so called “co-creation process” already in the planning phase – before the transition to circularity is implemented – is advisable. Hence, there is a great potential for the construction of a co-creation process to develop public policies and urban development towards circularity.

Knowledge gap

Achieving sustainability at the local scale is challenging. There is a widespread lack of research of how to integrate circular economy principles into the built environment, especially due to the lack of social-environmental inclusion into the research. Additionally, there is the absence of a coherent framework for circular neighbourhood transitions. Moreover, access to circular actions in daily life remains limited.

1.7. RESEARCH AIM

This research project aims for a design of spatial principles with help of a co-creation process that supports the development of a pattern language for circular actions in a circular built environment in post-war neighbourhoods. Using pattern language as a co-creation approach, the study seeks to promote circular actions in the everyday life of the residents, while suggesting a systemic spatial design for a circular neighbourhood.

The aim of this study is to develop a co-creation methodology that promotes the development of a circular built environment. The work shall provide insight into how design practices within the circular built environment can use pattern language to support this process. Conducting a co-creation process of possible design choices will support the transition of neighbourhoods towards better rainwater management, local energy production, effective food waste separation, and support for urban food growing, while enhancing biodiversity.

The purpose of a circular neighbourhood is to establish circular systems within a district that contributes to the water, energy, and food supply, while using resources efficiently, supporting social exchange, and implementing small-scale initiatives to promote this transition. These systems may start in one neighbourhood, extend to connect separate neighbourhoods, developing connections based on the most efficient use of resources and logistics.

The general objective is to establish a circular built environment that is location-specific (neighbourhood scale) for a robust and resilient community. The active involvement of the local communities into the process, is a vital element in achieving this objective. Therefore, I assessed how co-creation with stakeholders in the community can be encouraged throughout the design process. Through engaging the community in a co-creation process, the adoption of a circular built environment can yield various

advantages, such as augmented sustainability, resilience, and equity within the community (Leclercq & Smit, 2023).

The aim of my research was to investigate approaches for constructing a circular built environment, emphasising the importance of circularity within the local community. This included the examination of the utilisation of spaces that could encourage circular practices in daily life, such as the production of local agricultural goods, a self-sustaining water management system within the vicinity, and localised waste management initiatives.

The objective to implement circularity and at the same time enhance the well-being and quality of life for those residing within the community shall be reached by a co-creation process using pattern language during the design phase. Simultaneously, the project aims to investigate the involvement of local communities in creating and executing circular strategies, emphasising the principles of sharing, co-creation, and small-scale circular approaches.

The design of neighbourhoods will have a crucial role in addressing the challenges related to constructing a circular built environment. Using a pattern language, the study aims to identify and apply design patterns that can effectively manage the complexities and requirements of the circular built environment, while also integrating sustainable practices within neighbourhoods.

The overall aim is to contribute to the comprehension and design of a co-creation process that facilitates the establishment of a circular built environment in post-war neighbourhoods. Using pattern language as a co-creation method, the study aims at encouraging circular actions in the everyday lives of residents while addressing the distinct spatial design considerations linked to a circular community.



02 CIRCULAR FOODSCAPE OF THE EVERYDAY

This chapter explores the concept of the circular everyday foodscape. We will explore how the everyday is connected to the circular food system at the neighbourhood scale by bringing together different themes. This chapter sets out the theoretical background as a foundation for this project.

Figure 21
Picture by the author

2.1. A CIRCULAR NEIGHBOURHOOD

Definition of the Everyday Foodscape

The foodscape, as defined by Bosschaart, connects people to specific food-related places (2015). This project focuses on exploring this area, specifically the neighbourhood spaces that individuals interact with daily within the food system. The circular neighbourhood in this project focuses on three main resources and their transition: water management, renewable energy, and specifically the local food production.

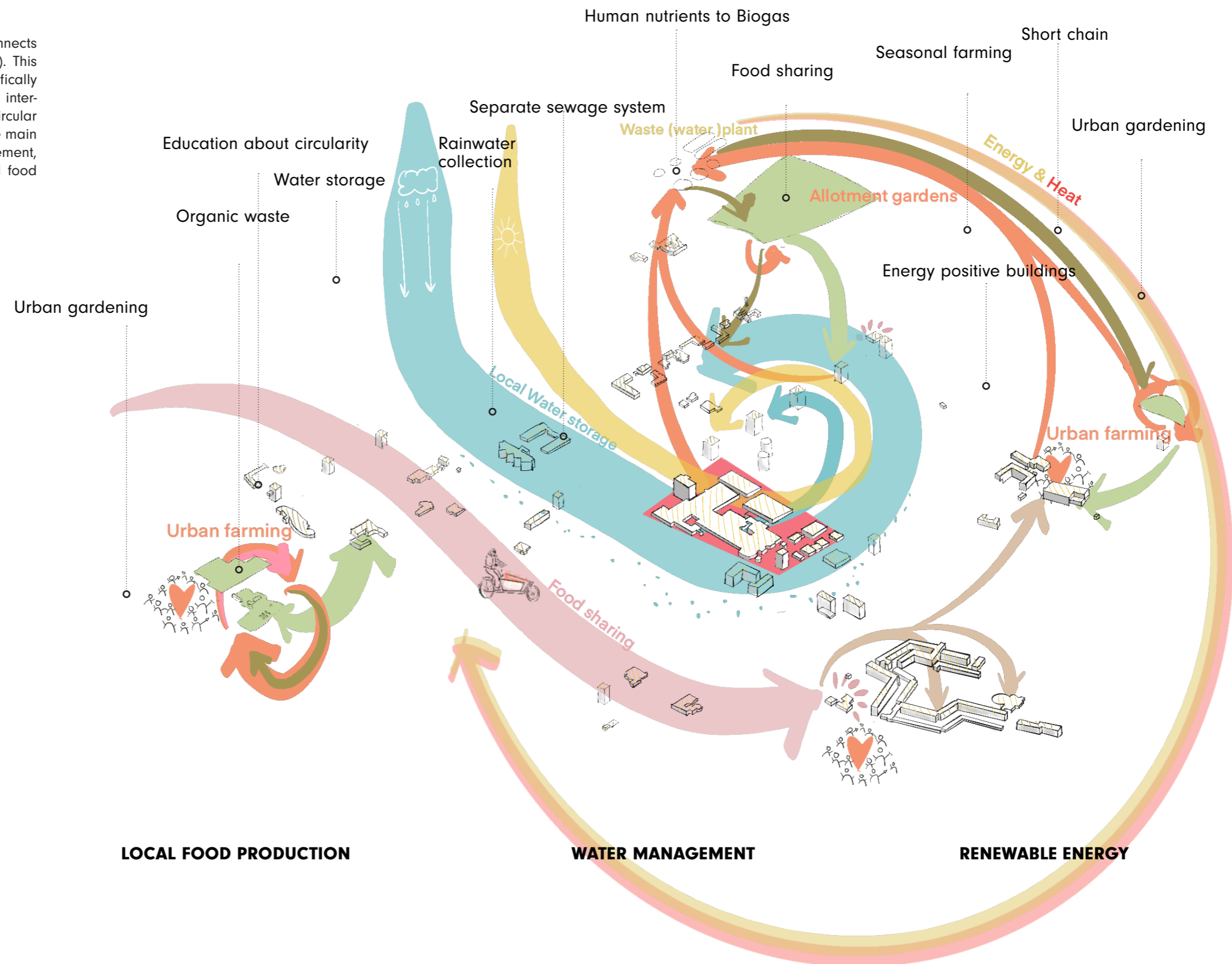


Figure 22
Visualisation of the circular neighbourhood,
made by the author

Food- Water- Energy NEXUS

“Man and corn – it all comes back to that. Cultivation and civilisation, city and country, paradise and hell: food has always shaped our lives, and it always will. Our legacy to those who inherit the earth will be determined by how we eat now – their future lies in our knives and forks and fingers” (Steel, 2008, p. 324).

The spatial food related challenges on the neighbourhood scale

Figure 23 shows the most important material flow in a neighbourhood. Overall, the most important flows in a neighbourhood system are food, water, and energy (Codoban & Kennedy, 2008). Therefore, this research will focus on the NEXUS of food, water, and energy. Special attention will be given to the food system, as this is where most households’ waste is generated. Food consumption is a very relevant topic for circularity and provides a system in which spatial interventions into people’s everyday lives can be made more easily, as food is considered as a central resource that everyone identifies with. It is therefore expected that people in the respective neighbourhoods are committed to discuss

the issue of food. Moreover, Cordoban and Kennedy also pointed out that most food and most nutrients are wasted through liquid household waste (2008). Therefore, when analysing the metabolic flows in neighbourhoods, the wastewater stream will also need to be considered for a systemic change in the water system. The focus is on the local water collection and wastewater system in the neighbourhood as a basic resource that we consume daily. And wastewater can be combined with food waste management at the same time, as they are both nutrient-containing waste streams.

Food is one of the main resources flowing through the urban setting of a neighbourhood and is also the resource that people interact with daily.

water-energy- food NEXUS

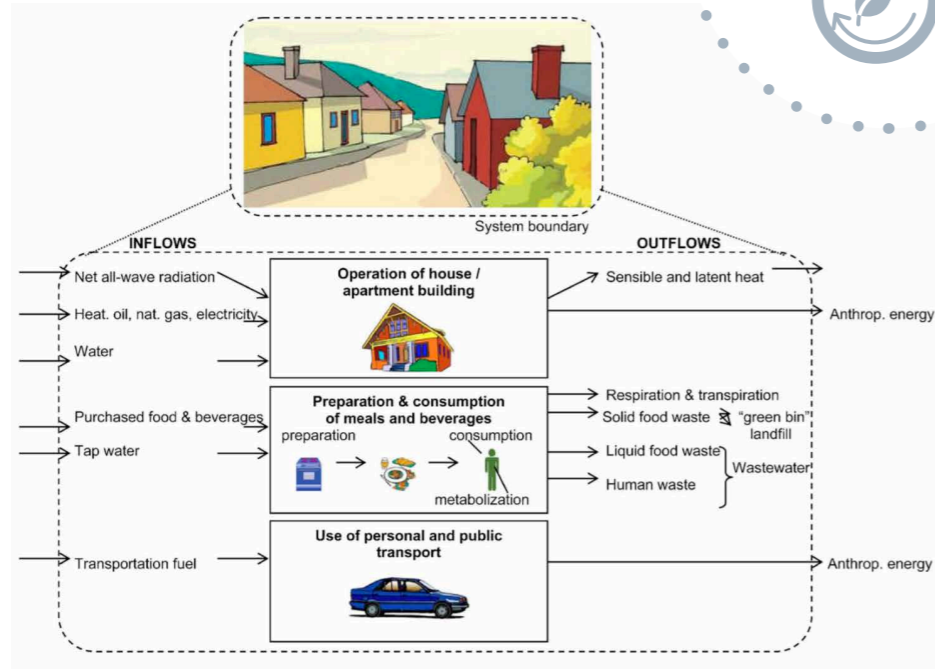
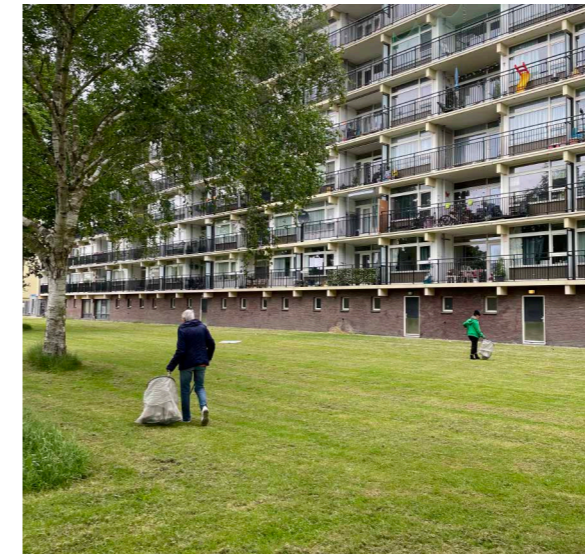


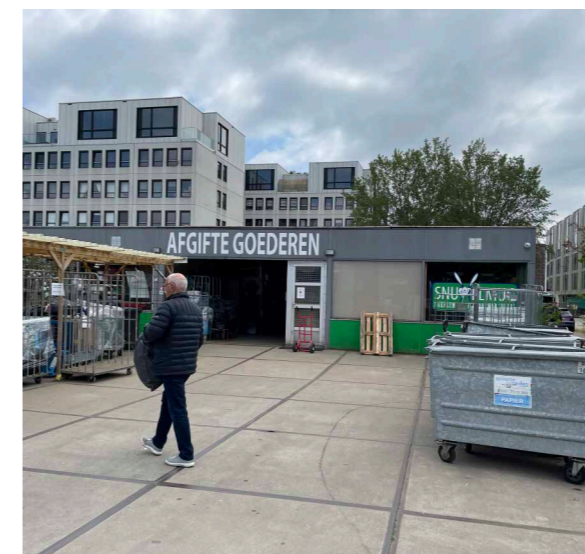
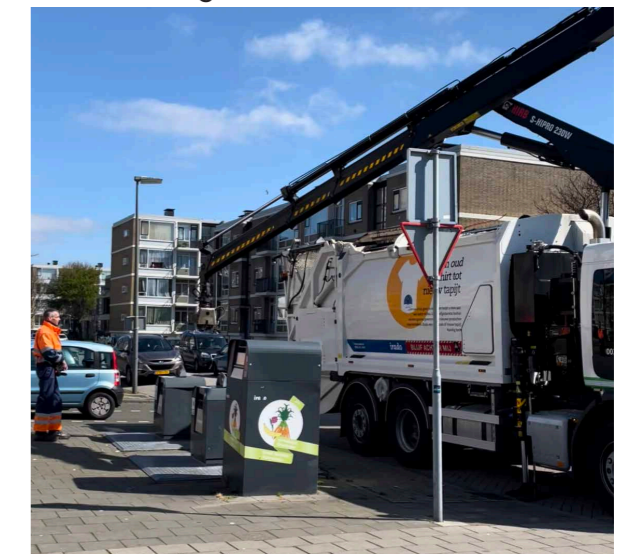
Figure 23 Key metabolic processes of study system of Toronto neighbourhoods, Codoban & Kennedy, 2008

Everyday actions

Maintenance



Waste management



Re purposing



Selling at Seasonal Food Shop

Figure 24 Pictures of the everyday actions in Schalkwijk, made by the author

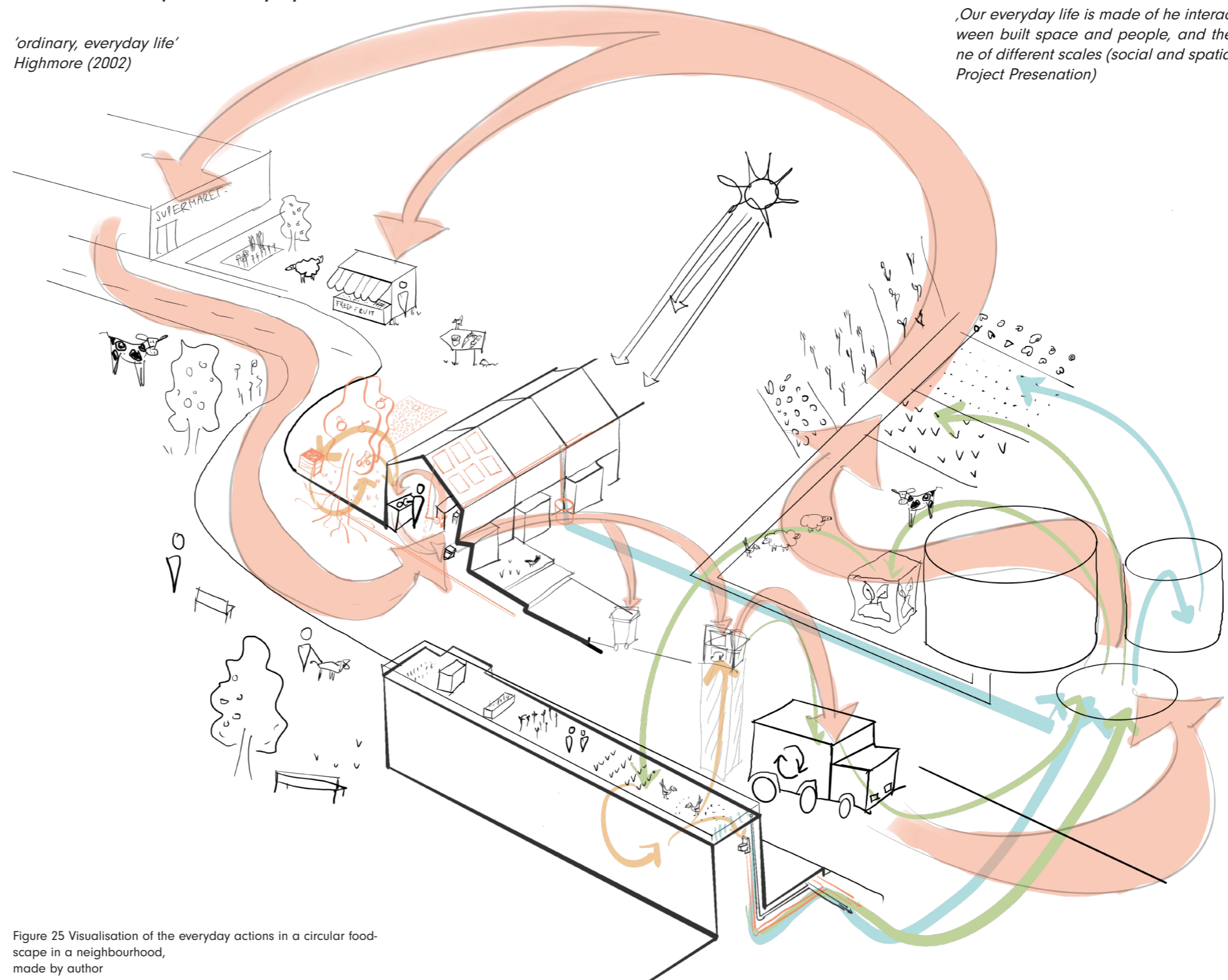
How can the Circular Foodscape be understood?

Promoting the circularity in daily life through food production concepts includes waste management. On the one hand, the promotion of local food production and consumption aims to improve accessibility to healthy food shops and restaurants and raise awareness of local food production in the community. Urban agriculture can be practised on public spaces such as areas for sports, playgrounds, and rooftops, to produce food locally, support social cohesion and promote sustainable local diets. Waste management begins with the preparation and consumption of food. In the spirit of circularity, food waste should be separated from general waste to facilitate the utilisation of renewable energy sources and the recovery of valuable nutrients. The recovered nutrients can then be used for local food production, creating a circular system. This concept is illustrated in the sketch on this page.

Figure 25 shows a sketch of the everyday actions, resources and infrastructures related to the food system that we encounter in our daily lives.

What is the Foodscape of the Everyday?

'ordinary, everyday life'
Highmore (2002)



'Our everyday life is made of the interaction between built space and people, and the interwoven of different scales (social and spatial)' (Yalla Project Presentation)

Figure 25 Visualisation of the everyday actions in a circular foodscape in a neighbourhood, made by author

2.2. THE NEIGHBOURHOOD AS A SYSTEM

The urban environment, which focuses on the scale of districts and neighbourhoods, is perceived as a system. The physical environment and the configuration of the system with its processes are analysed. The (technical and social) infrastructure is seen as a resilient component that facilitates the exchange of goods, including water and knowledge. The "neighbourhood" system focuses on water, food,

and energy flows (Codoban and Kennedy, 2008), the NEXUS. The definition of activities is not only limited to economic activities but incorporates also the activities of the residents' daily lives and their relationship to the shared space, which is liveable and supports the community's resilience to change.

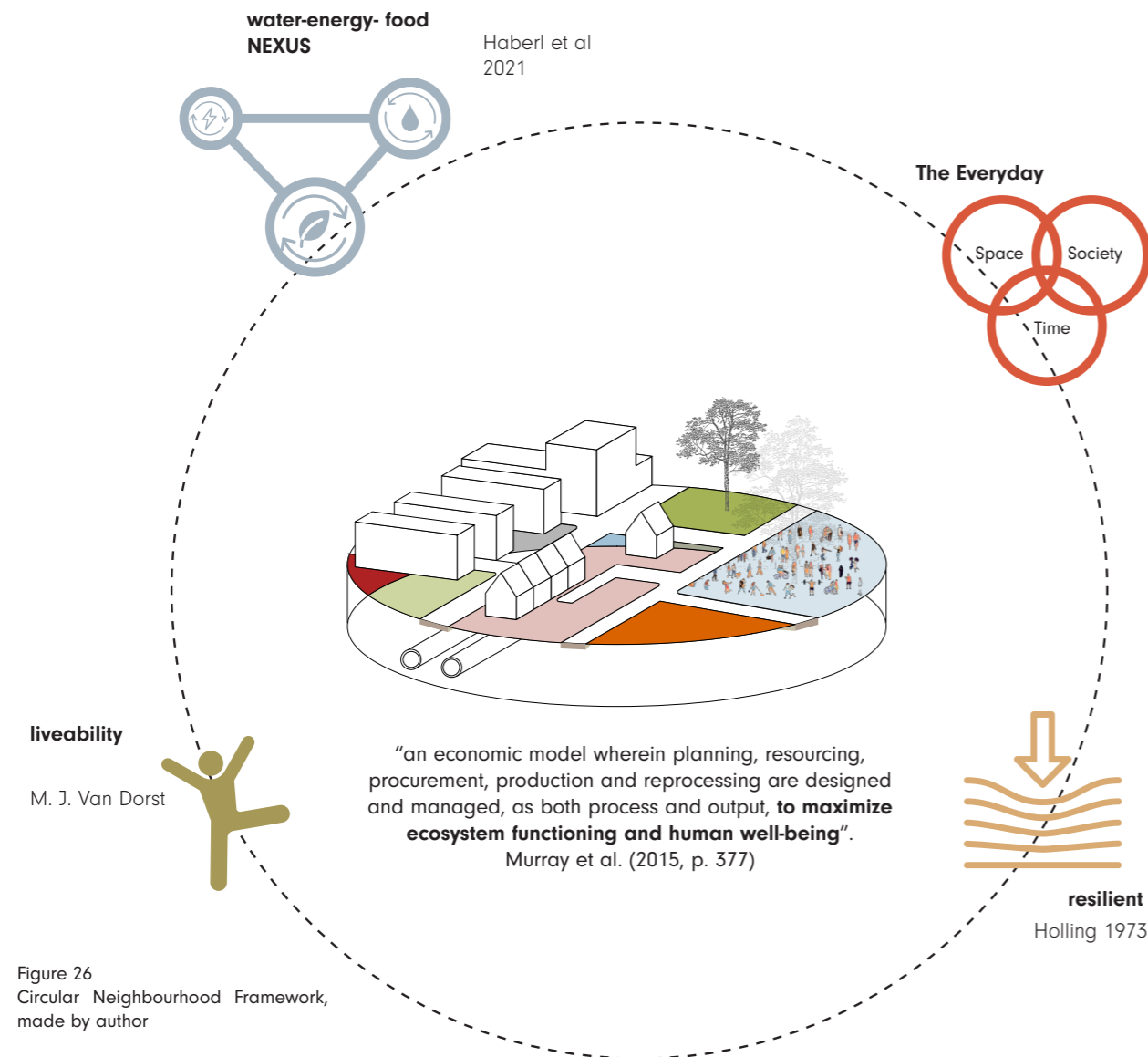


Figure 26
Circular Neighbourhood Framework,
made by author

Developing a sustainable, circular neighbourhood requires systemic change, which requires a diverse and resilient community. Stakeholder and resident engagement are critical to achieving this goal, as is social interaction to discuss potential transitions and their impacts. Governance should consider the needs and opportunities of all stakeholders and residents. Promoting stories, participation, ownership, and community organisation is crucial and underlines the value of a strong local economy.

What is Liveability in this project?

Liveability is the quality of the relationship between people and their spatial environment (Leclercq & Smit, 2023).

Liveability is described as a variety of values and experiences of daily life in a particular spatial context (a place) that affect both the individual and the community (Lloyd et al. 2016).

What is the foundational economic system?

It is based on the well-being of citizens (now and A foundational economic system is based on the well-being of citizens (now and in the future) and depends less on individual consumption and more on the social consumption of essential goods and services. Essential goods and services are the material infrastructure such as pipes and cables that connect households and buildings such as hospitals and care homes that all citizens depend on (Bärenthaler et al. 2021). However, a foundational economic system also depends on material and resources such as food (Figure 27).

	Form of	Examples	Provider business	Source of revenue	Organisational	Post 1980s public
Foundational Economy	Daily essentials via infrastructure systems of networks and branches	<i>Material</i> e.g. food, and utility supply; <i>Providential</i> , health and care, social housing	WAS low risk, low return, long time horizon for public and private providers	Tax revenue for free at point of use or subsidised; or regulated private purchase	Low mobility and mortality as networks and branches 'ground' firms, stable demand	Privatisation, outsourcing and shareholder value PLCs = new business model

Part of material flow (urban metabolism)
↓
Part of the Everyday

Figure 27
Chart of the Characteristics of zonal economies,
The foundational approach (2020)

What is the resilience theory?

C.S. Holling's resilience theory provides a useful framework for understanding and promoting the sustainability of socio-ecological systems, especially in the face of uncertainty and change (1973).

Resilience is a systemic property that manifests itself, for example when products change and consumers must adapt. This necessary adaptation is an expression of resilience. The same can be observed in the resilience of a system when community organisations and governance systems can effectively manage the necessary change at the right time.

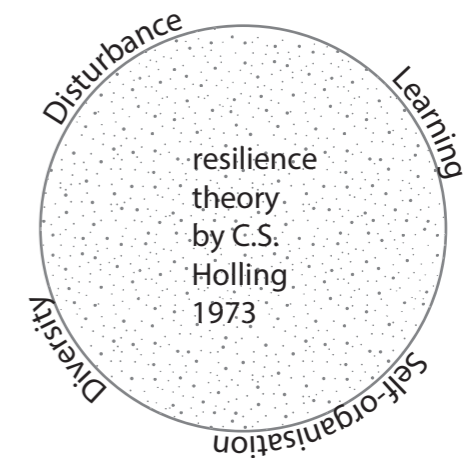


Figure 26.1.
Resilience Framework, made by author

2.3. FOOD CONSUMPTION & WASTE

The food consumption of the average in Netherlands

The typical Dutch person consumes around 3.1 kg of food and drinks every day, including one kilogram of solid food and two kilograms of fluid. A quarter of all animal products consumed by an average Dutch person are dairy products, which account for 10% of total daily consumption (van Dooren C. & Knüppe J., 2020).

The food consumption of different subgroups

Food consumption is age-dependent, as it depends on energy requirements, which change over the course of a person's life. Looking at the individual food groups, children consume more dairy products, sweets and savoury snacks, spreads, and soft drinks than adults. People aged 60+ consume fewer vegetables and drink fewer soft drinks than younger adults (RIVM, 2016). Residents in urban areas consume more vegetables, while residents in rural areas consume more fruit (RIVM, 2016).

The socio-economic status influences food consumption behaviour, which is strongly linked to the education level, working status, and salary income level. The neighbourhoods in Schalkwijk are the lowest-income neighbourhoods in Haarlem, and the education level is average - the RIVM report states that lower education and income levels are associated



Figure 28
Average diet per day of one person in Amsterdam,
image: van Paridon x de Groot landschapsarchitecten

with lower consumption of healthy foods and drinks (RIVM, 2016).

The Netherlands are multicultural. In 2022, 14.5% of the Dutch population was born outside of the Netherlands. This also explains the many multicultural food consumption patterns in the Netherlands (CBS, 7/9/2023).

The analysis of food consumption behaviour shows that there are dietary patterns in the population that can be identified over time, but people tend to switch between different dietary patterns (RIVM, 2016).

Food waste

Dutch households wasted an average of 34.3 kg of food per person per year in solid food (including viscous food and dairy products) in 2019. Solid food is mainly wasted via residual and organic waste. This household waste contains 26.5 kg of food waste per person per year, with an additional 7.8 kg of waste from other channels (sink, toilet, animals, compost, etc.). In general, 9.5 % of the food we buy is wasted. Bread, dairy products, vegetables, and fruit are wasted the most. In 2019, 5.5 litres of drinks per person per year ended up in the sink or toilet, however, in general, the figures are decreasing (Fact sheet, Food waste in households in the Netherlands in, 2019).

Waste separation trends Haarlem

To improve waste separation in Haarlem, my focus is on the waste streams that offer the greatest potential for improvement in terms of volume, contribution to cost reduction, and impact on sustainability. Based on these criteria, organic waste, paper, plastic, and textiles are placed at centre stage. However, there has been a negative trend in the collection results for organic waste streams and paper for several years. The diagrams below illustrate this observation. For the municipality, this is expensive. Current measures seem not sufficient to reverse this trend. This trend can be broken through sustainable waste management (Duurzaam Afval Beheer Haarlem, 2013).

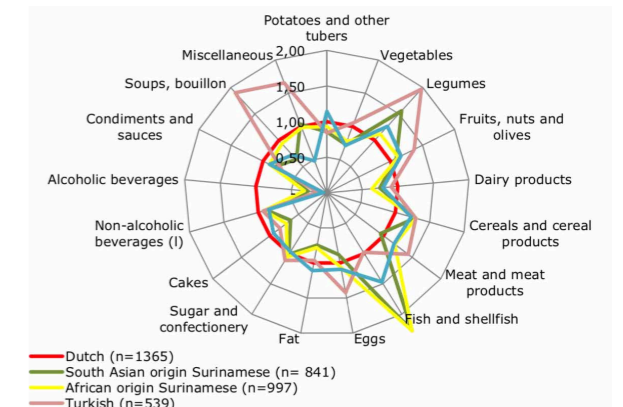


Figure 29, Differences in food intake in residents in Amsterdam with a Surinamese, Turkish and Moroccan background compared to native Dutch
RIVM, 2016

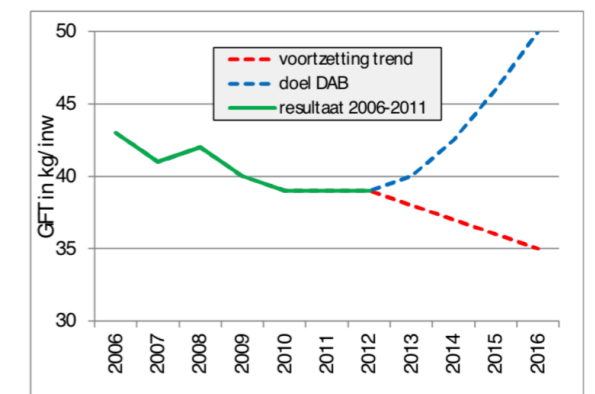


Figure 30 - Trend of GFT separation in Haarlem
Duurzaam Afval Beheer Haarlem, 2013

2.4. THE CIRCULAR EVERYDAY FOODSCAPE

What is a circular food system?

According to the ICLEI Circulars, which aim to facilitate the transition to a circular economy at the local level, the common ground between the food system and the circular economy framework is, that both consider the entire value chain. For example, a circular food system considers both production and waste management. By closing these loops, synergies such as the food and energy system are part of this cycle (ICLEI - Local Governments for Sustainability, 2021).

Circularity for the food system

The transition to a circular food system offers opportunities. These are explained in more detail in the following six points.

1. Regenerative natural systems

In regenerative natural systems, high quality food is being produced, and the natural ecosystem improves when food is grown in regenerative natural systems (Robertson-Fall T., 2021). Nature-based solutions are also a key concept (World Bank, 2021). Regenerative agriculture techniques such as agroforestry or permaculture means that organic fertilisers are being used, which improves the productivity of the soil (Robertson-Fall T., 2021).

2. Diversity

Diversity is a key point: Especially crop rotation (growing multiple crops on the same piece of land across different seasons) improves the ecosystem, and crop diversity leads to product diversity which is high in nutrients (Robertson-Fall T., 2021). Currently, more than 75% of our food comes from 12 plant species and 5 animal species (Food and Agriculture Organization of the United Nations, accessed 3/12/2023). Diversity in plants also increases diversity for local insect populations and thus has a positive effect on the downstream animals in the natural food chain. Moreover, pollination is also improved. This shows how plant diversity through a regenerative agriculture approach can change the beginning of the food chain by increasing diversity, which in turn leads to more diverse microorganisms such as

fungi and insects, which in turn improve soil fertility and productivity in a regenerative way (Robertson-Fall T., 2021).

3. More local food circulation means more business and more value creation

If the food is grown regeneratively and locally and the organic food waste, which is high in nitrogen and phosphorus, is collected close to the site of food production, it can be used as fertilizer or for producing "renewable" energy. There are new business opportunities such as "Agriprotein" in the UK or "Sanergy" in Kenya, which process food waste and human waste into oil, organic fertiliser, and animal feed (Robertson-Fall T., 2021).

4. Tackling climate change

"A circular economy for food could reduce the sector's greenhouse gas emissions by 49% or 5.6 billion tonnes of CO2 by 2050." (Robertson-Fall T., 2021). Every year, cities generate 2.8 billion tonnes of organic waste, of which only 2% is currently being recycled.

5. More nutrient-rich food

A regenerative, circular food system would mean a greater diversity of produce grown to achieve a healthy natural environment, leading to a more diverse range of agricultural products that would broaden the range of nutrients we currently consume (Robertson-Fall T., 2021).

6. Supporting local communities

Local and regenerative agriculture supports small farms that produce 70% of the food we consume worldwide (Robertson-Fall T., 2021). In the Netherlands, however, most agriculture is highly industrialised, which not only threatens the existence of small micro-organisms, but also that of small local producers and communities that are connected through food production. Every urban agriculture project builds its own community. There is a great potential for integrating and supporting food initiatives and grassroots organisations to build a circular food system in more urban areas (Robertson-Fall T., 2021).

The scale of the circular everyday foodscape

The foodscape described by Sobal and Wansink, which defines the type of food and consumption, can be categorised into three scales: the macro, meso and micro scale (2007). The macro and meso scales influence the choice of food that is consumed, the micro scale influences how food is consumed - and, applied to the circular foodscape, also how wasted food is managed (Sobal J. & Wansink B., 2007). At the meso scale food waste is separated and collected. This goes hand in hand with the choice architecture mentioned on page 29. The spatial configuration influences the circular everyday foodscape as well as individual behaviour. The built environment shapes the foodscape in the way we consume and recycle food (Sobal J. & Wansink B., 2007).

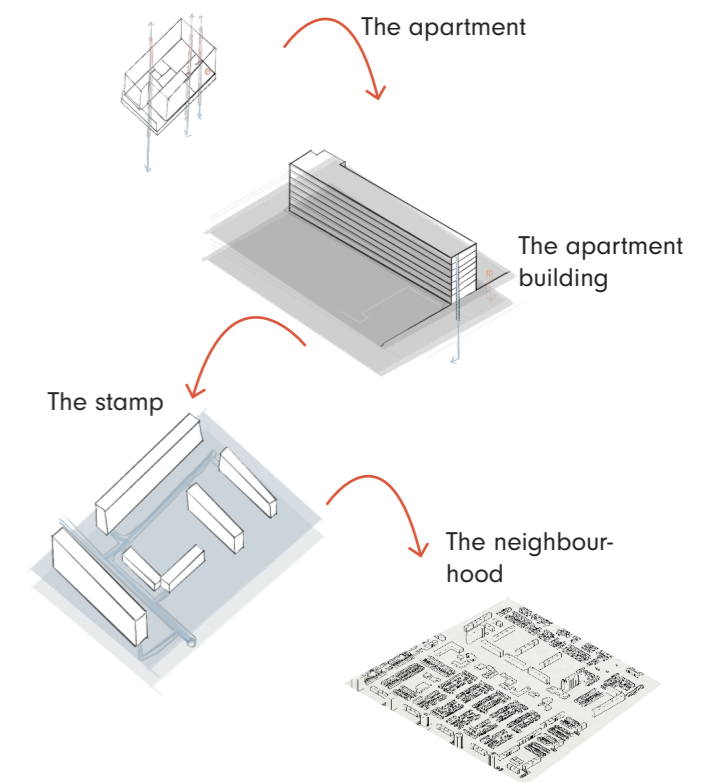


Figure 31.1. Axonometrics of the scales. Made by the author

	Foodscape	Circular Foodscape
Macro	Global or regional marketscapes that shape food choices through widely dispersed international food systems that include transportation networks, agriculture and food industries and food distribution outlets	Global or regional recycling and food waste treatment that include transportation networks, waste plants
Meso	Built environment at the community level providing ' food landscapes... that represent eating outlets available for choosing foods that determine food provisioning	Built environment at the community level providing The Collective Collection Of food waste. Representing The Waste Collection points Available For Recycling And Composting food
Micro	Domestic foodscape that is represented in how the food is being served, how much, how food is stored	Domestic foodscape that is represented in how the food waste is being separated, how long food is declared as good and how it is composted / recycled / reused

Figure 31, Chart adapted from Sobal J. and Wansink B., 2007

Why combine the foundational economy and an everyday food system?

Foundational economy (Bärenthaler et al. 2021) supports the local supply of essential basic goods by understanding the economic activities, in this case the everyday activities in the food cycle, and the associated actors who consume and work in the food system. Foundational economy delivers this through the interrelationships between individual consumption, public services, and infrastructure, both material (e.g., food, energy, transport, water) and social (e.g., education, healthcare). (Everyday Streets, page 194). This is also referred to as the “everyday economy”, as the non-essential local infrastructure economy such as restaurants, culture and the arts of our daily lives, is usually overlooked (Martire, A., Hausleitner, B., & Clossick, J., 2023, page 194). To analyse the everyday economy of the food landscape in Schalkwijk, the supply of essential goods (in this study it is food) in the public space is examined in relation to the infrastructure and services that characterise the everyday foodscape.

Great potential for closing flows

The neighbourhood scale holds great potential for closing product flows. However, such a radical change requires new processes: Citizen activity is

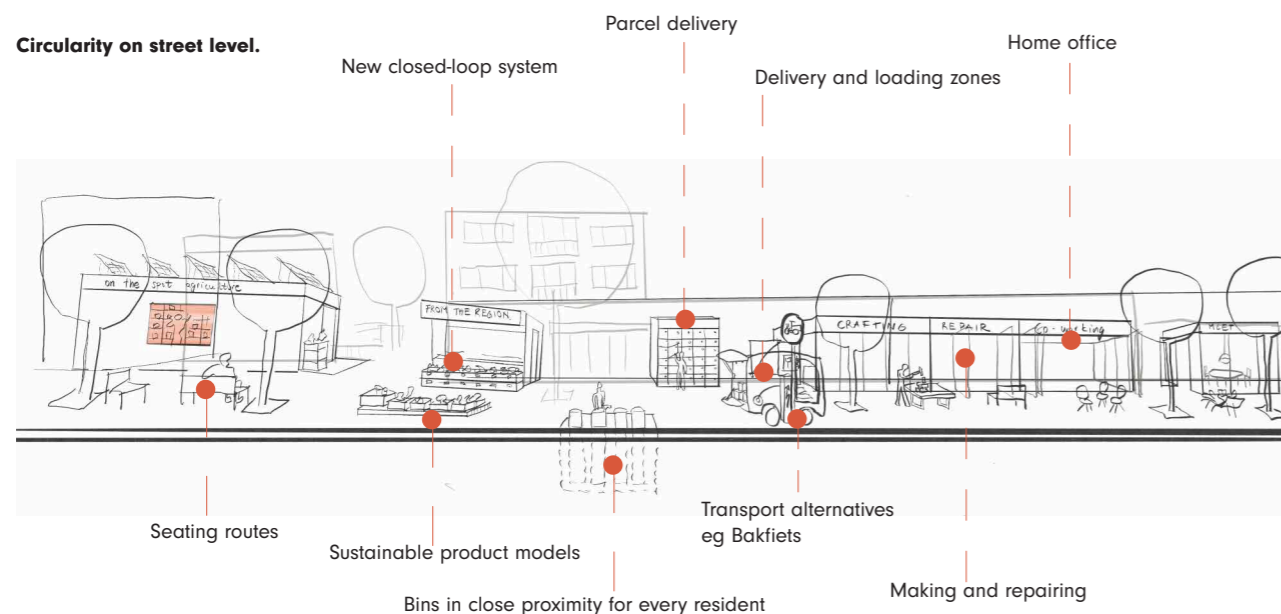


Figure 32 - Circularity on street level
Made by author - inspired by Free Street Manifesto UF2023

crucial, which is why the participation ladder rather than the R ladder is considered in this project. The extent to which these two-level concepts can be combined to support each other needs to be examined (Figure 33).

Participation- & Regenerative & R - ladder

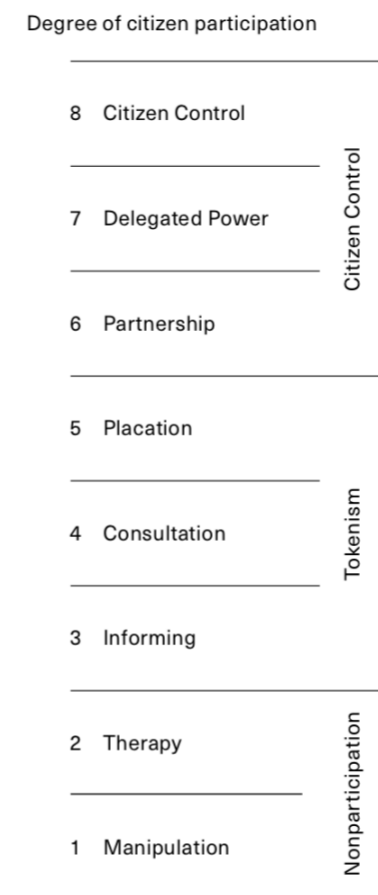
When looking at circularity on the neighbourhood scale, the cultural and social relevance of the transition is more in focus. Participation is the base of any sustainable transition and the transition towards a circular system not only provides the economic benefit and more efficiency, but also supports the local structures or can even enable empowerment of the residents. Thus, the transition towards a circular neighbourhood, which then results in a sustainable neighbourhood needs the support and acceptance of the residents which is based on their involvement and participation. Therefore, it is interesting to compare the R- ladder and the Participation ladder in this context. The more partnership, delegated power, and citizen control can be established in the neighbourhood, the more resilient and sustainable will be the transition towards circularity, including its actions of repairing. Reusing, sharing, and re-thinking as a community will enable more circular actions in everyday life.

The ICLEI Circular City Actions Framework in the Circular Cities Practitioners Handbook (ICLEI - Local Governments for Sustainability, 2021) includes the food system in the framework for a circular food system. The measures include the action “Regenerate” - in relation to the food system. Referring to “harmonise with nature”, ensuring contributions to local resource and nutrient cycles and focusing on regenerative ecosystem practices. The “rethink” step precedes “reuse” and suggests a rethink in extending the lifespan before the product is even used. “Rethinking” refers to the structural support of the cir-

cular system and the rethinking of the current food value chain. The “reduction” step focuses on designing the infrastructure to minimise material and energy consumption across the entire supply chain and life cycle. This is where the short (supply- or waste-)chains come into focus.

This distinguishes the Circular City Framework from the R-ladder, as the Circular City Framework does include the ecosystem and is focused on the city and local scale. However the socio-spatial aspects are still vague in Circular City framework.

the participation ladder (based on Arnstein 1969)



Circular City Actions Framework to food systems (ICLEI, 2021)



the R-ladder (based on Netherlands Environmental Assessment Agency 2019)

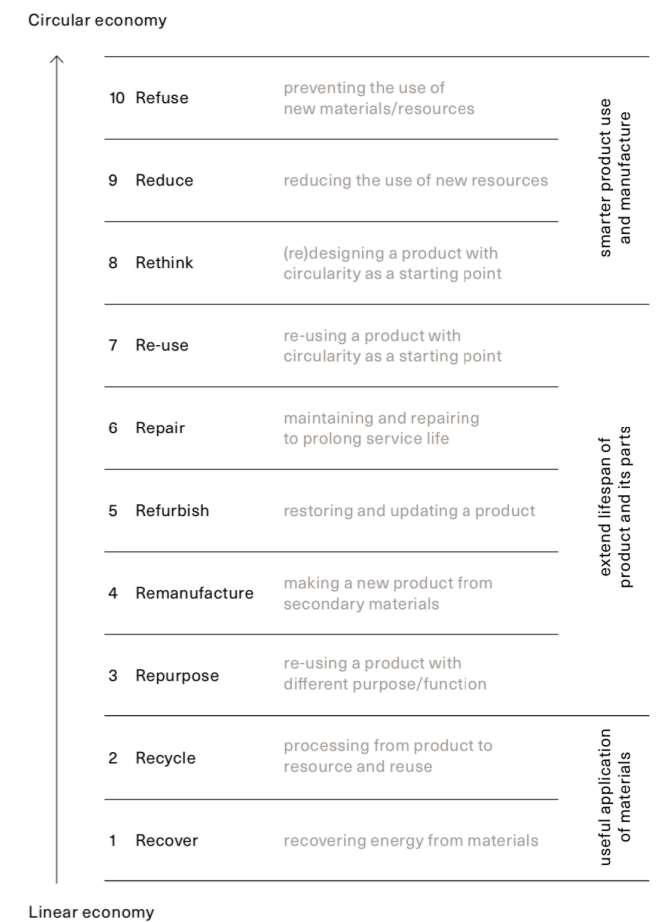


Figure 33
source: Circular Communities: The circular value flower as a design method for collectively closing resource flows (2023) by Leclercq & Smit

2.5. VALUES OF EVERYDAY CIRCULAR ACTIONS

Six step cycle of urban agriculture

This diagram from Jacques Abelman's master thesis "Local Agroforestry Collective Engagement - Networking People, Food, and Forest in Porto Algere" shows the six steps to the cycle of urban agricultural activities (2015). It outlines the different actions of urban agriculture/agroforestry and links them to possible locations within the urban agroforestry system in Brazil. This project builds on the actions displayed in Figure 34 as the six steps of circular activities in everyday life. These six basic steps form the basis for examining the daily activities involved in the transition to a circular food system. Abelman shows what actions the inhabitants of Brazil have taken to shape

the space for agroforestry and links this six-step cycle shown in Figure 34 to the corresponding areas that can facilitate agriculture. This work identifies potential actions and spaces for utilizing people, space, and power to develop a large-scale strategy where the landscape acts as a facilitator. The research has a significant impact on rethinking the system through the integration of daily activities, people, and the environment. During this thesis, however, it has become apparent that the six steps for a circular local agricultural activity are missing the step 'recycling' and the steps 'preparing' and 'producing' have been combined as one step in my master thesis.

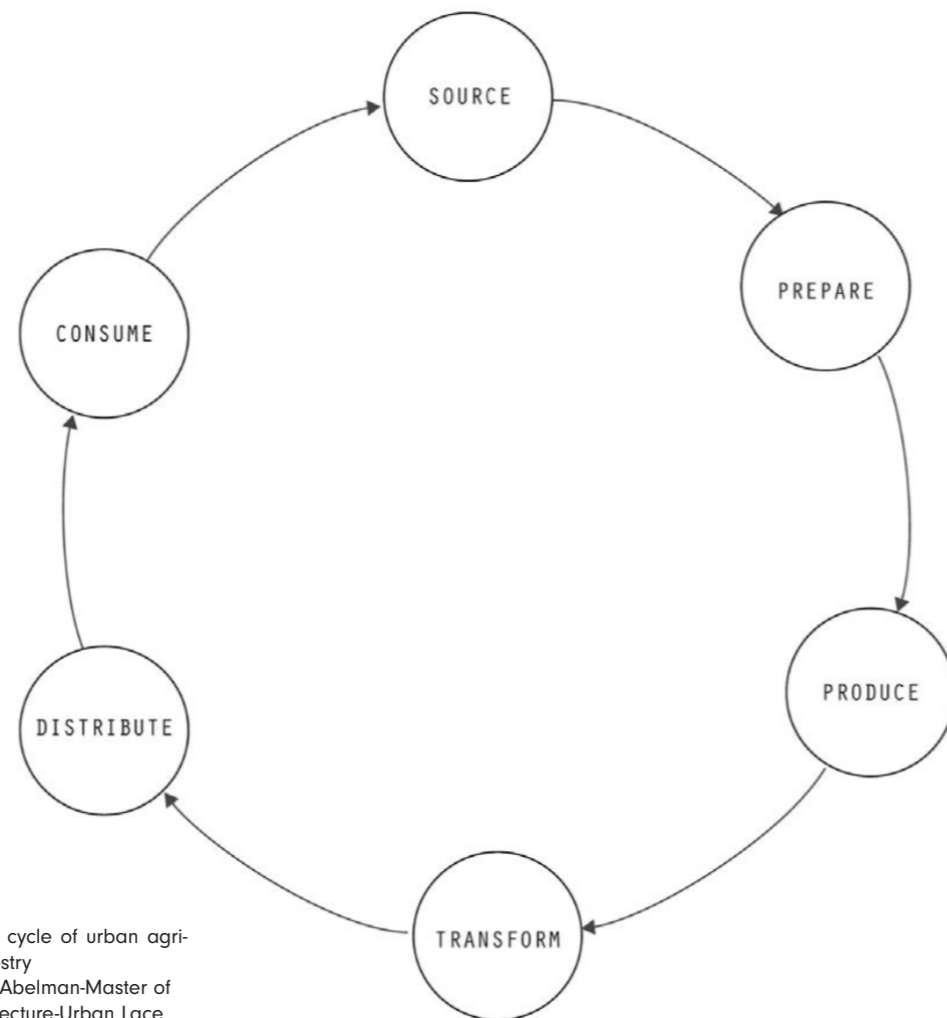


Figure 34: 6 step cycle of urban agriculture / agroforestry
source: Jacques Abelman-Master of Landscape Architecture-Urban Lace
Published on Oct 7, 2015

The value flower

To analyse and understand circular neighbourhoods, Leclercq & Smit's value flower is used for describing and evaluating circular communities (2023). The reason for this is that the amount of a circular community's resources are often defined in a given neighbourhood and affect the scale of the neighbourhood. Nevertheless, it is important to identify the spatial boundaries of the neighbourhood and its community. The value flower is a guide to analyse different values within a circular community, along with spatial elements such as gardens, public spaces, infrastructure, urban objects, and buildings. The value flower is a step towards a more social circular environment.

Values of everyday circular actions

The value flower does not encompass the actions of an everyday life. It focuses on the values, the built environment, the resources, and the actors. The six steps in Abelman's thesis, however, do not include the values and the resource flows, but the spatial connection to the actions and the associated actors. Therefore, by combining these two approaches, my thesis works on the connection between values and actions of a circular built environment. The analysis part will focus on analysing the values and identifying the actions. The results of my thesis will show how these relate to the urban quality of a circular neighbourhood.

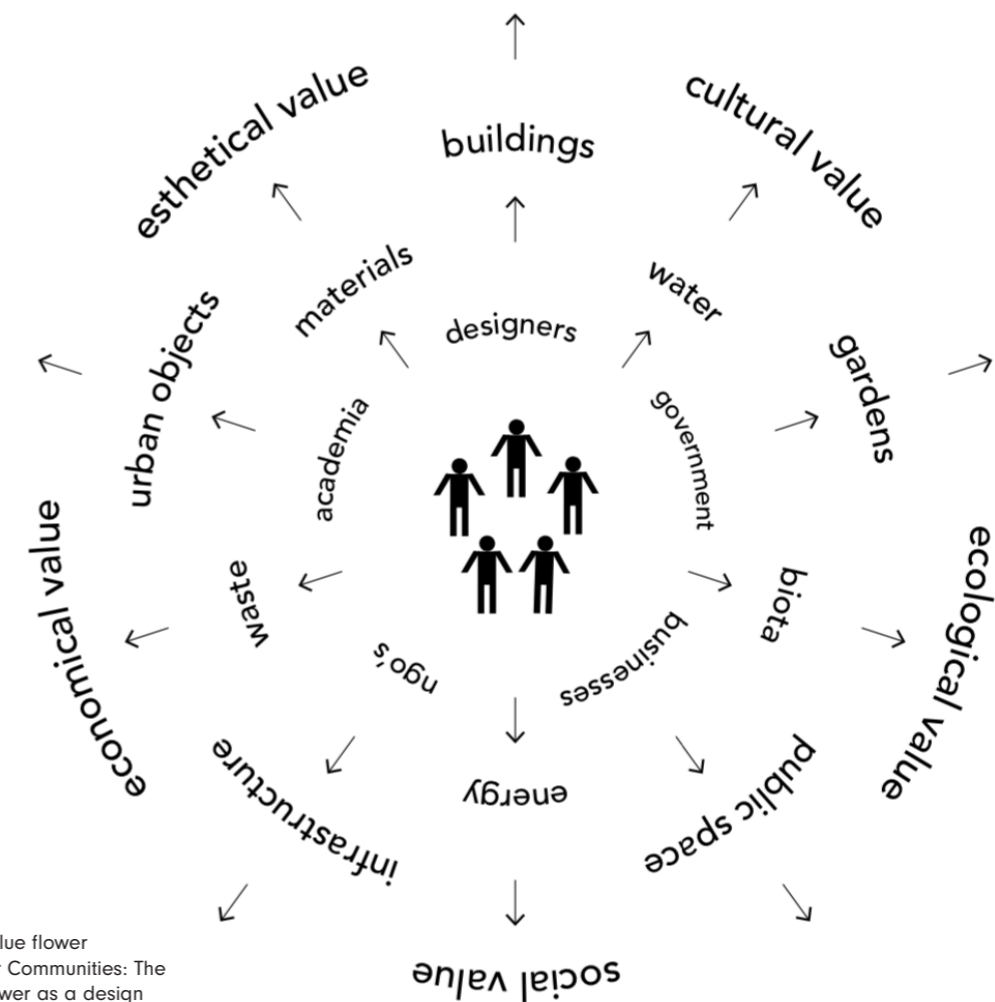
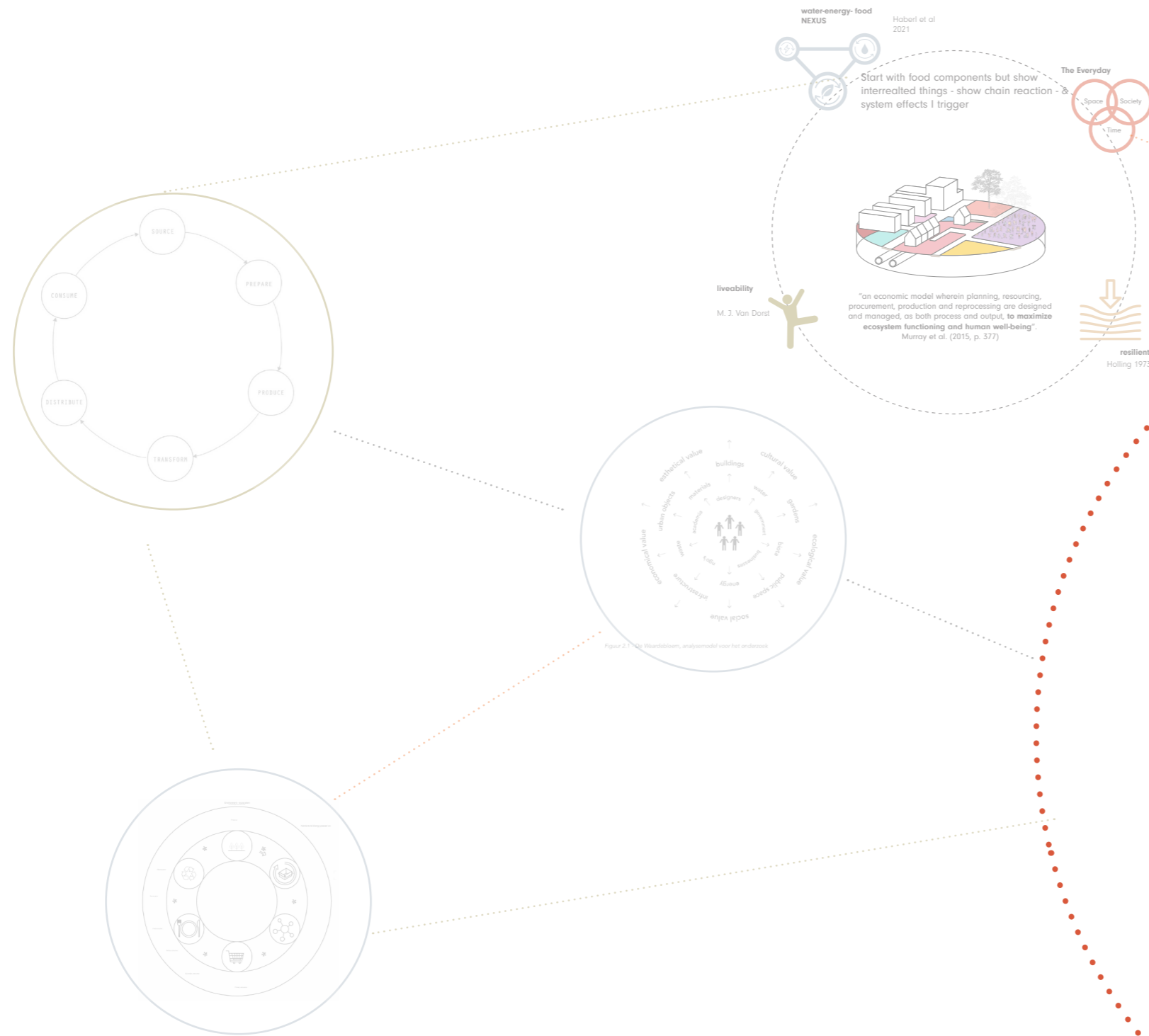


Figure 35: the value flower
source: Circular Communities: The circular value flower as a design method for collectively closing resource flows (2023) by Leclercq & Smit

SUMMARY OF THE THEORETICAL BACKGROUND



There is significant potential for closing loops and establishing a circular foodscape by focusing on the daily lives of residents at the neighbourhood scale. My project will consider the values and actions of these residents. Implementing circularity needs to consider to the basic resources of everyday life, especially food.

Figures are sourced in the previous pages

03

METHODOLOGY

This chapter will explain the conceptual framework, introduce the case of Schalkwijk in Haarlem, Netherlands, and demonstrate the methods used to answer the research question:

How can the transformation of Dutch post war neighbourhoods facilitate actions of our daily life towards a circular foodscape?

The project will use the research through design approach, conducting qualitative and quantitative research and testing the results through design development and workshops - in particular the creation of a pattern language.

The systemic design approach will form the basis of this research and design process as it embraces urban metabolism, co-creation and respects the diverse and complex nature of the project.

The use of a pattern language as a research and design tool allows for the exchange of research and design through a co-creation approach and possible spatial implementations for a circular neighbourhood with circular actions in the everyday life of the inhabitants of Schalkwijk.



Figure 36
Picture by the author

3.1. CONCEPTUAL FRAMEWORK

To frame this project, there are three main lenses through which the socio-ecological urban system of the post-war neighbourhood of Schalkwijk is studied. All of these lenses relate to the concept of the Circular Built Environment.

The following pages provide an explanation and introduction to this topic. The neighbourhood shows the daily life and physical aspects of circular flows, while the urban metabolism shows the flow and environmental aspects. The first lens is the basic

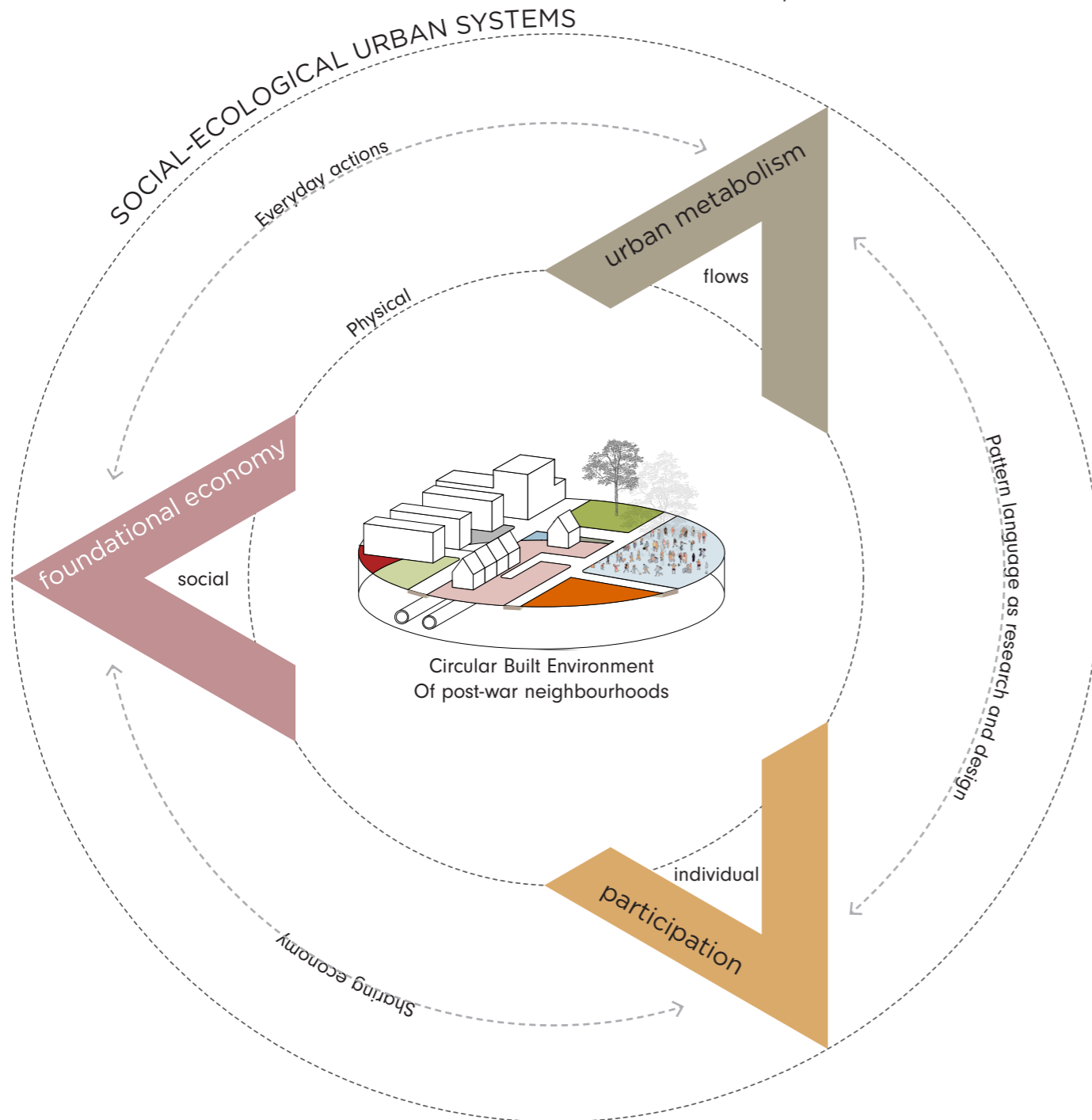


Figure 37
Conceptual framework drawing made by author

economy, which represents the economy with a focus on the social aspect. Its aim is to shape this circular transition in a way that benefits the whole social system. The second lens is the participation lens, which represents the individual needs of different stakeholders. This is approached through the systematic use of the pattern language, taking into account individual needs during the planning and project process. The different layers show how the project works through the everyday and physical transition of the social-ecological urban system. This is achieved through the integration of flows, social and individual needs and the transformation of the system.

The urban metabolism lens

Urban metabolism can be defined as “the sum total of the technical and socio-economic processes that occur in cities, resulting in growth, production of energy, and elimination of waste” (Kennedy et al., 2007).

Urban metabolism studies the flow of energy, materials and information in cities - in this project the neighbourhood. It treats the neighbourhood as a complex system and analyses resource consumption, waste generation and environmental impacts. It emphasises the importance of sustainable practices and the transition to a CBE (Wolman 1965, Kennedy and Bunje 2011).

The participation lens

To make this project more feasible, it is important to engage with residents, community organisations and other stakeholders to ensure that their needs and values are taken into account. By adding the co-creation part of participation, the project can be a systemic, adaptive and inclusive research by design project.

The foundational economy lens

The foundational economy is an approach that challenges established ways of thinking about the economy, society and policy. It is based on the idea that the well-being of citizens, both now and in the future, depends less on individual consumption and more on social consumption of essential goods and services in the foundational economy. These include physical infrastructure, such as the pipes and cables

that connect homes, and provision, such as health and care, on which all citizens rely. The foundational economy also emphasises the primary role of public policy in ensuring the provision of basic goods and services to all citizens in a socially responsible way, rather than stimulating private consumption to generate economic growth. Access to good quality basic services is seen as a political matter of citizens’ entitlement.

Finally, the Foundational Approach recognises the importance of careful policy practice, with a transition to radical transformation through learning by doing and building political alliances for change (The Foundational Approach, 2020).

The Foundational Economy comprises two main categories: the material and the providential (The Foundational Approach, 2020). The material includes systems of networks and industries that distribute water, electricity, gas, telecommunications, banking services and food. The providential includes primary and secondary education, health and care, and income maintenance. The foundational approach emphasises that these systems providing basic goods and services are broadly those whose employees are called ‘key workers’, and that many key workers providing essential services are often poorly paid (The foundational approach, 2020).

Alignment of these concepts

By linking these lenses, the research and design process of this project can be seen from a holistic perspective. Addressing multiple dimensions, but still focusing on the CBE and creating a more sustainable and inclusive neighbourhood. The sharing economy can be achieved through the participation and emancipation of citizens in the neighbourhood, which will then be part of the foundational economy as it focuses on social consumption and the provision of basic goods and services. The foundational economy focuses on social consumption and essential goods and services, while the urban metabolism takes into account all flows of food, water, energy and materials. Aligning these two concepts makes it possible to create a project that ensures foundational economic services in line with sustainable resource management.

3.2. CASE

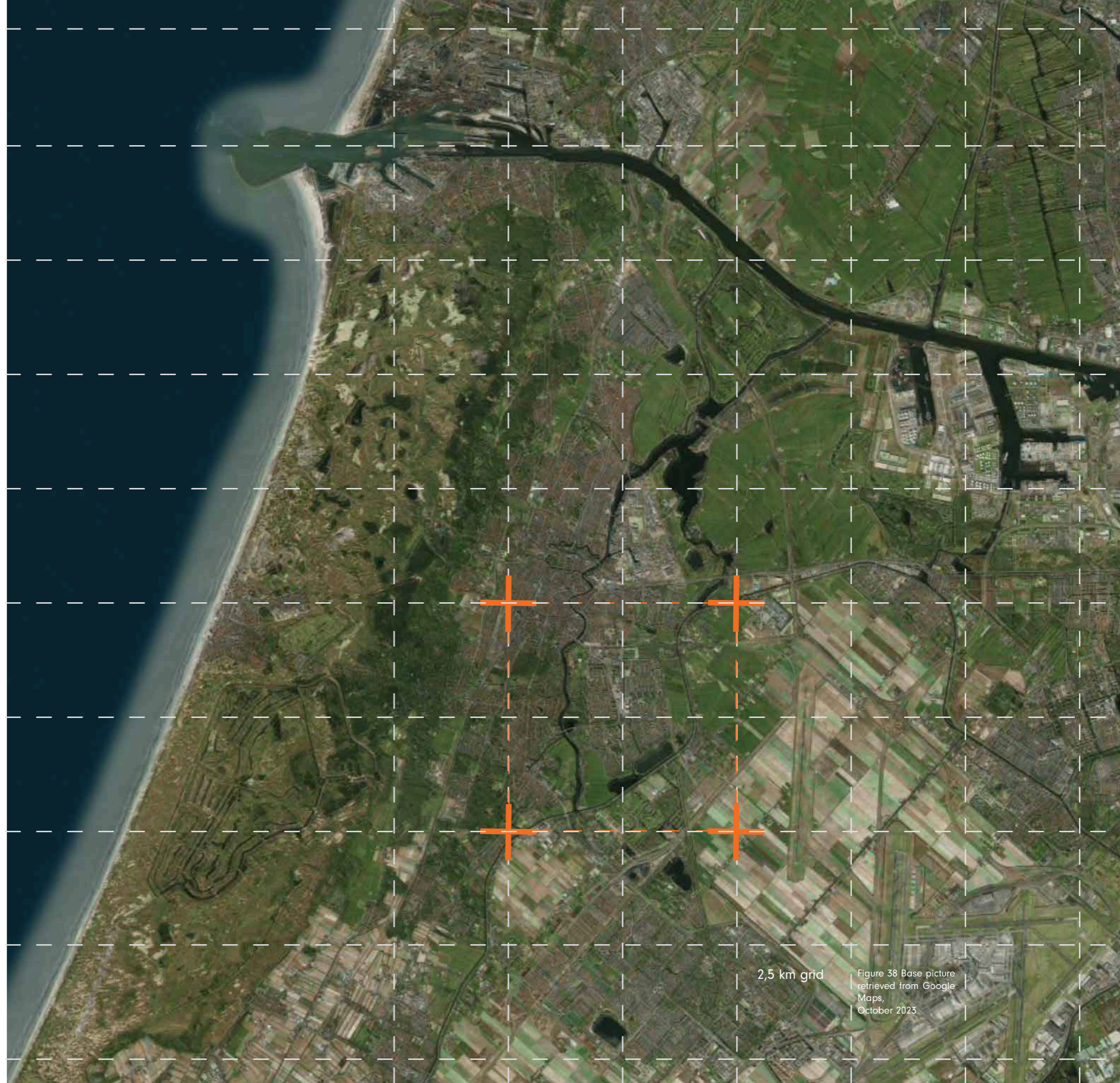
Place-based approach: Focusing on the unique characteristics and needs of a specific location

A place-based approach is a strategy that focuses on the unique characteristics and needs of a particular place, such as a neighbourhood. It aims to understand the spatial, historical, cultural, demographics, and economic conditions. It emphasizes the importance of context and local knowledge 'wisdom' (called by Leclercq) and seeks to engage and empower local stakeholders. It builds on the assets of a place, while also addressing its challenges and vulnerabilities.

Case Introduction

The case of this project is Schalkwijk, the largest district of Haarlem, in the Netherlands. It is a typical Dutch post-war neighbourhood ('naoorlogse wijk' in Dutch). It has approximately 35,000 inhabitants (Buurt Info Over Het Haarlemse Stadseel Schalkwijk - VK Makelaars., 2021).

The district has four neighbourhoods: Europawijk (north-west), Boerhaavewijk (north-east) met het Spaarne Gasthuis, Meerwijk (south-east) and Molenwijk (south-west). Europawijk links the centre of Haarlem with Schalkwijk via the Europaweg, which serves as Schalkwijk's main traffic artery. This neighbourhood consists mainly of apartment buildings - many of the old buildings have already been replaced by newer ones. Haarlem's main hospital, Spaarne Gasthuis Zuid, is located in Boerhaavewijk, along with a swimming pool, Boerhaavebad, and the only hotel in Schalkwijk. Meerwijk contains the large shopping centre, Schalkwijk Midden, with over 125 shops, a health centre and a pharmacy. Molenwijk borders the popular recreational lake known as 'De Molenplas'. Notably, Molenwijk has the highest number of owner-occupied properties compared to other regions in Schalkwijk. Approximately 60% of the properties are apartment buildings (Buurt Info Over Het Haarlemse Stadseel Schalkwijk - VK Makelaars., 2021).



2,5 km grid

Figure 38 Base picture
retrieved from Google
Maps,
October 2023

Visual introduction to the case

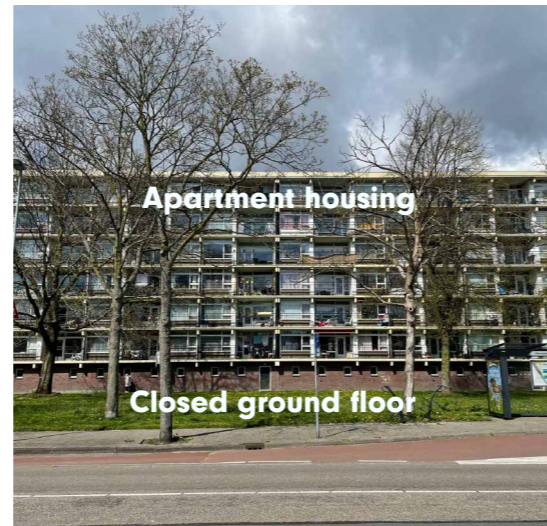
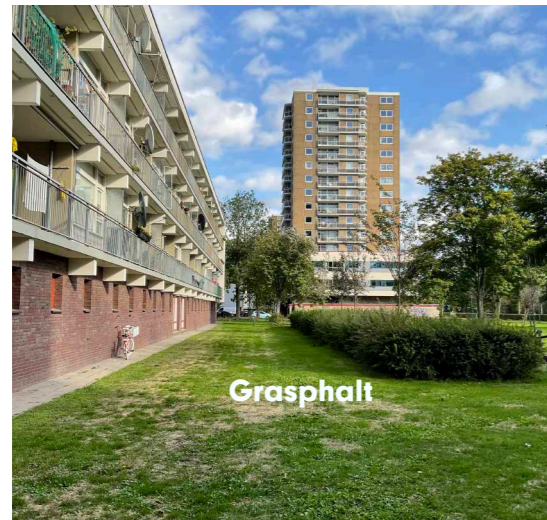


Figure 38.1.
Pictures taken by the author

3.3. BOUNDARIES OF THE SYSTEM

Haarlem, is part of the Randstand and part of the Amsterdam Metropolitan region. It is located along the Spaarne River and is 20 kilometers away from Amsterdam, close to the coastal dunes. For centuries, Haarlem has served as the focal point of the tulip bulb-growing region.

This project focuses on the post-war neighbourhood Boerhaaveijk in Haarlem, South Holland, in Schalkwijk. The entire Schalkwijk neighbourhood is planned in this area and identifies with the typical structures of a post-war neighbourhood. Schalkwijk, in the south-east of Haarlem, is the largest district built between 1962 and 1963. The district was realised in several construction phases. The two northern residential districts Europawijk and Boerhaaveijk were the first to be built in the 1960s. The southern districts of Meerwijk and Molenwijk were built after 1965, around 1970. The district centre with shops and offices was also built from the early 1970s.

They were planned with a strict hierarchy in the street system. They were planned as residential districts and are based on the principle that the main roads run along the areas. There are main access roads around the neighbourhoods (e.g. Europaweg) where there are taller buildings, followed by neighbourhood access roads (e.g. Avenue des Angers) where there are lower buildings - often already single-family houses - which branch off into neighbourhood streets and residential paths intended for slow traffic and finally for pedestrians and children playing. The street lighting adapts in height and brightness to the respective street type.

In the design of the Europaviertel, Boerhaaveijk and Meerwijk, high-rise buildings are mostly located at the edges of the residential area. Buildings in the form of high-rises or apartment blocks with seven to eight storeys form a prominent border to the residential area. This made it possible to take advantage of the view of green structures and parks. As far as possible, the single-family houses are located in coherent complexes in the central part of the neighbourhood.

Here, too, greening is an explicit component of the urban planning concept. It follows a similar hierarchy as the street structure; green spaces in the neighbourhood (e.g. England Park) are located at the edges of the neighbourhoods and are accessible to all. The residential area is bordered by a green belt that includes the district's main recreational facilities. The green spaces between the houses served as a green base for the neighbourhood's buildings and were also used collectively. In addition to playgrounds and ball fields, several public playgrounds were also created. Ground-level private gardens were available for the single-family houses. The neighbourhood concept also included that each residential area had its own facilities such as kindergartens and primary schools, shops, churches and the like, so that the neighbourhood was almost self-sufficient. Shops were concentrated in a few small shopping centres. Special attention was to be paid to the appearance and location of schools, churches, shops and other facilities in order to contribute to the experience and recognisability of the

neighbourhood. Each neighbourhood should have its own face.

This gave each neighbourhood its own structure, clearly different from the others. This was to promote the residents' appreciation of their own neighbourhood.

The facilities that were to serve the whole of Schalkwijk and possibly areas outside this neighbourhood were located as far as possible outside the residential areas.

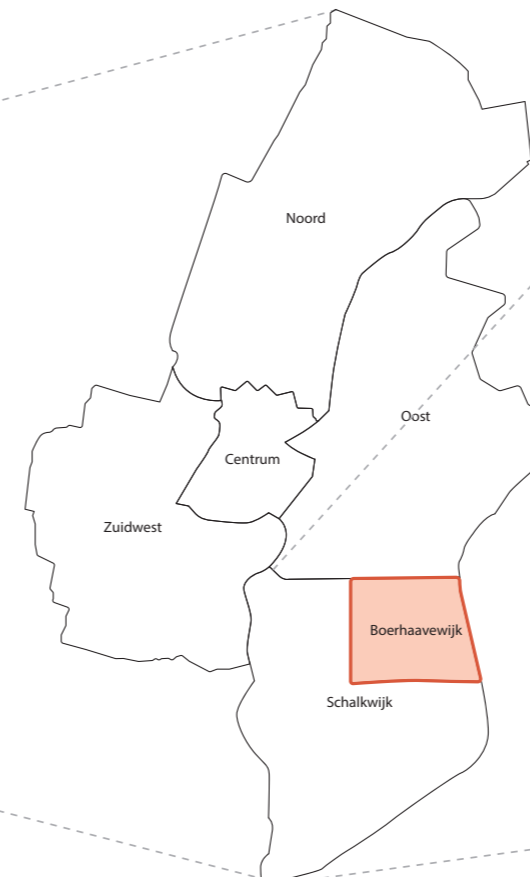
That this kind of development did not only take place in Haarlem is proven by the fact that the Southwest district has very many parallels in structure. This district also consists of four quadrants separated by main access roads and green zones. The residential units are also embedded in green spaces and together form a large contiguous green area. A large shopping centre has also been realised here in a central location.

Amsterdam metropolitan region



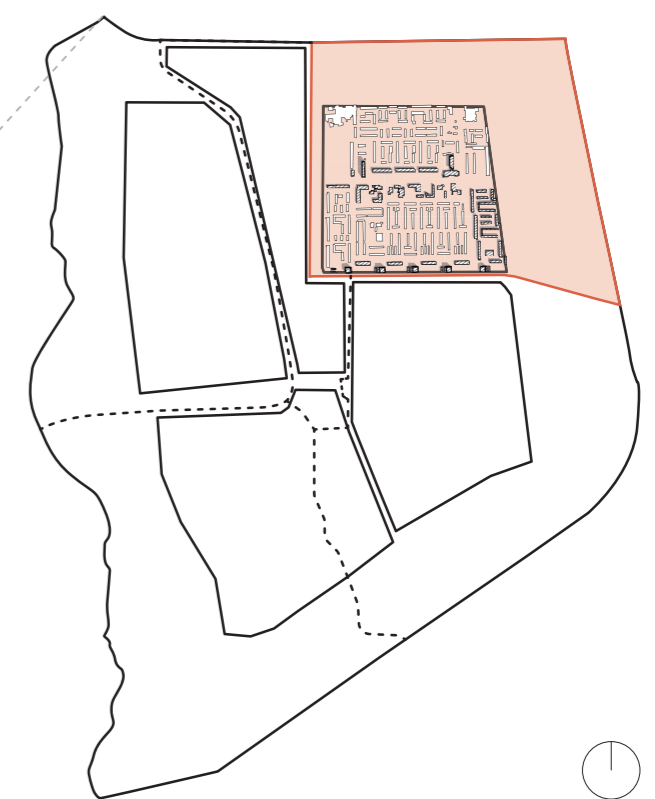
Figure 39
Location mapping of the case
drawing made by the author

Haarlem



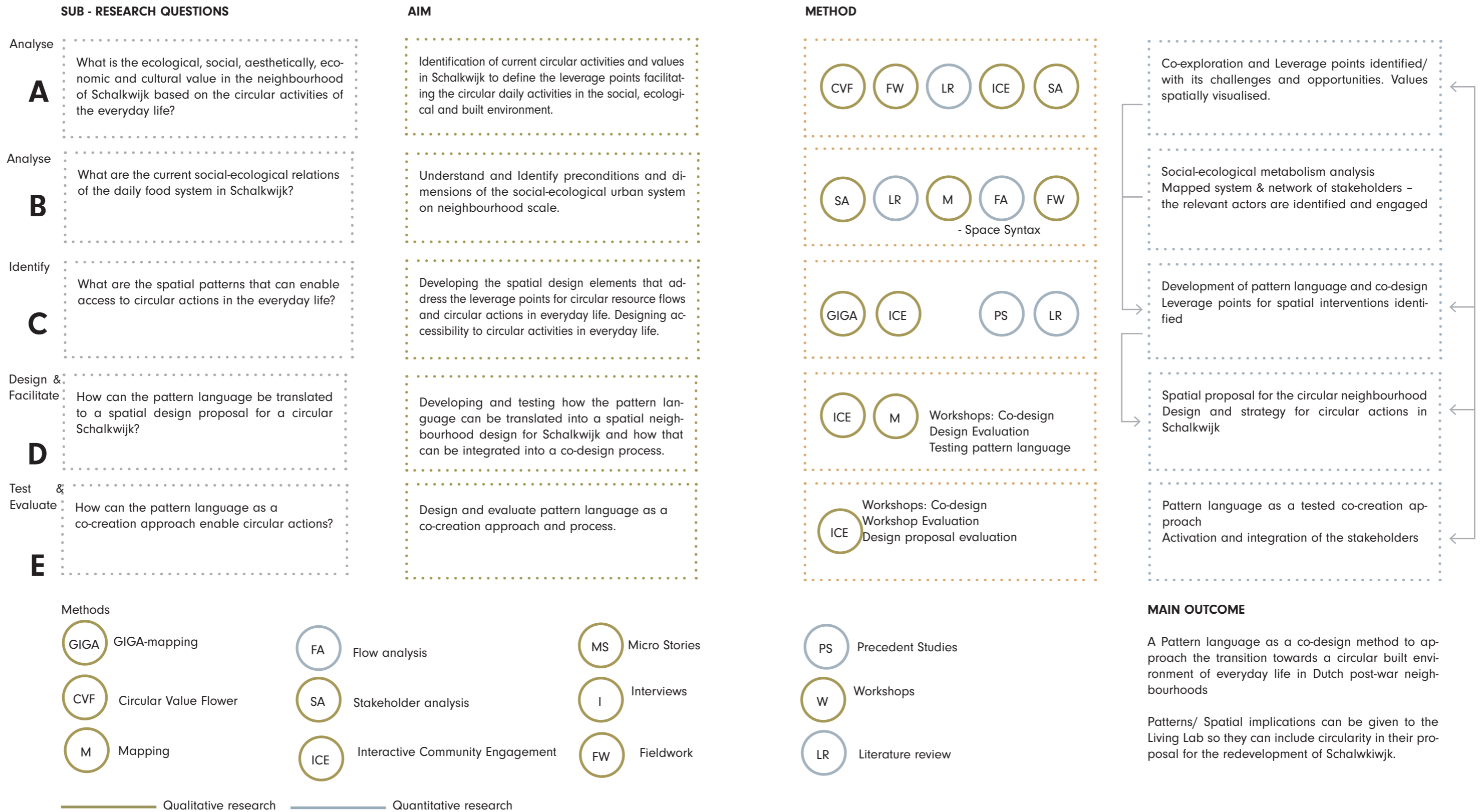
Schalkwijk

Boerhaaveijk



3.4. RESEARCH QUESTION

How can the transformation of Dutch post war neighbourhoods facilitate actions of our daily life towards a circular foodscape?



3.5. RESEARCH APPROACH

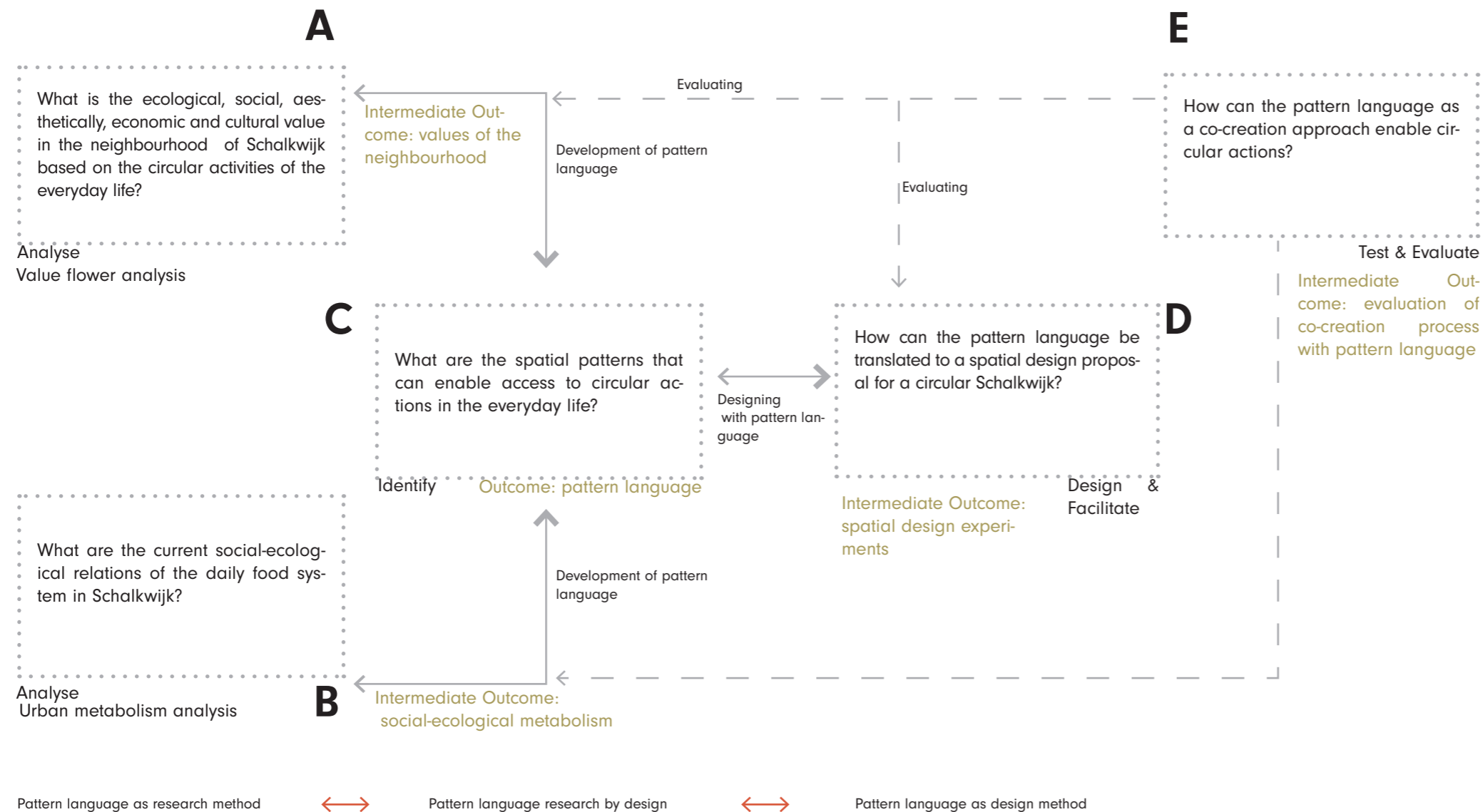


Figure 40
Drawing of the research approach made by author

This project is based on a research through design approach. By researching qualitative and quantitative data and testing the research findings through design, in this case by developing a pattern language, the design can then be tested again in a research setting. The basis of this research and design process is the systemic design approach, as it also works with the co-creation approach and takes into account the diversity and complexity of the project. By using the pattern language as a research and design tool, an exchange between research and design can take place through a co-creation approach. The pattern language can be used as a research and design method. It can complement the co-creation approach by providing a structured and systematic way of capturing and sharing knowledge. It can help to identify and apply design patterns that take into account the complexity of social-ecological urban systems and facilitate the development of a sustainable and resilient neighbourhood.

In this research, the pattern language is used as a co-creation approach in systemic design to understand the theory and possible spatial implementations for a circular neighbourhood with circular actions in the everyday lives of residents in Schalkwijk. It will be evaluated how the pattern language can be used in a co-creation approach to develop a spatial proposal for a post-war circular neighbourhood.

3.6. METHODS

CVF Circular Value Flower
A conceptual analysis model and design method developed by Leclercq and Smit, 2023. The Circular Value Flower method is a systematic analysis of initiatives to show how the resource cycles can be closed on local scale and creating various values. This method is great to integrate a place-based co-creational systemic design. It will be tested how it could be combined with the pattern language design. It will be used as a co-evaluation method for defining the values connected to circularity in the neighbourhood.

PA Policy Analysis
Analysing and reviewing various policy documents and visions and plans from the region, the city and the neighbourhood are being analysed to understand the former and planned transformation and policies and possible changes in connection with circularity that the neighbourhood is facing. Reviewing it with the national and European goals.

FW Fieldwork
Observing and analysing neighbourhood characteristics, spatial layout, and identity through on-site visits, photography, and qualitative research methods like snapshot analysis.

I Interviews
Conducting interviews with randomly selected participants during field trips to gain deeper insights into everyday life, activities, values, and perceptions of the neighbourhood.

ICE Interactive Community Engagement/ Co-Exploration:
Engaging stakeholders in workshops for testing, evaluating, and co-designing circular initiatives.

FA Flow analysis
The goal is to identify, define and map the NEXUS (water, energy and food) flows in the neighbour-

hood of Schalkwijk in Haarlem and identify actions in everyday life that could aim for closing the resource loops and creates synergies in the management of the resources. It is part of the urban metabolism analysis.

M Mapping/ Participatory Mapping
Understanding and visualising the spatial interrelations between the circular dimensions and the social and environmental aspects. And eventually even doing this in a co-creation session with stakeholders. This qualitative method is used to interpret the analysis conducted by field research, literature, data analysis and geodata and created a spatial overview on different scales. Identifying the places for transformation and synergies and opportunities and challenges by mapping.

GIGA GIGA-mapping
Provides an example of a method that is both systemic and designedly. GIGA-mapping creates an information cloud for visualising complexity from which a designer can derive innovative solutions (Sevaldson, 2011). GIGA-maps are a visualization tool that helps depict complex information gathered during a systemic design inquiry. They provide a multi-scale, multi-layered framework to visualize system boundaries, connections, and interactions across different domains. These synthetic and flexible maps integrate various elements and offer a comprehensive representation of societal-level challenges, including proposed actions for improvement and potential future systemic effects (Ryan, 2014).

PS Precedent Studies:
Analysing existing projects with circular activities to identify key roles, structures, and spatial elements that contribute to circularity. Site visits, interviews, and website analysis are conducted to gain insights.

SA Stakeholder analysis
Identifying stakeholders in the neighbourhood and relevant for circularity in the area. Via Network analysis (Literature review, policy review, social media research, fieldwork, interviews, analysis KIEM living lab)

W Workshops
Two workshops are planned with the pattern language. One co-creation workshop, with various stakeholders in the field of the current food system and one co-design workshop with architects, that are part of the living lab. The workshops test the usability and understanding of the pattern language as a systemic design approach and communication tool.

E Evaluation Tool
According to Food Urbanism by Verzone and Woods (2021), an assessment tool was developed to evaluate case studies related to urban quality (Appendix 12.1). The evaluational tool was adapted according to the assessment tool in the book Food Urbanism by Verzone and Woods (2021). It got adapted by combining it with the components of the conceptual framework (page 60) of this project.

MS Micro Stories
Micro stories are a method of making the everyday life of the residents in the neighbourhood more tangible. Identifying the daily activities of the people and visualising them in stories to being able to identify with the life of the person. Way of storytelling and creating persona's, and analysing the neighbourhood on a Micro stories take many forms, ranging from text to audio, visual, location, emotional state, and anything else people consider important. (Jain & Slaney, 2013).

Micro stories as a research by design element

In order to link the social analysis conducted through observation, community engagement and interaction, the spatial aspect was linked through a design process of identifying and designing the everyday spaces of the stories observed in the neighbourhood.

These micro-stories were derived from spontaneous interviews, overall observation of the foodscape, input from the experiences with the Living Lab Kiem and input from the co-creation workshops.

These micro-stories and interpersonal interactions were part of the development of the pattern language. All this subjective input is part of the overall system and network of knowledge, which also shows how adaptable and diverse a pattern language design can be.

3.7. CO-CREATION APPROACH

Why co-design or co-creation?

To broaden the perspective on the project and get different insights from different perspectives, co-operative working is very valuable and is used in this project: to better understand the complexity of the project and to work on it with different attitudes. To achieve a more holistic outcome of the project by actively involving other perspectives.

In order to develop an integrated and more holistic, decisive transition for the neighbourhood, this project has chosen to get more insights, different inputs and perspectives from different relevant stakeholders in the area.

At the outset of this project, connections will be made between the stakeholders working on the transformation of the area, from the city administration to the planning sector to the organisations that are socially and environmentally engaged in the area - to give them room for manoeuvre and broaden the scope and input for the project development.

Co-design workshop

To test how the pattern language can be translated to a spatial design proposal for a circular neighbourhood in Schalkwijk - a co-design workshop was set up with the architects of the living lab.

Their knowledge and understanding of the place is highly valuable for this project development and testing of the pattern language.

Co-design

This is co-operative design or participatory design for exchanging design experiences. In which relevant stakeholders are treated as equal collaborators. The participants have a design background, so showing a map and sketch is understood by the participants and there is a basic understanding of the current spatial developments and they have a sense of the space and how interventions could be implemented. Co-design is used to test the possibilities of pattern language as a design tool.

In the chart below are the five steps that were presented during the co-design workshop. In chapter 8 the execution of the workshop will be explained.

Five steps of the Co-design workshop

1. 5' **EVALUATE**, whether the chosen patterns as relevant and indicate if they are missing a pattern which can be added from the rest of the pattern language.
2. 5' **PRIORITISE**, the chosen patterns.
3. 10' **ANALYSE** maps according to prioritised patterns
4. 10' **LOCATE** the prioritised patterns on the map
 - a. Map is discussed with viability of the prioritised patterns
 - b. Add patterns or/and choose patterns form secondary patterns
5. 30' **SKETCH** out possible translations of the patterns into a design on the site map
 - a. Evaluate given set of patterns and indicate missing patterns

Co-creation workshop

Is carried out with the relevant stakeholders, whereby the workshop is abstracted from the spatial interventions, i.e. the mapping takes place within a matrix and not on a map. To discuss and develop a shared sense of values. Co-creation allows participants to influence the process at different stages of the process.

Co-creation

Co-creation is based on experience and knowledge of the specific topic that the co-creation workshop is about, as the participants must have knowledge of their own needs and daily lives and be able to relate to the project. For this reason, a co-creation workshop with residents was not conducted for this project, as the project assumes a set of basic needs in the current food system that will be addressed in this transition. Overall, stakeholders are not only included as part of the research, but are also given the opportunity to contribute to the project process.

The intended outcome of this co-creation workshop is a discussion between the relevant stakeholders about the value and effort required to realise a particular set of patterns. As the exchange and discussion between each other not only informs the researcher, but

the interaction also expands the knowledge between the stakeholders, the understanding and openness to share, help and understand each other is much greater than when there is no physical connection (own experience with the Living Lab Kiem workshops and discussion during the co-creation workshop with one of the participants).

In the visual below you can see the five steps that the co-creation workshop can be executed with.

What is the difference between co-design and co-creation?

The difference lies in the structure of the workshop and the way in which the pattern language is used. The professional backgrounds of the participants in the workshop are different.

Utilisation of participation

There is a fine line between how the workshops utilise the knowledge of the relevant stakeholders. It is also important to know what knowledge the project needs and which stakeholders to invite in order to run a productive co-creation workshop.

Five steps of the Co-creation workshop



Living Lab

In order to propose and build this project about people and place, the main method of gaining insight and knowledge of the area is to study the neighbourhoods and district first hand. The main research method of these field trips was to explore the area by bike, public transport and on foot. Dialogue and exchange wherever and whenever possible and useful. The experience gained from participating in the Living Lab 'Kiem' gave a good insight into the way the structure of actors and interaction in the Boerhaavewijk neighbourhood has developed and, following discussions with older people and other groups during the Living Lab workshops, a deep insight into the needs of residents from different groups.

The Living Lab 'KIEM' was the initial input to focus the project on the Schalkwijk neighbourhood. KIEM is located in the Boerhaavewijk neighbourhood of Schalkwijk and is funded by the Stimuleringsfond 'Aanders Werken aan wonen', an organisation dedicated to exploring new approaches to housing solutions. The Stimuleringsfond is a cultural fund that supports design, architecture, digital culture and related interdisciplinary fields, in this case innovative housing projects in the Netherlands, such as KIEM. The Living Lab is led by two architecture firms - 'studio DMAU' and 'AP+E' - and the former city planner of Haarlem. The lab focuses on the interplay between place, process and plan. By integrating the 'planned city' and the 'inhabited city' within a framework that illustrates how the transition could appear in an interconnected way. This approach takes into account the 'Omgevingsvisie 2050', which outlines how the city of Haarlem intends to improve its environment by 2050. It considers not only the spatial parameters of the planned city, but also the potential spatial opportunities offered by the neighbourhood, as well as the ideas and wishes of its residents. In addition, the Living Lab has conducted

several workshops to gain insight into the needs of different stakeholders and residents. The workshops have already established a basis for communication between different stakeholders and provided valuable input from the city's past experiences to facilitate the urban planning process. During the workshops, over 100 ideas were collected from local residents, participants and stakeholders about the situation and potential development of the neighbourhood, which were then used to develop a framework plan. The team is working on networking and engaging with different stakeholders to address the housing problem in the area through densification, while focusing on a different way of working and discussing alternatives to the current planning processes.

For using the knowledge of the Living Lab, this research project is part of the umbrella under which the Living Lab interacts, this project is part of TU Delft.

The project used the knowledge gained from the interactions with residents and stakeholders to develop a framework plan based on the social and cultural values and needs of the area. The resulting plan

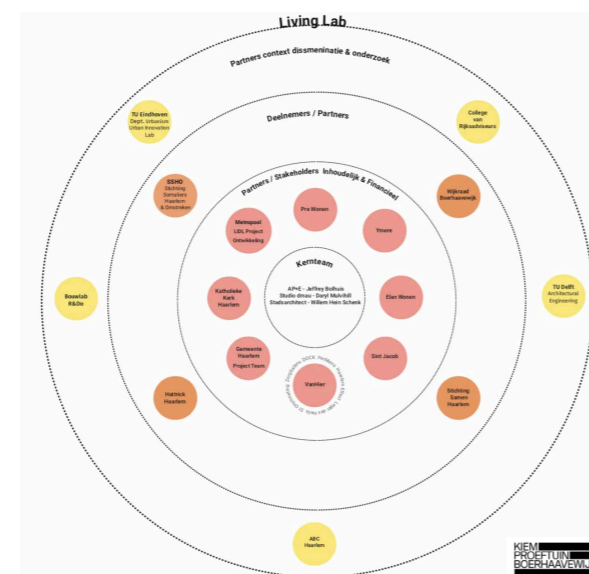


Figure 41 Stakeholders of the Living Lab Visual by Living Lab KIEM, Partner Bijeenkomst 27.9.2023

serves as an excellent guide and example of how the use of ideas, and in this project's case pattern language, can be used to create a spatial framework plan. The pattern language used in this project to develop a circular food system is derived from the needs of the residents of the neighbourhood, as well as the inputs and requirements from the municipal perspective that were observed during the Living Lab period, and some of the more than 100 ideas are also an input base for the pattern language developed in this process.

For a co-design workshop in which the knowledge of the architects of Studio DMAU and AP+E Architects is integrated to see how far the developed design language is relevant for the transformation and future phases of the neighbourhood.



Figure 42 100+ ideas of the Living Lab Visual by Living Lab KIEM, Partner Bijeenkomst 27.9.2023

For a co-design workshop in which the knowledge of the architects of Studio DMAU and AP+E Architects is integrated to see how far the developed design language is relevant for the transformation and future phases of the neighbourhood. It should be noted that the architects of the Living Lab have been working for several years on various projects in the Schalkwijk neighbourhood and in collaboration with various stakeholders in the area. They therefore have a lot of knowledge and understanding of the area. With this knowledge, they are now focusing primarily on strengthening the involvement of residents and social initiatives by planning 'shared' spaces, thinking about redesigning the current built structure, redeveloping the social infrastructure and working on urban permaculture.



Evaluation Tool

According to Food Urbanism by Verzone and Woods (2021), an assessment tool was developed to evaluate case studies related to urban quality (Appendix 12.1.).

The evaluational tool was adapted according to the assessment tool in the book Food Urbanism by Verzone and Woods (2021).

It got adapted by combining it with the components of the conceptual framework (page 60) of this project.

With this tool the outcome of the co-design workshop where the pattern language was used as tool was used to evaluate the urban quality related to the conceptual framework of this project.

Principles of urban quality

The relationships between the principles of urban quality are illustrated by Verzone and Woods and relate to governance and management, which can be assessed using sustainable development with the subcategories of environment and liveability, social cohesion and economic vitality (2021). This project encompasses the three pillars of sustainable development - environmental, social and economic - and categorises the relationships between the concepts of environmental well-being, social participation and the basic economy. Connecting the relationships between urban quality and the circular food system. By incorporating the urban performance of Verzone and Woods (2021). Looking at the everyday environment (instead of integration), spatial quality and the food system. This matrix was then translated and adapted to the assessment tool Figure 43.

Relationship among the principles of urban quality

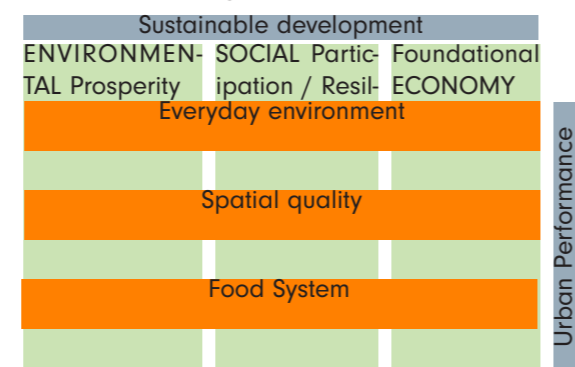


Figure 43 - Matrix adapted by author by Verzone and Woods (2021)

Foodscape Analysis

In order to understand the food places in the district of Schalkwijk, various methods of field research will be carried out. Some methods are inspired by the 'Foodscape Assessment' by Gehl in cooperation with the Cities Changing Diabetes programme of Novo Nordisk.

One method is the 'intercept survey', where interviews are conducted with people who work at the weekly local market in the shopping centre in Schalkwijk Midden. And the customers who come there. In addition, the owners of the grocery stores in the identified foodscape in the area will be interviewed, and residents and users of the everyday foodscape will be interviewed by chance and accessibility.

The observation of the foodscape in the neighbourhood will be carried out by means of the snapshot analysis (inspired by Gehl), which consists of these methods:

This method will allow an understanding of the everyday activities of the users of the foodscape.

The next method will be 'movement observation'. Each location in the neighbourhood will be observed for five minutes (5') and the people moving through the location will be counted and analysed by perceived gender and perceived age. Movement is recorded by drawing lines on a map and differentiated according to the modality of movement.

Another method is to 'observe stationary activity'. With this method, only people who are not moving are observed and counted. The perceived gender and perceived age are recorded. The activity of the people is documented by a picture, a sketch or a description of the situation if a picture is not sufficient. A mixture of several sedentary activities is possible. For example, reading, lying, sitting, waiting at a bus stop, queuing for food, standing, playing, selling food, talking, etc.

The foodscape mapped through desk research will be observed at eye level by understanding the types of food outlets, food production and food logistics in the neighbourhood. To understand what kind of

food is offered and sold or produced, what users the shops or production sites have. Whether it is sit-in or take-away. Whether it is an urban garden or an allotment and how big the plots are. The opening hours are documented and the times when people can access the food. The physical accessibility for people is also analysed, to see if the access is barrier free and the materiality of the pavement and the entrance. And also visual accessibility, to see what food is being produced or sold behind the facade. Or if there is a facade at all. Identifying mobile vendors that are not visible through desk research and identifying visual patterns, such as advertising, that draw attention to the location. Accessibility and availability by different modes of transport will also be analysed, such as the number of parking spaces for cars and bicycles in front of the food location.

Finally, these observations are evaluated to identify access to urban quality. This will identify the human experience of quality of place. This shows which spatial conditions can promote or hinder quality of place. This will provide spatial starting points for improvement and change that take into account the everyday lives of the foodscape users in that specific location and can then be combined with the more strategic systemic spatial design interventions.

3.8. PATTERN LANGUAGE AS A CO-CREATION APPROACH

Pattern language: A method to capture and share knowledge through interconnected design patterns.

Pattern language can function as a research and design method. It can complement the co-creation approach by providing a structured and systematic way to capture and share knowledge. It can help identify and apply design patterns that address the complexities of social-ecological urban systems, supporting the development of sustainable and resilient neighbourhoods.

The pattern language was first introduced in the book 'A pattern language: Towns, Buildings, Constructions' by Christopher Alexander et al. (1977). The individual patterns are a combination of a spatial design implementation or action and the theoretical backup. Thus, is a great design approach to combine theory and research with design in this project.

The potential of the patterns lies that the patterns relate to other patterns, and thus create a pattern field – or language, making sense between the in-

dividual design patterns and theories. Thus, the creation of pattern fields can be used a research method to categorise and structure theories connected with spatial interventions and creates a framework (Salingarios, 2000).

This project will be orientated with the pattern of the 'Cities of making, Foundries of the Future project (2020). The project developed the patterns

The opportunity in developing a pattern language for a circular built environment in post-war neighbourhoods, is that eventually it could be tested and applied also in other Dutch post-war neighbourhood settings. (note to myself: Check that with values!!!)

The pattern language supports the design and research on the strategic approach.

The pattern language unravels the connections between scale and theme. Being able to interpret and evaluate the pattern language helps to understand and design for circular interventions at the neighbourhood scale.

Focusing on how the 'place' of the community can facilitate the spatial interventions required for a cir-

cular neighbourhood. Finally, the design language can serve as a basis for communication.

The patterns help to close the communication gap between the abstract concept of the circular economy and its concrete implementation. There is potential of using patterns to create a co-design process, combining the understanding of patterns with an integrated co-design approach. Understanding patterns that operate and are interconnected at different levels (Salingaros, 2000), an integrated co-design approach can connect the theories and their spatial patterns well with the specific place and its actors.

This thesis will use the pattern language as a co-creation approach in the systemic design to understand and the theory and possible spatial implementations

for a circular neighbourhood with circular actions in the everyday life of the residents in Boerhaavewijk. It will be evaluated in which way the pattern language can be used in a co-creation approach to develop a spatial proposal for a circular post-war neighbourhood.

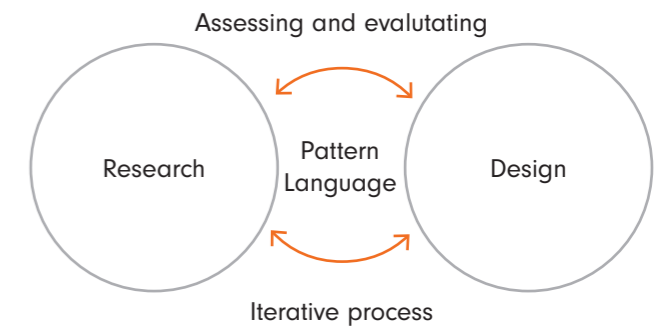


Figure 45 Diagram about design and research approach, created by author

<table border="1"> <tr><td>Title</td><td>Circular & collective buildings</td></tr> <tr><td>Hypothesis</td><td>Energy positive buildings, highest sustainable standard, that provide a closed water usage cycle and crates a collective living environment to share materials and products within a society</td></tr> <tr><td>Theoretical back-up</td><td>Circular building design could significantly reduce the environmental impact of buildings and the pressure on natural resources (Kanters, 2020)</td></tr> <tr><td>Practical implications</td><td>Renovate buildings, implement renewable energy production, create a communal space for fostering social interaction Innovative circular building materials Dry connections in building structure</td></tr> <tr><td>Image</td><td></td></tr> <tr><td>Relations with different patterns</td><td>Storage, material passport, collaboration</td></tr> </table>	Title	Circular & collective buildings	Hypothesis	Energy positive buildings, highest sustainable standard, that provide a closed water usage cycle and crates a collective living environment to share materials and products within a society	Theoretical back-up	Circular building design could significantly reduce the environmental impact of buildings and the pressure on natural resources (Kanters, 2020)	Practical implications	Renovate buildings, implement renewable energy production, create a communal space for fostering social interaction Innovative circular building materials Dry connections in building structure	Image		Relations with different patterns	Storage, material passport, collaboration	<table border="1"> <tr><td>Title</td><td>Circular Neighbourhood Hubs</td></tr> <tr><td>Hypothesis</td><td>Repair hubs in proximity engage and enable the process and behaviour of residents to recycle. 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Figure 44 Studio Intensive to develop an own pattern language, created by author

3.9. ANALYTICAL FRAMEWORK

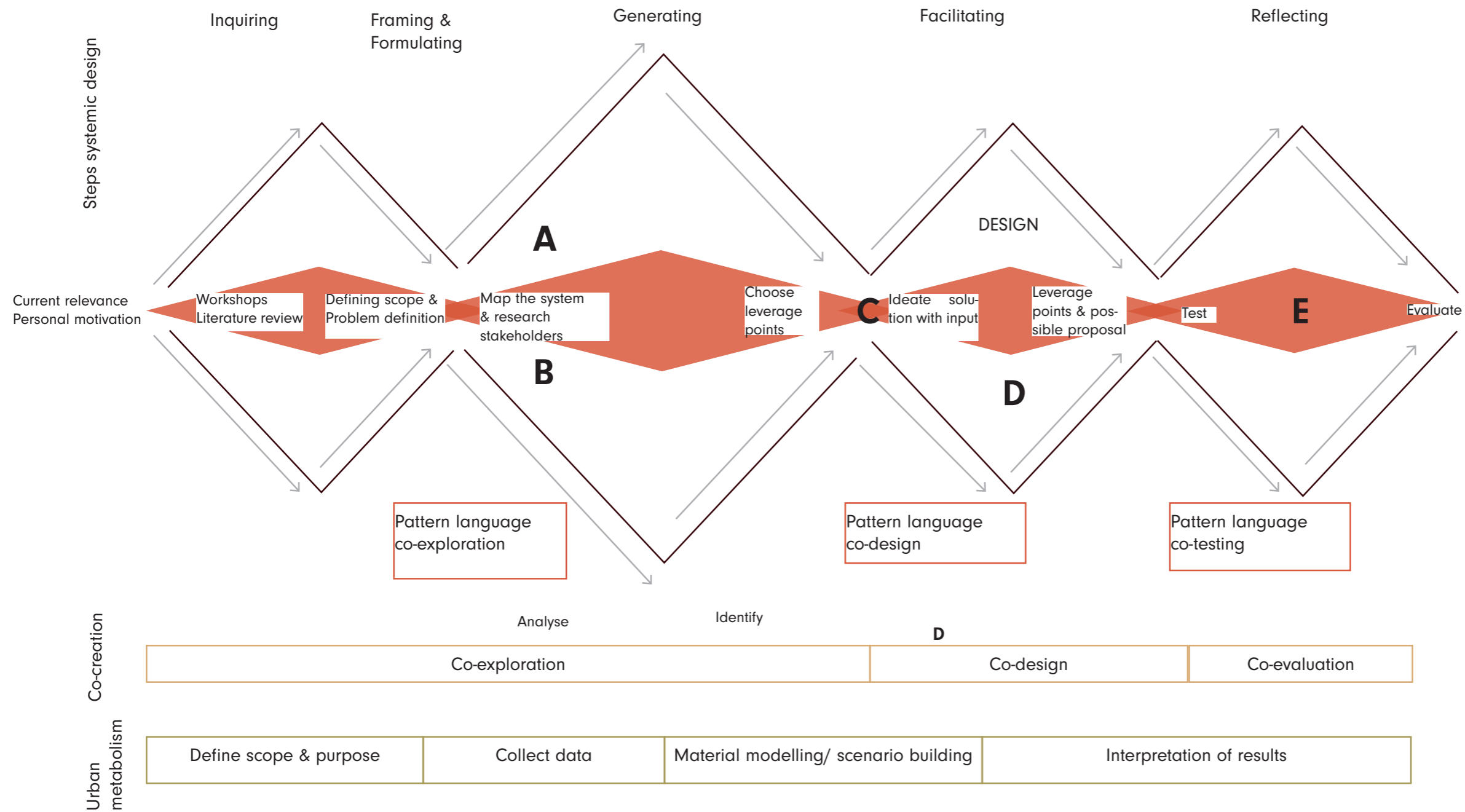


Figure 46
Drawing of analytical framework made by author

Systemic design: A holistic approach that addresses complex challenges through collaboration and considers diverse perspectives.

The foundation of this research and design process lies on the systemic design approach. For a systemic change there needs to be a systemic design process. The systemic design is a holistic approach that deals with complex challenges and systems and is generating innovative solutions by in cooperating co-creation (Systemic_design_theory-video, 2021).

Systemic design can challenge the 'complexity, uniqueness, value conflict and ambiguity over objectives' (Ryan, 2014). It is outlaid for a co-creational approach, taking the diversity of the team developing the systemic design into account. Systemic design is a combination of systemic thinking and design thinking and take a set of values (learning, growth, accommodation, teamwork and mindedness) into account (Ryan, 2014).

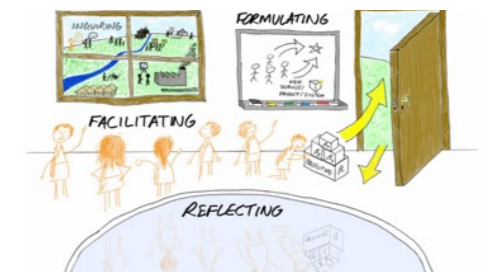
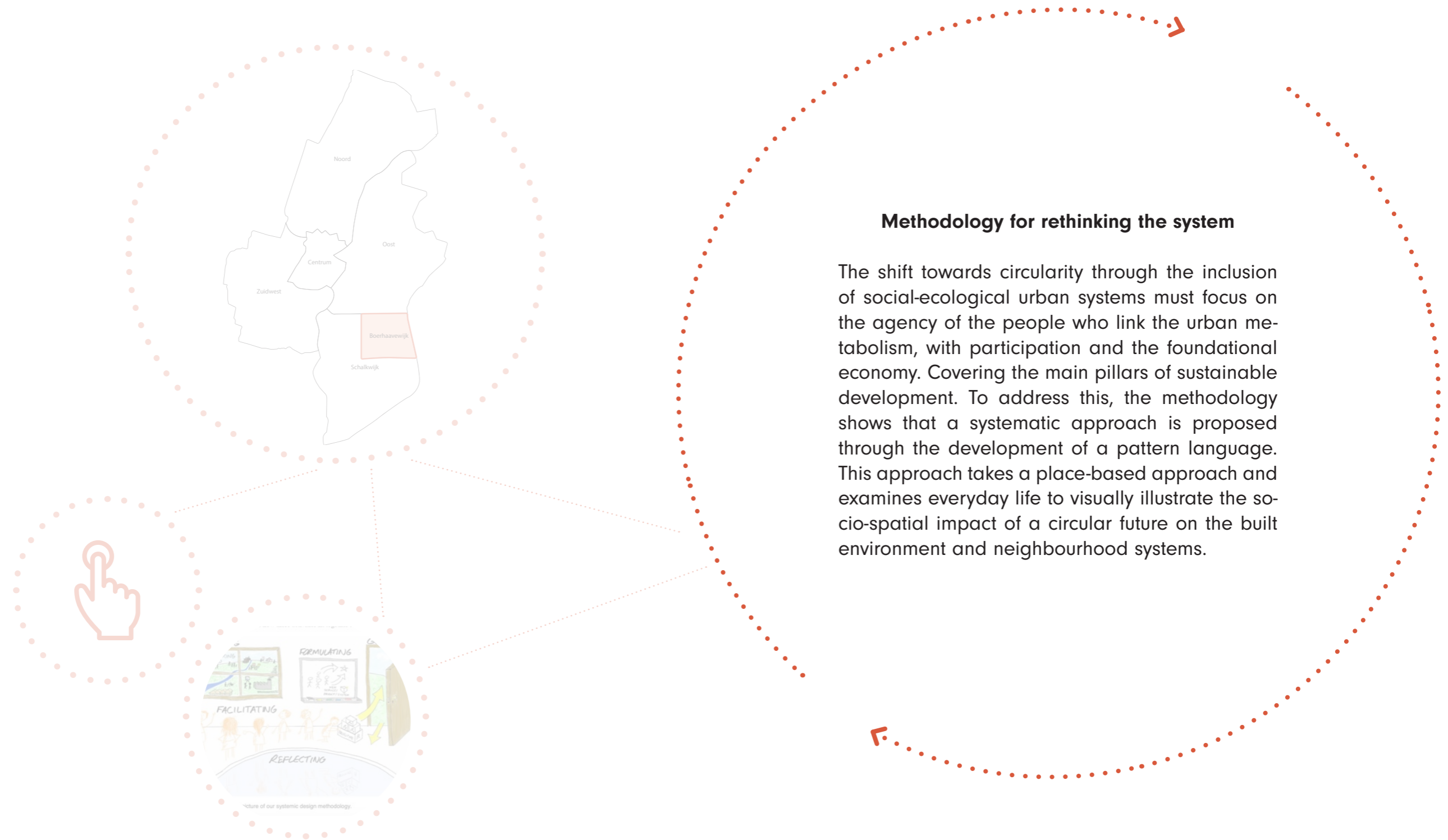


Figure 47
Steps of Systemic design analysis by Ryan, 2014

SUMMARY OF THE METHODOLOGY



Figures are sourced in the previous pages

04 INTEGRATED MORPHOLOGICAL ANALYSIS

This chapter analyses the form and flows of the case 'Schalkwijk, Haarlem', focusing on the food system and related issues such as biodiversity, food accessibility in the district, and ownership and accessibility of the infrastructure network.



Figure 48
Picture by the author

4.1. LANDSCAPE

Haarlem's landscape is a mixture of urban and agricultural richness. The historic city centre was built on the trade route between The Hague and Amsterdam. The agricultural areas are an integral part of the region's identity.

Agriculture

The extensive farmland that stretches to the outskirts of Haarlem is an important feature. The fields between Haarlem and Leiden, decorated with tulips, form a colourful patchwork that emphasises the area's strong link to floriculture during the flowering season. The fertility of the soil, which is especially suited to tulips, has made this region a key location for the cultivation of these flowers.

Dunes

The agricultural area is bordered by the dune area. This is a distinctive and ecologically valuable feature. As well as enhancing the natural beauty of the landscape, the dunes also have a practical function, acting as a barrier against the North Sea and protecting the city and its surroundings from potential coastal hazards. The tactical positioning of Haarlem in close proximity to these dunes in the selection of sites is based on both agricultural sustainability and environmental resilience.

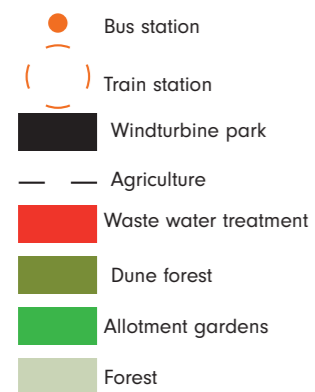


Figure 49
Map of the landscape, made by author, based on bgt data

Water management

In general, Haarlem lies just above sea level. Haarlem is situated approximately at sea level, with different elevations in the city and its surroundings. The specific elevation ranges from 1 to 5 metres above sea level, depending on the location within Haarlem. Due to the low-lying nature of the region, it is necessary to carefully manage water to prevent flooding and ensure the city's resilience to water-related challenges.

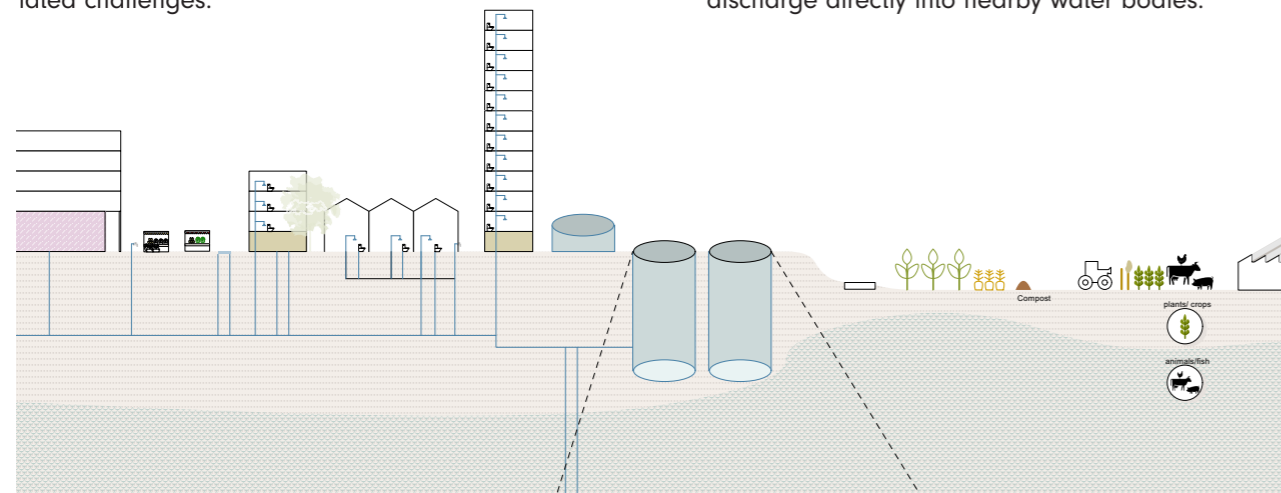
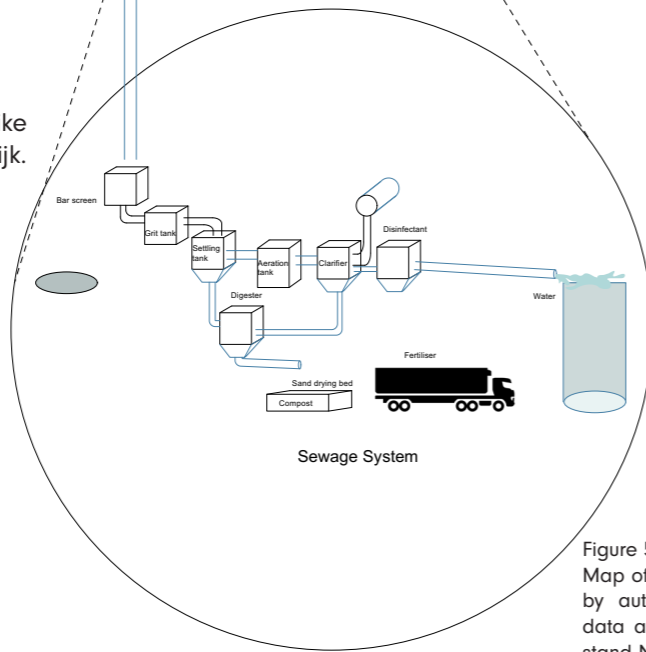


Figure 50.1. Systemic section water in the neighbourhood. Section made by author.

Processes of a sewage system plant, like the one located north east of Schalkwijk. Figure 50.2. Drawing made by author, adapted from Australia (2023)

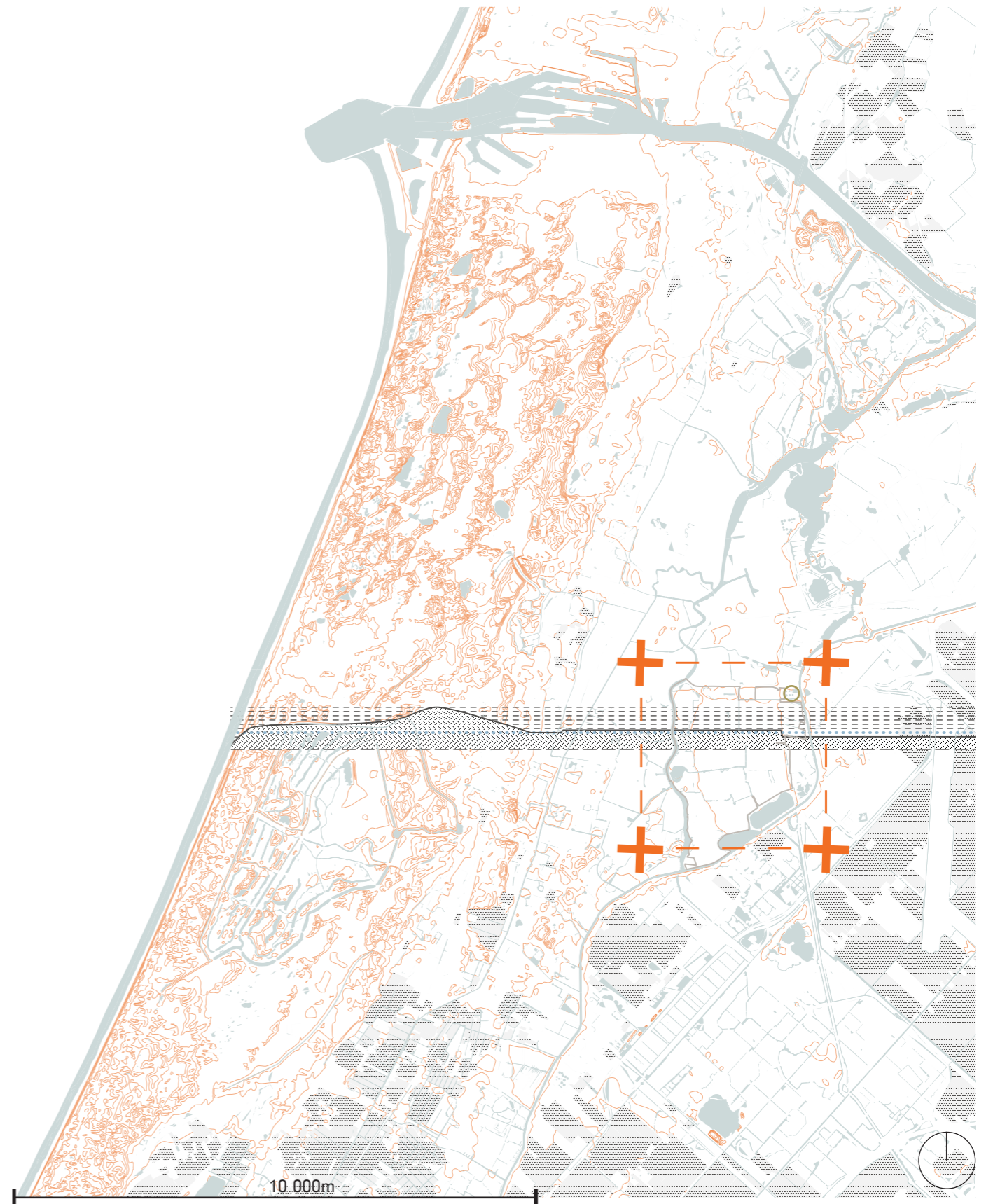


- Waste water plant
- Level Curves
- Agriculture
- Water structure

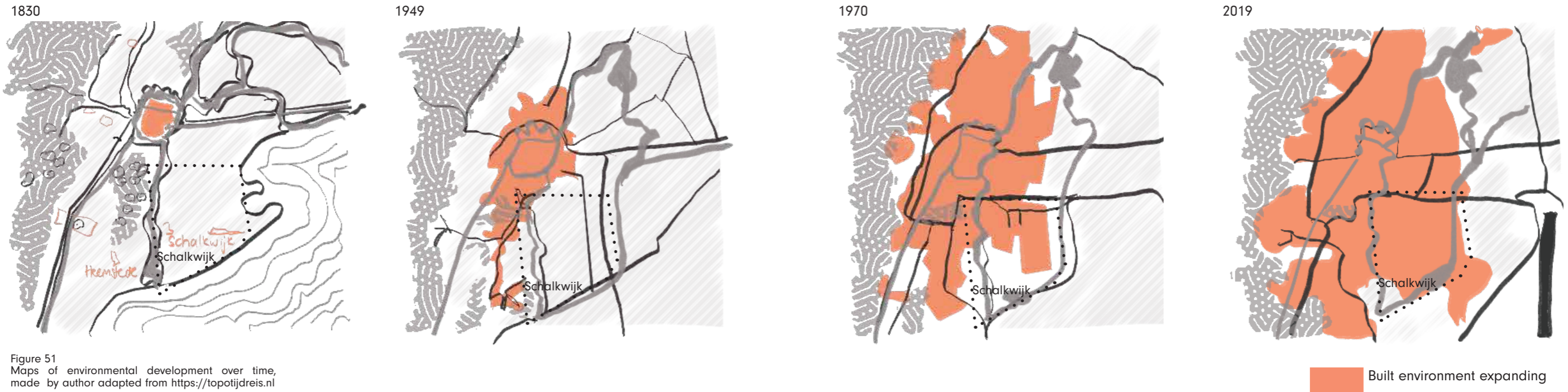
Sewage system

The district's sewage system combines rainwater and human sewage in a single sewer. This practice wastes water unnecessarily and has a negative impact on the environment and its resilience. During periods of heavy rainfall or storms, combined sewer systems can become overwhelmed and overflow. This particular overflow often carries a combination of storm water and untreated sewage and can then discharge directly into nearby water bodies.

Figure 50. Map of the landscape, made by author, based on bgt data and Actueel Hoogtebestand Nederland (ANH)



4.2. Urban development over time



Located next to a sea
'Haarlem': 'close to a forest dune'
developed on a strip of sand above sea level

1st canal of the Netherlands was between Haarlem and Amsterdam

Beer brewing and textile industry with cotton mills was important economy until 1830

Structure after end of second world war
After WWII the industries moved out of the city

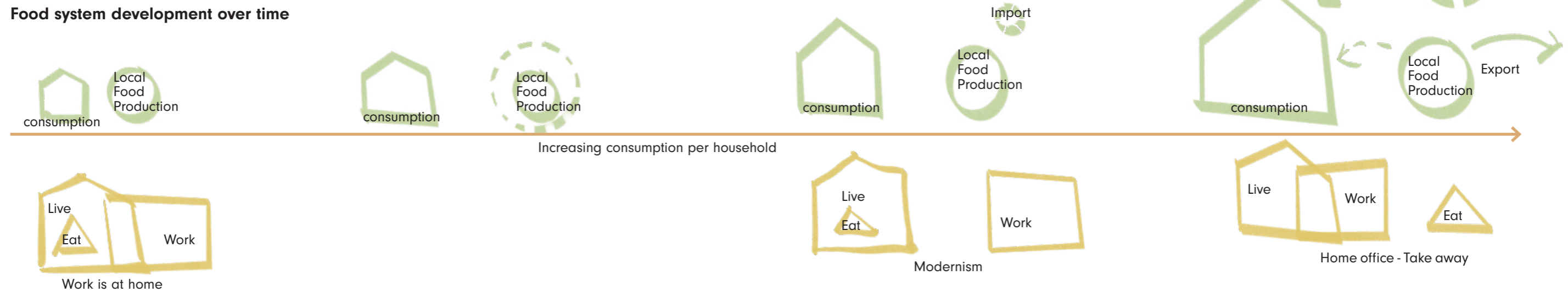
The centre of industry and shipping moved to Amsterdam

New wave of immigrants from former colonies sin Indonesia

Government funding building projects, the reconstruction projects, to facilitate the needed housing after the WWII.
Schalkwijk, including the neighbourhood Boerhaavewijk was constructed

Now Haarlem is know as a 'bedroom community' as it contains mostly residential buildings and not much industry. Or commercial options
Most of the residents commute else for work.
Goal to be circular by 2045

Food system development over time

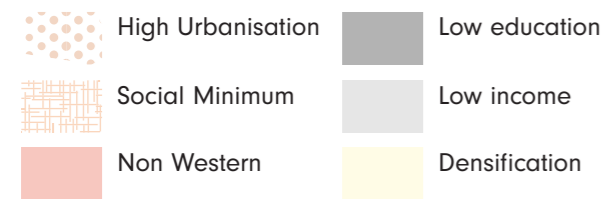


4.3. SOCIAL-ECOLOGICAL SPATIAL MAPPING

Overall, the socio-environmental spatial mapping shows that the most vulnerable neighbourhoods in the area not only face a lower level of social infrastructure, but also environmental insecurities such as higher levels of noise and air pollution due to the proximity of transport hubs via the road system and

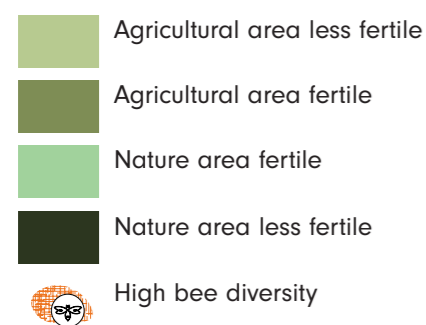
Social demographics

In the Schalkwijk focus area, there is great social inequality and vulnerable neighbourhoods. The district has the lowest-income neighbourhoods of Schalkwijk with other vulnerable population groups such as people with a low level of education who are below the social minimum and a very diverse neighbourhood. These factors have an impact on the neighbourhoods in Schalkwijk.



Bee diversity & Soil fertility

Bee map and soil of agricultural land show that diversity of bees is lower where there is fertile quality of agricultural soil. Whoever around the green fringe of the neighbourhood and at the areas where there is urban farming the diversity of bees is higher.



also the airport. In addition, the area has poor soil quality, which means that it is unable to absorb water in the event of extreme rainfall: there is a higher risk of flooding and it is also more vulnerable to climate risks (RIVM, 2020).



Figure 52
Mapped based on buurt&wijkenkaart information



Figure 53
Maps of environment with QGIS and Klimaatverandering in Nederland. (n.d.). <https://klimaat.esri.nl/> , and Atlas Leefomgeving, NL



Figure 54
Maps of environment with QGIS and Klimaatverandering in Nederland. (n.d.). <https://klimaat.esri.nl/> , and Atlas Leefomgeving, NL

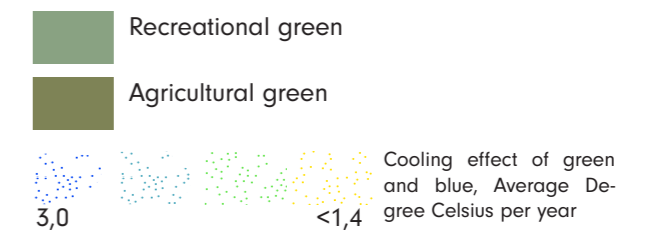


Figure 55
Maps of environment with QGIS and Klimaatverandering in Nederland. (n.d.). <https://klimaat.esri.nl/> , and Atlas Leefomgeving, NL

Land-use & Temperature

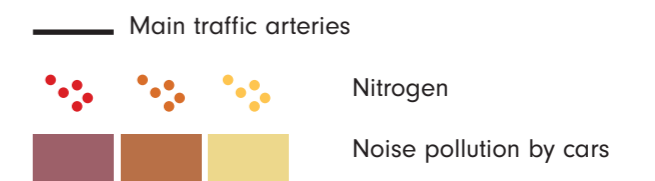
There is a correlation between land use and the temperature of the surrounding area. The area on the outskirts of the city, adjacent to the surrounding polders and dunes, is colder than the urban environment.

The air quality is also better around the dunes and the green and blue structure south of Haarlem. The eastern part of the area is polluted by air traffic.



Highway infrastructure & noise pollution & nitrogen

There is a spatial connection between the transport network via the air and road system. Noise pollution is located along these infrastructure hubs and nitrogen pollution is also measured most strongly along the transport infrastructure.



4.4 THE FOOD SYSTEM

In the current food system, it is evident that the distribution of goods and food is mainly through the use of vehicles on motorways or by walking along the streets and observing the numerous trucks. The distribution of food seems limited in everyday perception, especially if one is not employed in the food sector. For example, the unloading of goods at the back of a shop may obstruct the access route due to a lack of space or inadequate planning for loading goods from a truck into the shop. Another area where distribution is evident is delivery. In every Dutch town, groceries are delivered to your doorstep every day by fast orange or pink bicycles. These bikes are associated with the shop or restaurant. This is the consumption part of the food chain. The real part of the food chain, the part that is most experienced by the everyday user, is consumed on an almost daily basis. Whether it is a coffee, a loaf of bread from the supermarket, a kapsalon from the snack bar, or simply shopping, the experience of shopping varies depending on the location - a large supermarket or the local weekly market outside. In addition, the amount purchased affects the experience. The overall experience of food retailing is therefore different. It also depends on whether the person is walking, driving or cycling. Lidl, for example, relies on mass consumption and bulk buying, so car infrastructure is important to them. The weekly local market is accessible by public transport or bicycle from the surrounding area, so it is located in the neighbourhood. The local neighbourhood supermarket provides an opportunity to socialise with neighbours. The market offers a variety of products that are consumed at home, in restaurants, or in public spaces with take-away options. All waste or recycling occurs during food preparation, consumption or disposal in the kitchen, in restaurants or in public bins. Any waste or recycling that occurs during food preparation, consumption or disposal in the kitchen, in restaurants or in public bins. All waste or recycling occurs during food preparation, consumption or disposal in the kitchen, in restaurants or in public bins. From the kitchen, the next step is to transfer the waste to storage and finally to take the collected separated or unseparated waste to the public collection point. From there, the food system is more distant and the noise of garbage trucks and beeping cars is not part of everyday life.

What is the human experience of the foodscape in Schalkwijk, Haarlem?

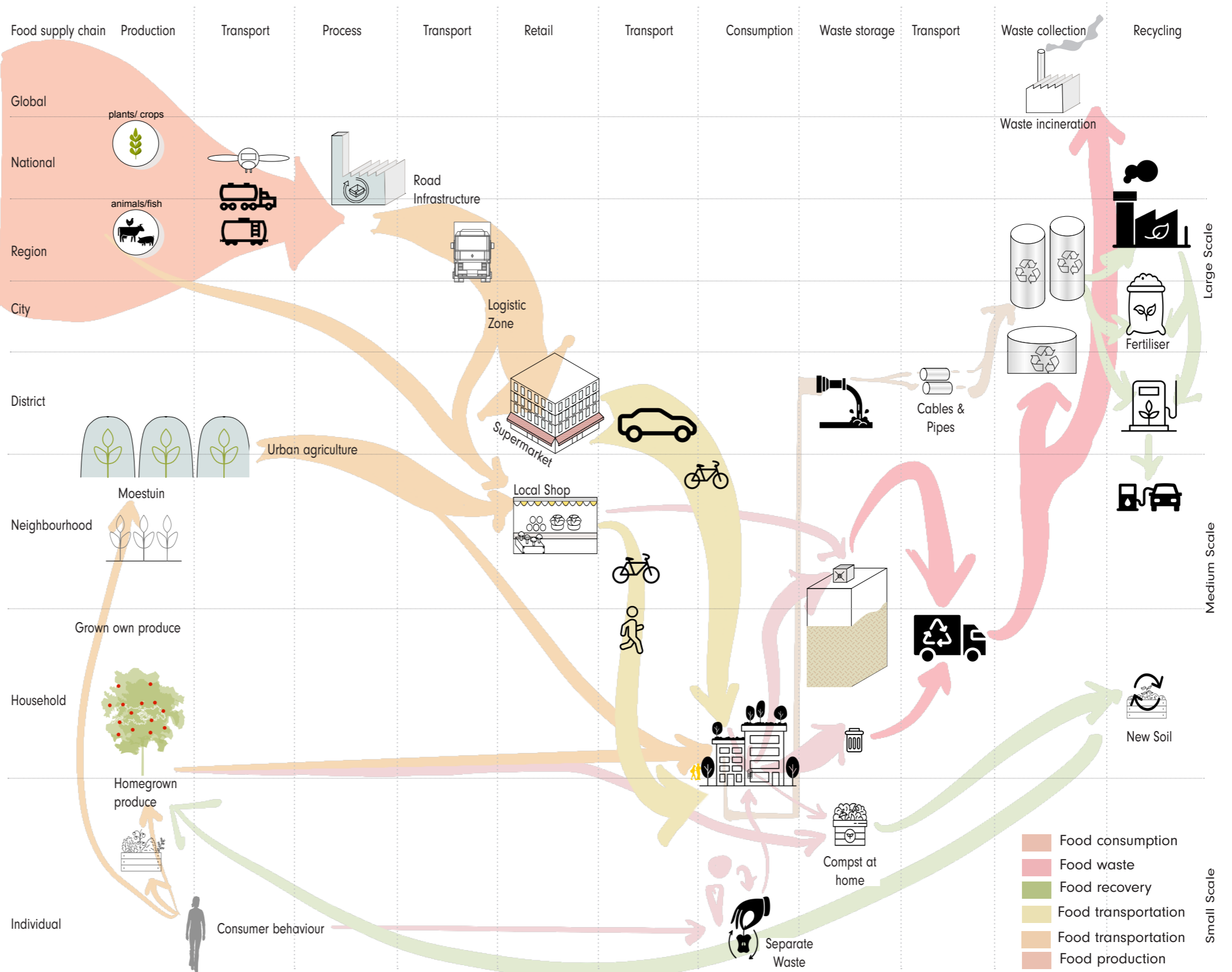


Figure 56
Diagram of food system made by the author

The social-ecological dynamics of the foodscape begin with food production. Currently, production takes place largely at a global level, and in some cases at a regional level, as shown on the map. In addition, production takes place at a neighbourhood scale, such as community gardens, allotments in the green outskirts of neighbourhoods, and moestuins in front of residential buildings. Circular production practices are also already being implemented, as in the case of the Osterzwammerij in Haarlem and Bloemendaal (Oesterzwammerij, n.d.-b). Food production is a daily activity for some residents in and around the district, based on social initiatives, individual innovation, social organisation and start-up businesses that focus on local food production.

The products are then transported to places of consumption. In the Schalkwijk neighbourhood, the well-known place for consumption is the Schalkwijk Midden shopping centre. In addition to other consumer goods, the shopping centre also includes a bakery, a local wine shop and various restaurants and snack bars. However, the majority of the shops are large chain restaurants such as McDonald's and KFC, as well as sub-market chains such as Albert Hein and Aldi. In addition, a weekly local market is held every Tuesday in the shopping centre's usual car park. Residents are likely to shop in the centre of Haarlem and along the high street in Heemstede. The town of Vijfhuizen also has its own supermarkets. However, the Schalkwijk Midden shopping centre is still closer for residents than the centre of Haarlem, and they are more likely to visit the centre of Haarlem or the main street of Heemstede. However, the residents of Vijfhuizen and the surrounding neighbourhoods may find it more convenient to use the Schalkwijk Midden shopping centre, which is closer than the centre of Haarlem. A closer look at the district reveals that, apart from Schalkwijk Midden, there is a supermarket in every neighbourhood, including a supermarket chain. Lidl in Boerhaavewijk, Vormar in Meerwijk

Figure 57-60
Maps of food system made by author with information of Dataset: Basisregistratie Grootchalige Topografie (BGT), database of Bedrijven op de Kaart, and open street map

PRODUCTION

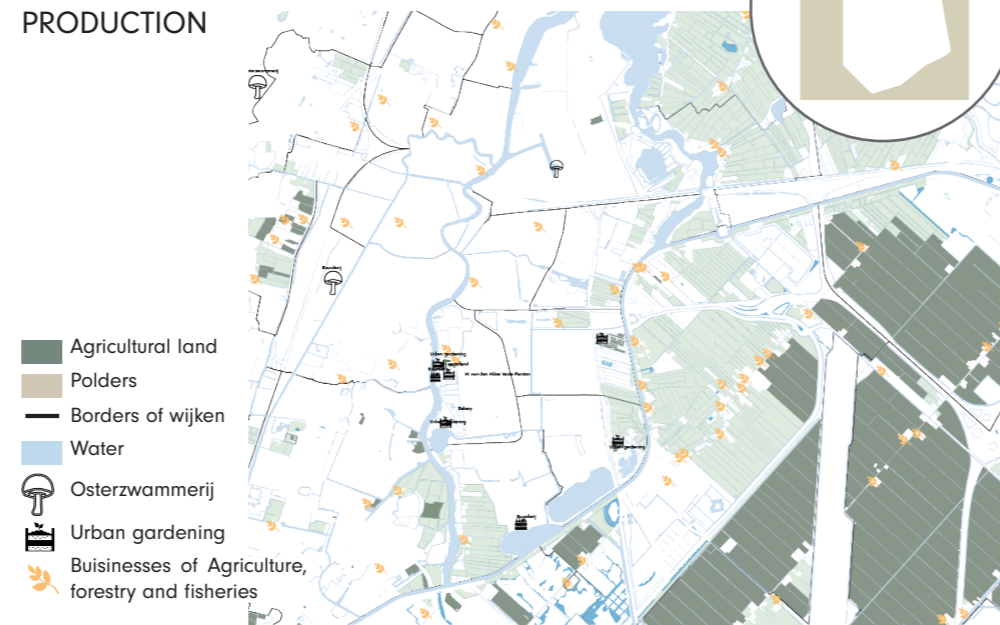


Figure 57 - Food production mapped

REGENERATING

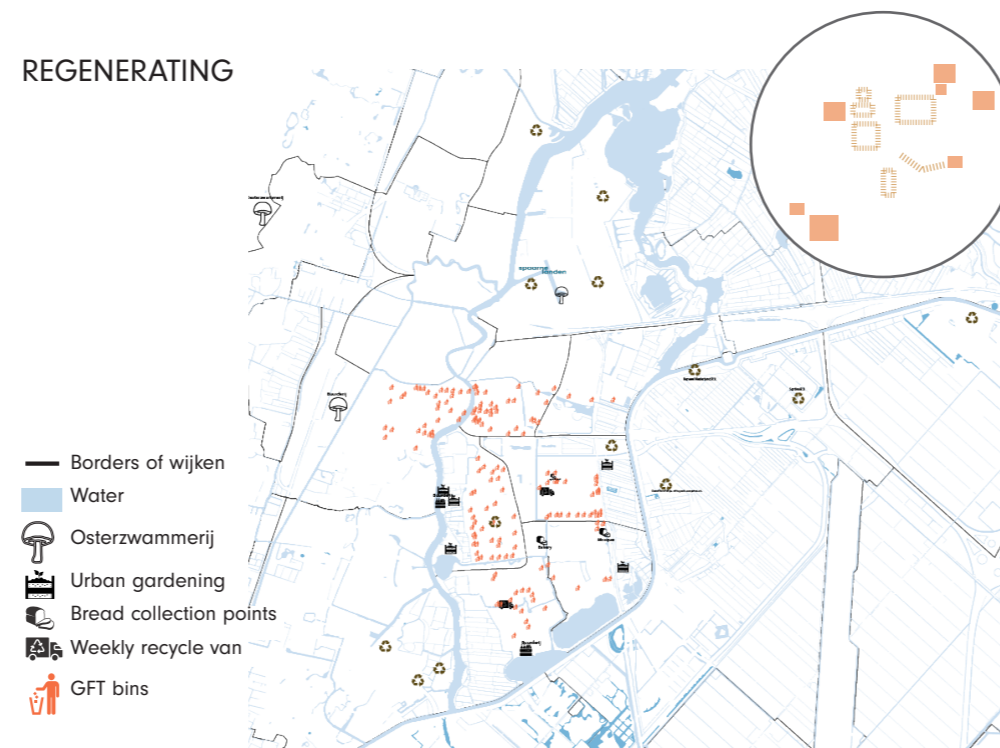


Figure 58 - Map of regenerating spaces of food waste

CONSUMPTION

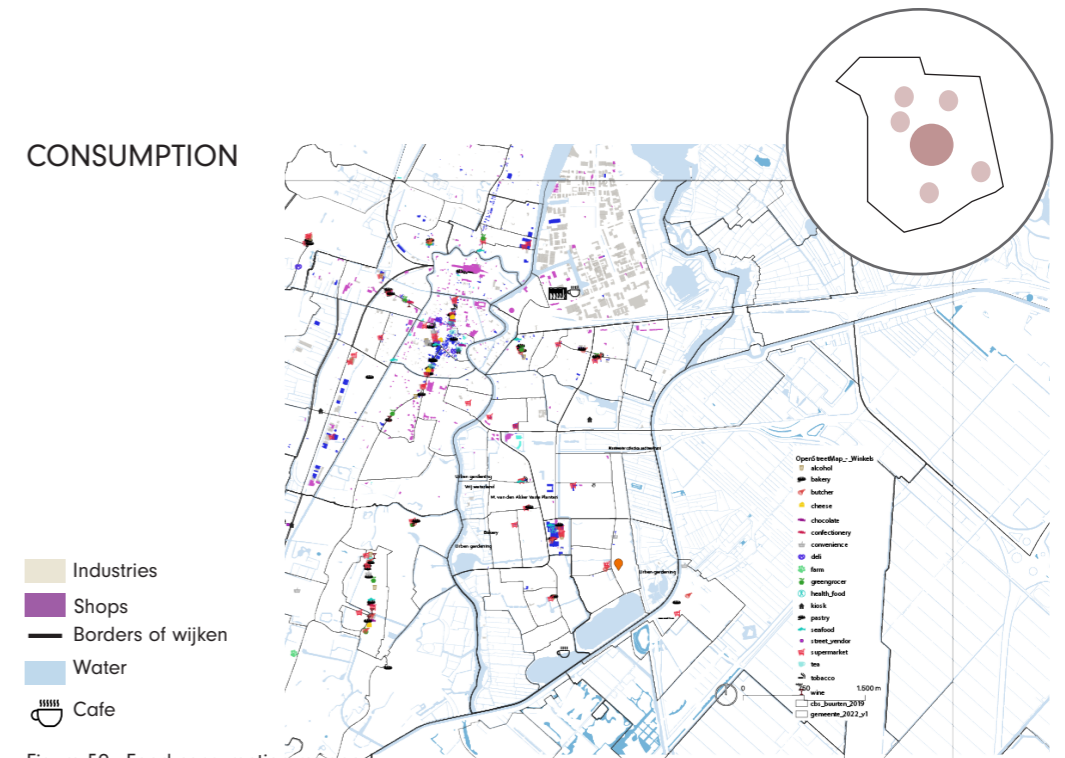


Figure 59 - Food consumption mapped

WASTING

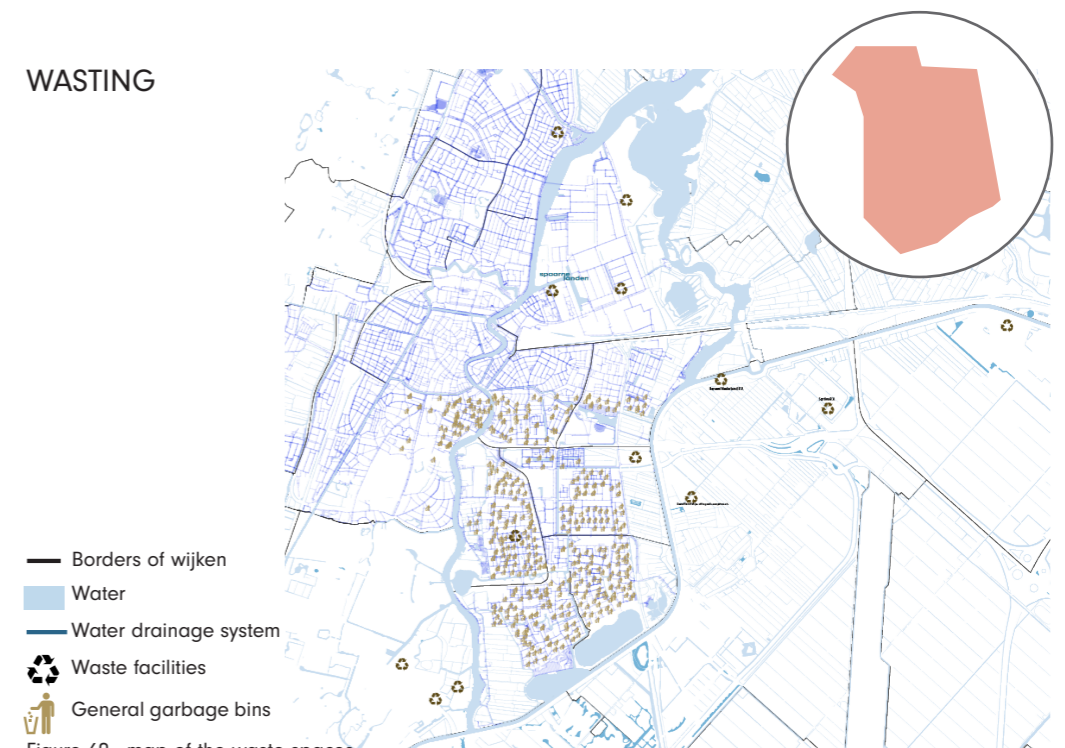


Figure 60 . map of the waste spaces

and Europwijk and Jumbo in Molenwijk are the main supermarkets in the area. In addition, Meerwijk and Europwijk have their own local shops that cater to the specific needs of residents, such as a shop in Europwijk that employs people with disabilities and a shop in Meerwijk that specialises in halal food. These stores offer a more welcoming and personalised shopping experience, as highlighted in the Foodscape snapshot analysis chapter.

Looking at the final stages of the food chain, the organic waste collection bins are not evenly distributed across the neighbourhoods. They tend to be located on the outskirts of the city, near larger buildings. This is related to the waste collection system,

where individual houses have their own bins and only multi-family houses require a shared organic waste collection point. It should be noted that in these locations organic waste is still separated in bins rather than in one of the underground containers.

These findings suggest that there is potential to improve access to waste separation. Waste treatment facilities are located further away from the town. There is a wastewater treatment plant north of Schalkwijk with considerable potential for integration into a circular food system and an associated biogas plant.

Waste separation takes place at the Waarderpolde, which serves as a central waste collection point

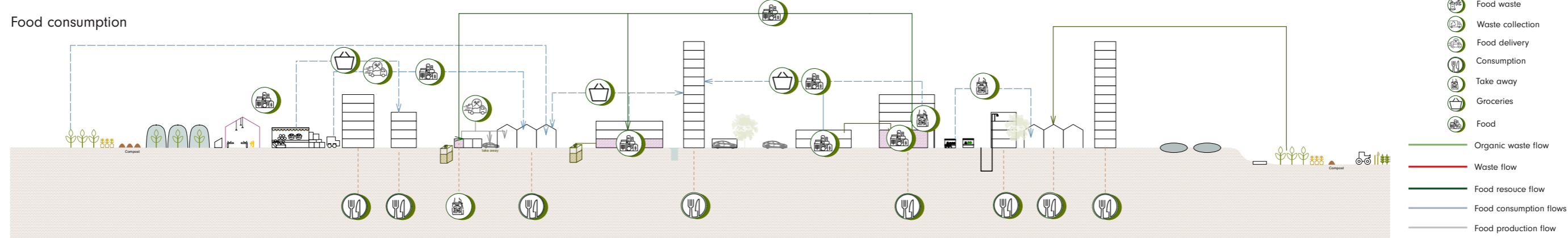
(Funcke, 2023). In addition, Schalkwijk is home to 'snuffelmug', a second-hand shop. There is also an organisation called 'Stichting MooiZooi' that collects and repairs unused household furniture, textiles and objects for recycling. However, there are no such circular actions in the food system. The collected organic waste is transported to the Bigas facility in Alkmaar, which is approximately 30 minutes by car and 36 km from Schalkwijk (Funcke, 2023).



Figure 61 - Food system in the area abstracted
Made by author

The current food flows in Schalkwijk

Food consumption



Food regeneration & Food waste

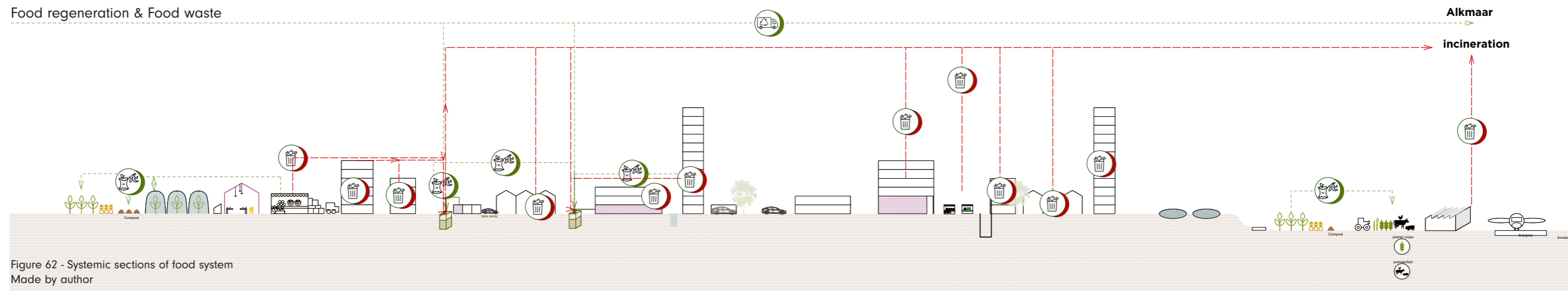


Figure 62 - Systemic sections of food system
Made by author

4.5. THE CURRENT ECO-SYSTEM

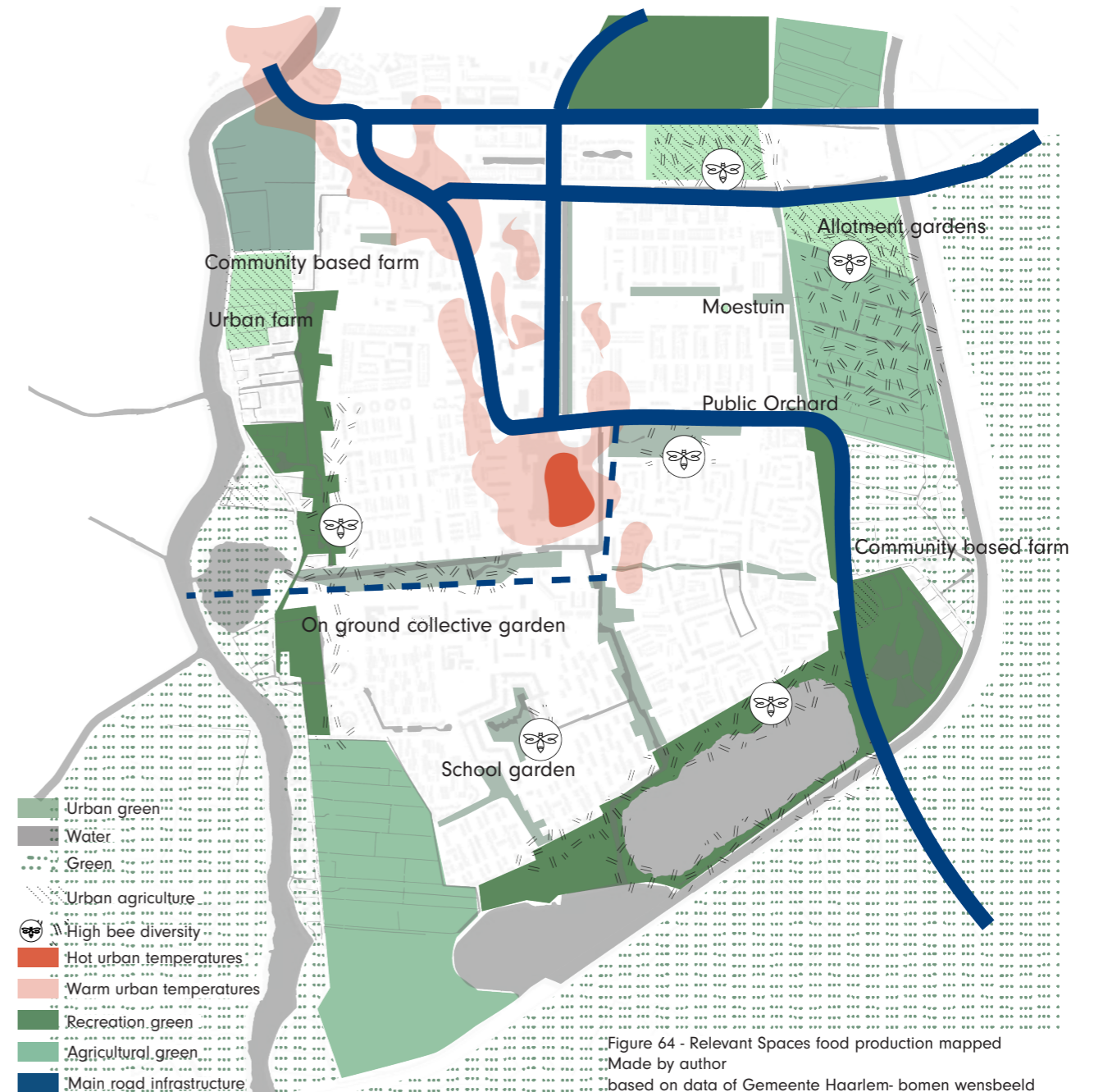
The Schalkwijk area has many green spaces and old trees, making it one of the greenest areas in the city of Haarlem. It also has a beautiful recreational route that connects the residential areas with the agricultural areas. Schalkwijk has also been a centre for the development of urban agriculture, including a two-community farm, an urban farm and allotments with a variety of plants that attract pollinators such as bees. On the biodiversity map, the bee population density in the agricultural area is significantly higher than in the surrounding areas. This phenomenon can be attributed to the use of insecticides in the quest for high yields and increased productivity in today's agricultural system. In addition, the dominance of mono-functional agriculture, which prioritises efficient production and yield, has impeded biodiversity in the green agricultural zones. This has great potential if toxic pesticides - such as glyphosate - are banned.

However, the ecological value of the green spaces in the borough is mainly based on the green areas along water and canal features and the road infrastructure. The green in the neighbourhoods is identified as grass - also called grasphalt as it has no real ecological value (Jeffrey Bolhuis, KIEM). Therefore, it can be concluded that there is a high potential in the green areas, but as they are not con-

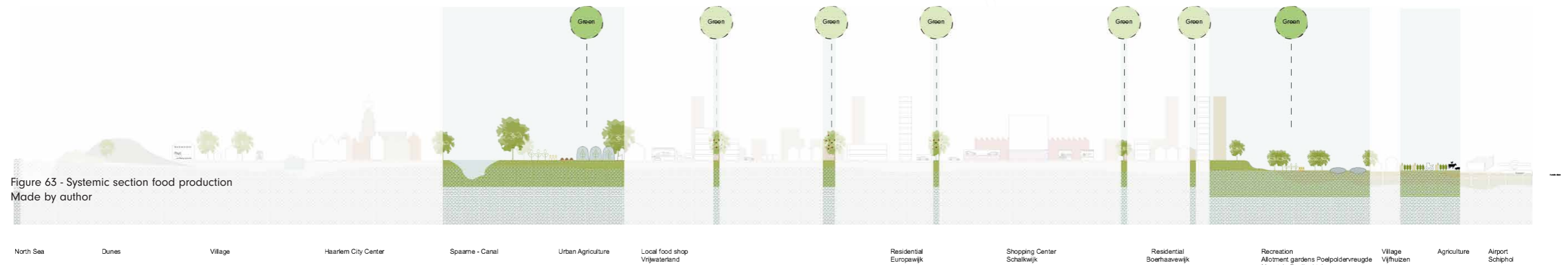
nected and diverse in themselves, they have even more potential if they were connected and more diverse than just grass.

Statistically the district looks green as it has a lot of green spaces, but the ecosystem is still mostly dead. Although a large number of bees were observed during the field trip, it is currently forbidden to plant fruit and nut trees in public areas (Staatsbosbeheer).

Biodiversity is also threatened by the deliberate lowering of the water table. The inhabitants of Meerwijk, who live next to the polder, which is four metres below sea level, have had problems with water in their cellars. Schalkwijk was created when sand was extracted from the Meerwijkplas quarry lake north of Schalkwijk. The lake is currently inaccessible. It is too deep, too cold and too dangerous. The Poelpolder have a problem with an excess of nutrients in the water, caused either by nutrient-rich water leaking from the Volkstuinen-Poelpldervreugd allotments, or by low water levels that trigger the decomposition of the peat, resulting in an excess of nutrients in the water. This excess of nutrients is detrimental to the ecosystem and biodiversity and increases the problem of land subsidence (Bewonersbrief, Hoogheemraadschap van Rijnland, 2020).

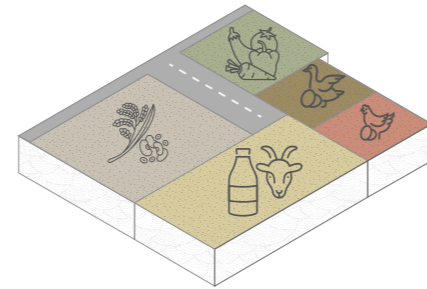


Current situation systemic section ecosystem

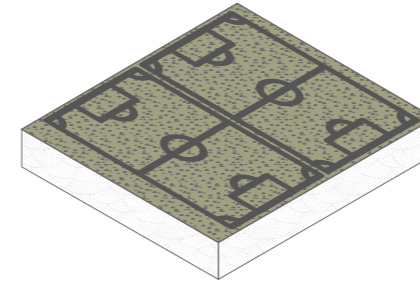


Space for urban agriculture

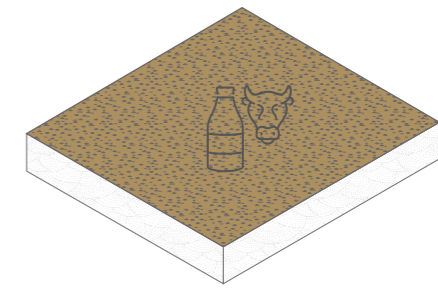
This area has great potential for local food production. If all the car parks and paved areas were converted into urban agricultural land and cultivated in permaculture, twice as much green space would be created. The potential green space could feed up to 283 people for a year if it was managed in permaculture and people ate a beef and dairy free diet (Swanson W, 2021).



Space needed to feed one person with Permaculture food for one year without beef or cow milk: 1,5ha



1,5ha is equivalent to two football fields



1,5ha is equivalent to the space needed to produce beef and milk

Figure 67 Space for food production visualised
Made by author

Current green spaces

2.302.337 m² green

Greening of all car parks and private and empty spaces

4.247.905m² green

Full potential for new green network



4.6. THE FOODWASTE SYSTEM

The current areas for organic waste collection are mostly located in the outer areas of the neighbourhoods rather than on residential streets. This presents a barrier to the separation of food waste, as waste containers are more frequently located in other areas. This increases the likelihood of disposing of food waste in general waste containers, which are incinerated and prevent the closing of the cycle. If waste is separated, it will be sent to the biogas plant in Alkmaar where it can be turned into renewable energy, biofuel, heat, and fertiliser. This plant could potentially be expanded as it is only 36km away from Schalkwijk district.

Additionally, systems are in place to reduce food waste, such as the initiatives of 'Haarlem Food Future' which promote cooperation. Social organizations and supermarkets redistribute unsold, leftover food to those in need who may not be eligible for social benefits due to earning an extra euro or spending prolonged periods in the government's food support system, the 'Voedselbank'.

Approximately 150 crates of still-consumable food are saved and redistributed on a weekly basis (<https://www.vwc-buuv.nl/hulpvragen/270285>, accessed on 2nd December 2023). The Saved Food Coordinator oversees this process. And Haarlem Food Future is deeply committed to enhancing the sustainability of the Haarlem Food Chain.

Food is redistributed at two locations in the district by the 'VOEDSELREDDER' of Haarlem Food Future and

the Stichting Ontmoeting (Maaltijden | Open Huis Haarlem, n.d.). One location is at the Open Huis in Boerhaavewijk, where people in need can collect leftover food every Thursday. The other location is at Molenwijk, where redistributions take place every Thursday and Saturday. On Thursdays, the 'Haarlem Tafel' receives leftover food, while on Saturdays, the Voedesredder collects food from Jumbo due to their collaboration with the supermarket.

A positive and circular example of dealing with food waste is demonstrated by Ostwewammerij in Haarlem (Oesterzwammerij, n.d.-b). They collect coffee grounds from cafes and use it to grow mushrooms as fertilizer.

Additionally, Vrijwaterland's urban agriculture provides a remarkable example of composting leftover produce to generate fresh hummus on-site within a few months.

Waste water System

A combined sewage system - as it is currently existing in the district results in flushing away the rain water that falls in place, depriving the soil and water level its water and resilience.

However there waste water treatment plant located north of the district, filtering the water of Haarlem. This area hold potential for more circulating more resources than water.

On the next page you can find the sewage system mapped.

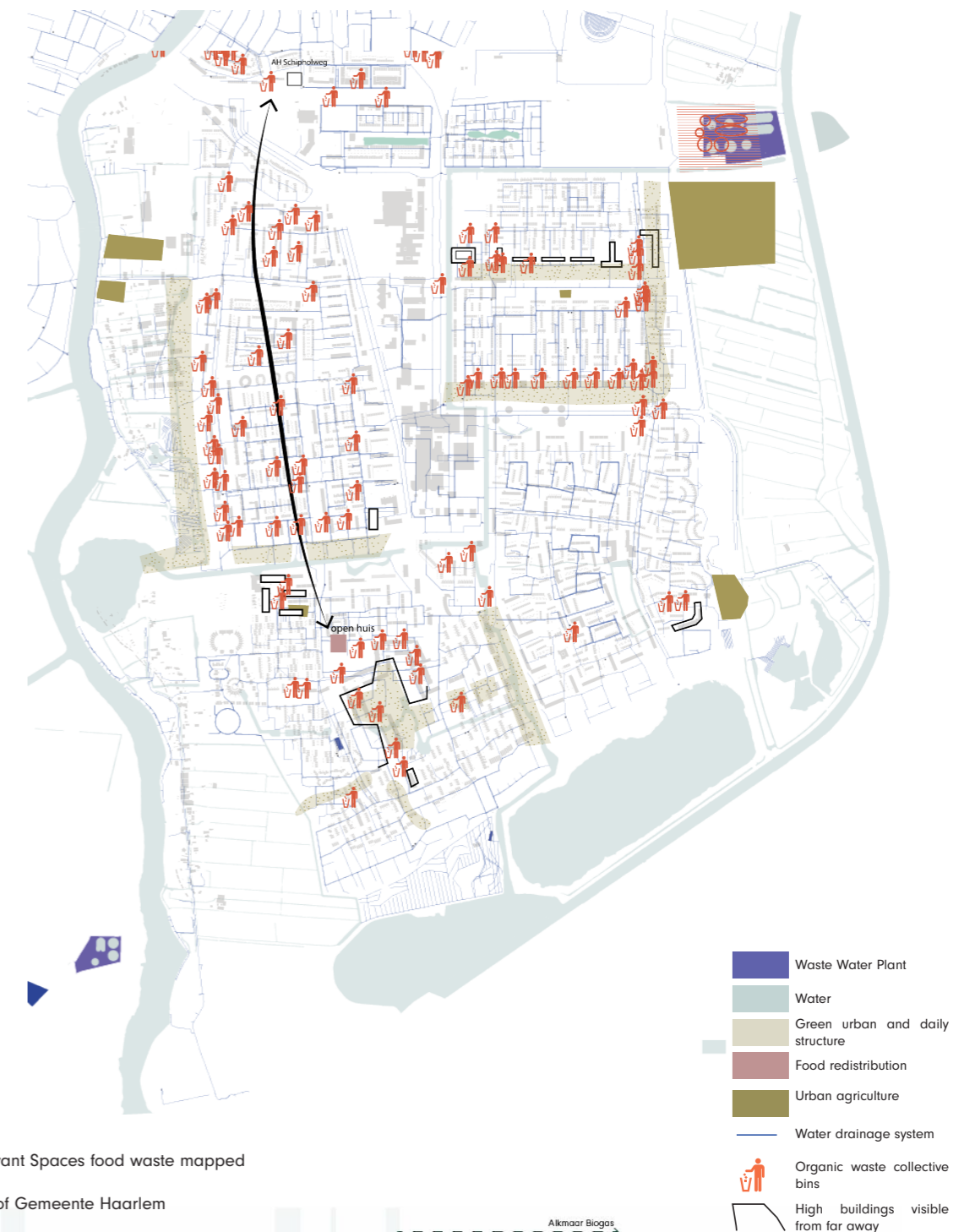


Figure 69 - Relevant Spaces food waste mapped
Made by author
based on data of Gemeente Haarlem

Current situation systemic section food waste

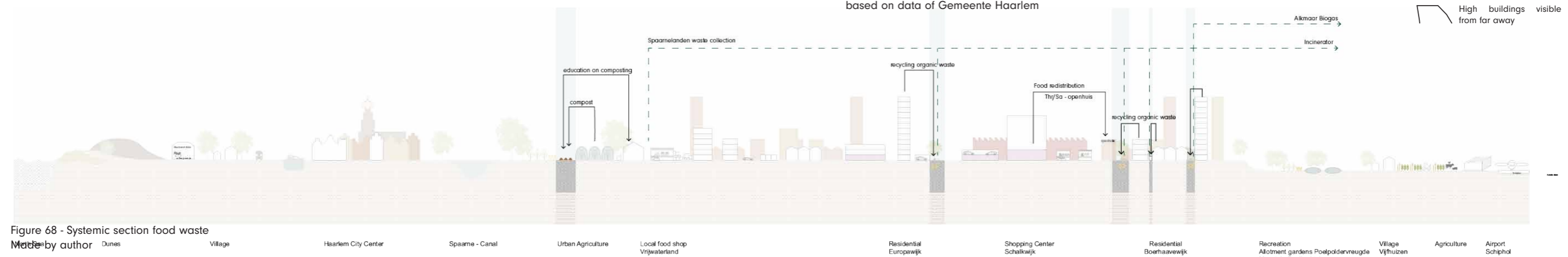


Figure 68 - Systemic section food waste
Made by author

Avoidable food waste

The REPAiR study has shown that the area has a significant potential for avoidable food waste that is collected as residual waste per person annually. It is worth reviewing the study outcome again for further analysis (Geldermans, R. et al, 2018).

Building typologies related to the Waste spaces

Upon examination of the housing typologies in the neighbourhood, four different types of housing can be identified. Although there are more, particularly in relation to schools, community centres and shops, these are the most prevalent ones for housing. It should be noted that in the neighbourhood of Boerhaavewijk, an interactive community engagement took place through the day of architecture event of the Living Lab KIEM. It is important to mention that the typologies of tower and row houses in Boerhaavewijk are predominantly privately owned, whereas the typologies of Galerijflats and Portiekflats are owned by social housing cooperation. This can be seen on the map Figure 72. This plays a significant role in the placement of organic waste disposal bins, as the organic waste disposals bins for the tower typologies are located in front of the buildings, whereas the row houses have their own movable organic waste bins.

These axonometries display the result of an interactive community engagement carried out during the Day of Architecture. The engagement discussed the disposal habits of residents, including whether they disposed of their waste. The primary outcome indicates that a majority of participants did not separate their waste due to the inconvenience of doing so. The reasons cited included unpleasant odours and the distance of the collection containers. Only residents living in row houses in the neighbourhood were able to separate their organic waste at home, as they have dedicated bins for this purpose. Conversely, living in an apartment meant that the communal organic waste collection points were less easily accessible than those for general waste disposal. As such, the latter proves more convenient. Another reason was the smell of the communal organic waste bin. As the bin is above ground, residents are concerned about potential spillages and odours on the street. Therefore, the underground container, which is mainly used for organic waste, is preferred.

Location of Schalkwijk

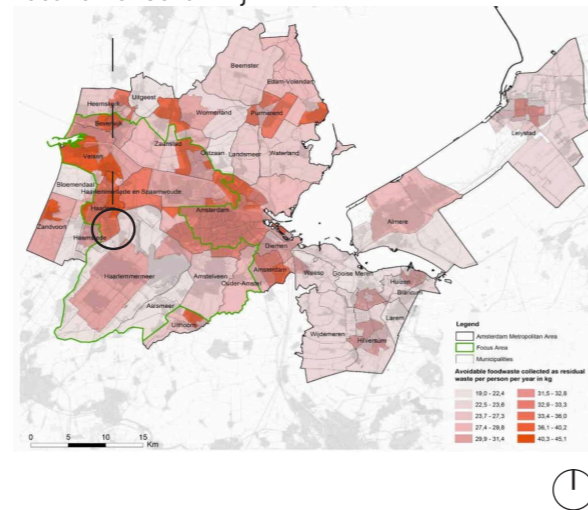


Figure 70: Avoidable food waste collected as residual waste per person per year in kg for each neighbourhood in the AMA in quantiles
Source: Geldermans, E., Et al. (2018)

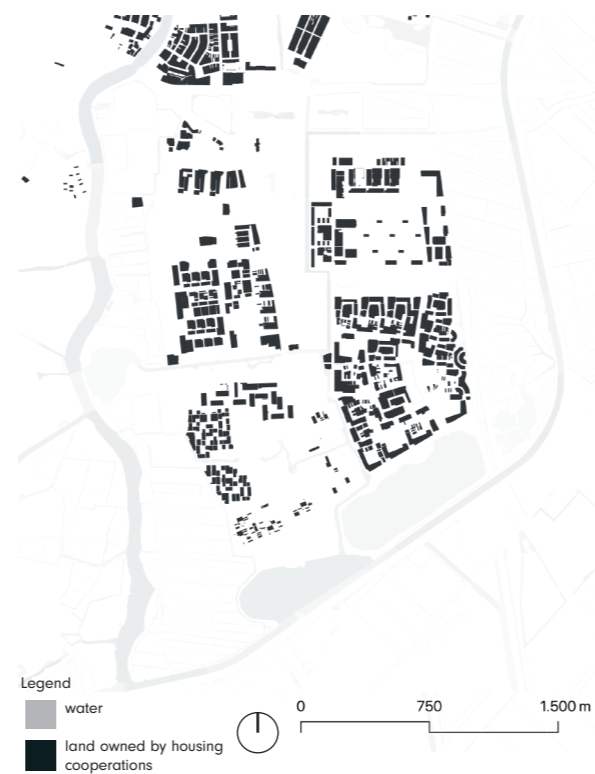


Figure 71
Ownership of housing cooperations mapped - made by author with data from Basisregistratie Adressen en Gebouwen (BAG) - Kadaster (BRK) - en Waardering Onroerende Zaken (WOZ)

This analysis is part of the community engagement, which was coordinated with the Living Lab Kiem in summer 2023. More information can be found in Appendix 12.3.

RIJTJESHUIZEN

A house set in a row and surrounded on both sides by another house.



TOREN

The tower contains flats in a building that is taller than it is wide and long. The base is usually square.

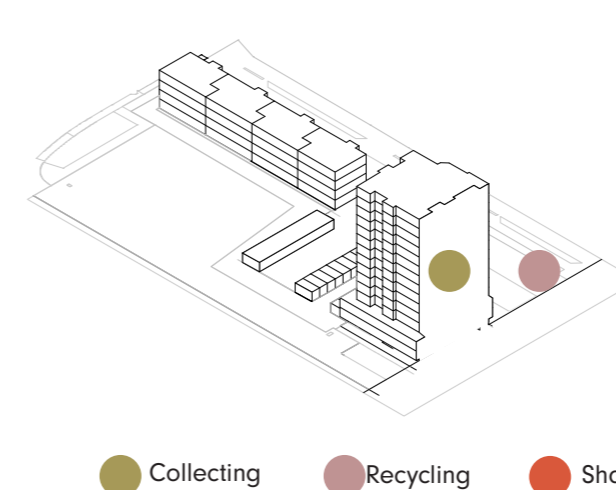


Figure 73
Housing Typology and food waste bin spaces - credits to Living Lab KIEM in cooperation with author

GALERIJFLAT

A galerijflat is a flat, usually with a lift, where the house door adjoins a gallery.

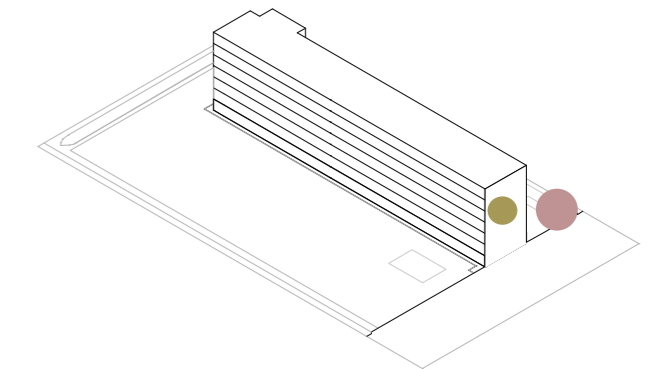
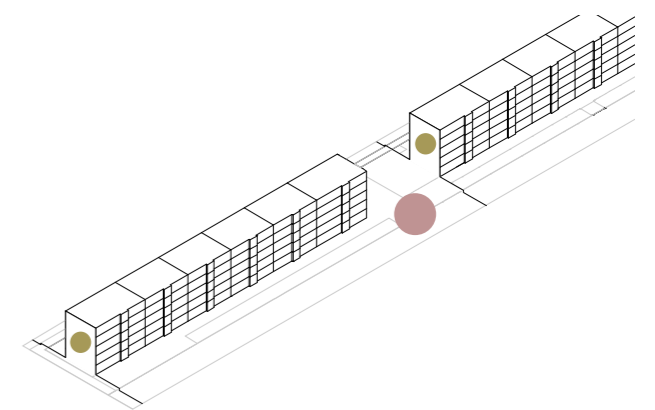


Figure 72
Pictures of Bins in Haarlem - <https://www.spaamelanden.nl>

PORTIEKFLAT

A portiekflat is a flat whose house door opens onto a communal staircase.



Location of public GFT bins mapped combined with the angular choice analysis

To analyse the human activity patterns in the neighbourhood, space syntax with QGIS is being used to analyse and see which streets in the neighbourhood are being chosen the most likely (Angular Choice) and which streets are easy to be reached (Angular Integration). Both maps can be seen in the Appendix 12.2., as here only the angular choice is shown.

It can be observed that the streets most likely to be chosen are the ones also main dominant in the overall planning of the infrastructure network. The paths less likely to be chosen are the ones between building blocks and secondary paths through the neighbourhood. This then refers to the everyday streets of the residents in the district and will be taken into account when making design choices.

Location Analysis GFT containers

The current location of the GFT containers is not always combined with the most likely chosen streets. This means that the containers are also not passed by as frequently as the ones located on a more likely chosen path.

Angular choice

Calculating the frequency with which each roadway segment lies along the most direct path between all feasible pairs of segments within a given range, known as the "radius," is the first step in calculating the "choice." (Hillier , B. & Iida, S. ,2005).

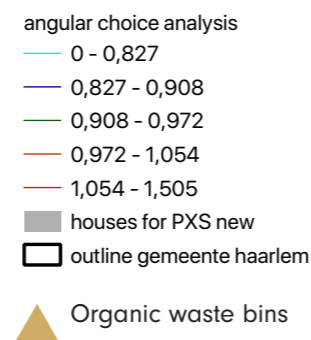
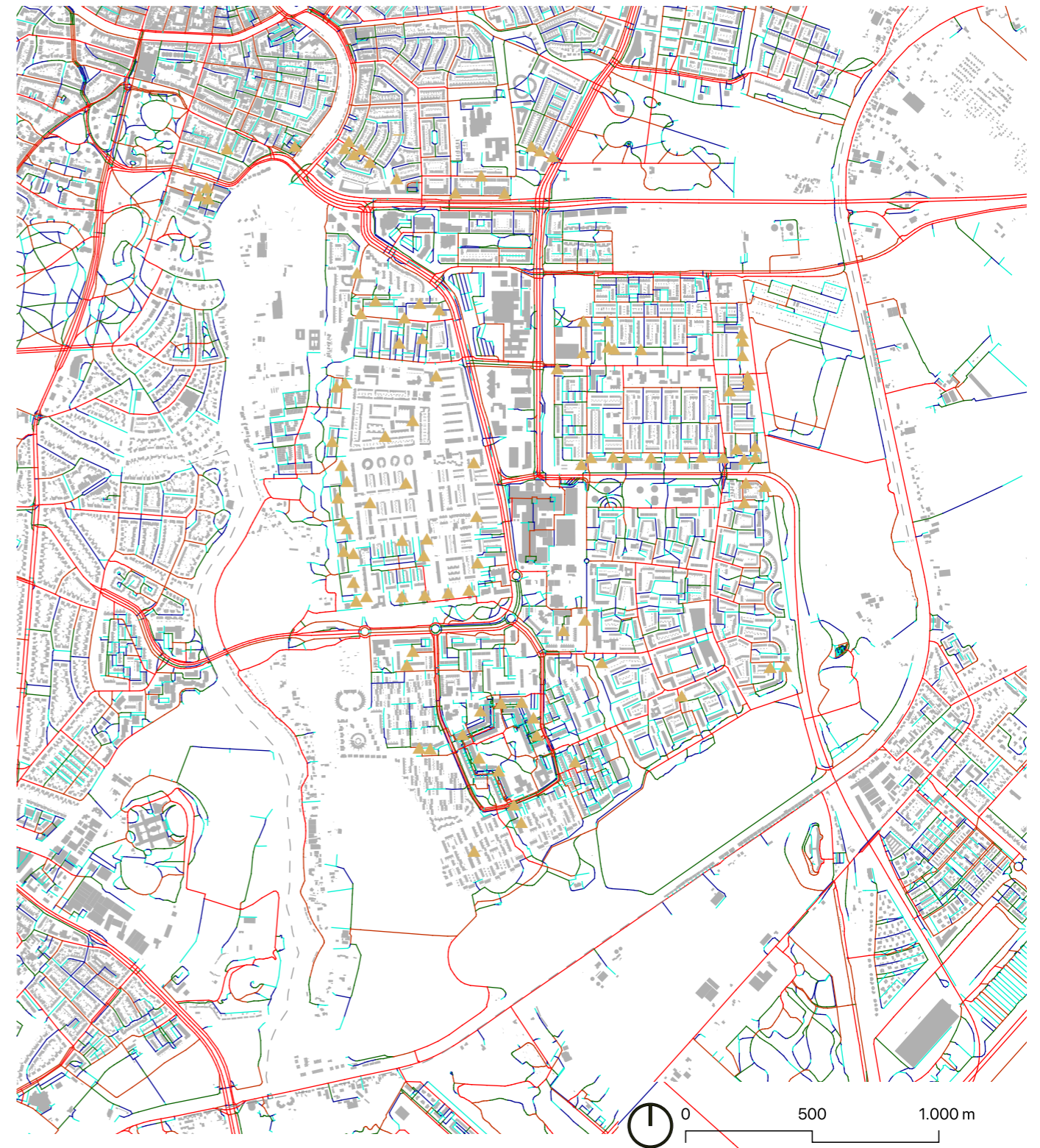


Figure 74
Map space syntax and GFT bins
- Data of OSM and Gemeente Haarlem



4.7. THE FOODSCAPE

Examining Schalkwijk, local food production is already evident, with individuals having their own apple trees. Additionally, sustainable and circular food production strategies, such as composting and community-based initiatives, have been implemented in the district's periphery to connect the entire food production process. The world garden (Wereldtuin) serves as an example of this. A space situated next to the River Spaare and sports fields is run by a cooperative of multiple organizations. It combines a 'Plukweide' with a small shop that provides space for the organization. Additionally, there is a space for hosting community meetings focused on food. Vrijwaterlanden is another location that not only produces its own food but also has three tunnels where vegetables like peppers are grown with extra protection. They are part of an educational system with a school located in Europawijk, which educates children about growing food and provides cooking lessons as part of the curricular offering. Additionally, they run a complete composting system. They also have their own little shop with seasonal produce, open at specific times. Furthermore, they offer a delivery service where they provide seasonal food boxes grown on-site to people who order them.

The allotment gardens are part of an organisation. Although everyone owns their own plot, there is a sense of community and familiarity among the gardeners, with Poelpoldervreugd hosting events for its members. Regrettably, the periphery allotment gardens are at risk due to the development of residential areas, thus threatening the space for food production and sustainability thanks to urban sprawl. As these plots are situated in close proximity to nature, while still being connected to the urban areas, such as on the outskirts of this district.

Overall, it can be argued that local food production areas have a significant social impact within the neighbourhood, as they facilitate education and support the community beyond merely producing food.

Current situation systemic section food production & distribution

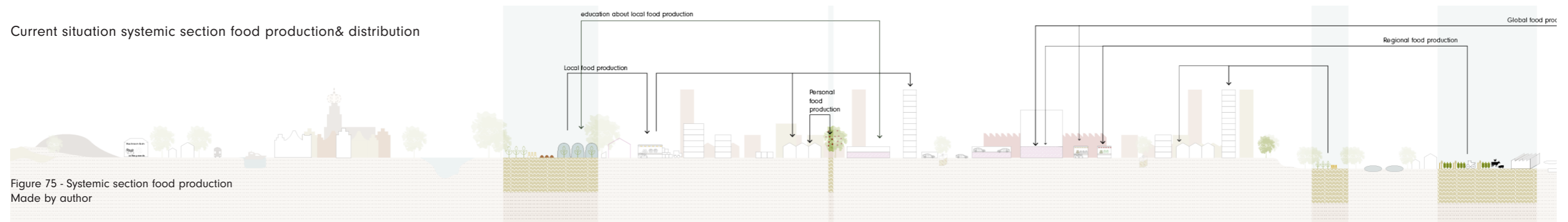


Figure 75 - Systemic section food production
Made by author

The development of new housing plans means that space for these areas may become increasingly limited.

Nonetheless, the current food system is not structured around these small-scale localized food production initiatives. The primary foodscape in Schalkwijk centres around consumption areas, such as snack bars and supermarkets. The food is transported lengthy distances before being sold in local supermarkets. However, several significant issues arise from the current situation, specifically regarding the quality of urban spaces.

Supermarket chains have an enclosed facade that is unattractive (Gehl, 2010), which diminishes the lively public realm. Consequently, the space can feel unsafe and uninviting to pedestrians. The lack of transparency regarding the food sold in this location creates an unpleasant environment, as it lacks spatial quality. Additionally, cars are predominantly placed in front of the shops, which is in line with the car concept of most supermarkets, as cars may increase the quantity of items purchased as compared to purchasing them on foot or by bike.

If one examines the produce and dishes available in snack bars and restaurants, they are predominantly meat-based, which has a significant carbon footprint, and much of it is fried. These establishments could be classified as fast-food shops and they represent the only source of food for many residents, aside from supermarkets which do not offer proper workday meals.

Without the supermarkets and takeaways the neighbourhood can be described as a food desert in the area. Access to health and local food is limited in most neighbourhoods. Therefore, if you aim to eat healthily while working in the district, your options are to cook your own food, order from Haarlem city centre, or bring your own healthy meal preparation.



Figure 76 - Relevant Spaces food production mapped
Made by author
based on data of Open Street Map

Food places in Schalkwijk

To locate the spatial composition of the foodscape in Schalkwijk, the places, restaurants, vendors, shops, public spaces and identified temporary food places have been mapped via google maps analysis and then the identified food places have been further identified via the site analysis so identify the current setting. Some mapped places did not exist and other way around too. This is the current foodscape in Schalkwijk in August 2023.

By mapping these spaces and visiting the space the spacial quality of the foodscape at these locations certain spatial and social patterns of the built environment and context could be identified. It shows the clustering and categories of food places and the trends of food consumption in the neighbourhood.

With this opportunities and challenges in the local food system can be grasped in the spatial connect of the food scape.

This map will also develop via the stakeholder engagement and site visits via talking to residents and will be fed with information of the engagement workshop, multiple site visits for example of the local market and different time spans to identify informal street vendors, private food consumption and community food places. So in this sense the mapping of the foodscape will change and adapt thought the project.

In general it is a 'food desert' as there are little places in the area to sit down and enjoy food. This can be done in the city centre (according to a snackbar owner). So the restaurants and snackbars usually only function for the residents in the neighbourhood when they come back from work. 5-8pm are the most busy times in the snack bars (according to two different snack bar owners). During the day, it is difficult to find a calm, safe, place with a high quality of place to sit down and enjoy food. The snack bars are small, smelly, simple interior design and seem private and are mostly visited by male costumers.

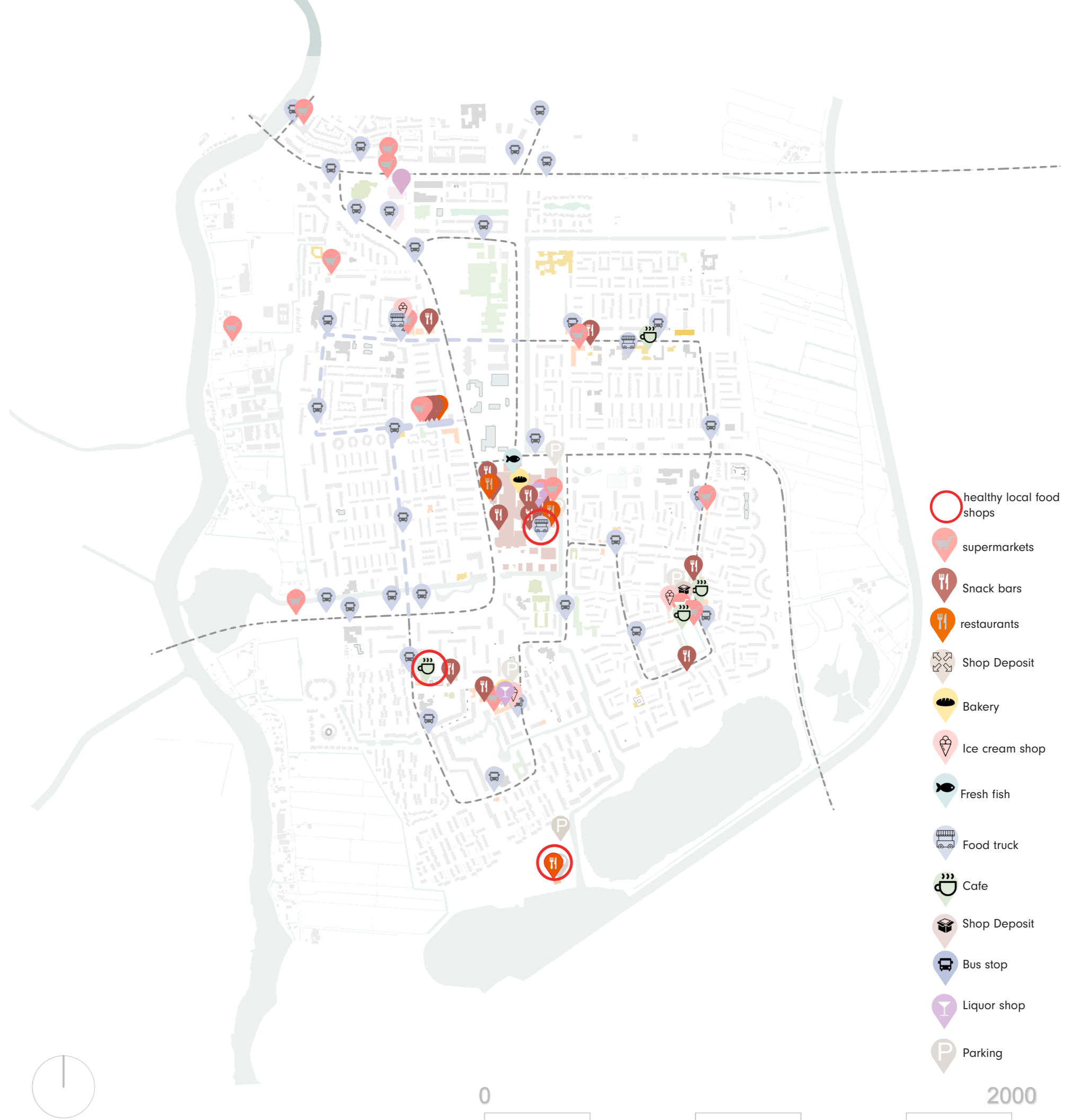


Figure 77 - Foodscape Schalkwijk
Made by author
based on data of Open Street Map



0 2000

SUMMARY OF THE INTEGRATED MORPHOLOGICAL ANALYSIS

Analysis Map

Synergy of all three drivers
 - outlining the potential areas according to the analysis of the flows and form of the food system in the urban context of Schalkwijk.



Figure 78 - Analysis conclusion map
 Made by author

Overall, the potential for local food production in the periphery is promising. The public infrastructure and the current connection to the foodscape also offer potential for reorganisation. Depending on whether a top-down or bottom-up approach is pursued, the property harbours potential for systemic change, for example in waste and wastewater infrastructure. The social housing cooperative, which owns many of the properties in the neighbourhoods, is an important player here. Supplying all the inhabitants of Schalkwijk through local food production is unrealistic and spatially infeasible. However, there are many opportunities to redevelop potential sites to create a more circular neighbourhood.

05 SOCIAL-SPATIAL ANALYSIS

This chapter presents the analysis of the observations from the workshops, the interactive citizen participation and the field research in the form of interviews and snapshots. It also demonstrates the relationship between the observations and citizen participation and explores how these elements profoundly influence the analysis process and provide valuable insights into the structure of the neighbourhood. Through the intersection of observation and citizen participation, a deeper understanding of daily life in the neighbourhood is gained.

Subsequently, well-founded proposals are developed and the values of the neighbourhood are linked to everyday activities to create a circular living landscape.



Figure 79 -
Picture Made by the author

5.1. VULNERABILITY

The map illustrates the vulnerable neighbourhoods, showing the neighbourhoods where the combination of climate risk, vulnerable elderly and livability according to energy standards.

Climate vulnerability

Climate vulnerability is the well-being of people and the environment as a result of a changing climate. The areas with the vertical lines show the vulnerable neighbourhood with a relatively high climate risk for flooding and heat stress (Rijksinstituut voor Volksgezondheid en Milieu RIVM, 2021).

Vulnerable elderly

The horizontal lines show areas where the elderly are particularly vulnerable, according to RIVM data on the elderly, loneliness and mobility, which shows which neighbourhoods have a relatively high number of vulnerable elderly people. They are often in poor health and cannot withstand climate risks (Rijksinstituut voor Volksgezondheid en Milieu RIVM, 2021). The areas where the two climate risk areas overlap are also the less liveable areas (Binnenlandse Zaken en Koninkrijksrelaties BZK, 2020).

Economic strength of the districts

The three poorest neighbourhoods in the whole of Haarlem are located in the Schalkwijk district. This shows financial vulnerability. Especially to inflation and unexpected conditions, such as the fluctuating price of gas. The neighbourhoods are still dependent on the gas supply.

Energy vulnerability

Many buildings in the area are of poor quality. The social housing cooperative needs to be energy refurbished by 2025. This can be seen from the dark background, as the above buildings are highlighted in red, indicating their low energy standard. As a result, tenants experience low quality housing and high gas prices. A significant number of Galerijflats and Portiekflats are currently under construction. Some buildings have already been converted and retrofitted. However, the Schalkwijk midden shopping centre is glowing dark red and would also need a major retrofit to be more energy efficient.



Figure 80 - Vulnerability map of Schalkwijk
Made by the author

5.2. OBSERVING THE FOODSCAPE

First steps to understanding the context of the foodscape in the district in Schalkwijk different methods of analysis are conducted.

The purpose of investigating in this foodscape is to identify the spatial and social configuration of the food places in the district. Understanding the demographic, the food offerings, identifying the different types of food shops and the logistics from food production to the retail and the accessibility to food. Focussing on the food places on eye level to understand the foodscape of the everyday life of residents in their daily life. Thus analysing the physical barriers to access and also the opening hours and prices for accessibility and affordability.

The socio-economic activity of food supply via three different structures is selected: Supermarket, local market and takeaways. Secondly, mobility, accessibility and public infrastructure in relation to food supply are assessed. Thirdly, the non-essential local and social infrastructure of cultural initiatives for circular food systems is analysed.

The observational studies were conducted on Tuesday, 29th of August on various sites in the district of Schalkwijk in Haarlem. Different places were identified with different food shops and according to the geographical location to include all neighbourhoods in the district, including the weekly market on Tuesdays on the square of the central shopping centre of Schalkwijk. to observe the count of costumers using the food offer.

The weather was cloudy, not rainy with passing clouds and a temperature around 17 degrees Celsius.

Snapshot analysis outcomes

There are multiple main points to consider for further steps regarding the foodscape in Schalkwijk.

First of all, the food shops are located in proximity to public Transportation Nodes. Also the Snack bars in the neighbourhoods are close to the bus stops. Also on the main streets, close to a supermarkets. This creates a food cluster repeating itself in every neighbourhood of Schalkwijk.

Logistics are mostly efficiently located at the back of the food shops, which usually fulfil multiple functions. Shops are located on the ground floors, while the upper floors are intended for flats. The supermarkets are characterised by an easily accessible bicycle and pedestrian infrastructure, which can also be reached by car.

However the urban quality is limited due to the closed façades of the supermarkets fronts. This creates a feeling of being unwelcome but provides better storage for the food against the walls from the inside of the shop.

The design elements of the foodscape pose a challenge. The façades of the large supermarkets are closed and not transparent, as are those of the smaller supermarkets. Snack stands are generally not very transparent. In addition, there are only a few public seating areas in front of the food shops.

The spatial quality for staying and eating in front of food stalls is not rated as high quality, which contributes to the overall low quality of the public space. The situation is exacerbated by a perceived "food desert", which indicates a limited availability of healthy snacks or takeaway food.

Architecturally, most of the buildings containing food

shops in the area have flat roofs. On a positive note, smaller supermarkets contribute to product diversity by offering a wider range of global products.

Overall, these are the spatial conditions that can currently be found in the foodscape of Schalkwijk.

The whole Snapshot Analysis results can be found in the Appendix 12.7.

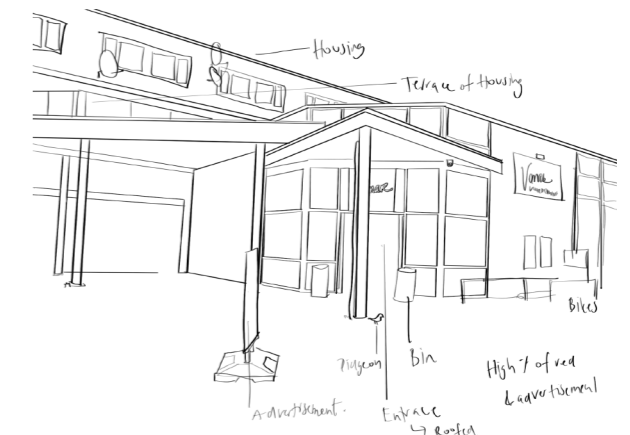


Figure 81.2. - Sketch Vormar - made by author

1. SPAR at highway, 13:20-13:25
2. Vormar & Supermarket Meerwijk, 14:44-14:49
3. Market Schalkwijk Midden, 15:55-16:10
4. Jumbo Molenwijk, 16:35-16:40
5. Alamori Supermarket Meerwijk 16:55-17:00
6. Lidl and Snackbar Chefs Burger 2 Boerhaavewijk, 17:13-17:18, 17:20-17:25
7. Vormar & Ijssalon Scoops Haarlem Europawijk 17:30-17:35

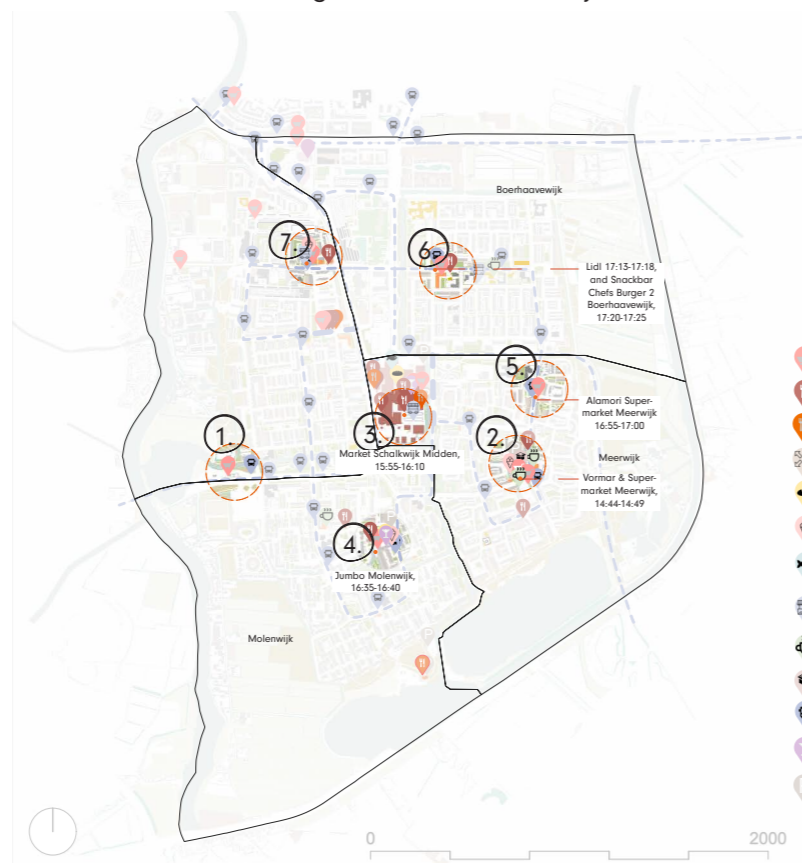


Figure 81- Locations of Observation Made by author

Picture analysis of urban quality of Foodscape



Figure 81.1. - Picture analysis - made by author

5.3. COMMUNITY ENGAGEMENT

Mental Mapping

Part of the Living Lab "KIEM" was to gain insight into the way school children move through their neighbourhood. This workshop provided a contribution to the development of patterns through the analysis of the mental maps drawn by the children.

The children are very aware of their public space, especially in terms of safety on the street, which was observed during a walk with the children on their way to school. And also about the "nibbles" they can get from the sunflowers and berry bushes. They complain about the stinging plants on their way. And after the drawing, the awareness of the location of the sports fields and the supermarkets and the location of the mosque.

These are two of the children's mental maps, which are representative of all the other maps analysed, which can be found in Appendix 12.8.

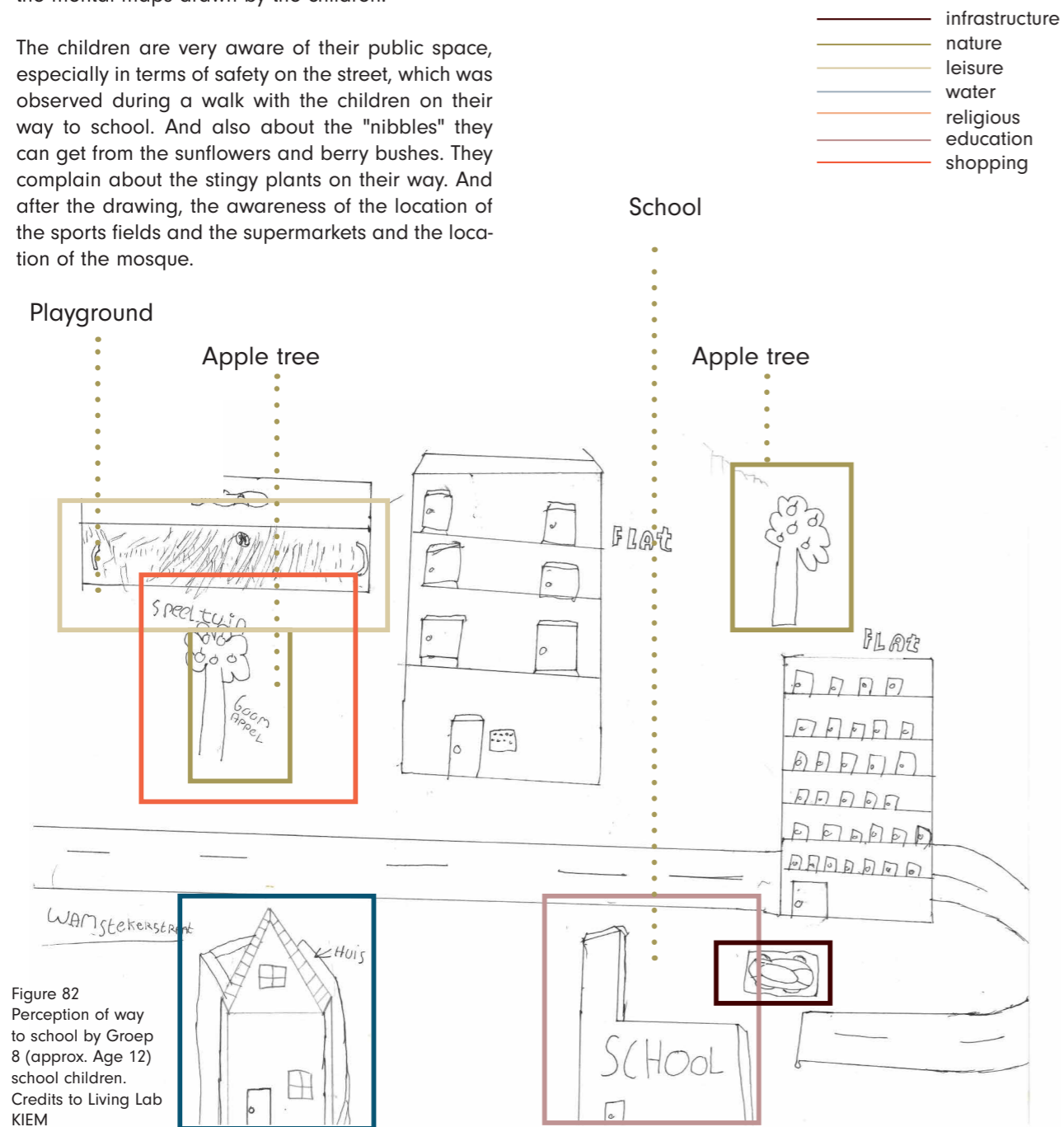


Figure 82
Perception of way to school by Groep 8 (approx. Age 12) school children.
Credits to Living Lab KIEM

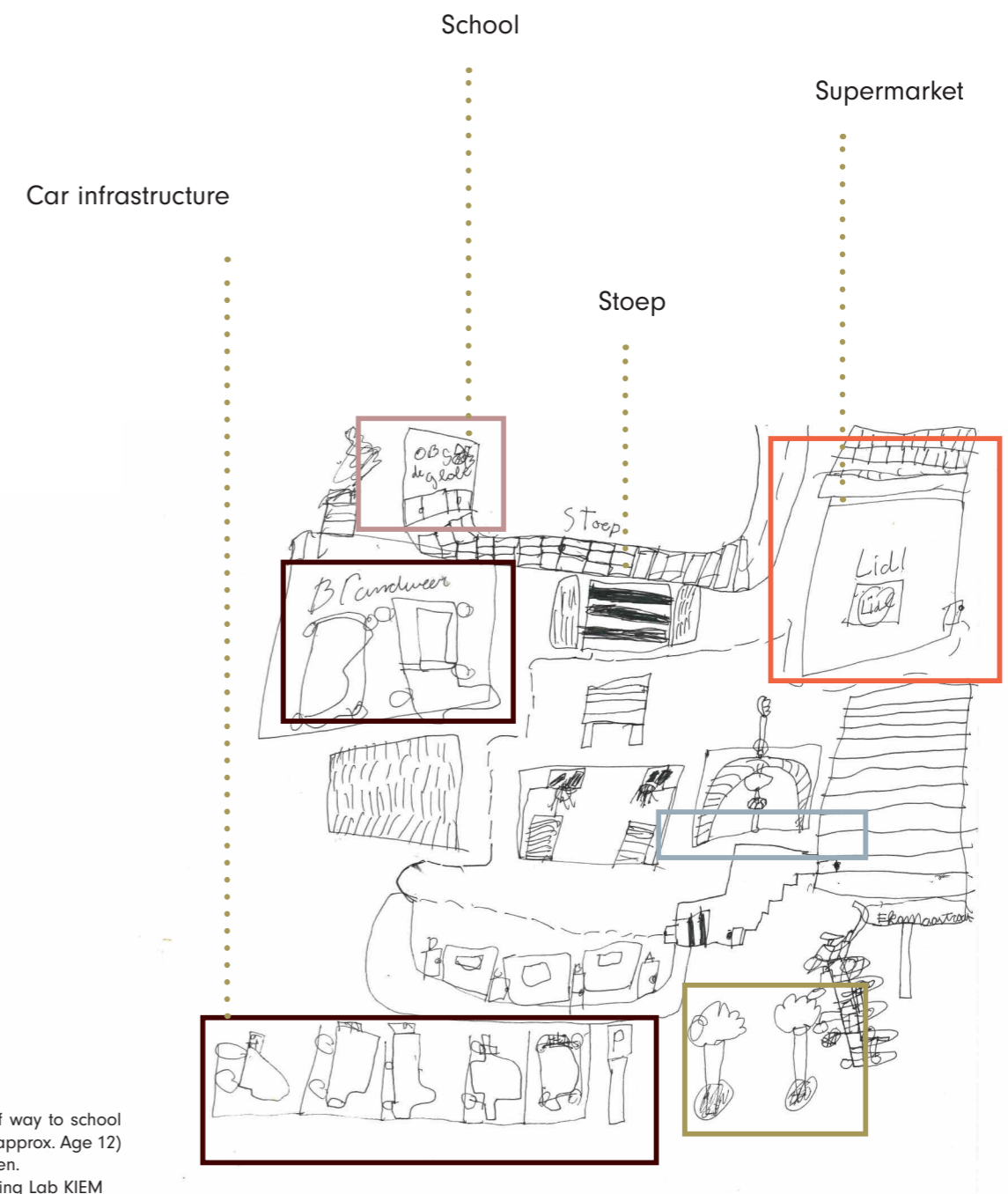


Figure 82.2.
Perception of way to school by Groep 8 (approx. Age 12) school children.
Credits to Living Lab KIEM

Photo workshop

During a workshop involving children walking home from school and capturing their journey through photographs, it became evident that their approach to walking was notably different from the observer's, characterized by a less goal-oriented and more exploratory mindset. The children frequently paused and expressed delight at various distractions, such as encountering dogs or other animals along the way. Interestingly, the children also displayed a keen interest in food-related aspects of their environment,

whether it was snacking on sunflower seeds from a nearby sunflower or nibbling on red berries from a bush. The photographs taken during this experience reflect the children's acute attention to natural details, often capturing plants, greenery, and animals, even in the absence of specific guidelines for their photography subjects. This exercise highlights the ability of children to immerse themselves in the sensory richness of their surroundings and to appreciate even the minutest aspects of nature during their everyday journeys.

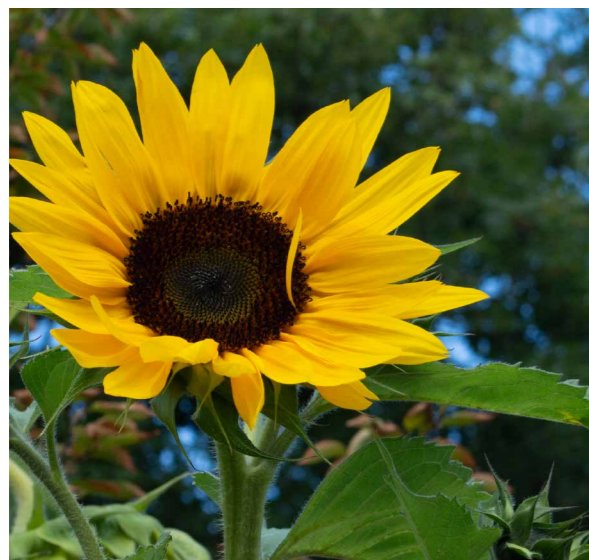
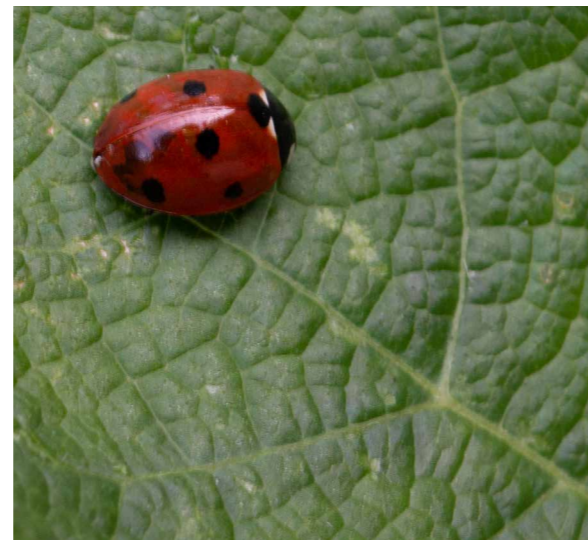


Figure 83-86
Pictures taken by the children of the workshop
Credits to Living Lab KIEM

Interactive community engagement

Residents do not separate their food waste because it is too far and unpleasant. They buy their groceries from various supermarkets and online stores, like Picnic. 'Buurtboerderij' is used for milk, eggs, and yoghurt, but the author did not verify this information. Only residents of row houses have enough space to grow their own food.

This shows that there is great potential in the neighbourhood to improve the food system and make it more attractive to separate organic waste and improve the waste flows.

More information on this event is in the Appendix 12.3.

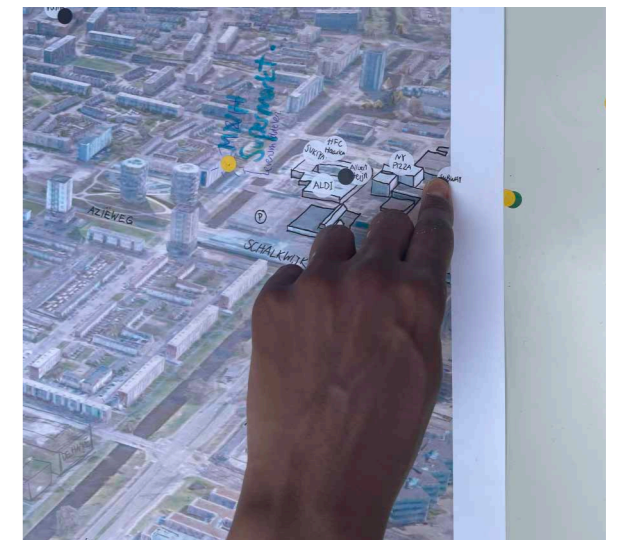


Figure 87-90
Pictures taken by author and Living Lab KIEM

Microstories

The micro-stories provide a different insight and a deeper understanding of certain actions of the neighbourhood's residents. They outline the human perspective of the already existing circular food systems and also their failures. But they also show the great potential and commitment of the residents in the already existing food system structures that enable a more social and ecologically just system.

In Boerhaavewijk, there is a food sharing initiative in which a resident has placed a box for surplus but still edible food in front of his house. Other residents can help themselves from the box as they wish, but it should be noted that it is not refrigerated and is only suitable for non-perishable or dry food. The initiative requires a considerable amount of maintenance on the part of the organising residents. However, it seems to work effectively and provides an anonymous method of distributing food locally. In addition, the residents themselves are building a larger network by communicating with other neighbours and only storing or depositing their goods in the box when it is empty.

Field observations and conversations with market workers have indicated that market stalls typically do not generate food waste due to the preservation of products sold, such as nuts, potatoes, cheese and dried fruit, which have a long shelf-life. Fresh produce vendors declined to participate in the discussion, with the exception of one who stated that they dispose of unsold items without using a food sharing system. Hopefully, the surplus food is being disposed of in the appropriate organic waste receptacle.

In Delft, there exists a food redistribution organisation that collects surplus fruit and vegetable produce from the market via several bicycles and stores it in a community-managed refrigerator. Hopefully, the surplus food is being disposed of in the appropriate organic waste receptacle. Many individuals participate in this process by collecting and redistributing the food items. Additionally, the supermarket chain Odin is a member of this Delft-based food redistribution collaboration.

One small supermarket owner in the district stated that if their food is not sold and goes bad, they dispose of it and do not take part in any food redistribution initiatives.

Additionally, it was reported that a container meant for collecting bread was removed as it attracted too many seagulls.

All in all, the micro-stories show that there are many committed residents in the district and that their environment is important to them. And they are happy to talk about prime examples, small changes that have changed their lives, and also about the failures of changes they have experienced. The failures in particular are interesting facts to consider, as other methods of analysis do not normally assess the success or failure of a project or initiative. The subjective input provided by the micro-stories thus gives a deeper understanding of the neighbourhood structure and the role of the residents in it.

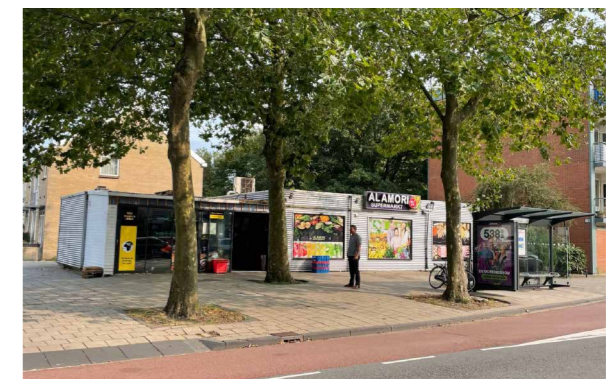


Figure 91 - Observing the Foodscape on Eve level
All pictures taken by the author

5.4. VALUE FLOWER OF SCHALKWIJK

This analysis is based on the five values of the 'Waaardeveolle Wijken' assessment by Lequercy and Smit. As the value defined for the group or stakeholder that has a certain value is very subjective, the values defined here are based on the author's experience. They can therefore also be described as qualities.

Socio-spatial values

The Haarlem-Schalkwijk area faces significant socio-economic challenges. These include a high prevalence of low-income households and welfare recipients. In addition, a worrying proportion of the population in this area is overweight or obese, while loneliness is widespread and residents report lower levels of health and happiness compared to the rest of Haarlem (Gebiedsanalyse Haarlem Schalkwijk, 2020). The neighbourhood has a high dependency on social district teams and a relatively high number of residents requiring WMO support (Gebiedsanalyse Haarlem Schalkwijk, 2020). There are, however, several social initiatives active in the neighbourhood, as can be seen in Figure 91.

Furthermore, the overall living environment in Schalkwijk needs improvement, with residents expressing lower satisfaction compared to other neighbourhoods (Gebiedsanalyse Haarlem Schalkwijk, 2020). Issues such as crime, noise pollution from air traffic, inadequate lighting, limited facilities for young people and the proximity of amenities are areas of concern. Meerwijk in particular requires special attention, as the quality of life there is below the average for the city. Residents express dissatisfaction with enforcement by the municipality and stress the need for more focus on improving the quality of life and safety in the neighbourhood. Boerhaavewijk and Europawijk also have characteristics that qualify them as 'priority neighbourhoods' in several respects, indicating the need for targeted interventions (Gebiedsanalyse Haarlem Schalkwijk, 2020).

More detailed maps in relation to everyday actions and values can be found in Appendix 12.5, Chapter 12.

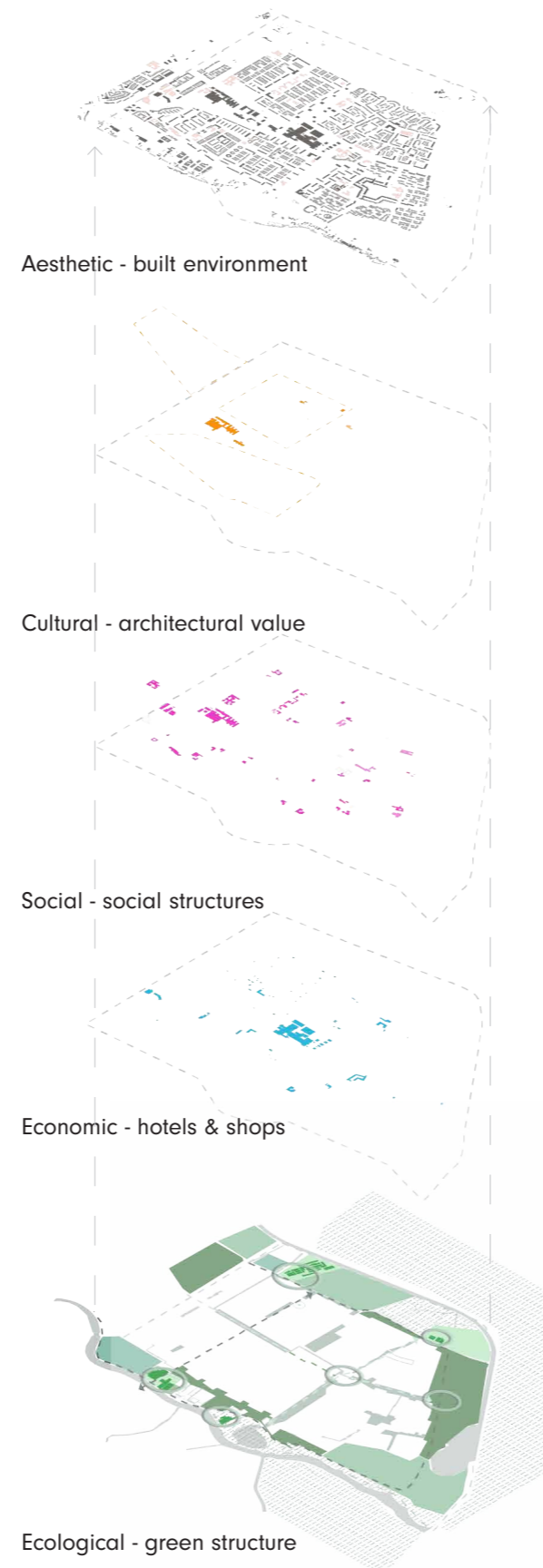


Figure 92- Axonometric of Values
Made by Author

Economic and spatial value

The neighbourhood is a typical post-war residential area. And with the spatial transition over time, the economic points in the neighbourhood itself moved out and are now quite unattractive, and there is only the 'Schalkwijk Midden' as a main economic centre. There are also small offices in the area. These are now planned as part of the area's redevelopment. However, many social structures, such as schools and retirement homes, are part of the working environment for people in the urban environment.

Ecological value

The green border around Schalkwijk has the highest ecological value. The post-war neighbourhoods are surrounded by a variety of green spaces. These range from allotments and urban gardens to agricultural land and recreational green spaces. The district itself has the highest percentage of public green with 37% (Gebiedsanalyse Haarlem Schalkwijk, 2020). Overall, residents are satisfied with their green infrastructure.



Figure 93- Values Mapped
Pictures made by Author, inspired by Living Lab KIEM

5.5. CIRCULAR ACTIVITIES

Circular activities

Source:
Sourcing local food through **fertilising** organic waste involves activities such as creating nutrient-rich compost at home by **composting** kitchen waste. Neighbours can participate by **sharing** the seeds of their own home-grown plants and caring for communal compost facilities. Furthermore, using the resulting compost to grow one's own food is an effective method. **Participating** in community garden initiatives, or even **starting** such an initiative, contributes to the circular sourcing of the food system. Additionally, by **exploring** nearby nurseries, farmers' markets, and community seed swaps, diverse seedling options can be offered. It is also crucial to **educate** others about the knowledge gained through sourcing as it contributes to overall development.

Produce & Prepare:

An daily activity that can be done to support local food production can be on different ways producing that food. One would be cultivating fruit or vegetables that would require initiating home grown food on the balcony, garden or roof, or even in front of the window. These then need care taking such as watering, weeding and pest control. And in the end harvesting. Overall actions such as implementing practices to minimise water usage for the food production and using natural methods without chemicals in the cultivation or basic actions that are taken in a circular food system.

With livestock it is even more activities such as feeding, breeding and managing their health. When producing food via Aquaculture, the stocking requires water, the water quality management and

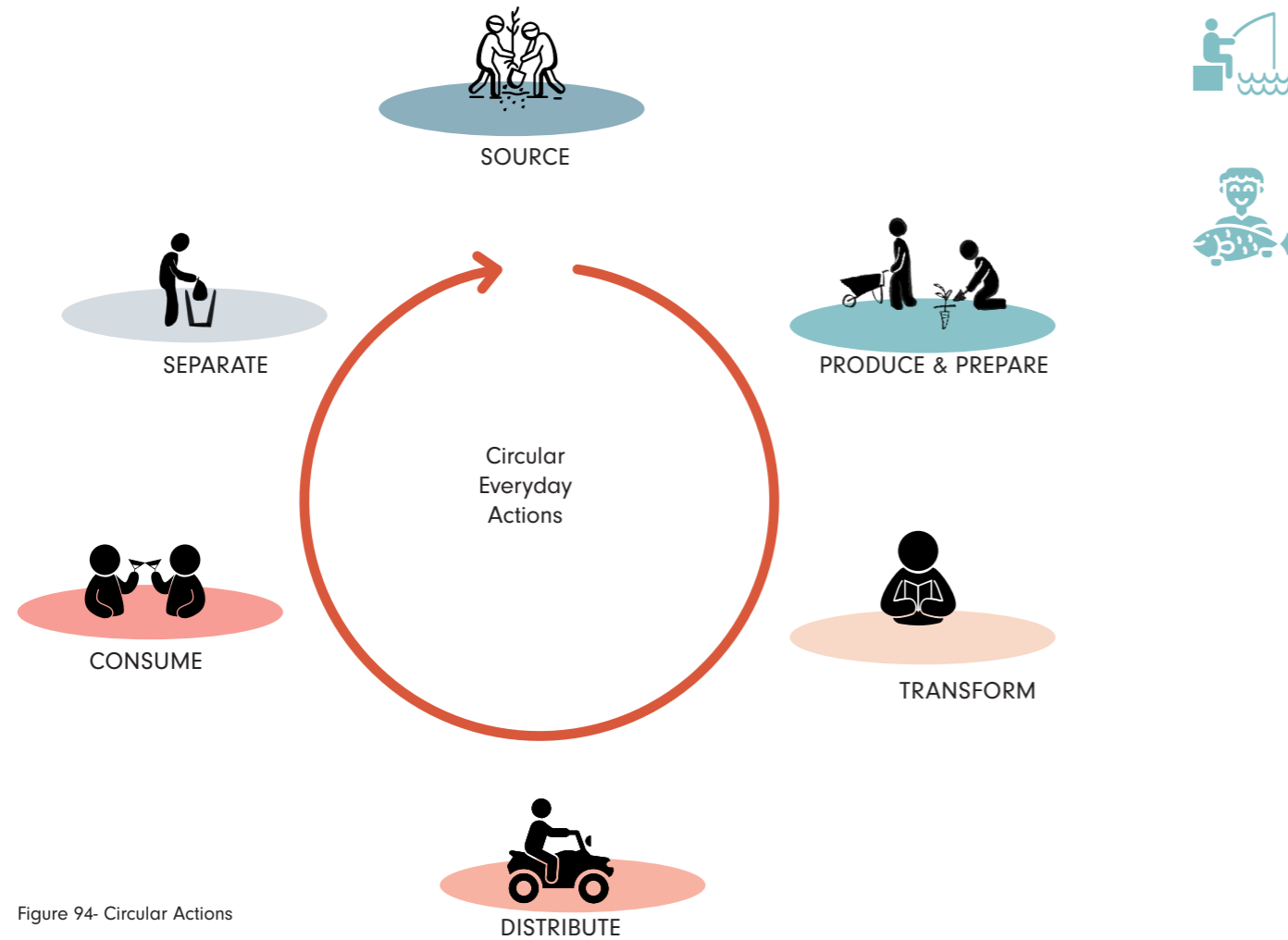


Figure 94- Circular Actions

then introducing the right fish or other organisms in the controlled environment and also feeding and collecting mature aquatic organisms for consumption.

Growing with permaculture practices such as Agroforestry requires an initial input of planting the trees and then integrating the wanted crops or livestock for a diverse agricultural system. Water quality should be self-sufficient, as the ecosystem should be well intact to care of it itself. Harvesting is then an action that will occur seasonally depending on the natural cycle of the food.

Transform:

This step of activities can be seen in three ways. One is activities such as education which transform the current way of food production by educating about local food production activities and how to engage, get active and what to do and where to start. Another way is transforming the local sourced food via a value-added process such as creating products like jams, sauces, or pickles from the raw ingredients. Other transformation processes such as food preservation like canning, drying, or freezing to extend the time the produce can be used it crucial. The third way to see the set of transformation is working with the newest innovations of farming techniques so an activity would be developing adaptive methods that are open for changing to new methods like hydroponics, vertical farming or aeroponics for example. This then connects again with the education part, as staying informed is a crucial action to take.

Distribute:

The next set of circular activities for a circular foodscape will be coordinating the movement from producers to consumers in the shortest way possible. This is meant by the short physical distance but also on the steps until the food is then consumed. So if one is directly consuming the home grown food at home, that would be shortest chain possible. But it can also be that the urban agricultural farm is delivering the fresh or locally transformed produce to the school canteen or the community kitchen. Or selling the produce on the local market.

Consume:

The goal would be changing to a Prosumer- a person that is producing what is being consumed. Overall shifting the lifestyle for valuing the local food production and short chain products more is a way of consuming more circular. A crucial action is choosing sustainable and local products, eating with the sea-

son and also refusing products that have high footprint. So looking at labelling and being aware then doing groceries is important. Also engaging in a food sharing or collaborative consumption practices is a way. For example food sharing platforms to get leftover food of supermarkets, markets and restaurants. Or taking part in community cooking events, or just cooking for our neighbours. Also changing the mindset of being fine with food not looking perfect, but being a bit crooked or discoloured being complete normal. This then is also part of education to learn and especially experience what food is edible and can be consumed. Mindful consuming then also related to the last step, separating.

Separate:

Separating are actions such as composting, at home, at working, in school or also in the public space after eating a burger to go. It is the end and at the same time the start of a circular foodscape. Thus the most important action to engage in. One action would be placing the source separation points where the type of waste is generated, such the kitchen or the garden. But also developing a curbside collecting system of organic waste so that residents can place their organic materials into a bins designated for composting programs. This action needs monitoring and impact assessment (Afval naar Oost example). Also supermarkets and resultants can take the role model part here, engaging in the businesses to separate or return certain products and then showing for example how the coffee waste can given there and then the mushroom you buy there are cheaper than if you would not separate your waste. Composting in wormhotels is also a great activity, as certain lend-resources need to be located also separately. Overall this part of action also needs to done by the municipality as they are the waste infrastructure taking care that there is frequent waste collection so the compost facilities are well maintained and are being used by the residents.

These actions were base for the development of the pattern language so that the pattern language is supporting and offering circular activity to make it feasible to engage in the circular foodscape in the daily life and can be broken down and discussed how one action would be implemented in the urban space and how it effects other actions.

Please take a look at Figure 110 in chapter 6 to see the relation between the actions and the patterns.

Circular actions and values

Here the value flower by Leclercq & Smit is combined with the six step cycle of urban agriculture by Abelman (2023; 2015).

With these two frameworks the sub research question will be analysed:

What is the ecological, social, aesthetically, economic and cultural value in the neighbourhood of Schalkwijk based on the circular activities of the everyday life?

There is no relation between the value and the activity. The order in the cycle is random.

Activity map showing where circular actions are already happening



Figure 95- Diagram of Circular Actions and Values combines

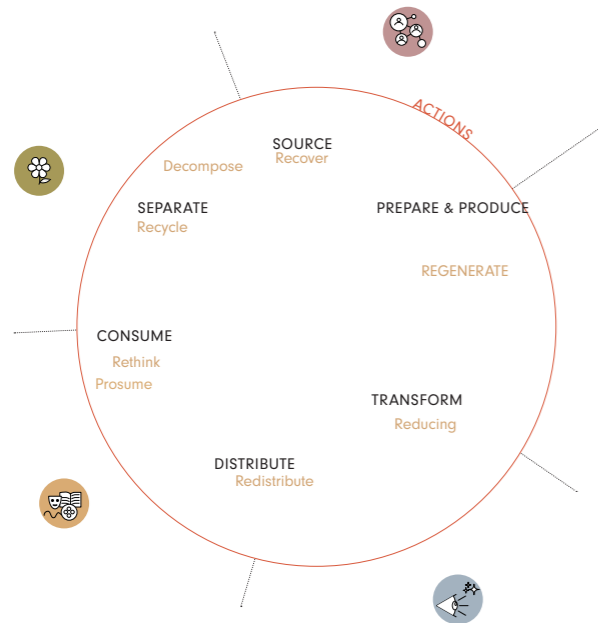


Figure 96- Axonometric of Circular Actions located in Schalkwijk
Made by the author

5.6. FOODSCAPE ACTORS

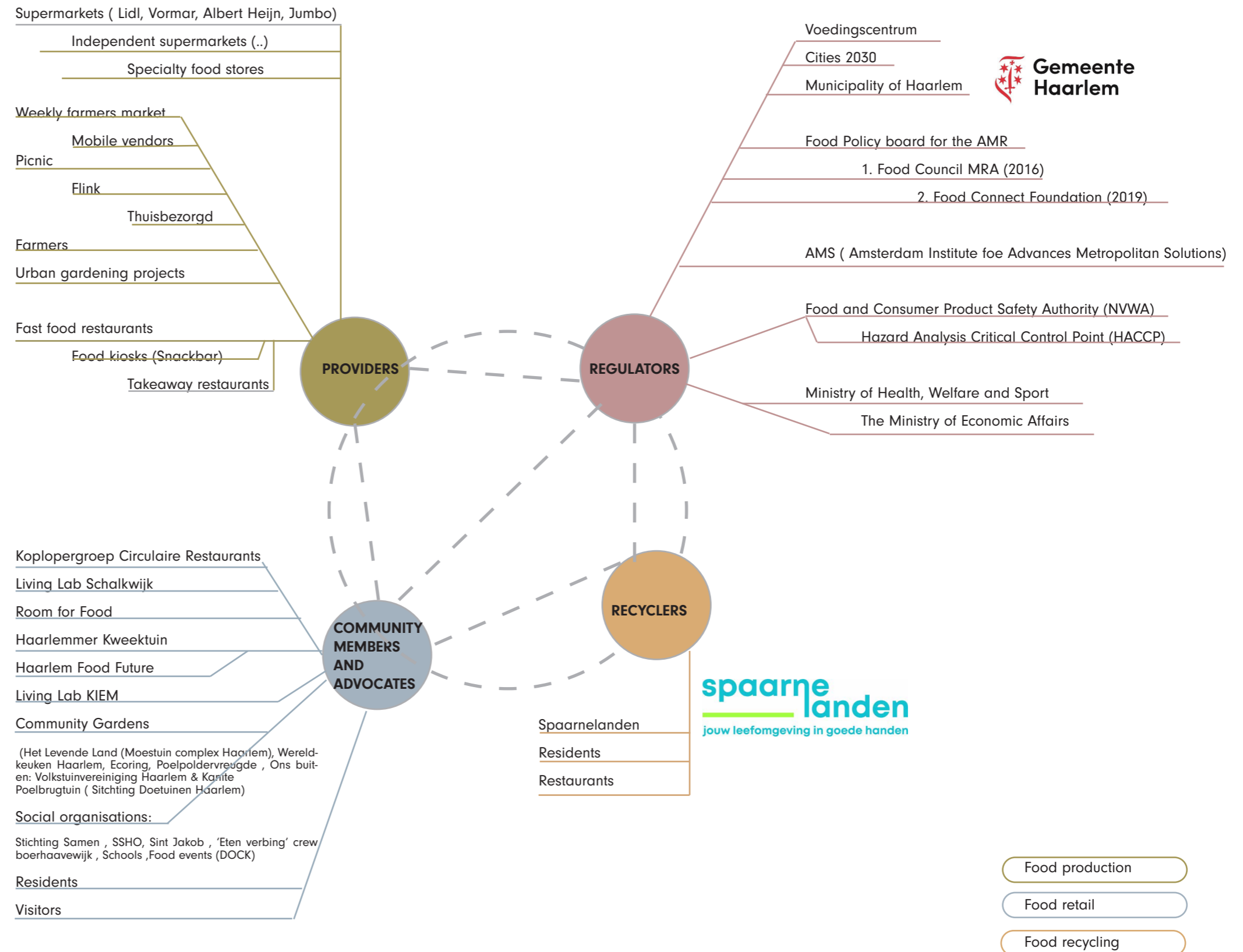
To frame the foodscape of the daily life in the area in consideration to circularity, the relevant decision makers and residents are being identified.

The foodscape is linking the people to the food places. 'Urban foodscapes can be defined as socially constructed urban landscapes or places which are able to produce food (...) along the food chain(...) which relate people and food to places, especially on a local or community scale (Wim Bosschaart, 2015).'

For this project it is important to identify the stakeholders to engage them in the co-creation process.

It will be separated into stakeholders that are **food providers** (stakeholders that produce, process, or sell the food), **regulators** (these are stakeholders who influence the food system in the area and how the food system is being regulated in the neighbourhood from production, to processing to recycling- the ones who write the food policies - individuals and departments and government programs and road maps for the food System. The public space and the food sector is highly influenced by key actors for long-term systemic change in the foodscape of the area - thus engaging the regulators in the project increases the success of a co-creation approach), **residents** (local members are the best insight for the food scape structure of the daily lives in the area, engaging with residents gives insight into key activities of the access and habit towards food and of the local lived experience) and **advocates** (community members that are interested in the local and communal well-being) and **recyclers** (these are actors that are part of the current collection and recycling scape) .

These categories of actors are mapped in the figure on this page .



- Food production
- Food retail
- Food recycling

Figure 97- Stakeholders of the Foodscape
Figures of Logos are from the corresponding business as it represents

Power - interest Stakeholder Matrix

In this matrix, it is evident that stakeholders representing society have low power and currently show low interest in the transition towards a circular food system. However, the water and waste management sector and government do desire the move towards circularity and their own benefits like more water storage and housing development- which all requires transition .

This highlights the crucial need for raising society's awareness to involve them in the transition.

Initiatives in Haarlem MAAK, small makers and start-ups operating in the field of circularity have a strong interest in the transformation, but less power. Policy-makers could support circular business development through upscaling and implementing more policies.

The Living Lab, as one of the transformers, has the connectivity and willingness to change the area to a more sustainable and inclusive one.

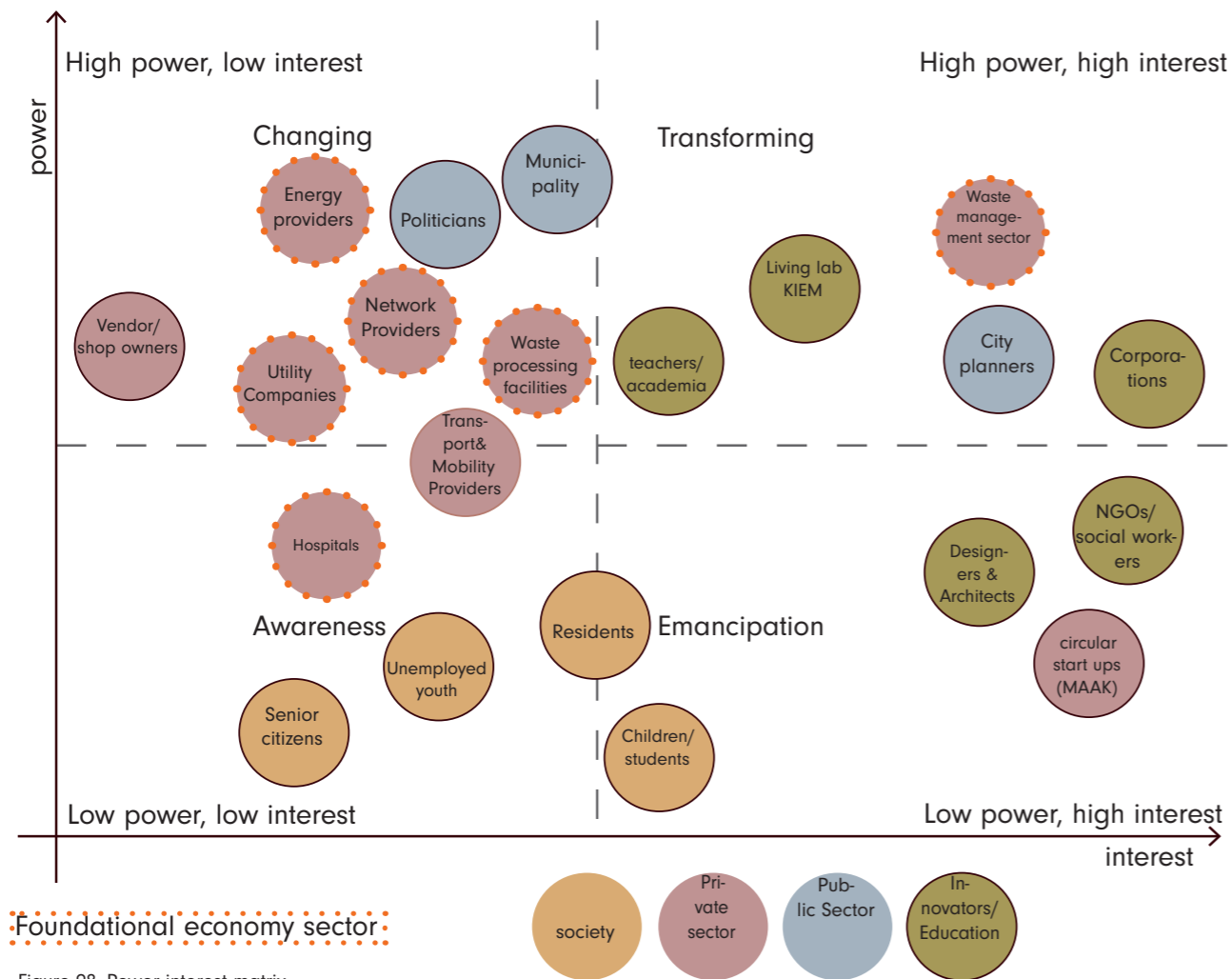


Figure 98- Power interest matrix

Policies and frameworks for the transition towards circularity

Understanding the circular transition in policy and planning.

Location	Year	Policy / Framework
Haarlem and South Holland	2016	Ruimte voor Groei. Coalitieakkoord 2015-2019 (College van Gedeputeerde Staten van Noord-Holland, 2015)
	2017	Werken aan een duurzaam, ondernemend en vernieuwend Noord-Holland. Uitvoering-sagenda Economie Noord-Holland 2016-2019 (Provincie Noord-Holland, 2016)
	2018	Ruimtelijk-Economische Actie-agenda 2016-2020 (Metropoolregio Amsterdam, 2016)
Government of the Netherlands	2016	Government-wide programme for a Circular Dutch Economy by 2050
	2017	Raw Materials Agreement
	2018	Transition agendas Plastics, Consumer Goods, Manufacturing, Construction and Biomass and Food
	2019	Circular Economy Implementation Programme Annual National Circular Economy Conference
	2020	Progress report : every two years by the Netherlands Environmental Assessment Agency (PBL) Circularity Gap report NL The 2020 Nitrate Report with the results of the monitoring of the effects of the EU Nitrates Directive Action Programmes, RIVM report 2020
	2021	Update: Circular Economy Implementation Programme Bestemmingsplan Foodhal Centrum Schalkwijk 2021
	2022	Update: Circular Economy Implementation Programme Haarlemse Routekaart Duurzaamheid Route voor CO2-reductie "Towards a Circular Economy" North Sea Commission 2022 Herijking warmteoplossing Schalkwijk Gevolgen decentrale warmteoplossing voor bredere warmtetransitie in Haarlem 2022
	2023	Omgevingsvisie Haarlem Groen Beleidsplan 2023
	2030	Integrale Circulaire Economie Rapportage 2023 Goal: 50% reduction in raw materials consumption Only raw materials!
	2040-2050	Haarlem wants to be a circular city by 2040 Goal: waste free economy

5.7. CURRENT URBAN SPACES FOR TRANSITION

Relevant Spaces

According to the previous analysis, there are some spaces that have greater potential for circular action and thus for circular development in a circular neighbourhood. These are shown here. They are further elaborated in the matrix on the following page, where they are linked to the ownership of the space, the potential transitions that can take place there and the circular activities that can take place there.

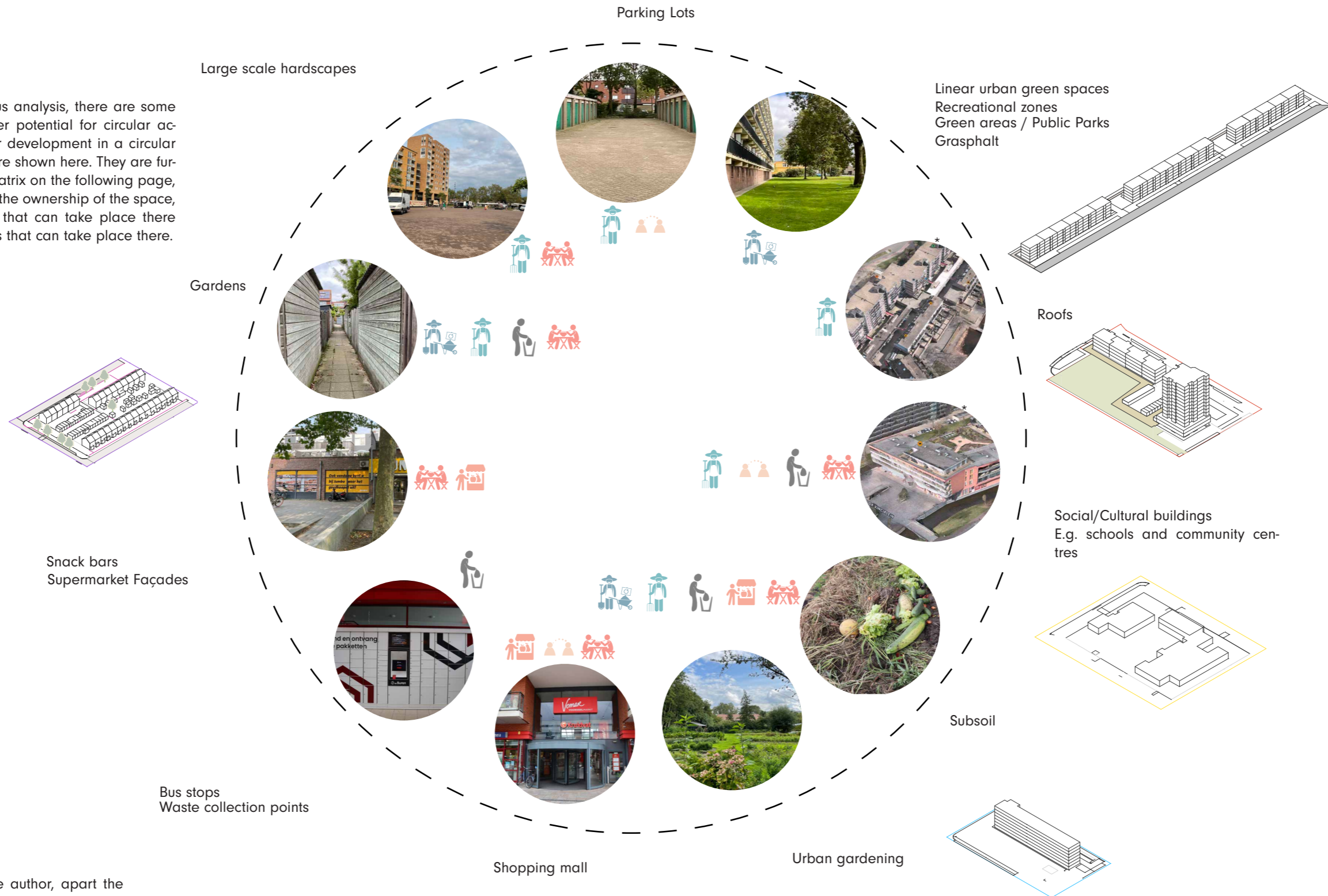


Figure 99
All pictures taken by the author, apart the ones marked with a * . source: apple maps

Relevant Spaces	Ownership of Space	Scale	Maintenance	Possible Project type/ Circular Transformation	Products	Activity
Roofs	Private/Common	Micro	Residents Housing Cooperation Roof owner	Roo gardens, solar panels on roof, wa- ter collection, green roofs		
Parking Lots	Public	Meso	Public Municipality	Less parking lots but more green for food production		
Bus stops Waste collection points	Public	Micro	Municipality	Accessible waste collection points on the daily routes of the residents	Waste	
Large scale hardscapes	Public	Meso	Municipality	Water collection, transform, local food production, less paved space		
Snack bars	Private	Micro	Shop owners	Healthy local food, supporting short food chains, placemaking		
Supermarket Façades	Private	Micro	Shop owners	Visible local food - public space quality	Local Economy	
Linear urban green spaces Recreational zones Green areas / Public Parks Grasphalt	Public	Macro	Municipality Spaarnelanden	Improving urban quality, soft transport potential, green and healthy walking neighbourhood routes City image, improving neighbourhoods, permaculture food production, water ab- sorption and storage		
Urban gardening	Common	Meso	Initiatives	Local food production, intensive food plots for communal use	Education	
Gardens	Private	Micro	Owners Residents	Local food production, intensive food plots for private consumption		
Social/Cultural buildings E.g. schools and community cen- tres	Common / Semi- private	Meso	(Social) organisations Municipality Initiatives	Local food production, intensive food plots , water collection, placemaking, climate adaptive public spaces, educa- tion, food directly processed and con- sumed	Education	
Subsoil	Public / areas private	Macro	Municipality Waterbord Rijnlanden	Supporting biodiversity, and urban green, healthy living environment , cli- mate adaptivity, supporting food pro- duction and water storage And infra- structure for transition		
Shopping mall	Semi-public	Meso	Shop owners	Food shops support local food produc- tion and local businesses - accessible foodscape for everyone	 Food	

Figure 100 - Diagram of relevant spaces related to multiple factor of this project

06 A PATTERN LANGUAGE FOR CIRCULARITY IN THE EVERYDAY

This chapter presents the application and development of the pattern language, including an introduction to the pattern set and the underlying system. Furthermore, it explains the three core drivers of a circular everyday foodscape.

Figure 101-
Historic picture, source: <https://boerhaavewijk.nl/fotos/>

6.1. THE PATTERN FIELD

What is a pattern?

Each "pattern" represents a small action or intervention that we can carry out. It is about something regular that already exists or is still being developed. When we put all the patterns together, we create a plan, a comprehensive system and a strategy to improve our neighbourhood.

According to Hausleitner a pattern is 'a relational solution' and 'context sensitive'. (CoM Pattern language intro, lecture, 10.2023)

A pattern is an implementation aimed at the end goal of a specific project, in this case a circular neighbourhood that is already happening somewhere or is part of an innovation. It is something regular that can be applied in different environments and places, depending on the practical implications. A pattern is defined by a title, an image and a hypothesis about how it would manifest itself in a particular system. A pattern is connected

to several other patterns, making a pattern part of a large complex system. In this case, a pattern can be. A starting point for the development of a systemic change towards a circular neighbourhood. The beauty of the pattern language is that it can be extended at any time - and that's great for co-design or co-creation processes. Stakeholders can add their patterns if they feel that an important implication is missing or if a connection is missing. This makes the entire pattern language not only interactive, but also grows as part of the participation process, adapting better to the knowledge already available in the stakeholder network and thus becoming more specific and relevant to the respective environment. However, the links between certain patterns can also contradict each other or require a certain priority, as only one option can be chosen. However, some patterns reinforce each other .

Pattern cloud

All individual patterns located as a pattern cloud, The bigger ones are the ones that provide a lot of connections with other patterns, the darker a pattern it, the more it is affected by other patterns.

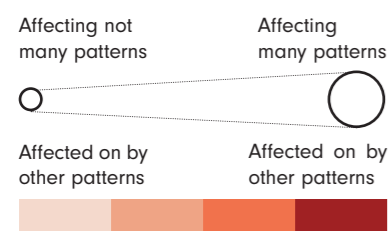
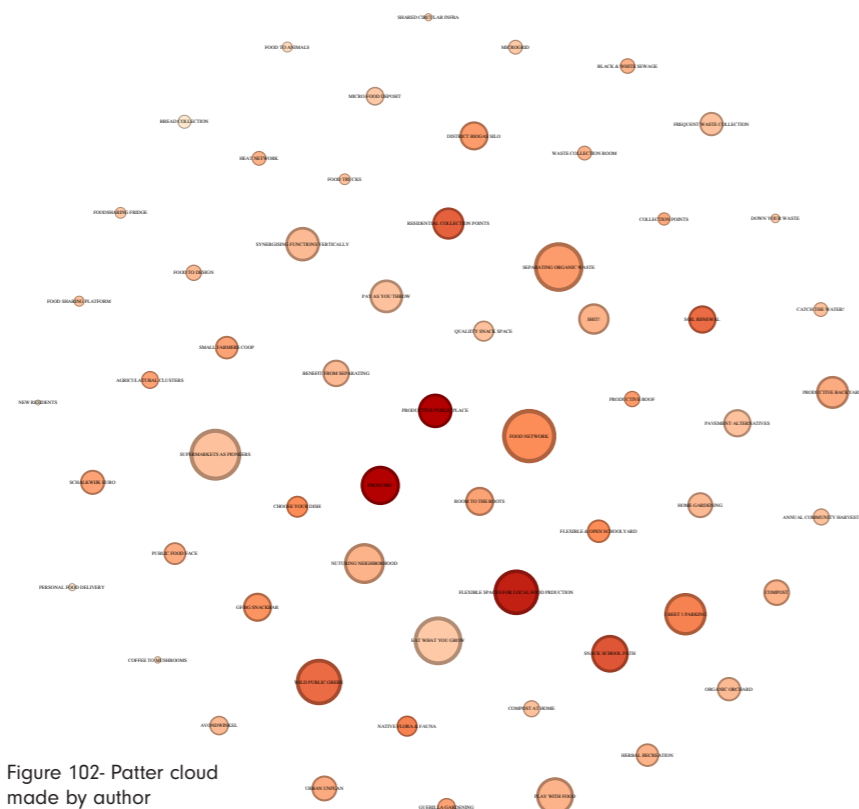


Figure 102- Patter cloud made by author



What is a pattern language?

When the patterns are linked together, the pattern language is created. Each implementation communicates in a network with other implementations. Everything is interwoven into a complex system. In this way, a pattern attempts to break down the complexity of the complex overall system of a pattern language in the direction of a circular neighbourhood.

, An urban pattern language tells us the meaning of urban patterns and how they should be combined to form a successful urban area' (Salingaros, 2005).

How will the pattern language be applied in this project?

The pattern language will serve as a valuable tool for several project phases, including simplifying and consolidating the intricate circular foodscape system.

Pattern language

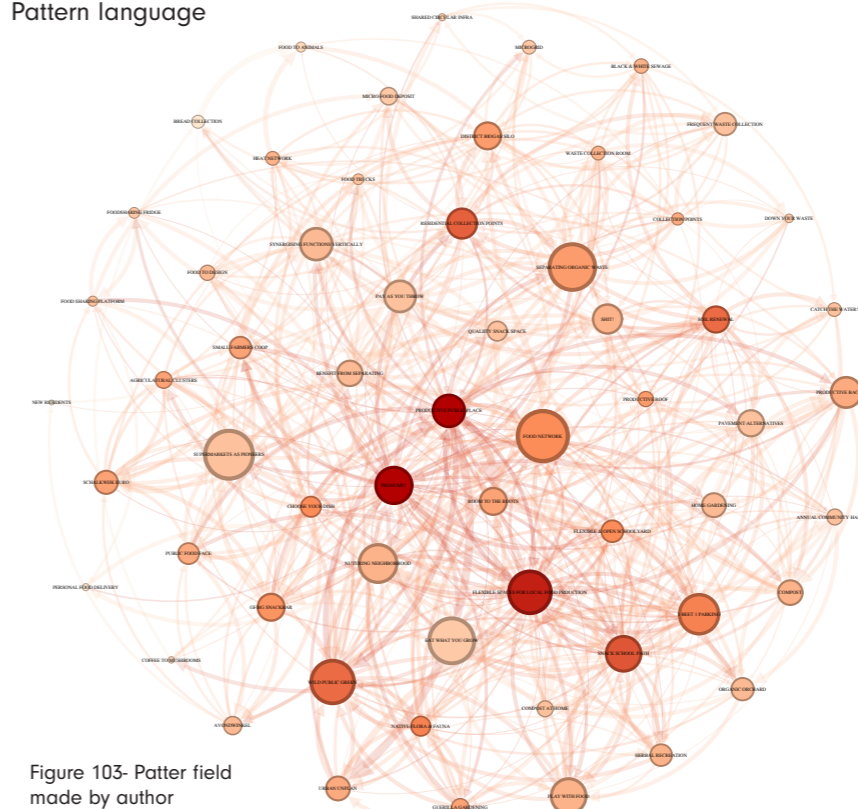


Figure 103- Patter field made by author

The language is created through the connection between the patterns, as each intervention is more or less strongly connected to another pattern or even contradicts it. This illustration shows all the connections made between the patterns.

The thicker the connection line the more relevant is the connection between the patterns. The huge connection lines are the ones that constraint a connection.

The pattern language is used to comprehend existing lock-in systems and path dependencies, and to determine the appropriate interventions, such as patterns, for disrupting and altering these dependencies towards a system shift.

Then it will be utilised to link the analysis and theories to a practical implementation, which, depending on the location, can be instantly relevant and used in a specific context. A district context has been selected to test the pattern language as a tool for co-design and co-creation.

6.2. CATEGORIES OF PATTERN NETWORKS

Which specific spatial design transformations result from adapting the pattern language to a particular location?

The physical outcome will vary depending on the location. It is not only the location, seen as a geographical position, that will affect the manifestation of the pattern in space, but also the morphological configuration of that space to the environment. For example, a pattern in a courtyard might look different from one in the front garden on the other side of the house.

Integration of four perspectives

Apart from the different scales the pattern set is covering various perspectives. The pattern language is connecting various entities and networks, for this project, the pattern language is designed for four categories.

To categorise the principles that were developed via the research has been categorised into four network: - next page

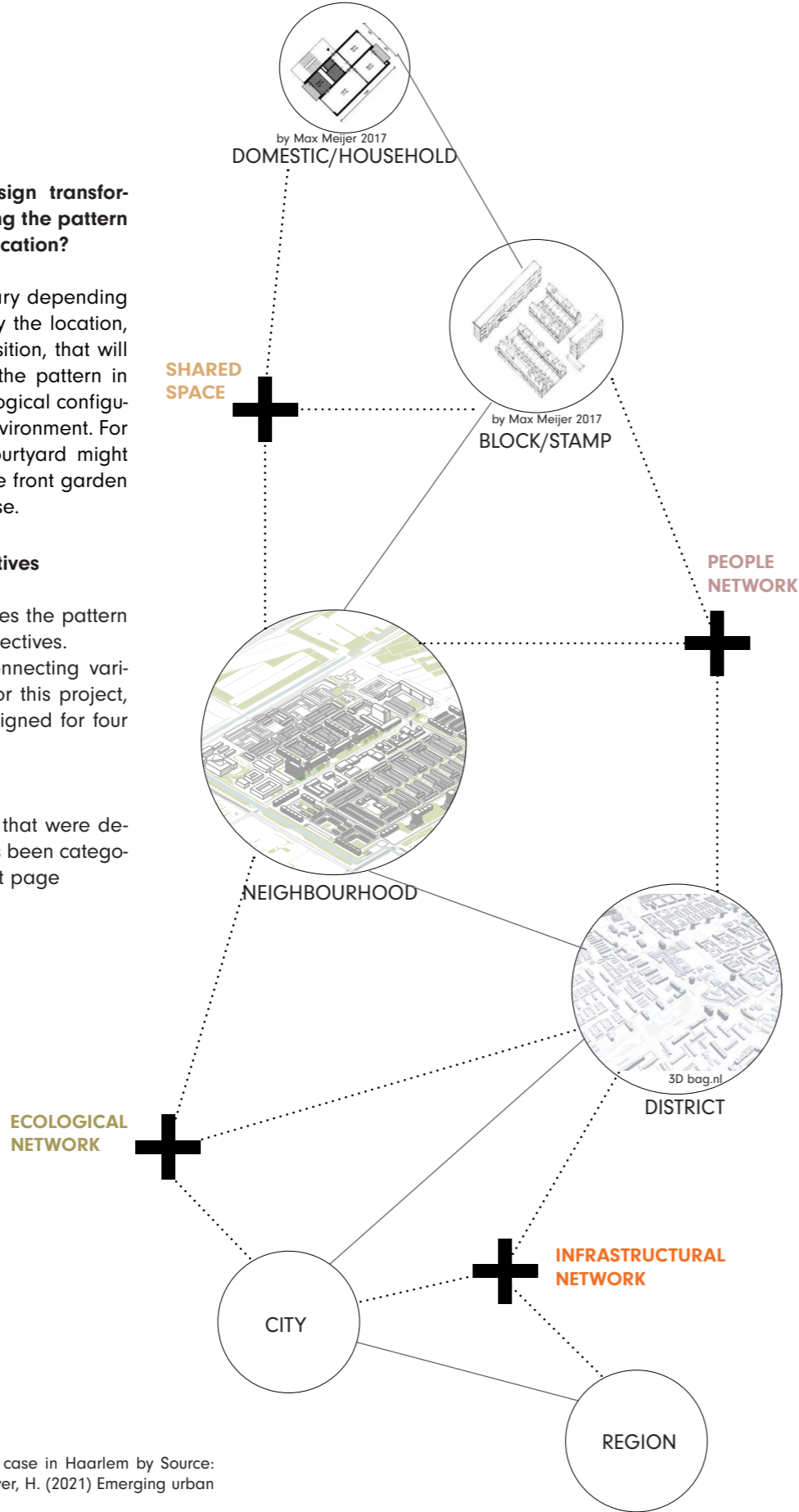


Figure 104- Graph adapted to this case in Haarlem by Source: Hausleitner, B., Muñoz Sanz, V., Meyer, H. (2021) Emerging urban spaces for manufacturing. Case metropolitan region Rotterdam-The Hague.

1. Ecological Network

This category maintains principles that relate to spatial manifestation of the ecological system and network in the neighbourhood. The principles are the provisioning services of the ecosystem services and the spatial transformation that the ecological networks has to facilitate to provide a circular food system. In this way this category can be seen as 'supporting circularity'.

2. Infrastructural Network

The category is overlapping and spatially connecting the spatial changes that need to happen in the socio-ecological networks to provide a circular food system. It is the logistics of providing space for no-food waste actions and also the space for regenerative and smart circularity actions.

3. People Network

The principles of the people network show the actions to be taken to promote circularity such as policy changes and lifestyle changes. These are the more soft infrastructural changes which are provided by the cultural services bog the ecosystem services. It also includes the shift towards a more foundational economy and the agency of the people t support a circular foodscape.

4. Shared Space

Shared space refers to the patterns related to spatial implementations. It is encompassing all other three categories as all aspects of this project are translated and associated with spatial aspects. The spatial implementations included in this space could contribute towards achieving a circular everyday foodscape. Therefore, the shared space ultimately serves as a platform for the everyday circular foodscape, facilitating organic waste collection, local food production and promoting accessible and healthy local food systems.

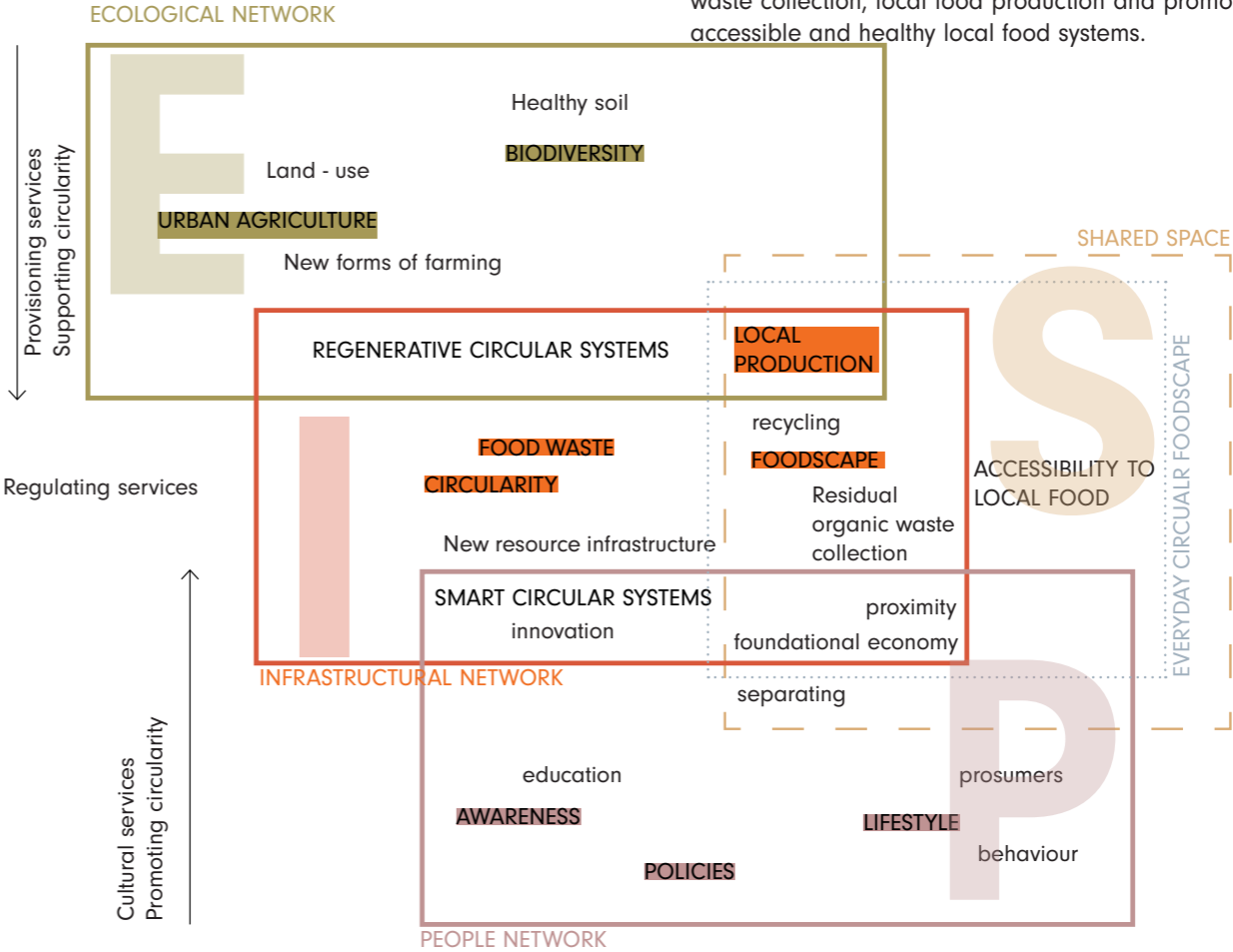


Figure 105- Categories of pattern language made by author

6.3. UTILISATION OF PATTERN LANGUAGE

The construction and utilisation of the pattern language in this project involve two approaches.

First, patterns are developed based on theoretical foundations, supported by references and practical implications. These comprehensive patterns are documented in a pattern booklet, offering a structured resource for project implementation.

In addition, the project also employs a second approach, wherein patterns are simplified and encapsulated within game cards. These game cards are designed for easy comprehension by residents and stakeholders, serving as tools for engagement and stimulating productive discussions. Each game card includes essential components such as a title, hypothesis, scale of application, in-depth analysis, and connections to other pertinent patterns, emphasizing the interconnected nature of the pattern language.

Furthermore, these game cards feature visual representations of the food-water-energy nexus, ensuring the integration of this critical concept into the project's discourse. This dual approach not only signifies the versatility of the pattern language but also underscores its adaptability for different audiences and purposes, enhancing its efficacy in facilitating meaningful discussions and guiding project development.

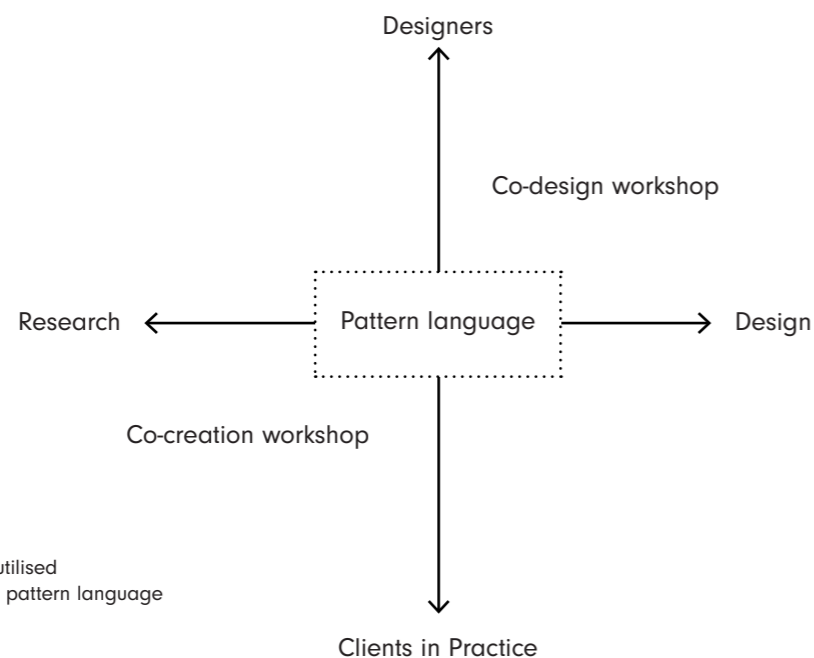


Figure 106- pattern language utilised made by author, inspired from pattern language workshop by TU Delft

Explanation of a pattern card

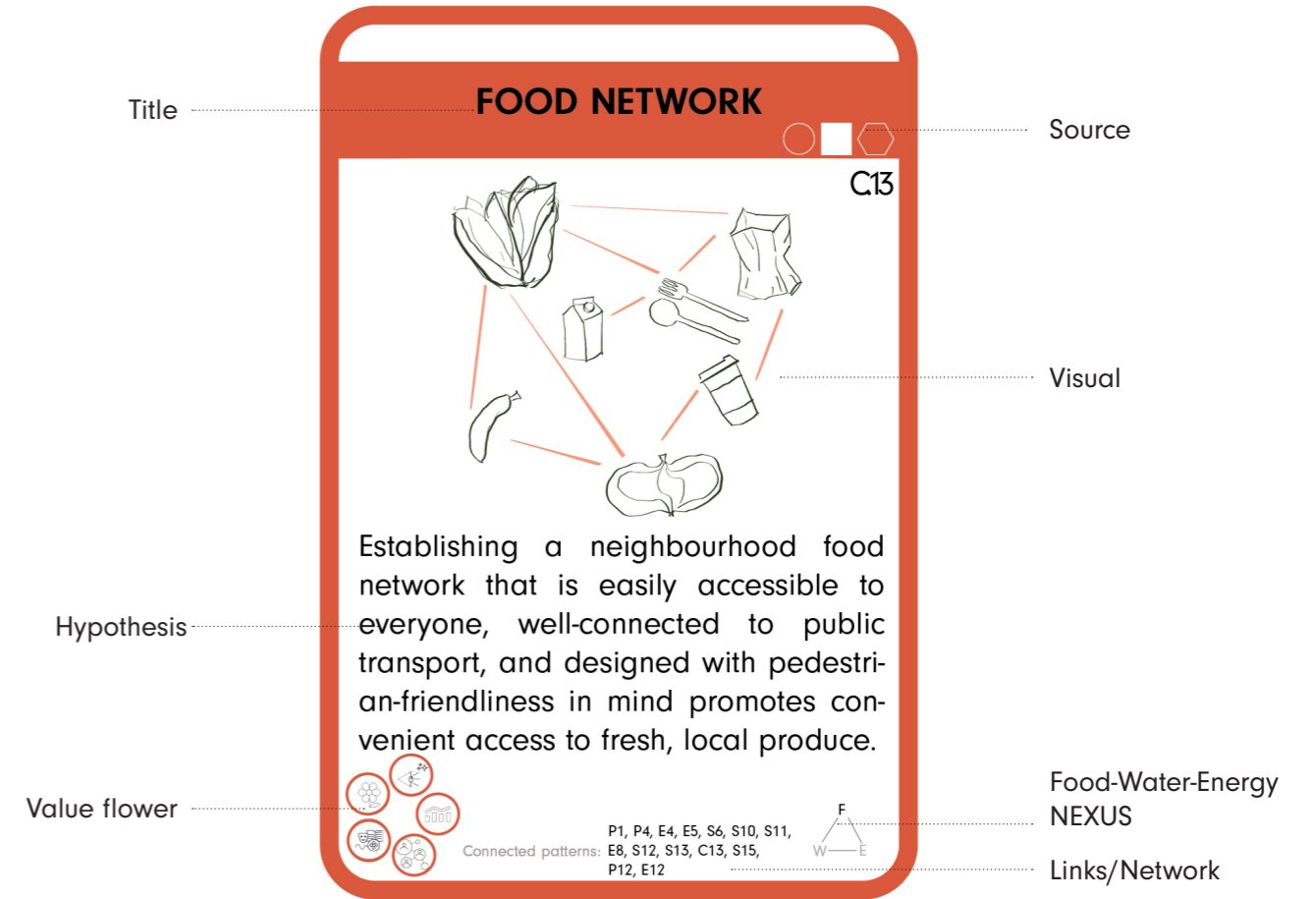


Figure 107- pattern card made by author

Development of new Patterns by analysis of other systems and observation

Development of Patterns and chain connections in current system

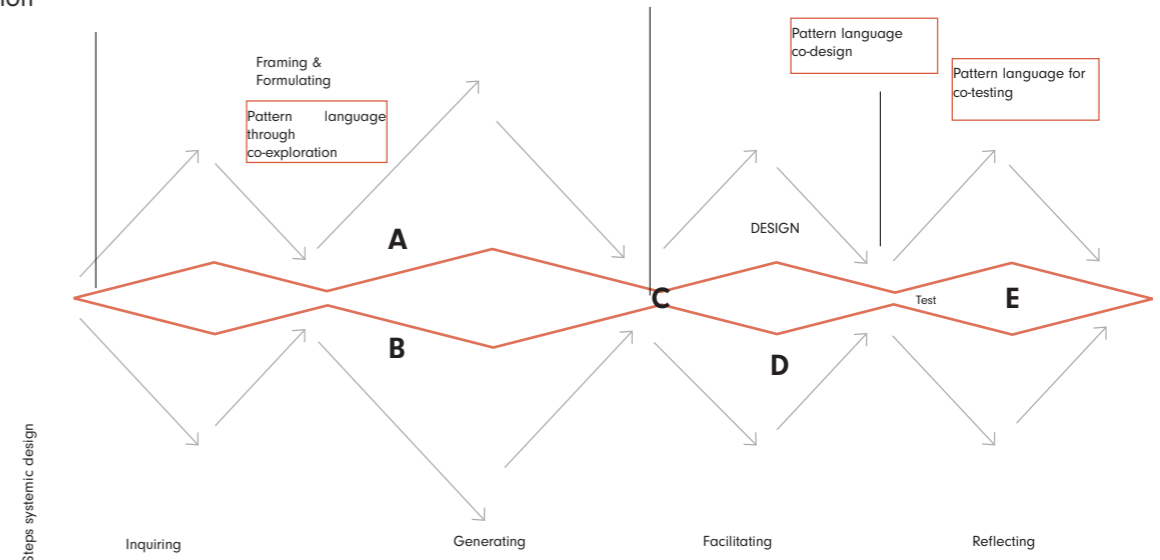


Figure 106.1 - pattern language utilised made by author

6.4. A SYSTEM OF SOLUTIONS

PEOPLE NETWORK

P

ECOLOGICAL NETWORK

E

SHARED SPACE

S

INFRASTRUCTURAL NETWORK

I

6.5. DRIVERS TO A CIRCULAR FOODSCAPE

Pattern language in an urban context

To translate the pattern language into the urban context, the patterns associated with the four networks of infrastructure, people, ecology and shared space are used to develop systems that improve the three driving forces towards a circular, everyday foodscape in the urban context: The three driving forces - biodiversity, no food waste, accessible foodscape - can be seen as the three pathways that are part of the circular transition.

The key drivers for the transition to a sustainable, circular neighbourhood are:

Biodiversity

Improving the ecosystem by implementing soil remediation strategies to improve conditions for local food production, prevent flooding improve water storage, and promote diversity of flora and fauna. This could be done through regenerative practices such as incorporating permaculture principles into urban planning and design. And improving the green networks throughout the district by adding plants that grow fruit and vegetables. Simultaneously improving the biodiversity of the local species. Here the focus on native species and nature-based solutions is important. The development of water collection systems, drawing on the concept of a sponge city, to store and utilise water on site to contribute to resource management and energy transition for water supply and provide water for urban agriculture.

There are three scales to approach this transition. One is 'Life Design Interaction', which designs places. Then 'habitats', can be designed as green networks at the neighbourhood and district scale, focusing on secondary green structures and main green structures. Thirdly, system processes, which focus on the systems - in terms of biodiversity, the focus is on ecosystem processes.

No Food Waste

This means the implementation of spatial measures to reduce food waste. This includes the collection of organic waste by setting up collection points for organic waste and local recycling infrastructures such

as silos for biomass fermentation in the immediate vicinity. This also supports the energy transition by creating energy and heat supply through the implementation of heat networks that utilise Aqua-Thermal, WKO (underground thermal energy storage) and anaerobic digestion of wet biomass to generate heat.

One starting point for making that change is the individual - through waste separation, which also leads to a main pattern of 'organic waste segregation'. Then the places and spaces that allow for easy deposition of segregated waste via 'waste col-

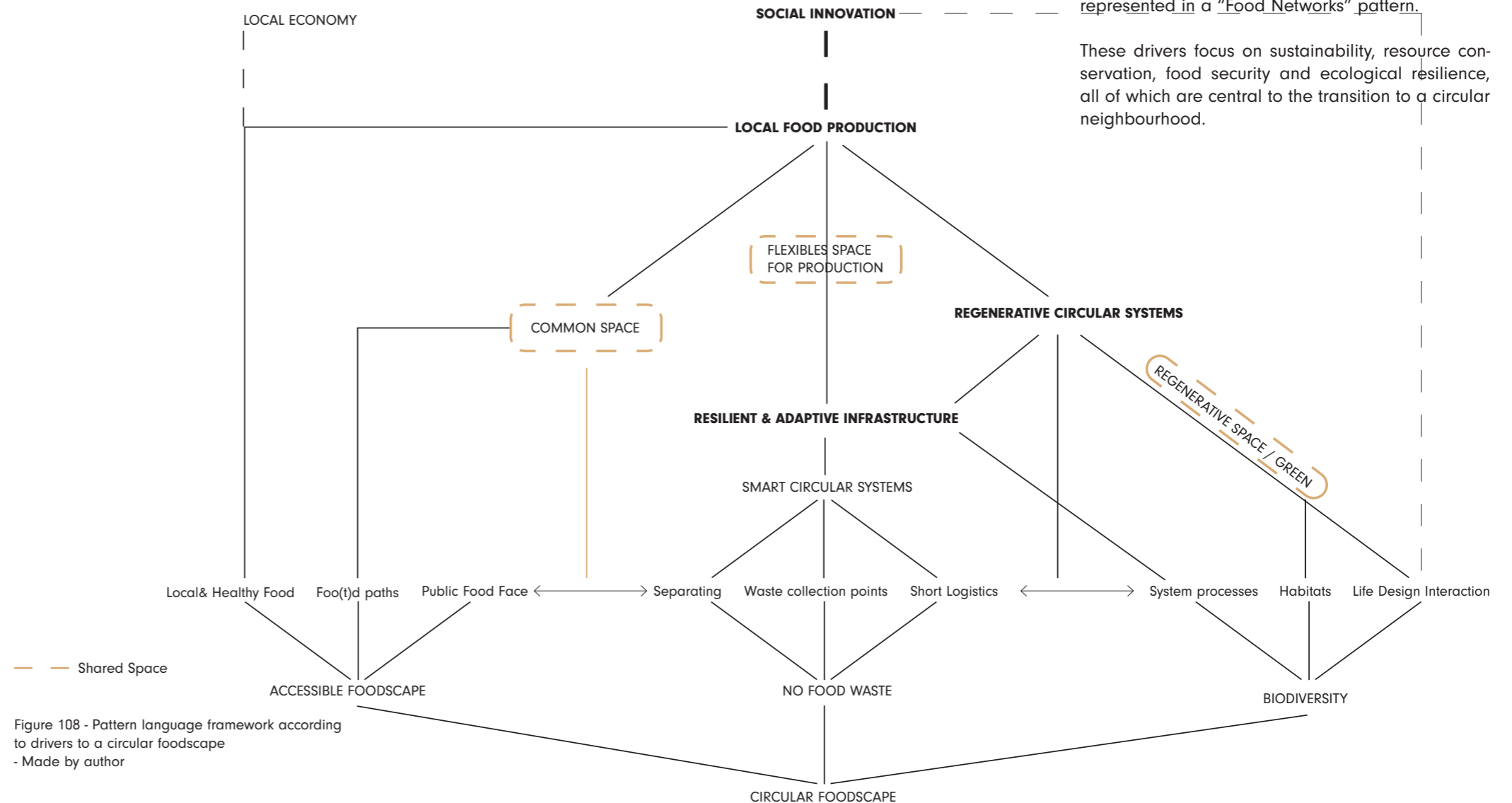
lection points', also a pattern centred on collective spaces in buildings and shared spaces in public areas. From there, the scale shifts to the district and city scale - in the current system even to the regional scale as the street infrastructure is the space where the short logistics can be realised.

Access to Healthy Food and Circular Foodscape

Ensure that residents have easy access to nutritious and locally produced food. The Circular Foodscape promotes local food production and consumption through accessible healthy food shops and restau-

rants and more visible local food production in the neighbourhood. Urban agriculture through the establishment of urban agriculture spaces in public spaces such as sports fields, playgrounds and rooftops to produce food locally, promote social cohesion and support local food consumption. This is observed on three scales: at the micro scale of the product by looking at local and healthy food. At the meso scale, the focus is on public space and spatial quality, with an emphasis on designing places with a 'public food face'. This also results in a pattern of its own. Then the everyday routes in the district by looking at the pedestrian infrastructure in the neighbourhood, Foo(t)d Paths, which is also represented in a "Food Networks" pattern.

These drivers focus on sustainability, resource conservation, food security and ecological resilience, all of which are central to the transition to a circular neighbourhood.



The circular foodscape in Schalkwijk...

... provides necessary ecological diversity and resources to support local food production

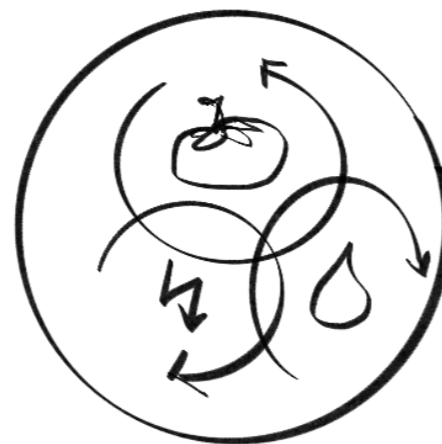
The socio-ecological analysis has shown that biodiversity suffers from monofunctional agriculture and pesticides, especially in the peripheral areas of the district, while the area of urban agriculture has high biodiversity and great potential. The sites also have systems for composting their organic waste and re-using it to improve soil quality in order to grow their local produce.



BIODIVERSITY

... has an infrastructure network that collects the organic waste to provide then renewable heat and energy to the residents in the neighbourhood and therefore is closing loops in small scale.

By separating organic waste - food waste - and general waste, an entire flowing system can be created that supports the transition to renewable energy in the form of biogas, heat and electricity. This can then be utilised by building a microgrid and a district heating network. In addition, a separate sewage system would also support the system as this would allow the water to be collected locally instead of being flushed away as in the current sewage system. In this way, human waste rich in nutrients can be efficiently reintroduced into the system and rainwater is collected.



NO FOOD WASTE

... cultivates food within the neighbourhood that offers residents healthier and locally sourced food alternatives

Flexible and new spaces for local food production can be created that support the short food chain system. This would not only support the local economy through food production and other opportunities such as honey production or viticulture with rooftop vineyards. It would also promote social cohesion by involving part of the local population in the process. Local food is not only circular but also healthy (depending on the quality of the soil) and can limit the current metabolic rift in agriculture.



ACCESSIBLE FOODSCAPE

The pattern set

The graph depicts language patterns based on three drivers: Biodiversity, an accessible foodscape, and no food waste. The pyramid-shaped visualization is arranged in a triangular form, which represents the same strategy. Each driver is divided into three scales, from a space to a network to an overall topic. The findings demonstrate that the pattern range addresses various aspects.

The patterns located between the edges implement and support both drivers. The patterns located at the centre enable and support all three main drivers towards a circular foodscape.

The patterns situated in the centre mainly belong to the category of people networking as a shift in lifestyle and regulation are the primary patterns that would bring about change to all three drivers. Social innovation is one of the main aspects to shift towards a circular food system.

Another crucial aspect is local food production which impacts biodiversity and therefore requires the driver of 'no food waste' to truly benefit from the closed-loop system and provide local food production.

Moreover, regenerative systems within local food production and waste management are also beneficial for all three aspects.

A resilient and adaptive infrastructure is needed to not only facilitate immediate change but also to remain adaptable for future major transitions that cannot yet be predicted. This can be achieved by implementing an adaptable infrastructure and relying on regenerative natural systems that can adapt to change.

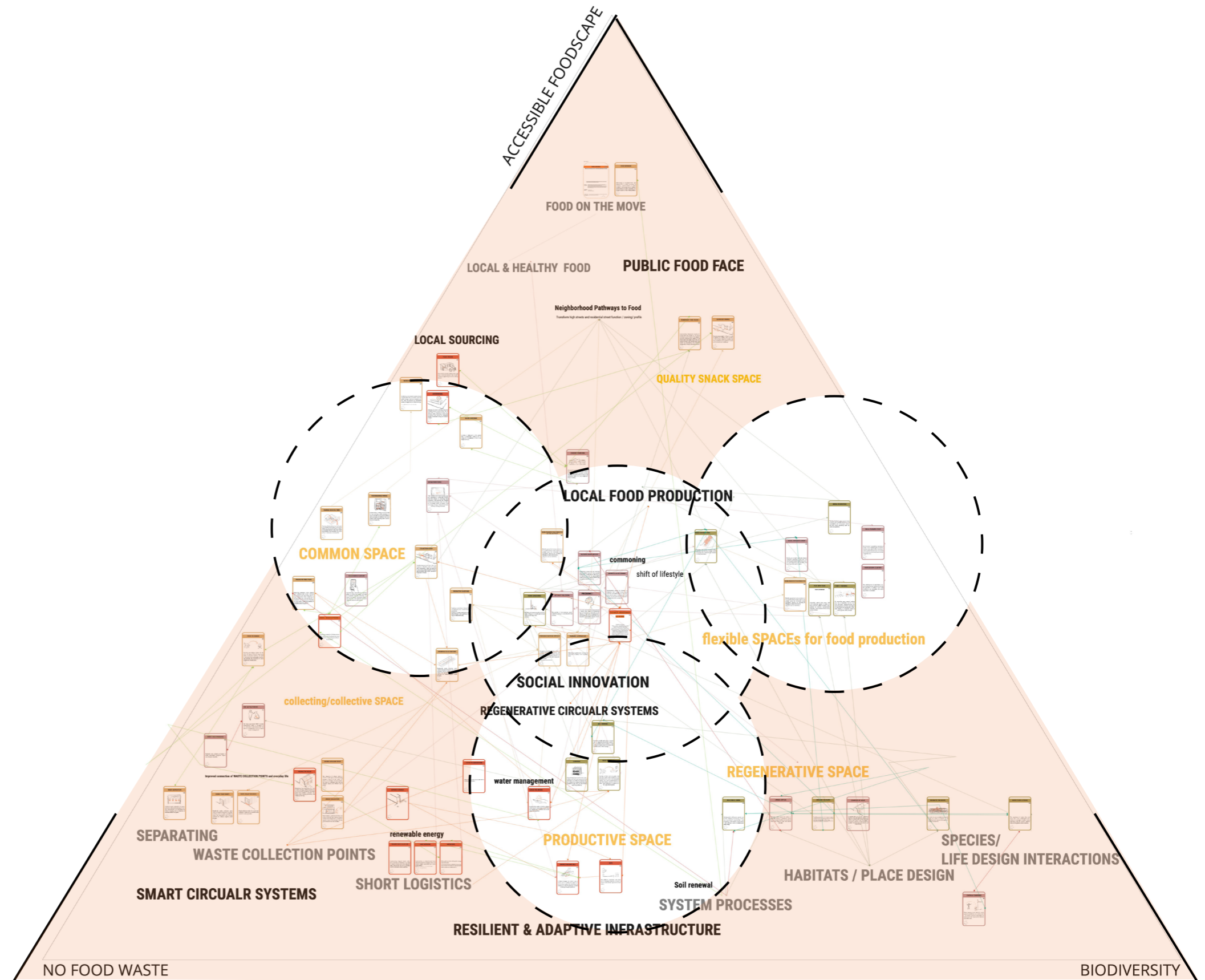


Figure 109 - Pattern language set according to drivers to a circular foodscape
- Made by author

6.6. PATTERNS AND CIRCULAR ACTIONS

Locating Patterns in the Everyday Actions of the Circular Food System

Each pattern can be related to or supports a certain circular action. The 'environmental network' patterns are mainly located in sourcing, preparing, and producing actions, as well as in separation actions like composting. However, there are no 'circular infrastructure' patterns related to consuming or transforming actions; this is a crucial aspect that needs to be taken into account. Preparing and provisioning infrastructure are crucial processes, which should be considered during preparation and distribution activities. The end-of-life stage of the separating system should also be taken into account to enhance the system's accessibility and circularity. The circular actions in the "people network" patterns should be represented at every stage. Additionally, the spatial implementations of the circular system in shared spaces should be considered for every action.

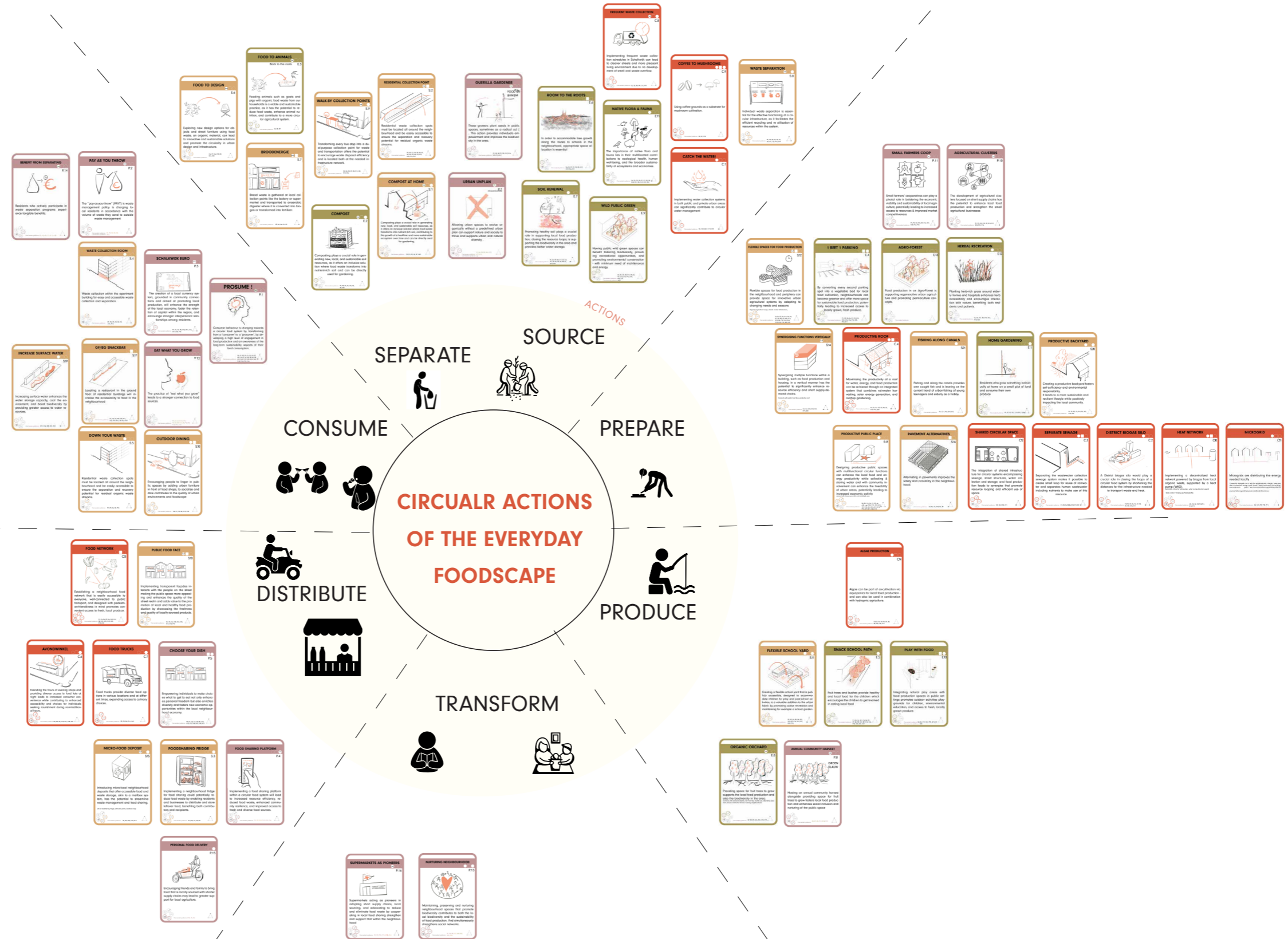
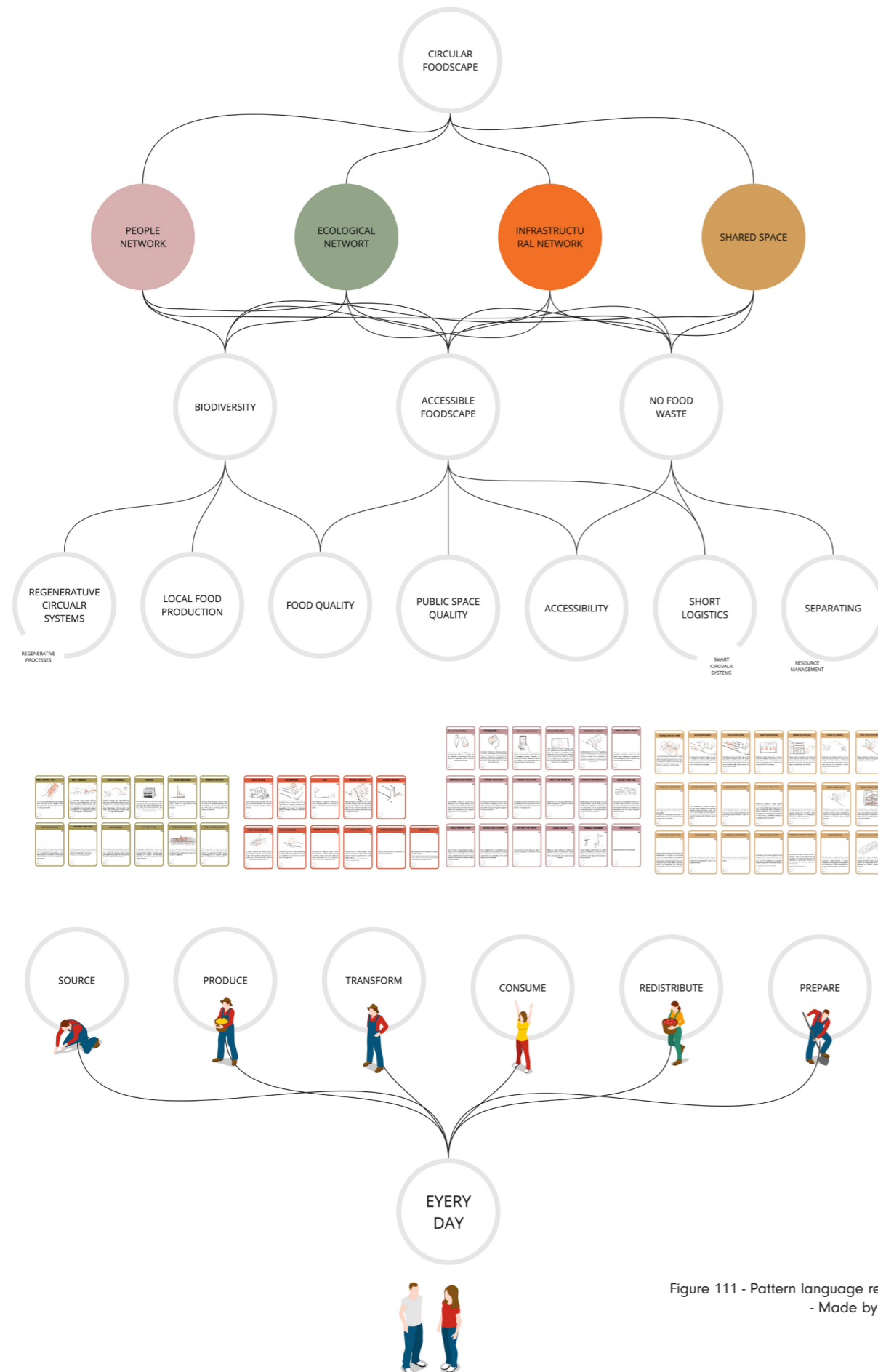


Figure 110 - Pattern language set according to circular activities
- Made by author

SUMMARY OF THE PATTERN LANGUAGE FOR A CIRCULAR FOODSCAPE



The graph Figure 111 on the left hand side depicts the relationship between the top-down approach and the bottom up approach. The top down strategies according to the three drivers and the bottom-up approach of the individual with their agency and circular actions. The pattern language acts as a connector of these two entities.

Figure 111 - Pattern language relations
- Made by author



Figure 112 -
Picture made by the author

07 SYSTEMIC DESIGN: SHIFT THE SYSTEM

This chapter illustrates how the pattern language can facilitate a transition in the current path dependencies towards a circular everyday foodscape as identified in the previous analysis and chapter. The chapter will outline the strategic shift of each driver, mapped and presented in a systemic section, referring to the systems responsible for their maintenance and shift.

7.1. DRIVER: BIODIVERSITY

The analysis shows that there is great potential for a green network in the Schalkwijk district. The main aspect is that the existing green is not highly valuable in biodiversity nor in relation to the circular food system used for local food production. The systemic sections show which patterns can be implemented or used in a different or new location to increase biodiversity and thus the circular food system in Schalkwijk.

This shift can be achieved by creating green networks. There are two spatial elements that can be worked on - one is the improvement of green links and corridors - the other is the development of green spaces, habitats. Both will then lead to the improvement of the existing green structure, the support of regenerative food production and a circular system for organic waste that supports the green structure and food production. This strategy as a whole is based on regenerative circular systems.

This strategy needs: engaged residents to grow and strengthen social cohesion and also support the local food production and engage in the local food landscape and separation actions. This will enable the exchange between green and social structures. And then it would result in a flourishing diversity - socially and ecologically above and below ground over time.

It will also promote the economic benefits to the community of being part of the local food production and the development and support of the local biogas silo, as this will provide financial benefits in the long term. By profiting from the heat and electricity network that will come with a biogas silo. This means that the strategy would have a direct positive impact not only on the environment and biodiversity, but also on social connections and economic benefits for the local economy.

A key step would be to start segregating waste, which is linked to the 'no food waste' diversion, but then affects the circular economy in the district. Separation of organic waste can also be stimulated by green spaces, such as the integration of composting and re-greening or urban gardening in one space. In terms of circular infrastructure, developing a system that turns human sewage into fertiliser for soil renewal would also be beneficial for improving biodiversity and local food production in the area (Shit! C5 and Soil renewal E7).

Planning more trees, not only to provide shade and increase biodiversity, but also to provide fruit and nut trees in public spaces.

This can connect the green spaces and provide 'Snack School paths E5' s residential stress that provide fruit and nut trees that hem the paths through the neighbourhood. This not only increases access to local seasonal food, but also improves the biodiversity of insects. The design of new trees must also take into account the 'space to the roots E6'.

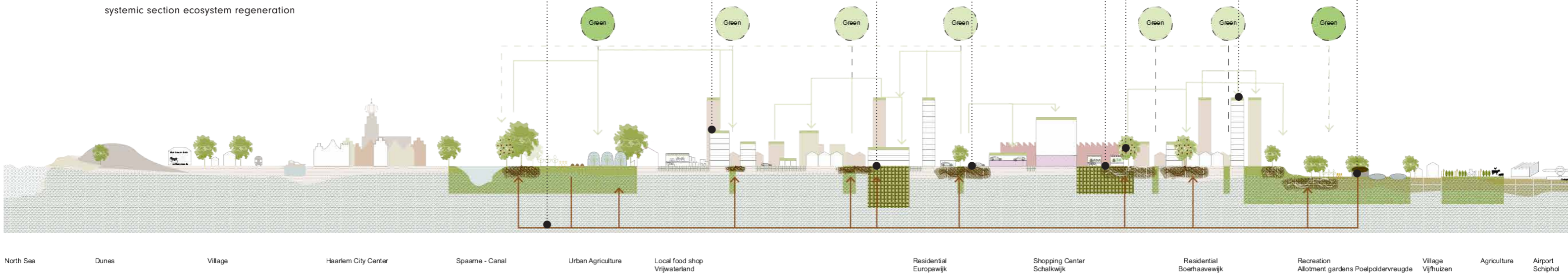
Using the space of flat roofs (Productive Roof C4 and Vertical Synergy S14) by greening them or even using them for urban gardening improves the quantity of habitats for ecosystems and thus connects the whole ecosystem more efficiently through the district.

All these individual interventions are interconnected and create a system to move towards a more biodiverse area that has the capacity to support local food production in a sustainable, inclusive way.

The links and impacts are shown in the strategy on the following page.



Figure 113- circular system interventions systemic section ecosystem regeneration



Strategic relationships of patterns towards more biodiversity

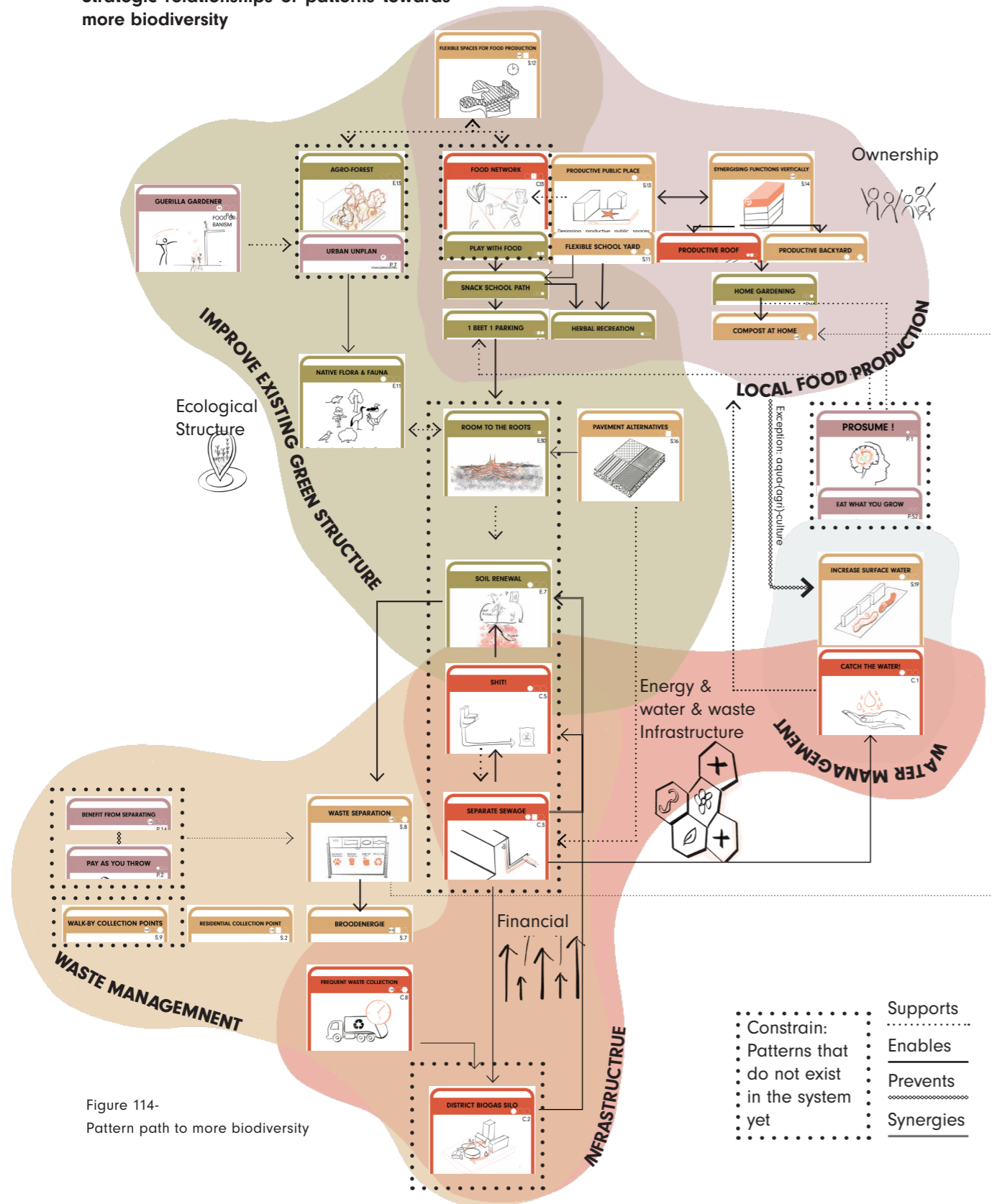


Figure 114- Pattern path to more biodiversity



Figure 115- Strategic map to more biodiversity

7.2. DRIVER: NO FOODWASTE

Shift to no food waste

The system currently has a high percentage of avoidable food waste (Geldermans, R. et al, 2016). Furthermore, the analysis reveals that the collection points for food waste are predominantly located outside the periphery. Thus, the transition towards a circular foodscape begins with the final activities, specifically, the act of separating. Moreover, this action is solely an individual choice. However, the spatial environment and design can facilitate and encourage the separation of food waste from general waste, providing a foundation for generating small-scale loops within neighbourhoods. By implementing more precise food waste separation measures, composting actions such as the worm hotel can take place, for instance in places like schools. Another potential loop involves separating used coffee grounds and providing them to a farm for growing mushrooms. After separating the leftover bread, one option could be generating biofuel or feeding it directly to chickens or goats on local farms. It should be noted that while pigs would be a suitable option for leftover food, halal dietary preferences and the local demography may make goats a more appropriate choice.

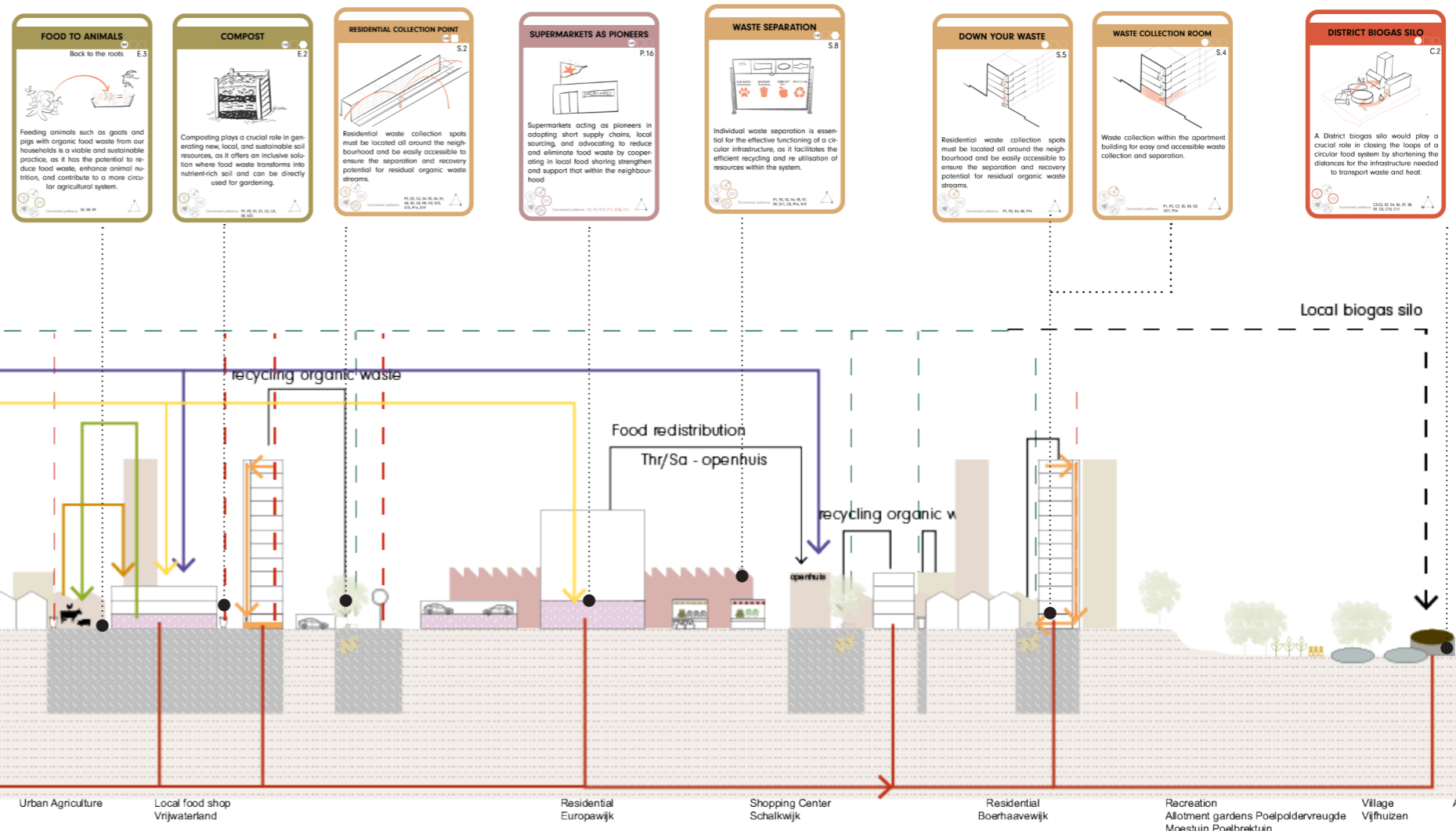
Figure 116-
circular system interventions
systemic section for food as a resource

System description of strategy

The strategy to reduce food waste can be initiated by implementing 'waste separation E8'. Changing the space and modifying the built environment can help facilitate waste separation as a daily practice. Increasing the **proximity of organic waste disposal** is one such measure. This can be achieved by incorporating a waste chute (Down your waste E) and a 'waste collection room' in the ground floor of apartment buildings. For the row house typology, implementing composting in the garden is achieved through 'compost at home S1'. The spatial configuration heavily impacts the success of the strategies, as each neighbourhood and building requires its own adaptation. Technical terms are explained throughout. The co-design outcome includes four diverse strategies for composting in public spaces, presenting a space-related approach to separating

food waste on a daily basis. The co-design outcome includes four diverse strategies for composting in public spaces, presenting a space-related approach to separating food waste on a daily basis. However, the current economy and products also play a significant role in this shift towards reducing food waste. This includes initiatives such as reducing packaging waste, selling imperfect or "ugly" food, and implementing programmes to collect and redistribute leftover or unused food. In terms of local communities, supermarkets can serve as excellent examples of pioneering efforts towards zero food waste (Supermarkets as Pioneers P16). The daily routine of consumers can be made more convenient by not only visiting retail shops, but also by separating waste. Moreover, food shops are

strategically located in the public realm, connected with daily life and public infrastructure network. This facilitates the ease of connecting and separating actions, such as dropping off old bread at 'Broodenergie S7' collection points or using the 'walk by collection point S9'. Consequently, this also stimulates the **local economy**. If the infrastructure for separating waste is in place and managed by the local government, namely Spaarnelanden in this case, it can contribute to the **energy transition** and facilitate the benefits of a microgrid (C11) and a district heat network (C10) with a 'district biogas silo C2' to minimize the supply chain.



Strategic relationships of patterns towards no food waste

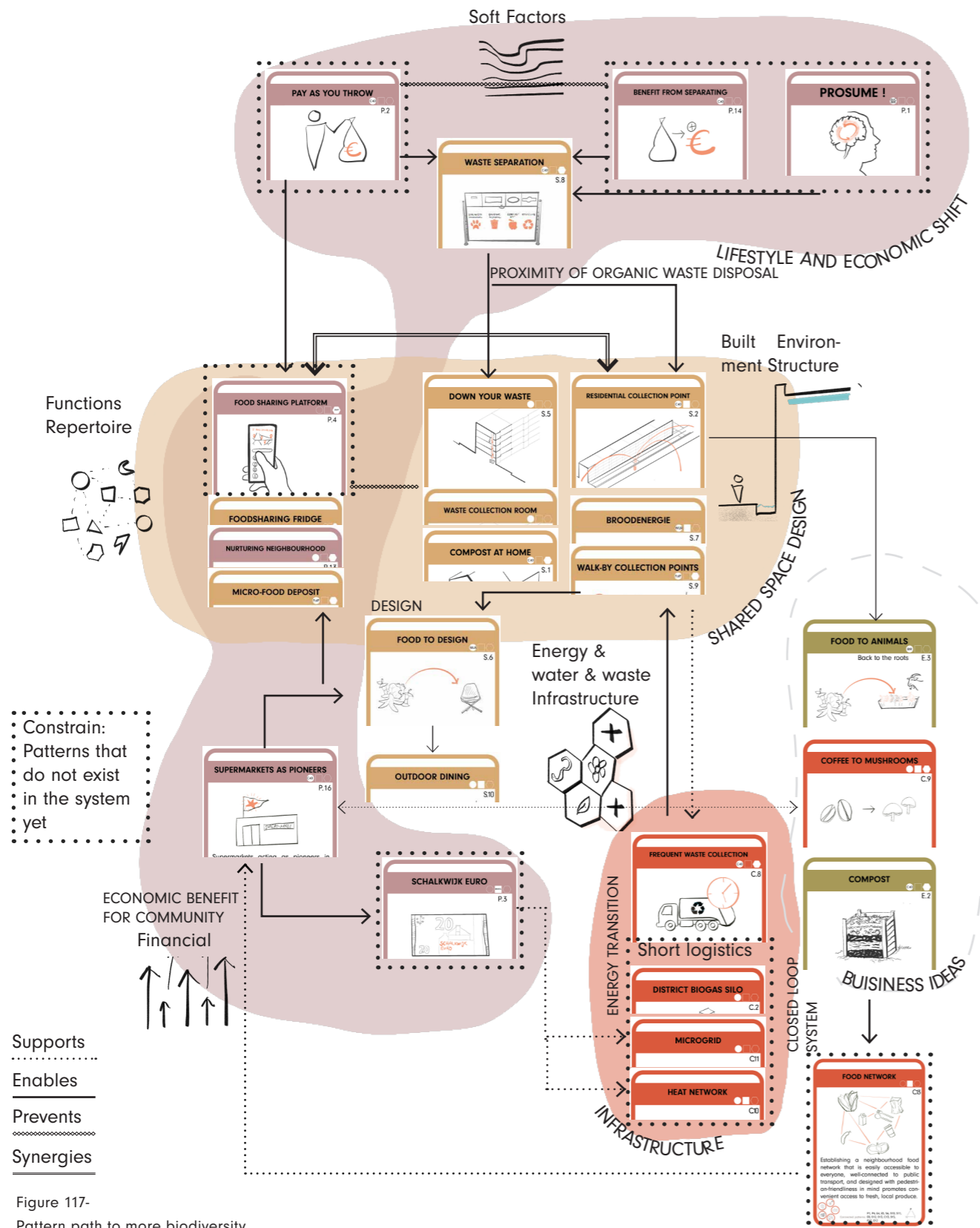


Figure 117- Pattern path to more biodiversity

Spaces for interventions towards no food waste in Schalkwijk

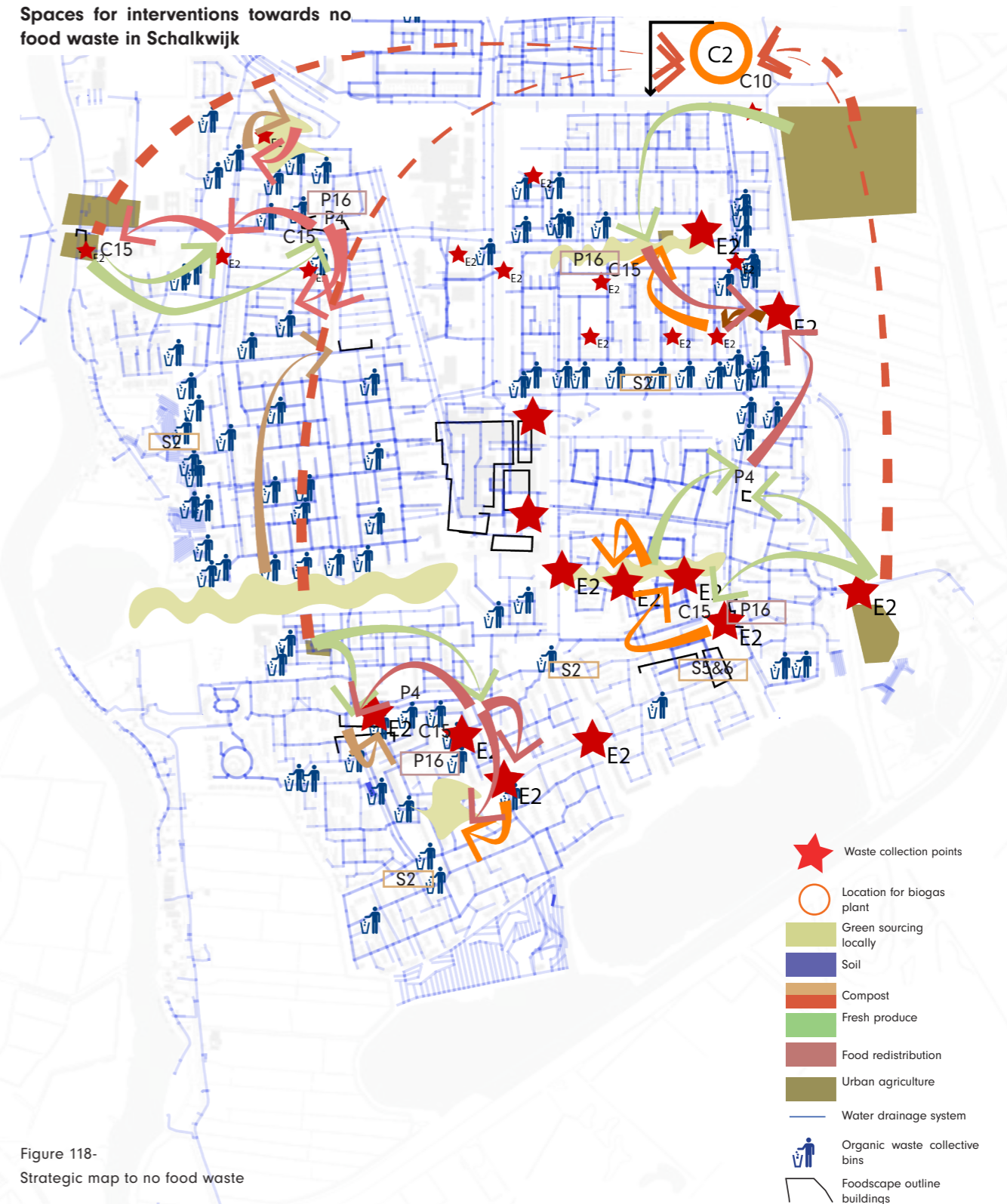


Figure 118- Strategic map to no food waste

0 1000m

7.3. DRIVER: ACCESSIBLE FOODSCAPE

Shifting to an accessible foodscape

This strategy sets out how a shift towards a more accessible foodscape can be achieved. The overall aim is to develop a 'food network C13' where local produce is available and accessible for consumption in shops and in everyday life. Local sourcing E14' also makes it easier to implement and engage in 'Flexible Spaces for Food Production S12', which means a real shift in our public spaces. By introducing more green structures that enable local food production, such as urban farming, urban roof gardens and 'agroforest E13', which then support 'herbal recreation E12' and are part of not only a green network but a green food network, we have fruit trees along the streets 'snack school paths E10' and 'organic orchards E8' that frame all the paths through the neighbourhood. On the other hand, the food network also needs to be established by the supermarkets and restaurants. Here supermarkets can play a pioneering role P16. So that it is possible for everyone to 'choose their meal' P5. This measure

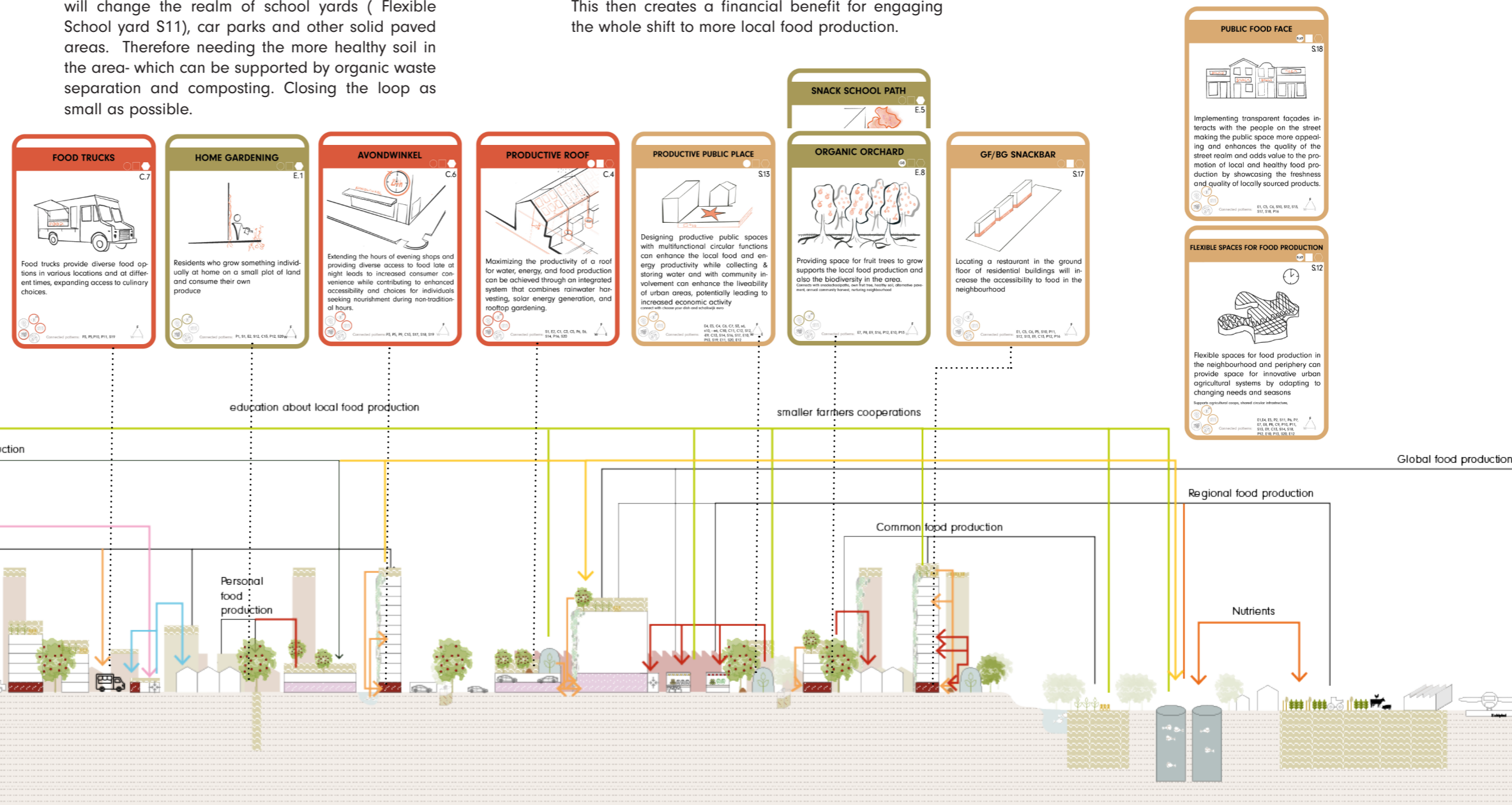
also increases the number of shops in the area. For example, by introducing temporary food shops such as 'Food trucks C7' and a shop that is open 24 hours a day such as an 'Avondwinkel C6'. All of this can be supported with locally produced food by supporting 'small farmers' cooperatives P11', which are supported by 'agricultural clusters P10'.

Providing more flexible spaces for food production will change the realm of school yards (Flexible School yard S11), car parks and other solid paved areas. Therefore needing the more healthy soil in the area- which can be supported by organic waste separation and composting. Closing the loop as small as possible.

Furthermore, by creating small spaces for food production and also giving ownership to residents and start-ups, small businesses can be created, such as the home-made wine on the roof of the Schalkwijk apartment building. This could then be sold by opening up the ground floor of the currently closed apartment buildings and selling, storing and also fermenting the home-made wine - in the roof - there. This then creates a financial benefit for engaging the whole shift to more local food production.

All this can also supported with the 'Schalkwijk Euro P3' to boost the local economy and create exchange for good other than products on district scale, building on the sense of a neighbourhood.

Figure 119- circular system interventions systemic section for foodscape



Strategic relationships of patterns towards a more accessible foodscape

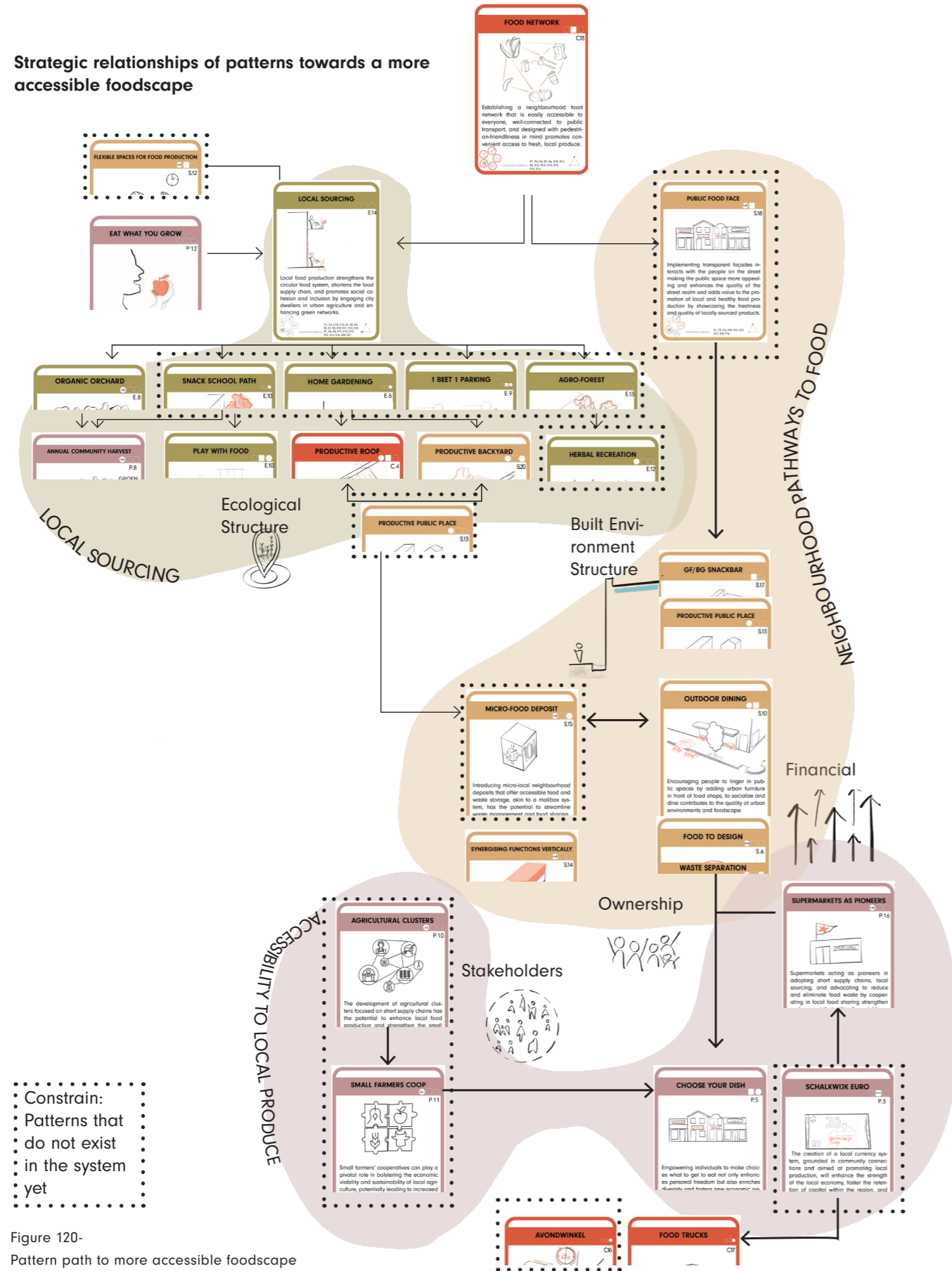


Figure 120- Pattern path to more accessible foodscape

Spaces for interventions towards a more accessible foodscape in Schalkwijk

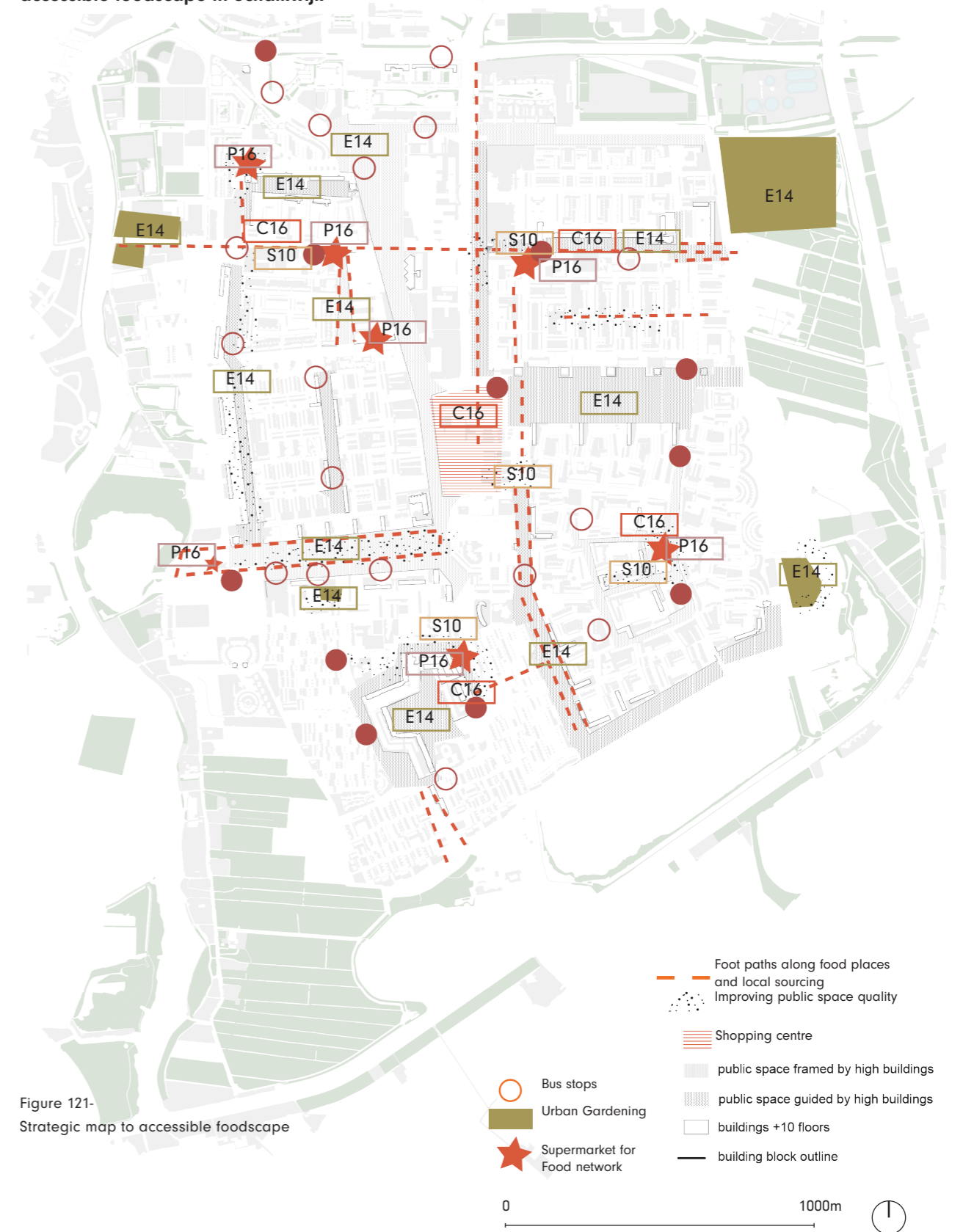


Figure 121- Strategic map to accessible foodscape

7.4. SYSTEMIC BOUNDARIES

Instrumentalisation of the pattern language

The pattern language without the place-specific conditions is only an individual intervention without taking into account the systemic starting point. By applying a place and then place-specific conditions, such as soft factors, stakeholder structures and environmental and infrastructural aspects, the pattern language develops an instrumentalised strategy that is applicable to this specific context. The individual intervention is turned into an instrument that can enable a strategy for a circular everyday food system for the neighbourhoods in Schalkwijk.

Actors

The actors applying the strategy of this pattern to the site include the municipality, residents, start-ups, housing co-operatives and shops. These actors cover the daily lives of the residents, the systemic planners through the municipality, but also through the housing cooperatives that own a lot of land in the neighbourhoods of Schalkwijk, as a lot of social housing is being built there. There are the shop owners, investors and start-up pioneers. These players are crucial for sustainable development. In the figure on the right, you can see that there are some patterns that are only influenced by one stakeholder group. Changing and implementing this pattern then requires this stakeholder to take action. If there are multiple stakeholders responsible for a pattern, there must be a way to communicate the values among each other. In which way which actor should be involved in the implementation of the pattern and whether the actor attaches value to the pattern. A co-creation process would be advantageous for this. In the next chapter, a co-creation workshop will be conducted with this set of patterns in Schalkwijk.

Stakeholders

- Shops
- Start ups
- Housing cooperation
- Municipality
- Residents
- - - Little impact
- Impact

Category of pattern

- Shared space
- Ecological network
- People network
- Infrastructural network

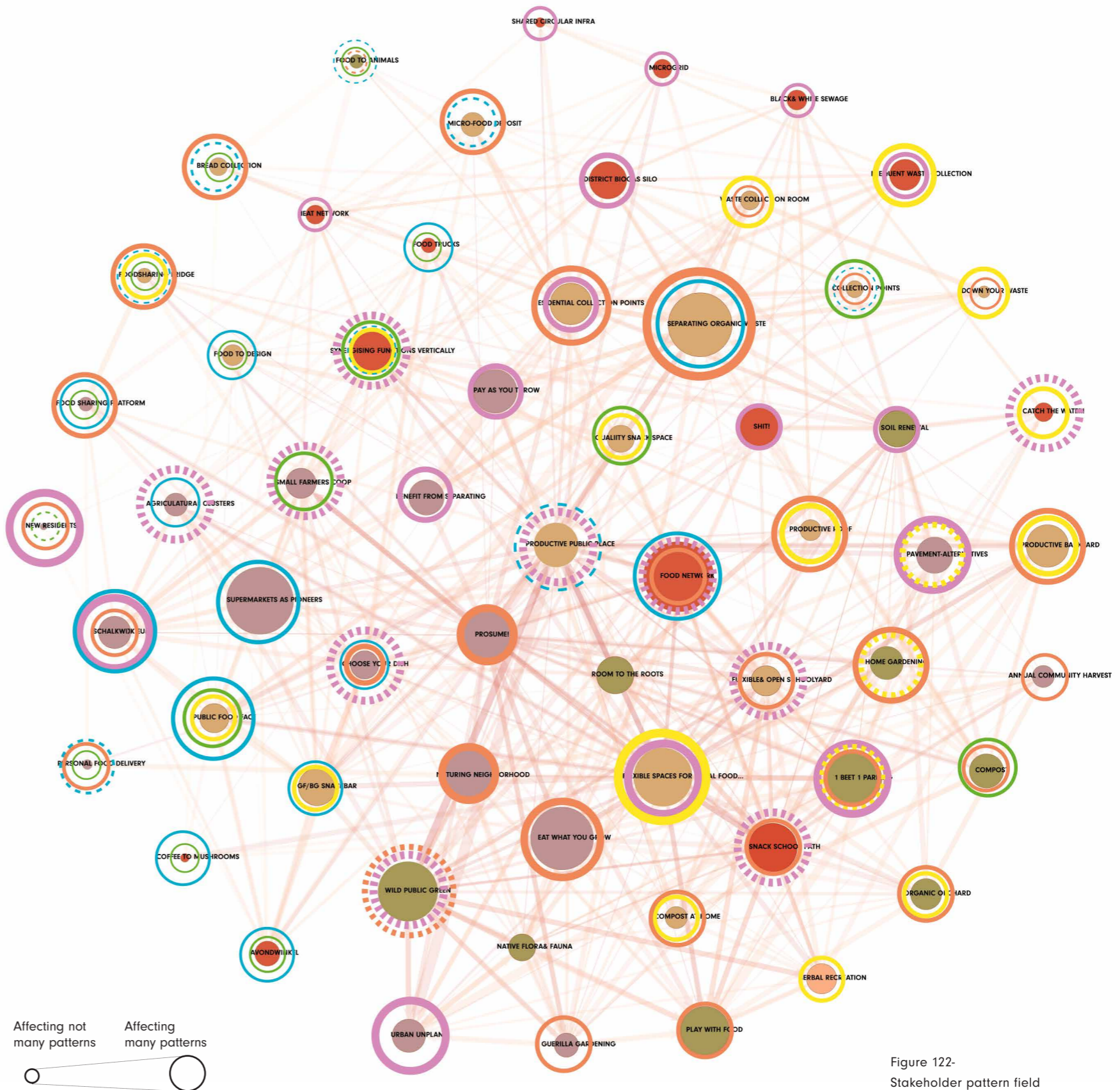


Figure 122- Stakeholder pattern field

Spatial references

Each pattern is associated with a specific space. You can see this in this diagram. In particular, the patterns in the 'Ecological network' category relate to nature and food production. The patterns in the 'Shared space' category relate to buildings - especially roof gardens. But also shops and waste infrastructure. The 'People Network' has no reference to space.

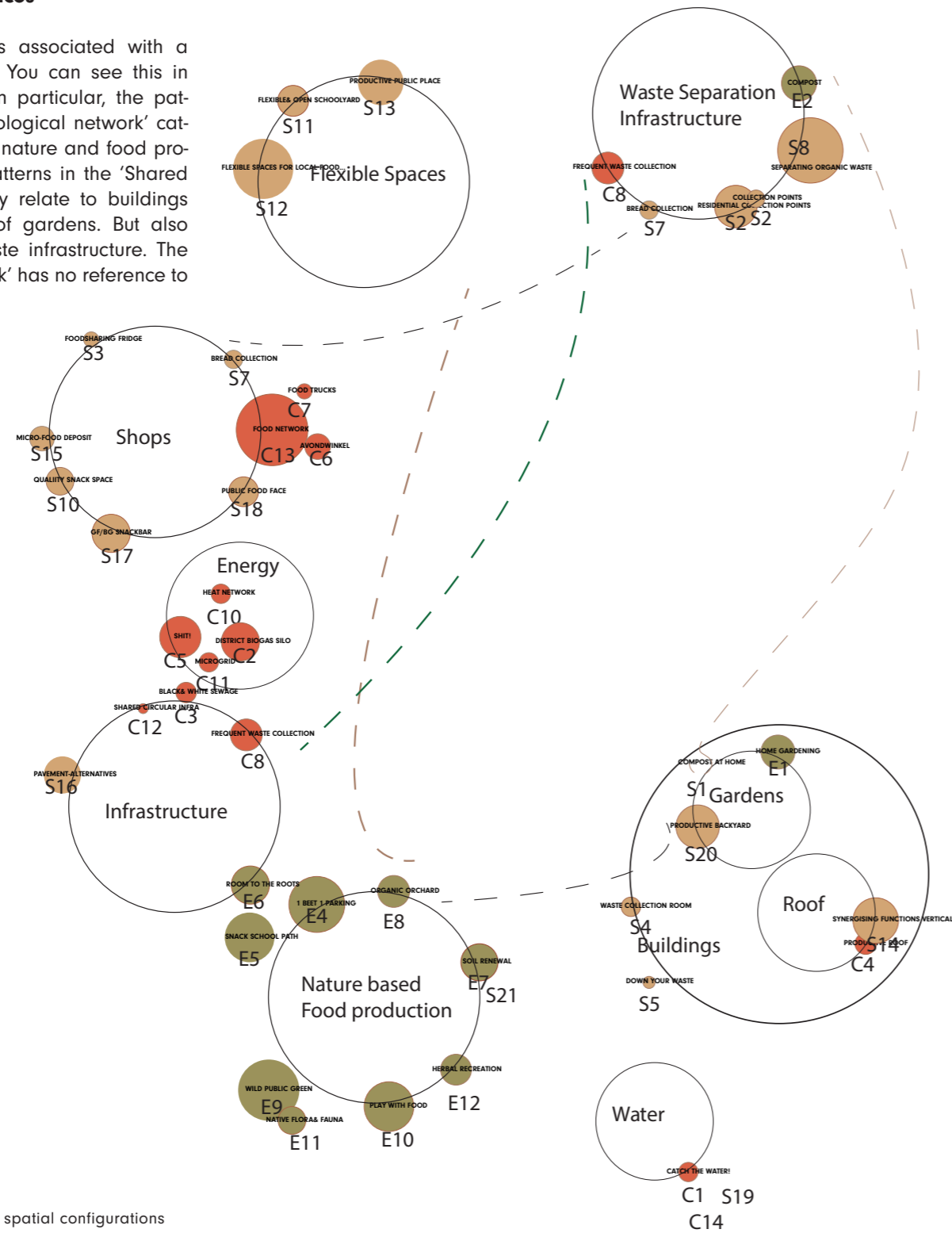




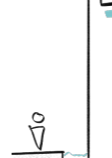





Figure 123- Patterns related to spatial configurations

Conditions for a Circular Food System

<p>Financial</p> 	<p>There are financial conditions that influence the attractiveness of joining something with a financial benefit or a financial penalty. Overall, economic growth also means financial benefit, so strengthening the local economy also means financial benefit for the region.</p>	<p>Energy & Infrastructure</p>  <p>The existing concepts for the wastewater & wastewater infrastructure, depending on the road network, the distance from waste disposal facilities and the nature of the wastewater system, are cutting-edge and influence possible strategic planning steps from the municipal side.</p>
<p>Functions Repertoire</p> 	<p>Depending on certain functions that are present in the urban space and in the urban network, the possibilities differ as to which patterns can take effect.</p>	<p>Soft Factors</p>  <p>Soft factors such as demographics and thus the resilience of the social infrastructure are very fragile and context-specific. But one of the most important factors to take into the strategic planning process for this sustainable transitions.</p>
<p>Built Environment Structure</p> 	<p>The built structure of the Dutch post-war neighbourhoods is a specific structure in which the patterns emerge spatially and the design of this built environment stimulates certain actions by the residents.</p>	<p>Ecological Structure</p>  <p>The existing ecosystem structure and ecological health of the soil and flora&fauna is the basis for a regenerative planning approach that allows the food system to be integrated into the natural ecosystem.</p>
<p>Stakeholders</p> 	<p>The group of stakeholders and participants in a particular place with their specific values and interests is a very context-specific variable.</p>	<p>Ownership</p>  <p>Land ownership is an important prerequisite for involving certain owners/occupiers in the process of participating in a sustainable transition to a circular foodscape and enabling flexible use of space.</p>

08 CO-CREATION : PATTERN LANGUAGE AS A DESIGN TOOL

*To change life, we must first change
space -*
Henri Lefebvre, 1991

This chapter will outline how pattern language is used as a co-design tool in a workshop setting. Additionally, a design for a neighbourhood was chosen based on prioritized patterns from the co-design workshop. It will describe the development of a framework for the district based on the input received. The use of pattern language as a co-creation tool will also be elaborated on and the input will inform the co-design outcome.



Figure 124
Picture taken by the author

8.1. CO-DESIGN WORKSHOP

Co-design Workshop

The first step towards working with the pattern language as a co-design tool for the workshop was done with the Living Lab KIEM Architects - it's time to put knowledge into action! As has already been shown, the transition to a more circular neighbourhood is a complex, interwoven system that changes depending on a range of values, stakeholders and locations. In order to test the results of the research and put them into practice, it is therefore crucial to test them with stakeholders. As such, the patterns are generally applicable. By applying them with stakeholders in a concrete context, the patterns come to life and show their actual realisation of improvements or challenges.

The method was tested in the form of a co-design workshop with the Living Lab 'KIEM' in Boerhaavewijk.

The framework and settings of the participants are mainly characterised by their broad knowledge in the field of participatory workshops and deep understanding of the area, as they have been involved in projects with many different stakeholders in the district for years.

This co-design workshop is based on the examples and methods used and explained by the Foundries of the Future to facilitate a workshop that deals with pattern language in different phases of the project. For the workshop itself and the preparations I will use the process tool provided by the Foundries of the Future to support the design workshop (Hill, Adrian V (ed.), 2020, Chapter 5, Applications).

The workshop was conducted online via MIRO due to an unplanned corona quarantine.

The intro consisted of a short introduction to the project and the systemic relevance of the transition to a closed-loop system. Then the pattern language and its use was explained and how each pattern is part of a larger system. To illustrate the implications of pattern language as a systemic design approach, the three factors important to the transition (biodiversity, food waste, accessible foodscape) were outlined and compared to the current values and system and how the pattern language interventions could change the current food system actions in the borough.

The workshop itself was developed according to the Foundries of Futures guidelines (Hill, Adrian V (ed.), 2020, Chapter 5, Applications).

The visual workspace was designed to facilitate the different steps of the online workshop. First the introduction, then assessing, prioritising, analysing, localising, sketching and stakeholder mapping.

Evaluate

After the introductory presentation, participants evaluate whether the selected patterns are relevant to the circular transition and indicate whether they are missing a pattern that can be added to the rest of the pattern language. To make the process clearer, they selected the top six patterns that are most relevant for future analysis and key connection points, especially in the area of spatial and systemic infrastructure.

In the actual execution, the selected patterns were

not used, but patterns were picked out on their own. Two positions were taken in the step, one more communal and systemic side and one from the residential side, representing the convincingness, ease and simplicity.

The pattern set differentiated itself through the different perspectives. On the one hand, the perspective of the residents was represented and on the other, the perspective of the municipality.

Prioritising

The second step is to prioritise the selected and evaluated patterns. The patterns prioritised for plausibility, ease and simplicity were rather part of the Ecological Network 1 - Composting E2 and 2. Agro-Forestry E13, which then leads to a systemic infrastructural pattern, the 3. Food Network C13, which in turn led to the People Network 4.1. Annual Community Harvest P8 & 4.2. Small Farmer Cooperatives P11.

Missing patterns were added in all steps. That's the great thing about pattern language as a co-design tool, as it adapts to the process and evolves with more knowledge and input. For example, the pattern "Cooking Lessons" - expanded the pattern language and possibilities on-site by using blank pattern cards, naming them with the missing pattern and adding a small description. This process was carried out throughout the workshop whenever there was an input that could be translated into a pattern, and also to make connections between specific actions and interventions.

In addition, the entire process of prioritisation was

also a process to provide examples of what is already working. Examples from Amsterdam, such as the "Afval naar Oogst" initiative, are crucial for setting priorities. The initiative sets up composting stations for fruit and vegetables in various districts of Amsterdam, from which fresh compost and soil are then obtained and used to fertilise community gardens in Amsterdam. In addition, the impact will be presented in an "Impact Dashboard". Other contributions were food co-ops such as the Food Co-op Amsterdam and Growing Communities in Hackney. The prioritisation of the municipal perspective started with the shared space where waste separation should be made more accessible and attractive Waste Separation S8. The next important patterns would be systemic infrastructures that require large input from the municipal side, such as the complete rehabilitation of the borough's sewage system Separated Sewage C3, then Shit C5 and finally the implementation of a Biogas silo C2.

Analysing

The third step was to analyse the maps according to the prioritised patterns. A series of maps were provided as .png files so that they could be overlaid online and the individual basis for the next step, the localisation of the prioritised patterns on the map, could be created.

These maps can be found in Appendix 12.6.

Go-Design Workshop

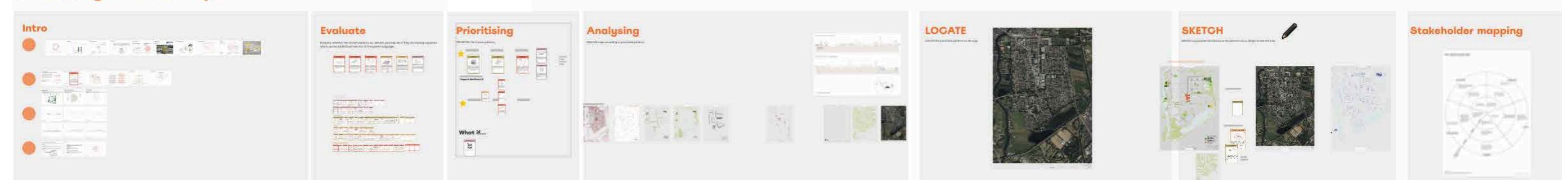


Figure 125- Screenshot Miro board of co-design workshop setting

Locate

The composting sites were mapped. For this step, the current urban gardening sites and potential areas for urban agriculture were selected as the main sites for composting. The manure and soil produced by the composting stations could be used directly in local urban food production. Most of the sites were located around social buildings such as community centres and schools, and around open green spaces. In this way, open green spaces and used spaces could be transformed for local food production. This could be agroforests as food forests, planting walnut trees, providing a piece of food infrastructure that is almost self-sustaining, could be easily implemented in these places and has an iconic project impact. Linking composting and agroforestry is then the starting point for linking them together to develop a circular food network. As a micro-scale demonstration project, it would be a way of showing how it works.

One example is the "Tiny Forest" of the Molenwiek school near Molenwijk, an exemplary approach to the integration of agroforestry in connection with a school. A small forest was planted here, but not with a view to local food production. Nevertheless, it is a nice example project for planning an agroforestry (Fountain, 2023). Another important structure is the secondary green structure that runs through the neighbourhoods that are closer to the residents' homes and thus more accessible and easier for residents to bring their fruit and vegetable waste to these places. In this step, the compost drums are placed along these green structures by the workshop participants. They are collected along the secondary green structure and then transported to the main composting sites.

Sketch

By placing the composition and agricultural areas, the patterns were often spatially associated with schoolyards, so that the Flexible schoolyard S11 pattern came into play and can be integrated into the pattern network. Implementing an agroforestry system in the neighbourhood or on school playgrounds, ties in directly with the Play with Food E10 pattern. But that would also be necessary. Patterns such as

'worm hotel' or 'insect hotels' make composting more interesting for children, and the supervision and location of a worm hotel in the school would be suitable in this location and work well (according to the experience of one workshop participant). Another missing pattern would be the establishment of more 'community gardens' in the area so that the compost resource can be utilised directly and there is a pattern that is part of the structure as it is inversely related to the other patterns.

For the design of the more structural approach of the municipal side, it was mentioned to also locate the heat transformer room and start with the one that was planned in Meerwijk. And the location of the biogas silo could be next to the water treatment plant northeast of Schalkwijk. This should then be connected to the heating network to be realised in Schalkwijk. This could go hand in hand with the separation of the wastewater system. Promoting the installation of a remote biogas silo that is fuelled not only with organic food and garden waste but also with sewage sludge.

In the workshop, it became clear that it is crucial for the project to work more on the everyday actions and to explain these to also utilise the everyday and simple possibilities that are more part of everyday life than the systemic end goals with systemic change.

Conclusion

These are the main conclusions of the workshop: First, the introduction needs more clarity: The workshop introduction could benefit from brevity, clearly outlining the objectives, design patterns and activities. Second, defining the role of designers was challenging due to the lack of a clear design brief. The use of 'what if' questions could provide a clearer approach. Third, the dual approach was important for further development. The workshop focused on two approaches - improving the lives of residents and addressing systemic issues controlled by the municipality. Fourthly, the definition of 'importance' in co-design varied according to individual values, with two primary approaches - persuasive factors and strategic perspectives. Fifthly, the design inter-

ventions were categorised as 'starter' and 'municipal', highlighting the link between small and large impacts. Sixth, the workshop is a testing ground for new design patterns. New patterns, such as the 'cooking lesson' and the 'impact dashboard', combined social interaction with practical activities and provided residents with tangible measures of their contributions. Community gardens and iconic projects are then crucial. Initiatives such as community gardens and agroforests represented small-scale interventions with potentially significant impacts, serv-

ing as self-sustaining iconic projects. Also, it is Strategic vs. small-scale interventions were designed. Certain patterns were strategic, focusing on broader ecological considerations, while others, such as worm hotels and insect hotels, were small-scale interventions. Finally, the neighbourhood scale needs more clarification. There is a need for a more detailed explanation of the emphasised neighbourhood scale while working on the district-wide perspective, especially in the context of Schalkwijk.

What was learned?



Afval naar Oogst example in Amsterdam

Tiny forest of Molenwiek school

Food cooperatives AMS as example

What new ideas came up?

New patterns

*Impact dashboard
Community kitchen /
Circular Cooking lessons*



*New stakeholders who
might be interested for the
next workshop*

references to include and to look at

More precise into presentation



Prioritising the patterns

Mapping the patterns on the analysis maps

The prepared analysis maps



The online MIRO board setup

*Doing an online design workshop
with two participants*

What worked?

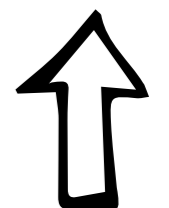
*Developing role cards for the participants
when working with designers that can
play a role and are used to that*

*Adding secondary green
structure into green map*

*Some aspects on the analysis
maps outlined more
clear and leged more clear*

*Introduction presentation
more precise and short*

*Starting with a 'what
if...' question*



What can be done better?

Outcome co- design workshop

Both designs were developed simultaneously during the co-creation workshop, highlighting the two different starting points of the strategy. There are

two ways to approach this issue: Design 1, through resident action. And design 2 by addressing the infrastructure, which is the responsibility of the municipality.

Design 1:
with priorities of Com-
post - Agroforest - Food
Network

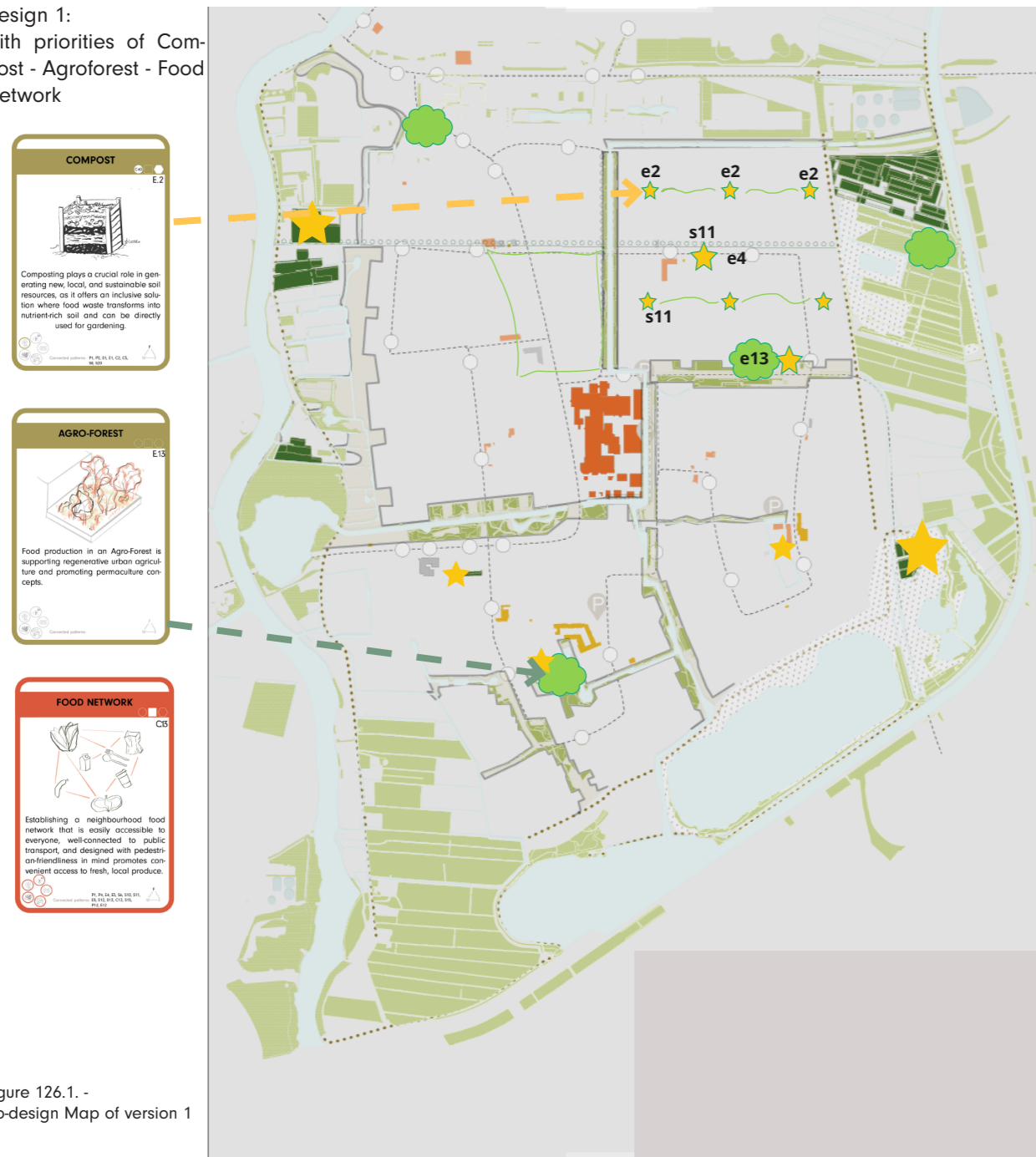


Figure 126.1. -
Co-design Map of version 1

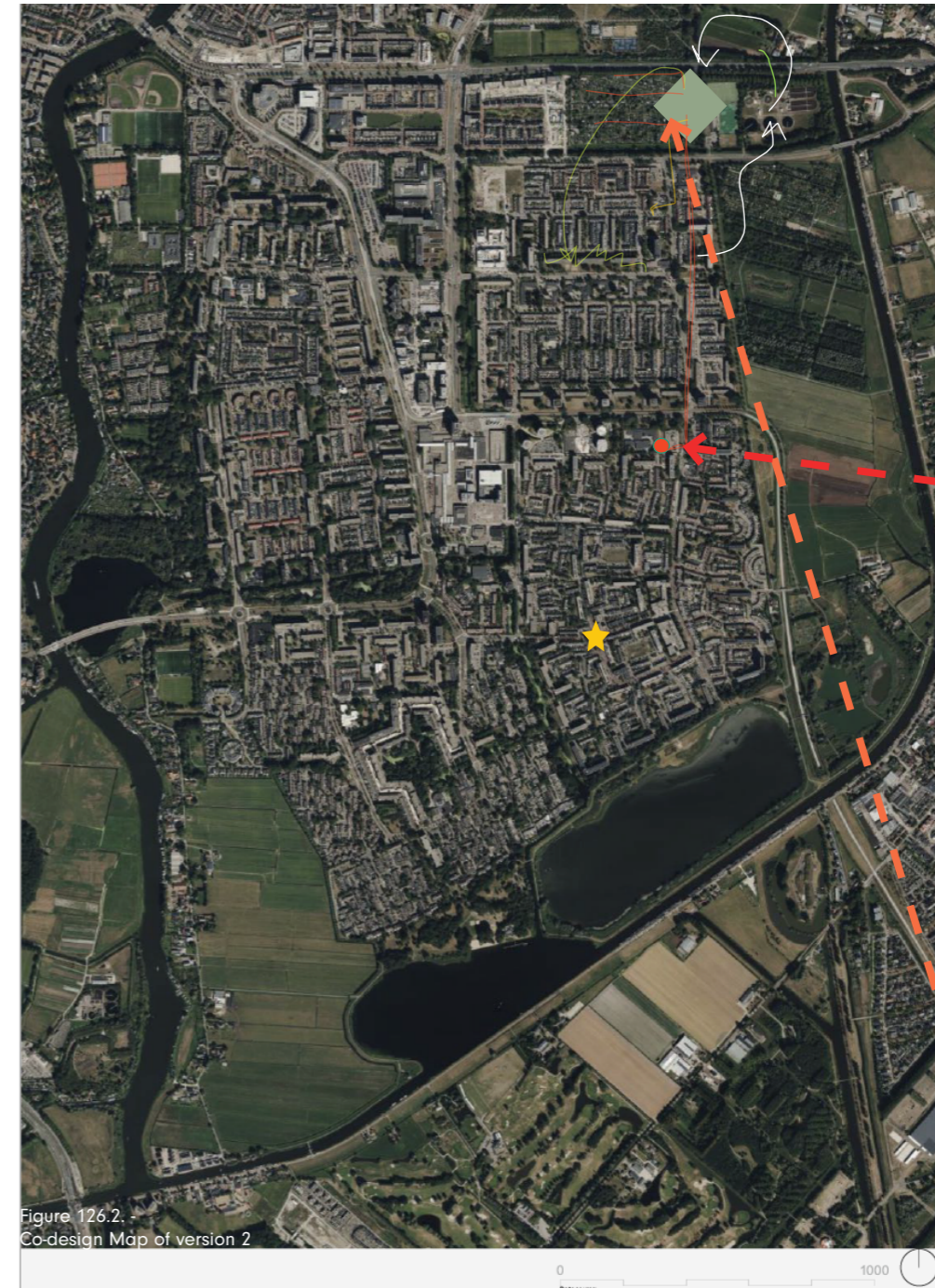
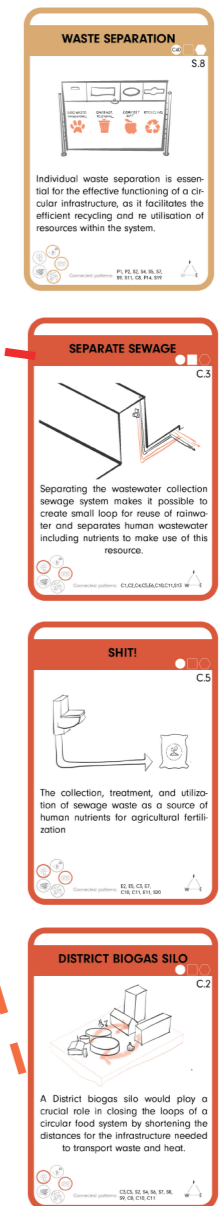


Figure 126.2. -
Co-design Map of version 2

Design 2:
with priorities of Sepa-
rating - Separate Sew-
age- District Biogas Silo
- Shit!



8.2. CO-DESIGN RELATED SYSTEMS

Compost E2

HYPOTHESIS

Composting plays a crucial role in generating new, local, and sustainable soil resources, as it offers an inclusive solution where food waste transforms into nutrient-rich soil and can be directly used for gardening.

Looking at the pattern of composting, it's clear that it is linked to other patterns to form a network. An associated pattern is 'composting at home,' which highlights the spatial relationship for composting, such as in a productive backyard or garden, or on an accessible roof. Despite being able to begin the process of separating organic waste in your kitchen, which is crucial for composting, you can also expand to larger spaces for a more productive composting process. If implemented in a personal rooftop or balcony garden, composting creates a small but significant circular intervention on a building and garden scale.

However, if composting were to be introduced in a public space, it could be integrated with collective collection points or other productive initiatives. Schoolyard: the process of composting has a significant impact as it can be utilised for social inclusion and urban gardening projects, or as a base for the energy transition (when used with a 'biogas silo' and the composting of human nutrients) and fertiliser

(again for food production). Hence, composting is automatically part of a meso or macro circular flow. A direct use of certain parts of compost, like reusing used coffee ground can directly be used as a base for growing mushrooms.

Connected with Patterns:

P1,P2, S1, E1, C2, C5, S8, S20

Composting is related to separating your waste (S8) which is implemented by P2 (Pay as you throw), by making it financially attractive or unattractive to separate and to change the lifestyle to Prosuming P1. The spatial elements such as S11 and S7 which are part of the common and public realm and then also S1, composting at home, focussing on the smallest scale of circular food system by having a S20 or C4 and then 'Home gardening E1'. The meso scale would be S11,, then using the 'Productive school yard' as a space for transformation, education and also growing food there with the compost. And S2, by implementing C8, the organic waste will not start to smell, and then could be transported in short distance to the district biogas silo C2, which is also then having an anaerobic process for energy and fertiliser production, when also including 'Shit C5'. Another option of composting with S2, is feeding that compost of small dram located in the neighbourhood to urban gardening projects, such as shown in the example ' Afval naar Oogst '.

AMSTERDAM, NL - Afval naar Oogst



Figure 127
Afval naar Oogst - Afval naar Oogst. (2023, October 9). Afval Naar Oogst. <https://afvalnaar-oogst.nl/>

1. Bring your fruit and vegetables in all neighbourhood of Amsterdam
2. Collection points in neighbourhoods all around the city
3. Impact Dashboard - Seeing your impact when participating
4. Fighting organic waste by engaging results t show their impact when composting
5. Using compost for community gardens to grow own fruit & vegetables
6. Short chain



Interconnected network

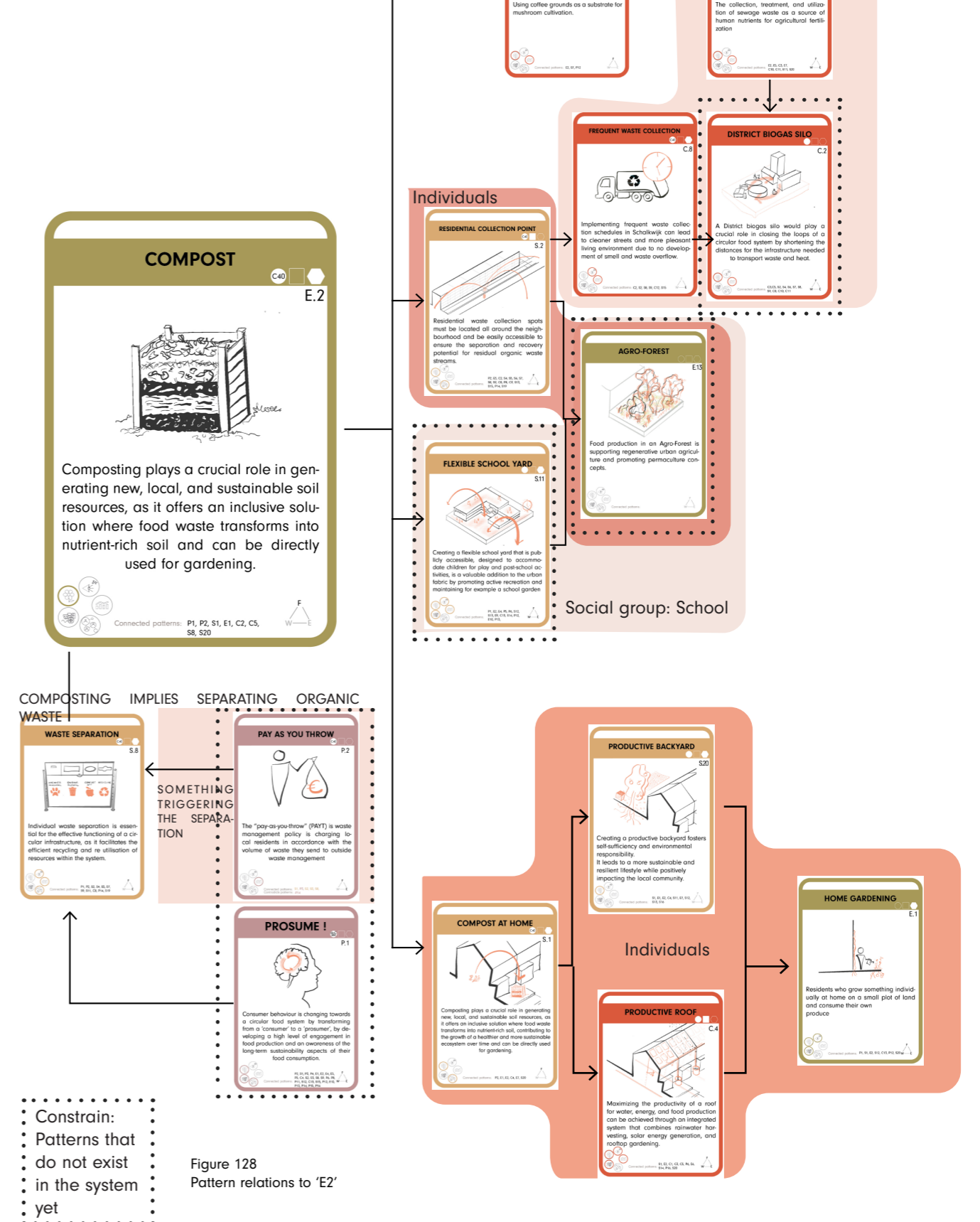


Figure 128
Pattern relations to 'E2'

Waste Separation S8

HYPOTHESIS

Individual waste separation is essential for the effective functioning of a circular infrastructure, as it facilitates the efficient recycling and re utilisation of resources within the system.

Connected with patterns:

P1, P2, S2, S4, S5, S7, S9, S11, C8, P14, S19

S8, implemented by P2 (Pay as you throw) by making it financially attractive or unattractive to separate and change lifestyle to consume P1. This is the same for composting, but separating your waste is more related to the general aspects of the design, making it accessible and easy to separate the waste in the first place. The spatial elements such as S11 and S7 which are part of the common and public realm and then also S1, composting at home, focusing on the smallest scale of the circular food system by having an S20 or C4 and then 'home gardening E1'. The meso scale would be S11, then using the 'Productive Schoolyard' as a space for transformation, education and also growing food there with the compost. And S2, by implementing C8, the organic waste will not start to smell, and could then be transported a short distance to the district biogas silo C2, which will then also have an anaerobic process for energy and fertiliser production, if also including 'Shit C5'.

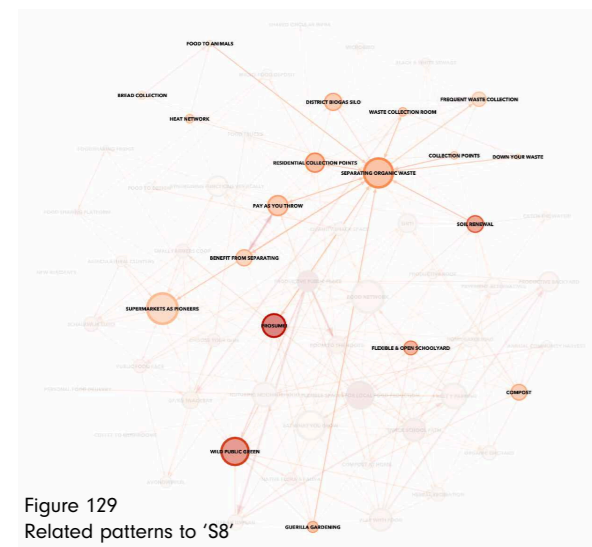


Figure 129 Related patterns to 'S8'

Interconnected network

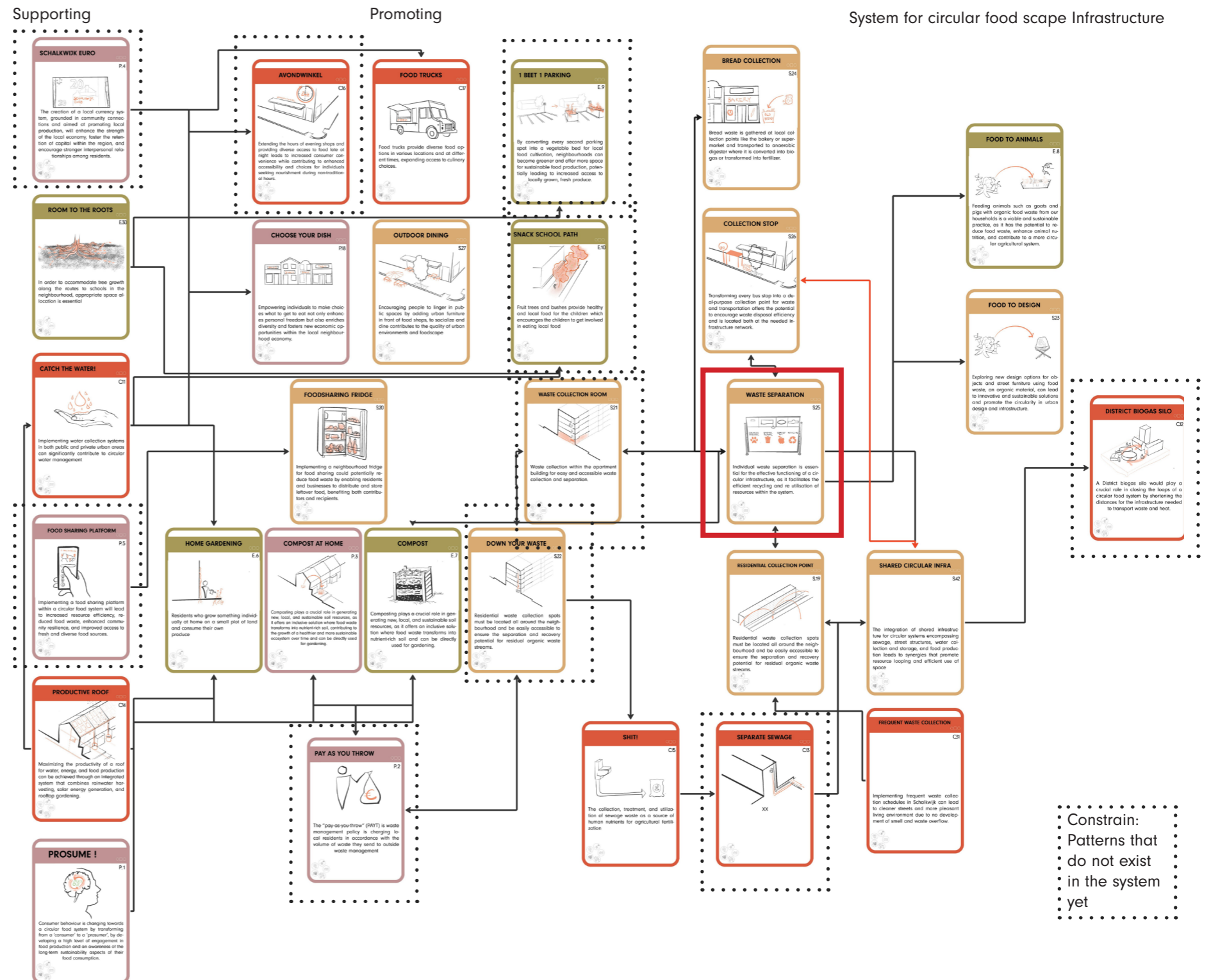


Figure 130 Pattern relations to 'S8'

Related patterns to Agroforest E13

As a pattern does not stand alone, there are several other patterns that affect or can affect the 'Agro forest E13' pattern. However, if you want to create an agroforestry at a specific location, the 'Productive Public Place S13' pattern cannot be created at the same time, as other conditions apply to the decision on what should be created at this specific location.

Spatial relation to patterns

For the development of a spatial framework, the prioritised patterns from the co-design workshop were selected and assigned to the corresponding spaces. In particular, the combination of social structures and green sports or car parks was chosen. This is because it combines the social and ecological infrastructure for local provision.

In this matrix you can also see the patterns associated with each of the selected interventions, as one pattern is always connected to others and develops a systemic strategy where elements are linked to an intervention. The interconnected patterns are also related to the selected relevant space.

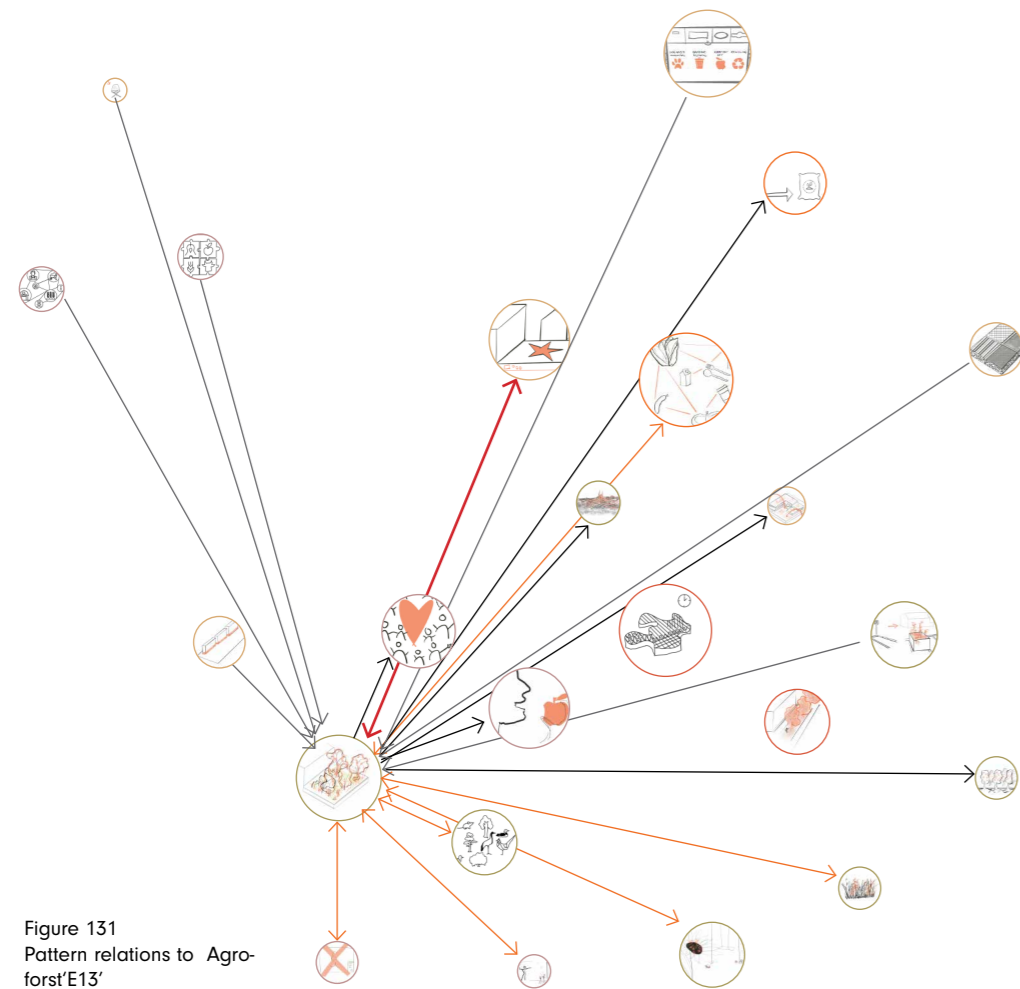


Figure 131
Pattern relations to Agro-
forst'E13'

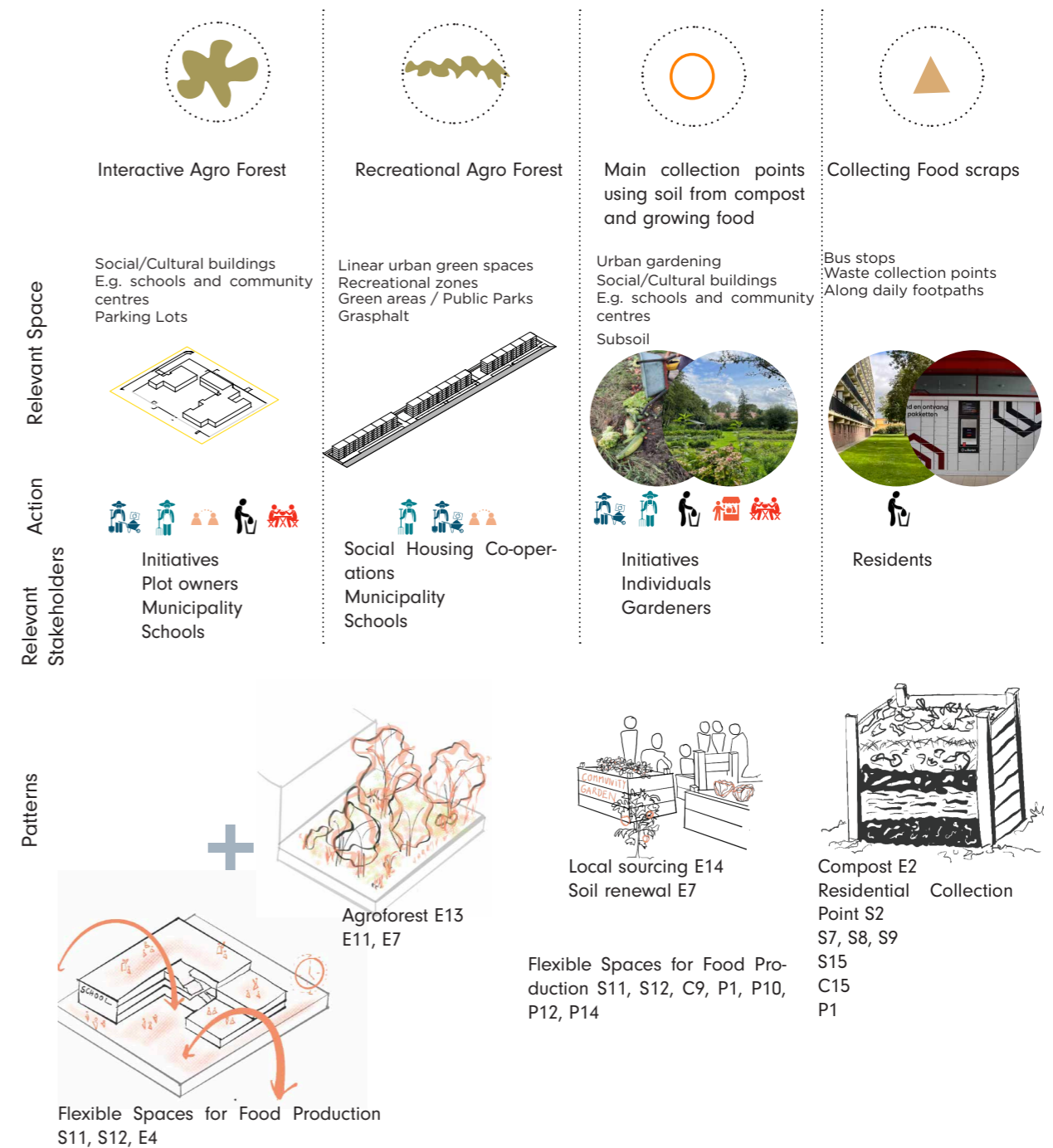


Figure 132-
Strategy related to space, actions, processes
and stakeholders

System change description

How does the system work now, and where and how should it work in the future?

It is being explained according to the pattern 'Compost E2'.

Composting is currently associated with urban gardening in the periphery, but it is mainly collected, produced, and used locally in one spot for food production. Urban gardening initiatives are connected with schools, which deliver the food. The current system prohibits fruit and nut trees along paths, but this is expected to change in the future. Urban gardening with composting facilities is becoming increasingly prevalent in urban environments. Making space for the storage of food waste in small-scale drums and connecting composting not only with urban gardening but also with social action and community buildings, can help to initiate the process of local food production. When fresh soil has been generated next to the green patch in front of your apartment building, social housing corporations are interested not only in the rentals but also in their liability and quality in the surroundings. Therefore, they support actions such as small-scale composting and provide rooms for storing maintenance materials such as lawnmowers. Possible improved version: Compost will be collected elsewhere, where it will be produced and stored using organic matter. Soil will be processed somewhere else, and then transported to the nearby urban gardening patch in smaller circles. Possible future: Wherever compost is collected, there will also be food production to keep the chain as small as possible. With the increase in urban gardening locations throughout neighbourhoods, delivery paths are becoming shorter and a local economic opportunity arises for small local food shops to sell their produce. By participating in maintaining the vegetables, individuals can obtain them for free or at minimal cost. Additionally, fruit and nut trees are planned to be planted along walking paths in the future, providing accessible snacks and opportunities for harvest.

Maintenance over time

Another system that will change is when we start to implement the patterns. They work best when they are related - connected. However, it should be mentioned that the amount of maintenance required is expected to decrease over time. Many of the patterns need an initial start and peak of maintenance and support. For example, planting trees and converting land for food production. But once these systems

are in place and other systems change, like the separate sewage system, other systems will be more efficient and require less maintenance and provide more financial benefit. This shows that it is all an integrated system with many interdependencies, but especially with green networks and the focus on organic farming practices and the location of these in relation to social organisations, there is potential for long-term diversification and improvement over time.

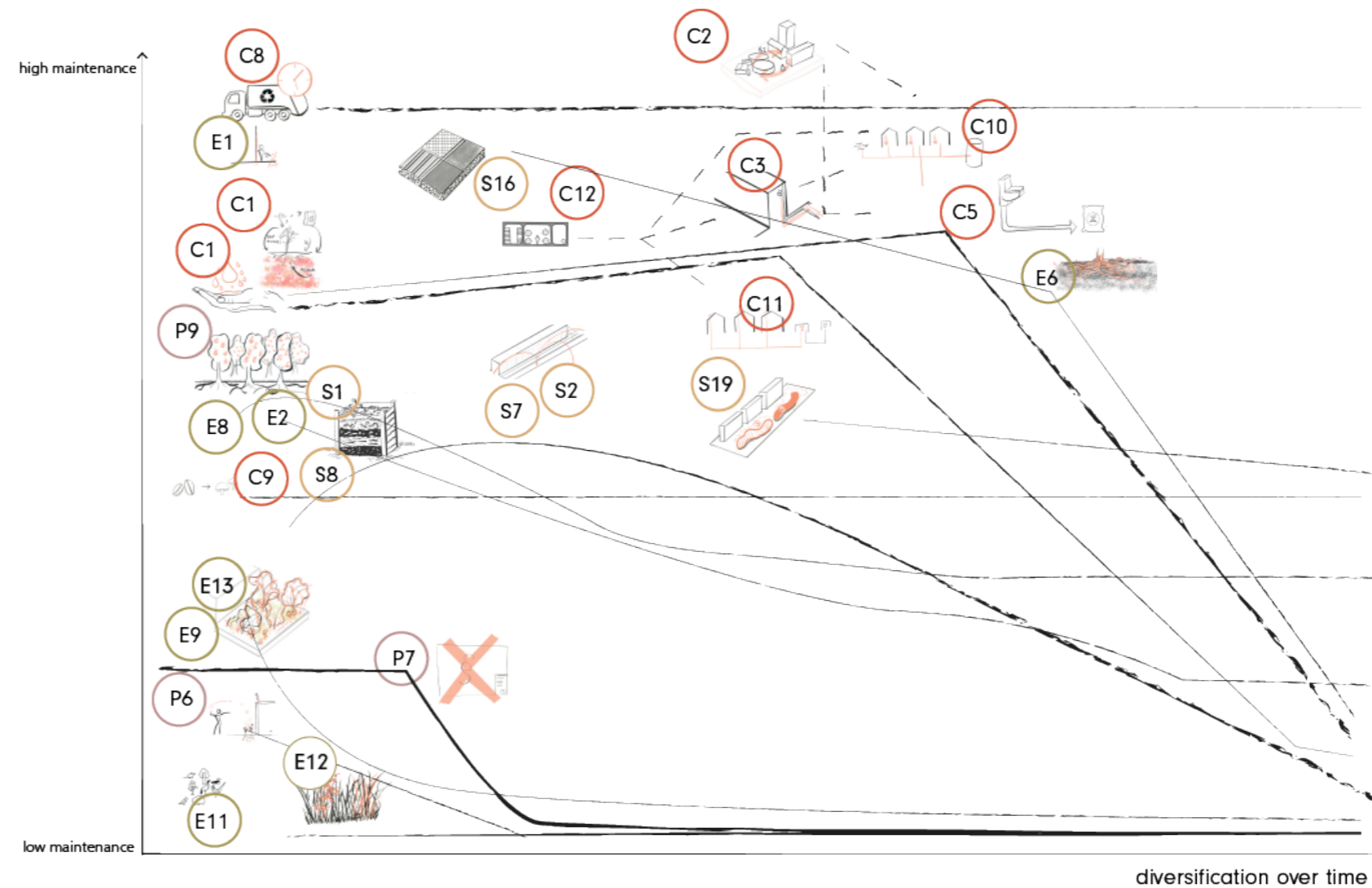


Figure 133- Matrix of maintenance over time of pattern interventions

8.3. FRAMEWORK

To link co-design with a more systemic approach, a framework for implementing the co-design outcome and the strategic pattern language are combined in these frameworks. With this framework, the identified drivers are introduced into the design.

Framework of Design 1

This framework illustrates the related spaces for implementing the transition prioritisation in the co-design workshop.

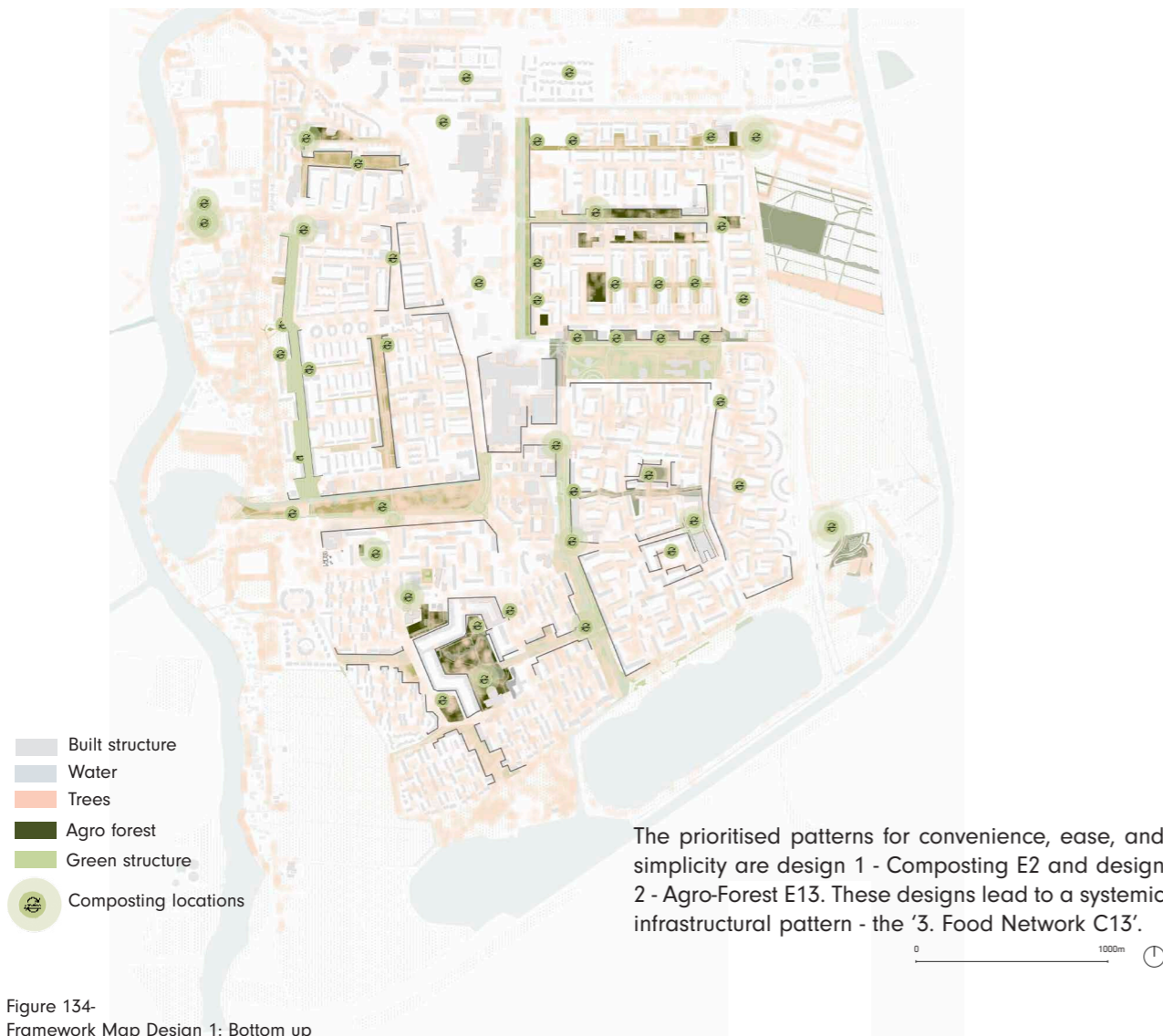


Figure 134-
Framework Map Design 1: Bottom up

Framework of Design 2

A framework map illustrates the spatial implementation of the biogas silo's location and its connectivity to the district's heat network.

The municipal priority was to improve waste separation accessibility and appeal through the shared space scheme 'Waste Separation S8'. This necessitated the redevelopment of the district's sewage system via 'Separate sewage C3', followed by 'Shit1 C5', culminating in the implementation of a 'district biogas silo C2'.

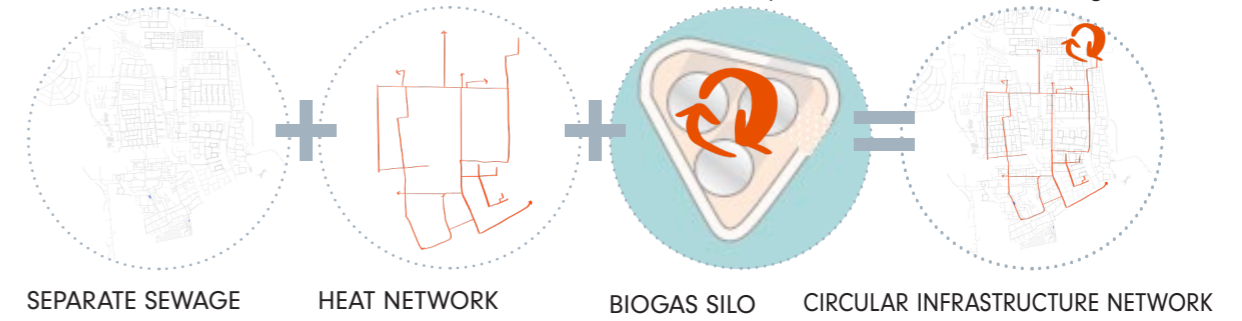


Figure 135-
Framework Map Design 2: Top down

8.4. SPATIAL STRATEGY NEIGHBOURHOOD

Neighbourhood Concepts mapped

Here, all four distinct strategies are displayed on the map of the entire district, indicating that each neighbourhood has its unique spatial configuration. Particularly, the social and ecological structures in each neighbourhood vary morphologically within the urban context, resulting in four distinct and individual food networks and strategies prioritising patterns such as compost E2, Agroforest E13, and food network C13.

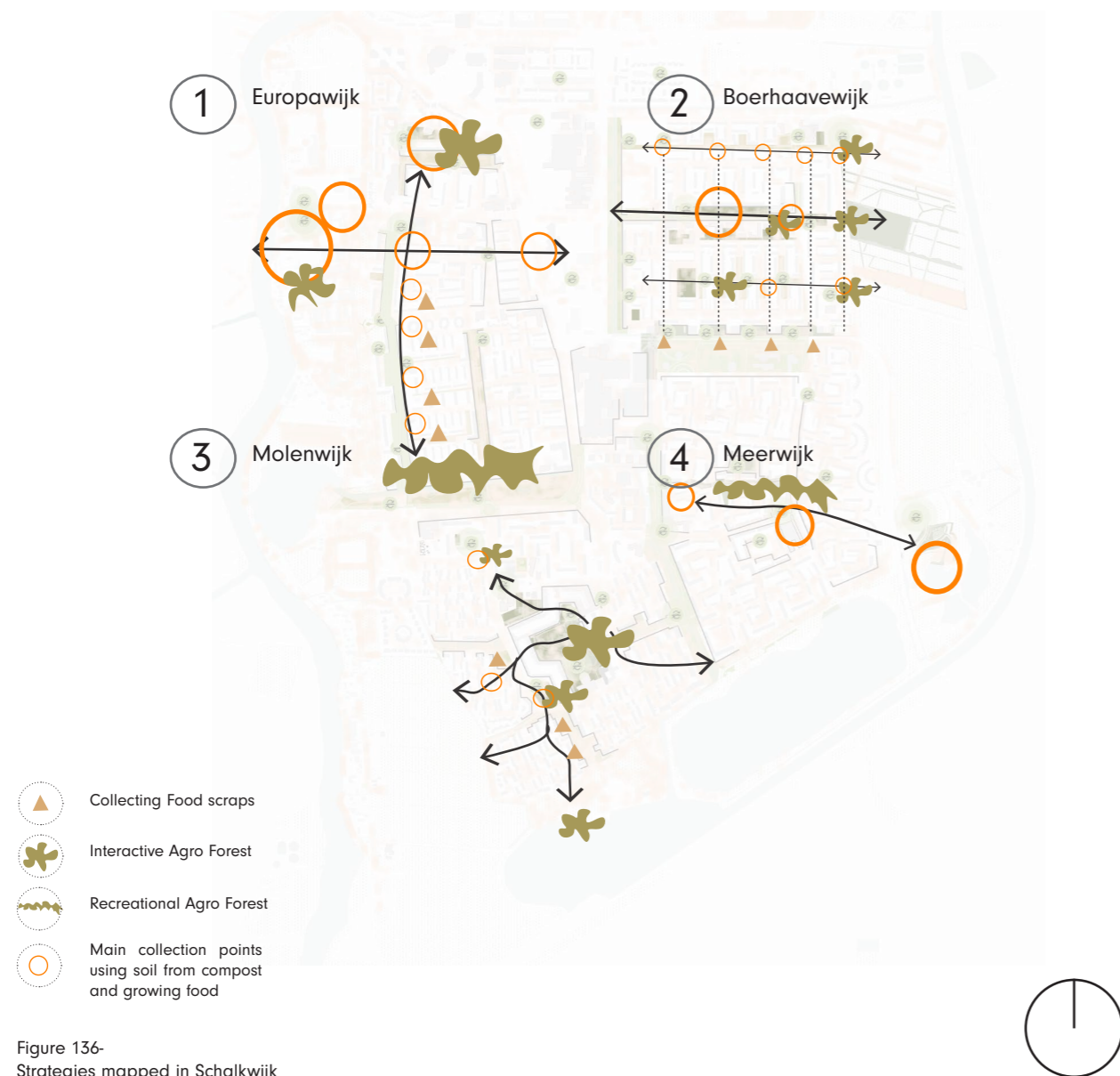


Figure 136- Strategies mapped in Schalkwijk

Spatial strategy for implementing composting and agroforestry and the food network connection for every neighbourhood.

Looking deeper into the individual neighbourhood structures, it can be said that Europawijk has one main street, which also extends horizontally to the main street of Boerhaavewijk and has a lot of social and educational amenities located next to the street. In Dutch, it is called 'Voorzieningstrook', so amenities strip. In Europawijk, the Supermarket Vormar, the smaller shops, and the school are located along this main axis. It ends when running against the river Spaarne, where a big urban agriculture area is located. This is the main point and already existing exemplary composting site. An agroforestry would be easy to implement there, as the maintenance, the infrastructure, the soil quality and the community are already set up for food production and have people working on urban agriculture. Moreover, there is already an education system in place, as the urban agriculture area is connected with the school in the

Europawijk

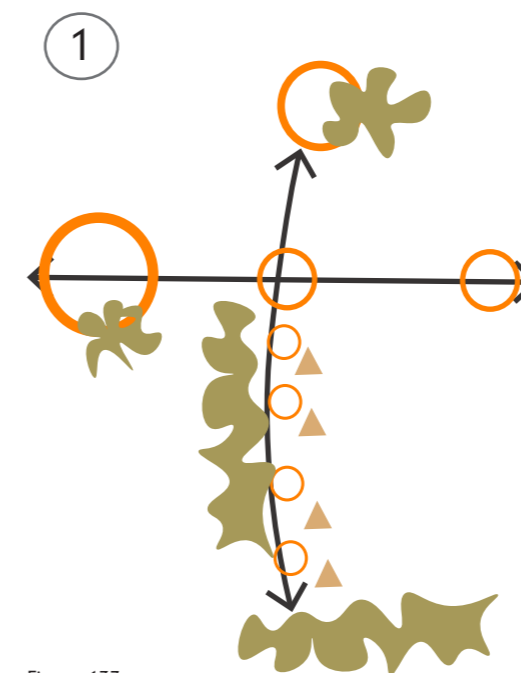


Figure 137 - Strategy Europawijk

Bigger orange circles show which location is the main composting area, as that is connected with a special location, different due to the neighbourhood values.

same axis, where students engage in cooking and urban gardening lessons in that area. And a social cohesion aspect is also given, as there are multiple organisations engaged in the urban gardening site already. So this area shows great potential spatially and stakeholder setting wise for a starting point of implementing more circular structures in the whole neighbourhood and implementing a food network (C13).

The secondary axis for implementing composting (E2) and agroforestry (E13) in Europawijk runs perpendicular to the main axis, alongside the apartment buildings next to the park area. This links the green infrastructure of the neighbourhood with the residential housing area and utilizes the utility structure as a guiding line. Due to modernist planning, the space between the buildings currently provides ample parking spaces and green areas that can showcase the agroforest in an urban environment between apartment buildings. Additionally, we propose connecting the current organic waste bins with composting drums using the existing collection space and constructing a bridge for observing the impact of soil generated through composting action on the thriving of the agroforest. The north end of the main infrastructure arteries surrounding the Schalkwijk district is where the secondary axis terminates. Before reaching that point, a community center is situated in a small park, nestled amidst high-rise towers and high-rise apartment buildings. This area has significant potential for transforming the current park into an agroforest, by planting fruit and nut trees and building a ground food layer. Simultaneously, the residents can be involved through activities organised by the community centre in Europawijk, such as cooking lessons and educational sessions on edible park foods. This will provide edible food for everyone.

A different approach is taken in Boerhaavewijk where the main green structure, as explained earlier, runs along the 'Voorzieningstrook'. The main green space is located in a linear arrangement next to the apartment buildings and along the main street throughout the neighbourhood. Therefore, the transformation's action would lie in the maintenance and actions taken by the municipality and the social housing cooperation, which acquired the plot from

the municipality. The agroforest would be planned in a long stretch, having also to cooperate the composting drums, other waste separation facilities and playground facilities, as it is currently valuable for children to play there. The green stretch is located directly next to the 'Galerijflats' Apartment buildings, which will have a positive effect on cooling the forest. Additionally, the forest is situated in a southward direction, enabling sunlight to facilitate plant growth and provide shade and cooling for daily walks or bike rides through the surrounding neighbourhood. Currently, the ground floor of the adjacent buildings remains closed. The area could offer robust facilities for storing the materials necessary for compost production and maintenance, as well as sourcing them. Another possibility is to provide a meeting space that promotes community building, not only for residents of the building, but also opening up the façade to encourage the cultivation of personal food in the forest. Additionally, Stichting St. elderly care home is also located within this area. Jakob, located on the periphery of the green space, can

Boerhaavewijk

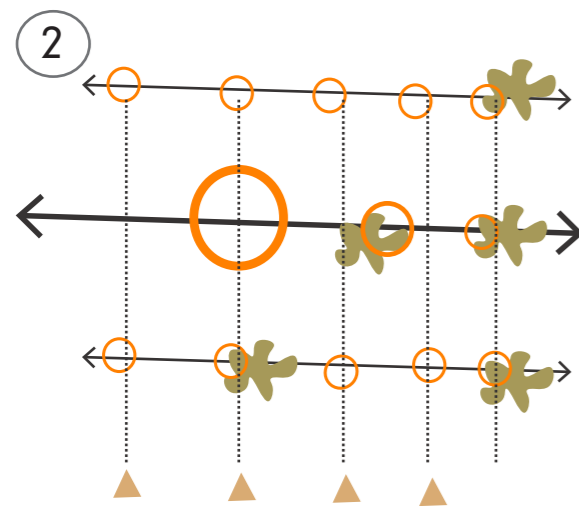


Figure 138- Strategy Boerhaavewijk

participate in maintaining an everyday activity for the elderly by enjoying the climate, smells and seasonal changes generated by the agroforest. To this effect, an agroforest placement would be a visible intervention, albeit a slow transition that needs to be followed over time. As this space is clearly visible to everyone going to Boerhaavewijk, the elderly can play an active role in creating a vibrant space.

The only LIDL in Haarlem is located along a busy axis and draws many external visitors to the neighbourhood, thus affecting their shopping habits. Incorporating LIDL as a pioneering 'supermarket' into the strategy could also have potential, as locally sourced food could be directly distributed through the shop platform.

Overall, the combination of a food forest and urban gardening would be a favourable option for creating a green space in the community. The forest would serve as a park area that showcases community engagement with the implementation of beets for urban agriculture. Additionally, it would provide space for social interactions just off the main street, across from Lidl and other social buildings.

On the opposite side of the main road, there are several amenities including two schools, two community centres, a church, and a fire station. Their courtyards face away from the street, allowing for the creation of quiet, semi-public spaces. If you are part of the school, church, or fire station community, you can use the courtyard to grow and produce your own food. Overall, the introduction of fruit and nut trees and bushes creates a functional connection between the various plots given that these plants require minimal maintenance. Thus, this aspect serves as a key strategy for the organization. Additionally, this can be implemented in the current green grass patches which have the potential to develop into a forested area, serving as a shaded pathway for cycling or walking eastwards since it is situated to the north. And it belongs to the grounds of the organization, which, during harvest time, utilizes the food and connects it with the community to create events such as the "Annual Community Harvest." Afterwards, storage possibilities are produced by processing the food, such as making jam.

The implementation of a footpath in Molenwijk could be achieved by utilizing the central building structure in the neighbourhood. This complex houses several shops, including an ice cream shop, a Jumbo store, and a small bank, with housing units situated above. Furthermore, the complex features an elderly care facility and a school. The latter has initiated a 'Tiny Forest' project in the adjacent park, which is surrounded by these facilities. This is essentially a park structure, where the small forest can be developed and expanded into a Food Forest, with the potential to involve elderly participants in both the growth and maintenance process. The local supermarket and ice cream parlour could also take part, by sourcing fresh berries from the nearby food forest for ice cream production. From there, the edible landscape/network can extend and expand to the urban garden beside the uninspiring playground amidst the apartment buildings. There is immense potential to transform this space into a more interactive playground through PLAY WITH FOOD E.. Proceeding onward to the Molenplaspark, a park treasured and frequented by the entire Schalwijk community, and then to the agricultural field near the Spaarne river via the secondary green structure.

Molenwijk

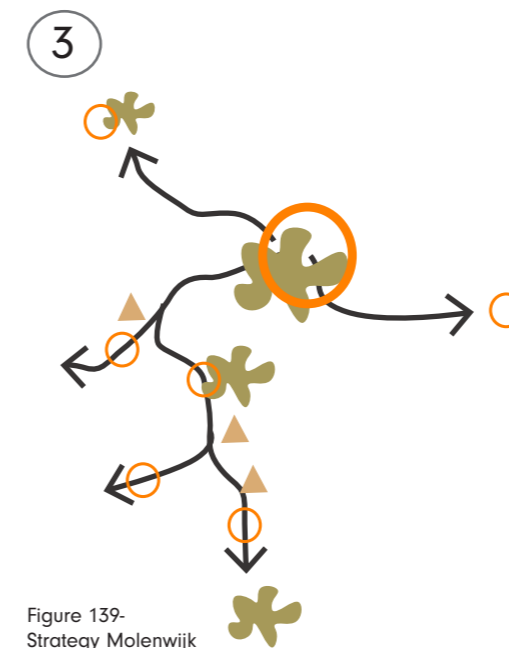


Figure 139- Strategy Molenwijk

For the neighbourhood of Meerwijk, the secondary green structure serves as the primary connector for the composting facilities. Along a canal, the same structure offers opportunities for connecting agroforestry, in a more humid environment and providing additional water storage capacity. The starting point for the Food Network is an urban garden located on the other side of the bus lane, separating the green periphery and the neighbourhood. The connection is made via a bridge which leads directly to the neighbourhood's main cycle lane through the secondary green structure of the neighbourhood. The green structure connects to a previously-built area, which is now a brownfield site, perfect for creating an agroforest park that benefits the surrounding residential area. This can be achieved by implementing urban gardens, edible foodscapes, recreational opportunities, and shade and cooling effects. This area is also present on the southern side of the neighbourhood. These two regions can serve as hubs for the redevelopment of organic waste through the process of composting, thus making a significant impact. The Meerwijk shopping centre serves as a base for distributing local produce, while the community centre can provide a space for knowledge exchange within the community.

Meerwijk

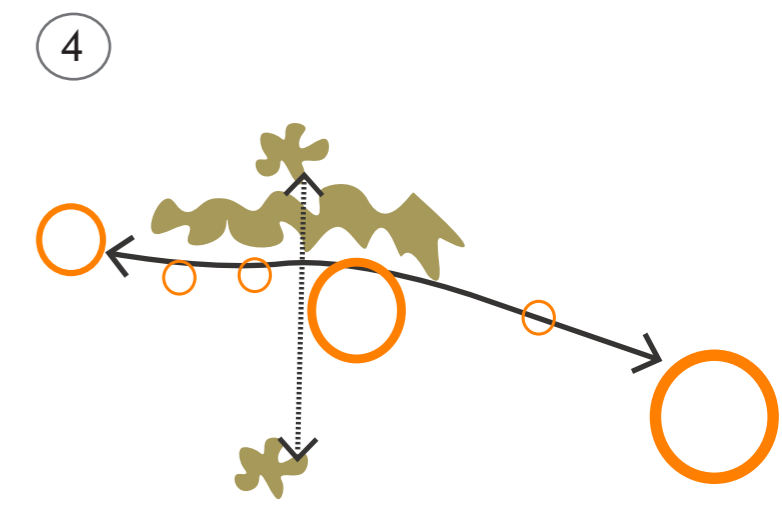


Figure 140- Strategy Meerwijk

Bigger orange circles show which location is the main composting area, as that is connected with a special location, different due to the neighbourhood values.

8.5. NEIGHBOURHOOD DESIGN

For further design steps the neighbourhood Boerhaavewijk was chosen. Here the strategy mentioned before was applied to showcase in one neighbourhood how the pattern language can be implemented in a spatial design on neighbourhood scale.

To visualise the transition towards an accessible foodscape, local sourcing is one of the meta patterns.

Therefore six main spaces configurations in all four neighbourhoods of the district of Schalkwijk were identified.

Typologies in the district of Schalkwijk that facilitate 'Local Sourcing E14' depending on the spatial, social and environmental structure.

- Spatial structure**
 - 1. Flat roofs (and balconies of Galerijflats) and gardens
 - 2. Green strip along infrastructure (water and street infrastructure)
 - 3. Paved surfaces like parking lots
- Social structure**
 - 3. Places next to social functions like schools, community centres
- Environmental structure**
 - 4. Periphery
 - 5. Green strips along high buildings
 - 6. Secondary green structure

In the floor plan below you can have a look at the spaces for the Boerhaavewijk neighbourhood.

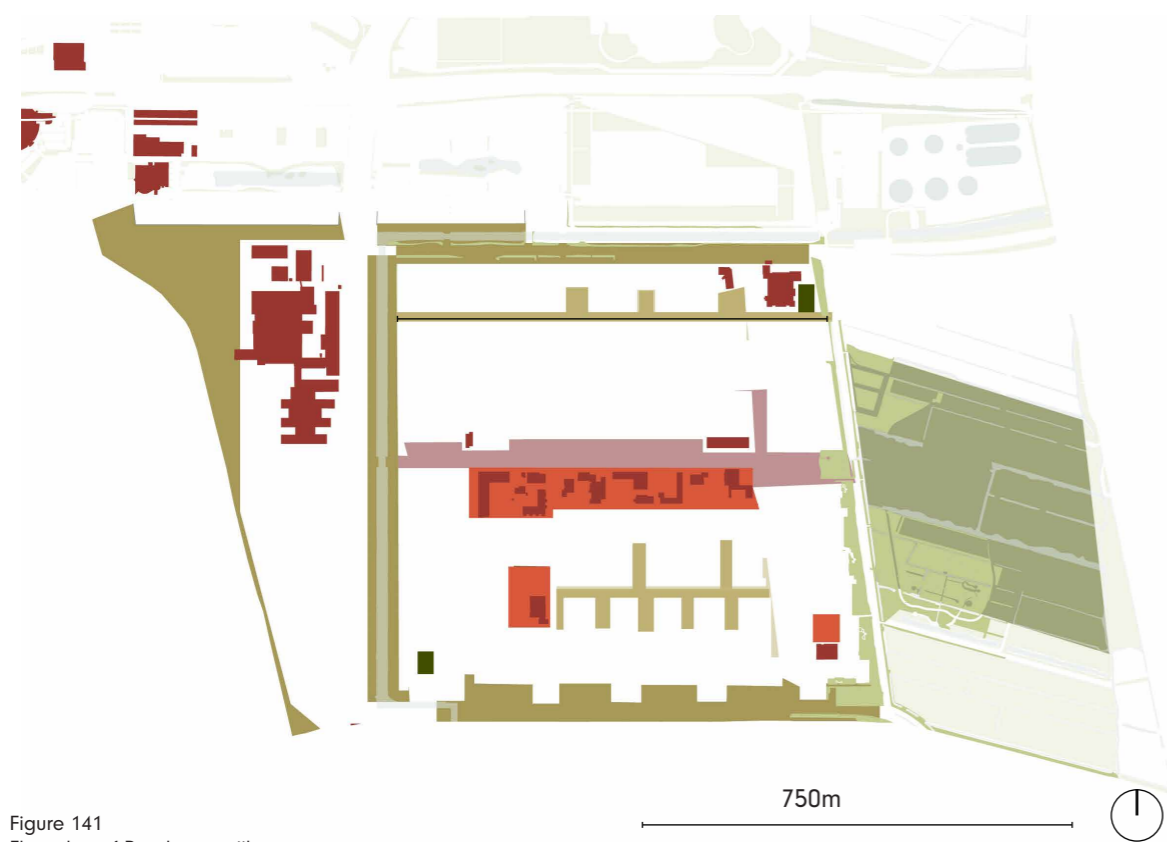


Figure 141
Floorplan of Boerhaavewijk

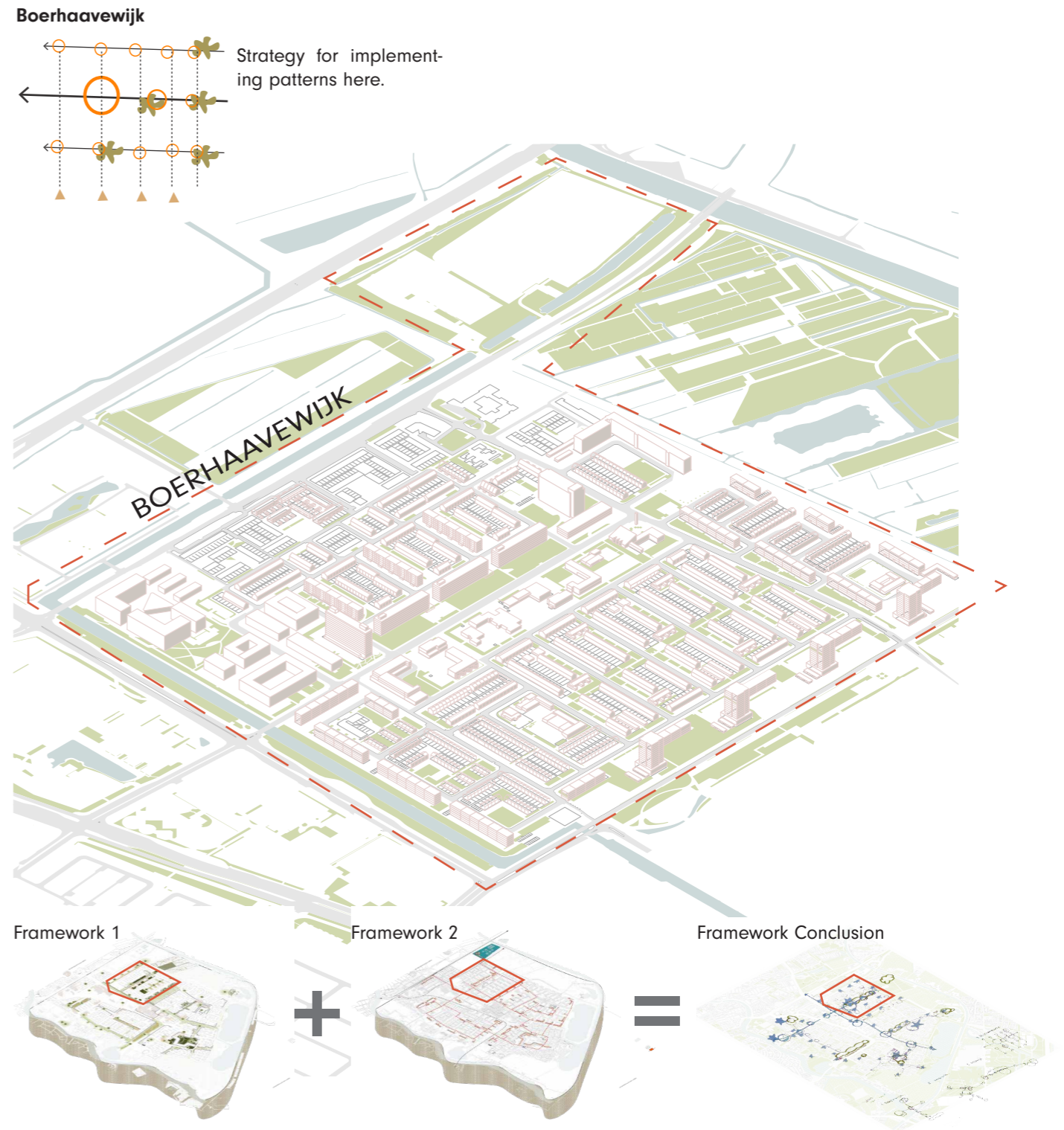
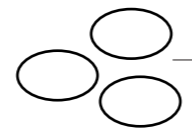


Figure 142
Location of Boerhaavewijk Axo



Axonometric visualisation of agro-forests in the urban context of Boerhaavewijk

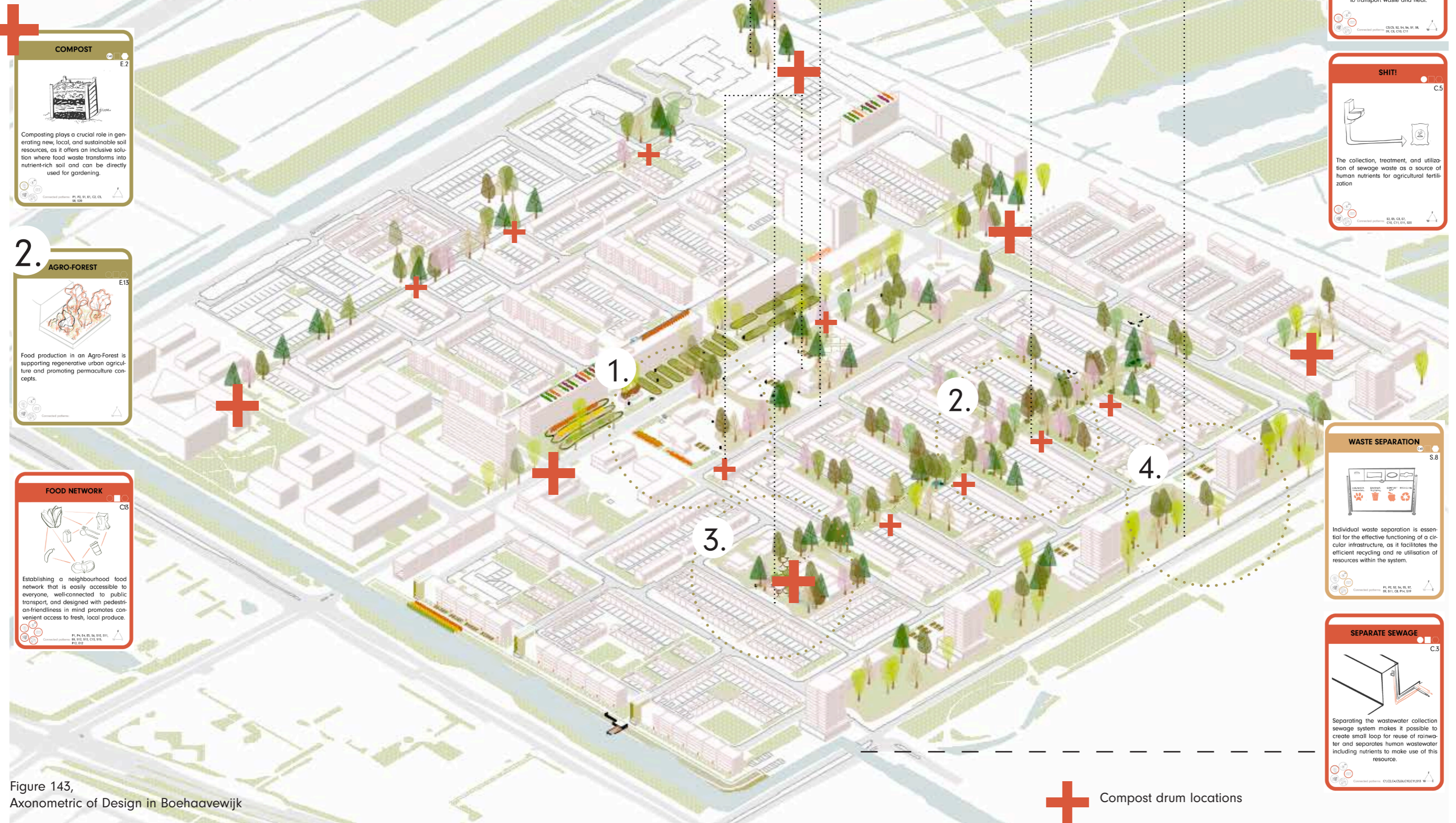


Figure 143, Axonometric of Design in Boerhaavewijk

The Agroforestry Border

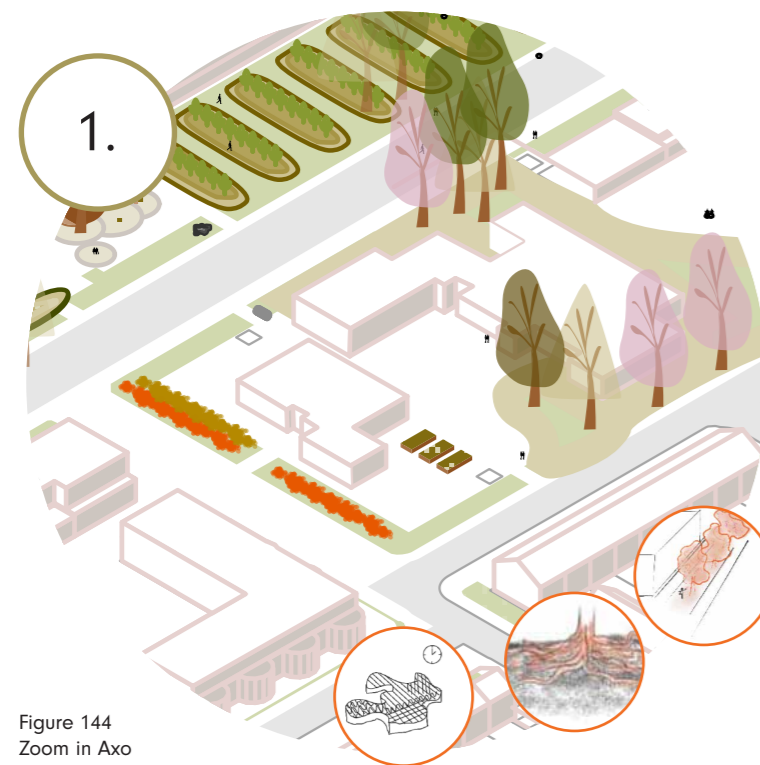


Figure 144
Zoom in Axo

The "Vorziestrook" is lined by green (mainly grass) spaces along the pedestrian walkway, separating the community buildings from the street. This intermediate space is ideal for creating an agroforest border to supply food for residents walking down the street. Moreover, it has the added advantage of being maintained by the community that uses the building, such as the community center, Ringvaart, and its senior citizens. Why not extend the Moestuin project beyond the fence of the SSHO community in kleine Ringvaart? By doing so, the community can reap the benefits of local produce and promote interaction within the neighbourhood. And the pedestrian walks in Boerhaavewijk will be hemmed with little snacks along the way.

Foodforest

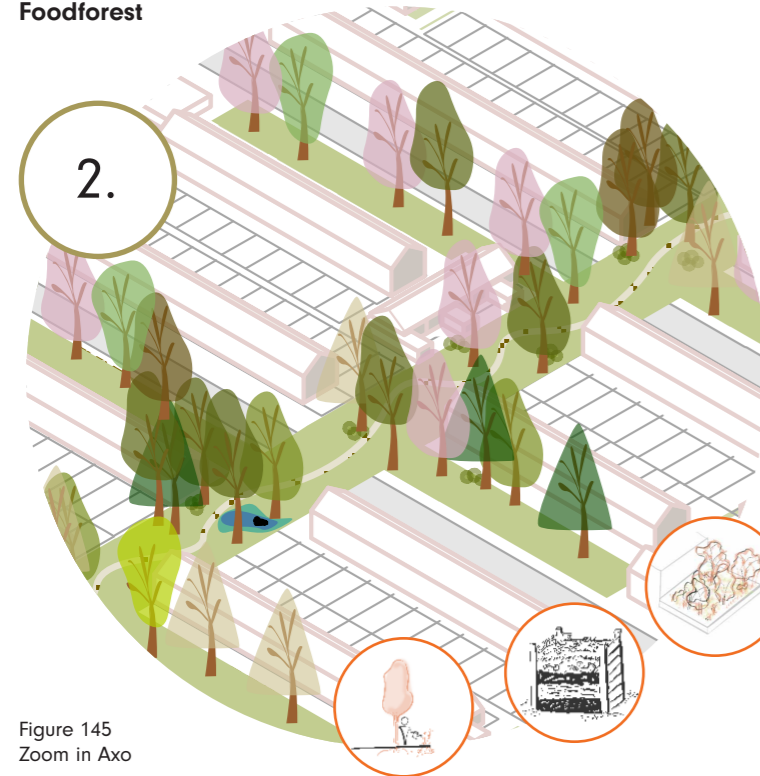


Figure 145
Zoom in Axo

The secondary green structure is part of the daily paths through the neighbourhood of Boerhaavewijk, already here is a great green structure existing. In integrating tall tree layers, such as a walnut trees, lower trees such as apple trees, a vine layer, such as grapes and then a shrub layer - like blueberry bushes and ground cover like wood sorrel and an herbaceous layer like Daylily and a root layer like tunitps. The variability of the green can be turned in to low maintenance food forest sprawling in-between the residential building blocks. Enjoyed by everyone walking past.

School forest playground

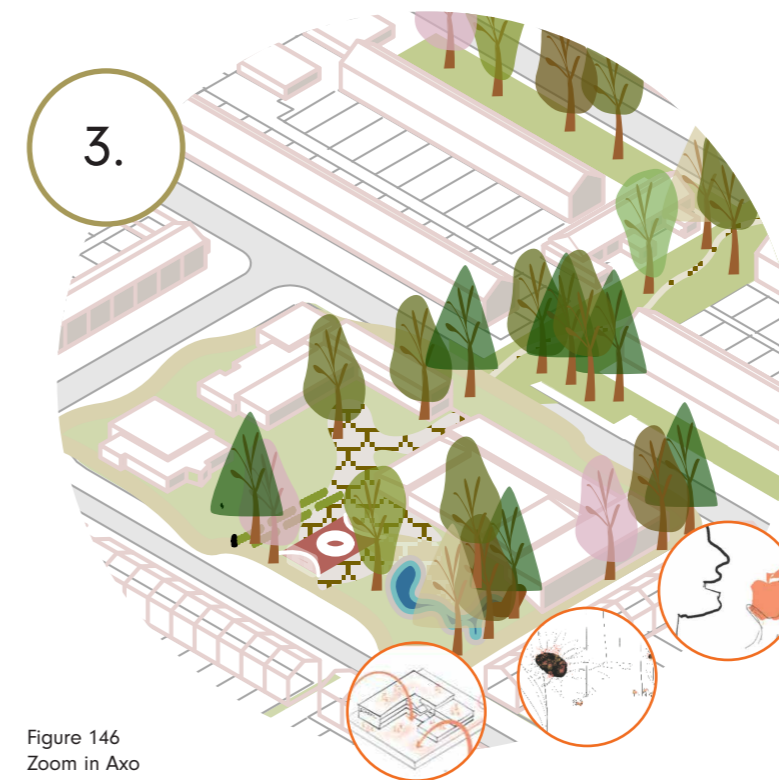


Figure 146
Zoom in Axo

The existing built and social environment - here the school yard is a perfect space for such a pilot project integrating circular actions into the daily lives of children, teachers and parent. Outdoor urban farming can be accomplished by integrating social organizations such as schools and the concept of an agroforest. This involves combining beet gardening with a natural playground to establish a connection that promotes education regarding a circular food system that encourages children to become prosumers. Additionally, composting in a compost bin, playing amongst fruit and nut trees, and acquiring knowledge about edible foods and how to care for them enables children to cultivate a deeper understanding of the process.

Organic orchard

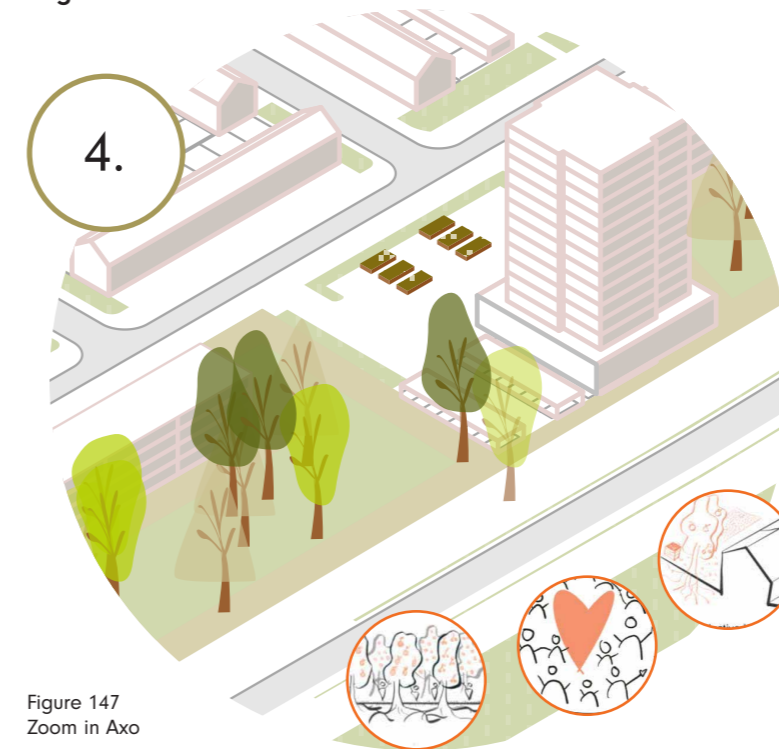


Figure 147
Zoom in Axo

The plots belong to residents who own the towers adjacent to the green space. An organic orchard would be a fitting addition in this area. To ensure a welcoming and transparent atmosphere for visitors from Meerwijk and the Shopping Centre in Boerhaavewijk, the design should mainly feature mid-height fruit trees. This way, visibility through the tree structure is more likely than with a multi-layered green food forest. The privately owned land can also be utilized for public foraging, thereby providing the entire district with a supply of fresh fruit during the harvest season.

1. The Agroforestry Border

The flows in and out of the building typology of a 'Galerijfalt' are outlined here. The use of the roof as a production roof, the planting of own fruit and vegetables and the change of the building structure to bring waste separation closer, through the introduction of the 'Waste WChust' (S5). This has also led to the creation of a space on the ground floor for collective waste collection (S4). In addition, the ground floor opens up to a green area where waste can be stored (Catch the Qawater C1'). And also an edible foodscape. The function of the ground floor can range from a shop to a café to a small manufactory for leather made from food waste 'S6'.

Figure 148
Section of the Floris van Adrichemlaan, Haarlem

Connected Patterns:

- Schalkwijk Euro P3
- Eat what you grow P12
- Benefit from separating P14
- Compost at home S1
- Residential collection points S2
- Waste collection room S4
- Down your waste S5
- Waste separation C15

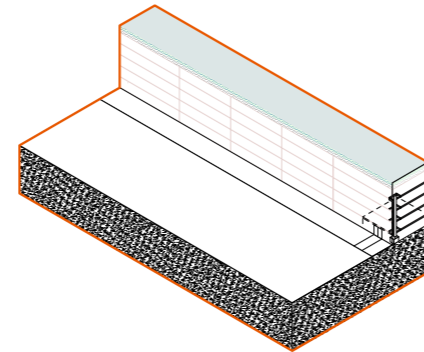
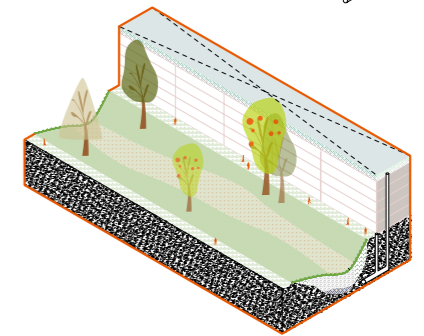
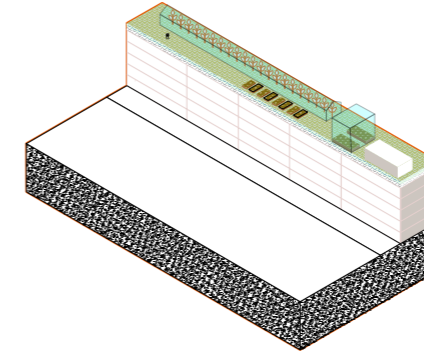


Figure 149
Design Axonometrics System

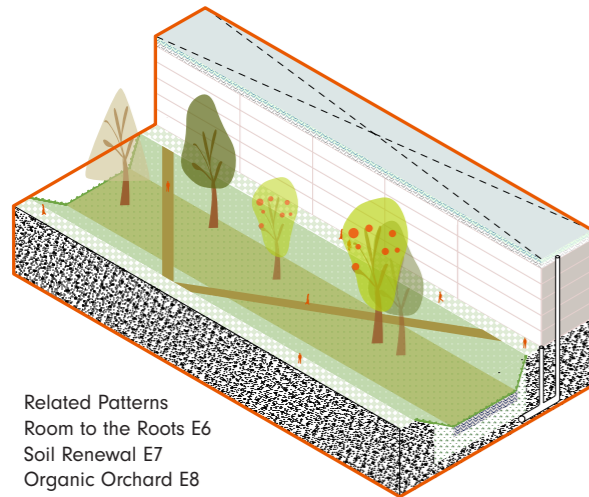
Connected patterns

- Home Gardening E1
- Compost E2
- Local sourcing E14
- Prosume P1
- Flexible Spaces S12
- Synergising functions vertically S14



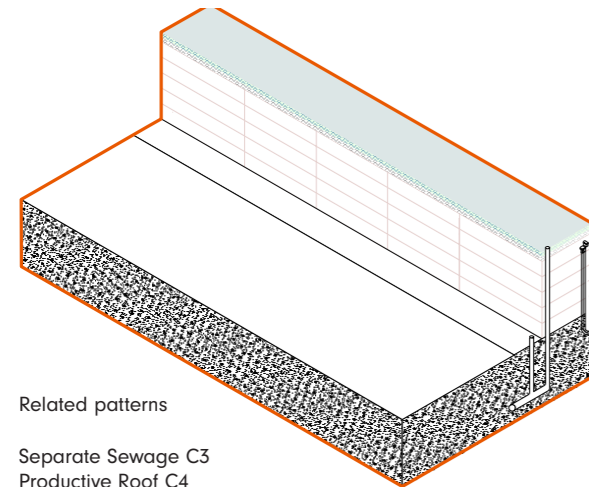
Designing the typology Gallerijflat

The green oasis



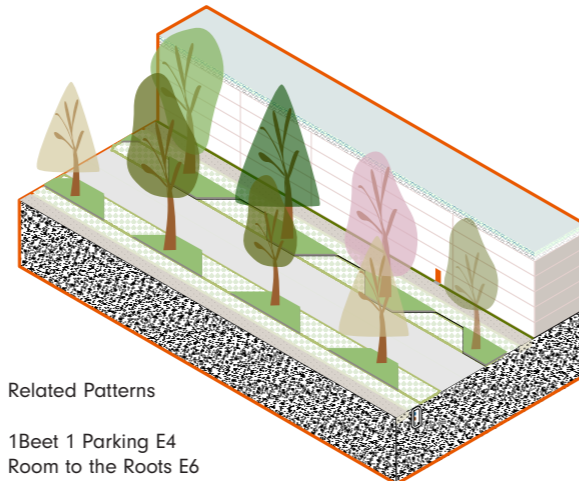
- Related Patterns
 Room to the Roots E6
 Soil Renewal E7
 Organic Orchard E8
 Annual Community Harvest P8
 Wild Public Green E9
 Native Flora & Fauna E11
 Herbal Recreation E12
 Agro Forest E13
 Local sourcing E14
 Prosume P1
 Guerilla Gardener P6

Building Technology



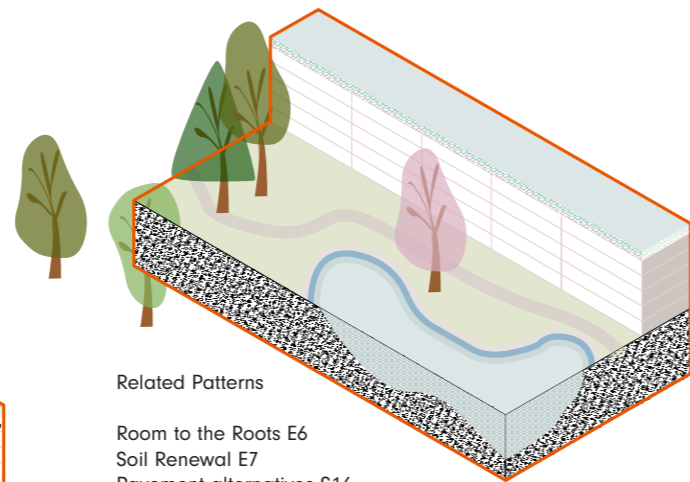
- Related patterns
 Separate Sewage C3
 Productive Roof C4
 Shit! C5
 Shared Circular Space C12

Avenue



- Related Patterns
 1Beet 1 Parking E4
 Room to the Roots E6
 Pavement alternatives S16
 Wild Public Green E9
 Native Flora & Fauna E11
 Herbal Recreation E12
 Agro Forest E13

Park



- Related Patterns
 Room to the Roots E6
 Soil Renewal E7
 Pavement alternatives S16
 Wild Public Green E9
 Native Flora & Fauna E11
 Herbal Recreation E12
 Agro Forest E13
 Local sourcing E14
 Guerilla Gardener P6
 Catch the water C1
 Increase surface water S19

Figure 150-154
 Design Axonometrics System

The Agroforestry Border

There are various systems that play a role in the development of a circular food chain. From the structural aspects to the soil quality and the functions at the level of the individual layers that create the accessibility of the food system. On the previous page the system is described in more detail.

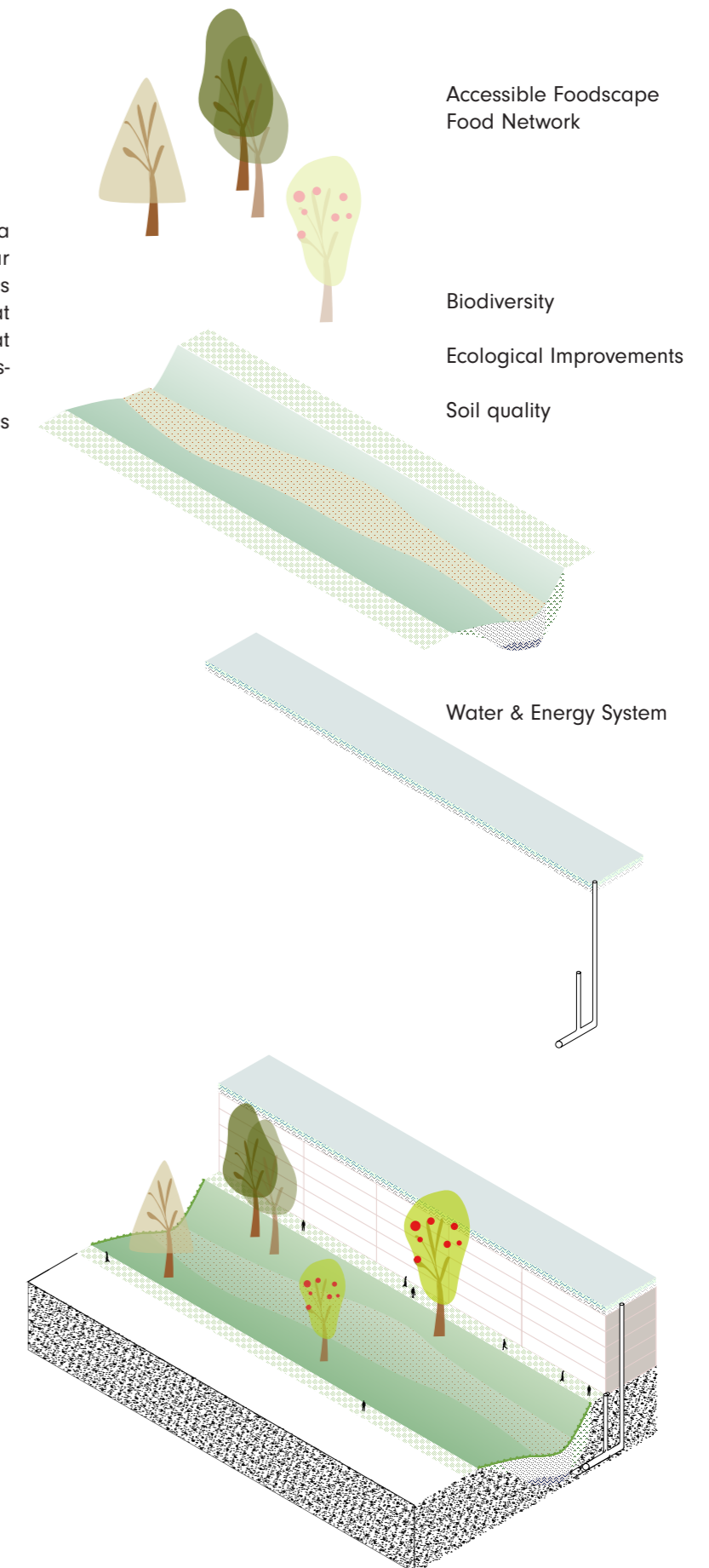


Figure 155
 Design Axonometrics System

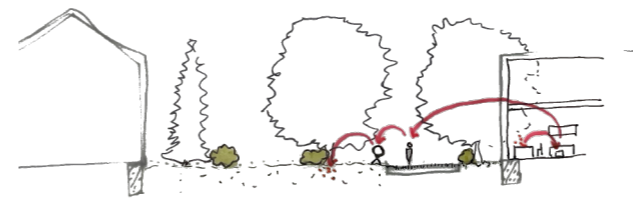
2. Foodforest

Development of a food forest over time

Section 1. Current situation. A secondary green structure of grass and trees already exists. A great structure for implementing a food forest and building on the existing trees by adding fruit and nut trees and creating more nutritious soil through the composting facility shown in section two.

Section 2. Implementation of the composting facility and start of planting some ground cover such as bushes, start of planting some fruit and nut trees. Encourage the local residents to recycle their food waste and compost it in the composting drum in the secondary green structure on their daily routes.

Section 3. The fruit trees begin to grow and thrive with the compost and begin to participate in the edible landscape, closing the food cycle of the daily life of the residents of Boerhaavewijk who live next to the secondary green structure.



The flows of a compost in secondary green structure

Figure 142
Zoom in Axo

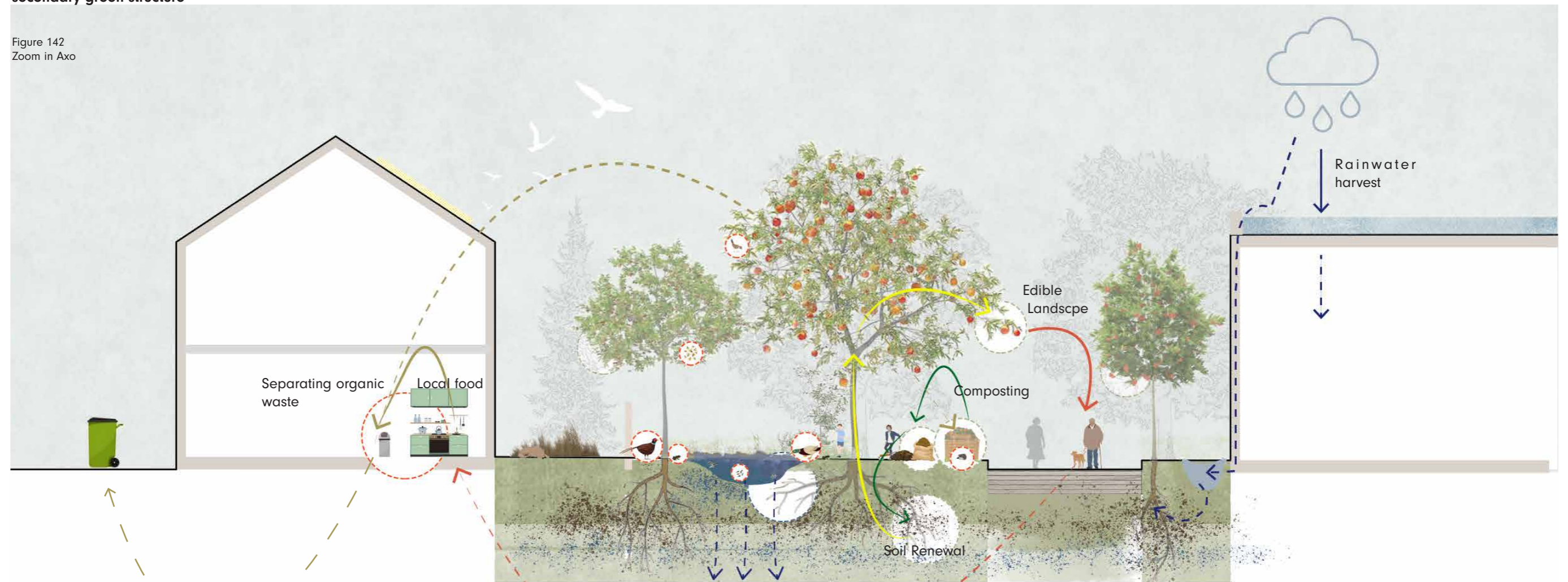


Figure 156
Section of the Foodforest in Boerhaavewijk

3. School forest playground

School playgrounds are one of the most important spaces that enable the transition to a circular food-scape. This is because they combine education, participation and entertainment in one space. Educating Spring

future generations about a sustainable food system. The current schoolyards in the Boerhaavewijk neighbourhood are largely sealed. By opening up the sealed ground and creating the 'Compost E2' in the schoolyard, the compost becomes an accessible place not only for the children but also for the

parents who bring their children to school. A perfect solution for the everyday lives of schoolchildren and their parents. Also, the phenomenon of parents waiting outside school while waiting for their children to finish their school day can now be integrated into gardening, making socialising and physical labour

easier. It also educates the parents. The fresh-grown produce can be directly used for cooking lessons. Teaching the children from a young age how to 'Prosume P1' and 'Eat what you grow P12'.



Figure 157 - Perspective Schoolyard (Spring) screenshot by google street view and sketched over by author



Figure 158 - Perspective Schoolyard (Summer) screenshot by google street view and sketched over by author

Summer

4. Organic orchard

To show how the meadow in front of the towers in Boerhaavewijk can be transformed by creating an 'E8 organic orchard'. A number of fruit trees have already been planted on this selected site. The threshold for developing a food forest system with different layers and more fruit trees is therefore not far away (E13).

The design of a particular space takes into account not only the appropriate patterns of the system, but also the elements already present, such as the dwelling house, which frames the lawn for the or-

ganic orchard. The flat roof of the house is suitable for 'Catch the water C1' and the vertical energy functions S14, which increases the storage of waste on the roof (S19) and the greening of the roof at the same time.

The building structure can also open up the ground floor to facilitate the connection between the building and the public space, while integrating functions such as, in this case, a nursery to facilitate the storage and use of garden materials for the maintenance of the organic orchard in front of the building.



Figure 159 - Perspective Organic Orchard (Sun)
Picture and sketch over by author

It is also important to show and rethink the space in rainy weather, as this is often the case in the Netherlands. The unsealed space and improved soil can now absorb much more water and also the roof now collects waste and creates a sponge system in the neighbourhood.



Figure 160 - Perspective Organic Orchard (Rain)
Picture and sketch over by author

8.6. CO-CREATION WORKSHOP

Workshops objective

The workshop's objective was to encourage communication among stakeholders involved in the food system, social organizations, and neighbourhood planning. The focus was on discussing and prioritising the transition to a circular Schalkwijk based on the workshop's prepared pattern language. Then, the effort and value that prioritised patterns would entail was discussed. Representatives from the Living Lab architects, social housing cooperation, local cultural organizations, circularity advocates, and water management team were planned to attend the workshop.

However, due to external circumstances, such as illness and delay, the planned workshop could not be carried out. However, it resulted in two interviews, which were also used to test the pattern language, get an evaluation feedback of the interview participants and gain a deeper insight into the current situation and plans of the existing food system and which patterns would be feasible in these current situations. Also extending the current pattern set through the interview with stakeholder input.

Interview instead of Workshop

The workshop focused on using pattern language and prepared sessions to generate interest and value among the participants, resulting in interviews and discussions.

The interview was guided and stimulated using the developed pattern language of this project.

Numerous reference projects and experiences and deep insight of certain actions in the food system – based on specific patterns emerged as a result. Other result were three added patterns, which will be elaborated on further in this outcome analysis.

Interrelationships boosts agency

The primary objective of the discussion was to facilitate physical meetings among people, enabling better connections and exchange of ideas between all stakeholders working towards a common goal. My participant stated that there are so many institutions also on different scales – regionally, nationally, city wise and on neighbourhood scale – and hence

on every different scale so many initiatives working with the same set of goals and agency for change in mind, but the communication between and bringing them together is the difficult impact. But according to the participant's experience, if multiple stakeholders convene and one individual presents a problem, establishing connections with the others enables a clearer path for them to offer help or solutions.

One major takeaway from this interview is that bringing together various stakeholders who are working towards a sustainable transition and facilitating an exchange of needs, as could be done using the developed pattern language, serves as a starting point for promoting communication, activating the shift, and fostering support and opinion sharing among stakeholders. To support the organization in the social aspects of transitioning towards a circular foodscape. Having a set of cards to lead workshops for establishing links and building interrelationships between individuals with agency supports the overall transition process. This is true for all individuals, whether they are social workers supporting the community, social housing cooperatives deciding on spaces in their buildings for energy transition, or small entrepreneurs working on sustainable products, such as Oesterzwammerrij in Haarlem.

Spatial Temporality

Another important topic discussed during the interview was the concept of spatial temporality. A prime instance of this is the Wereldtuin Haarlem, an urban gardening plot that is utilised by various organisations for growing their own food, providing education, hosting social events, and facilitating individual small gardens for residents of the district to grow their own food. These areas are leased by the municipality for a duration of seven years. Over a period of five years, considerable effort and care have been devoted to revitalising the area; rejuvenating the soil, creating a fertile environment, and establishing a comprehensive social framework. The municipality may determine if it is a viable location for the much-needed gym in the district in two years. As a result, the use and ownership of this space are once again of paramount importance.

New patterns

Thought the workshop new patterns were discussed and added to the pattern field. Here are the patterns which were added:

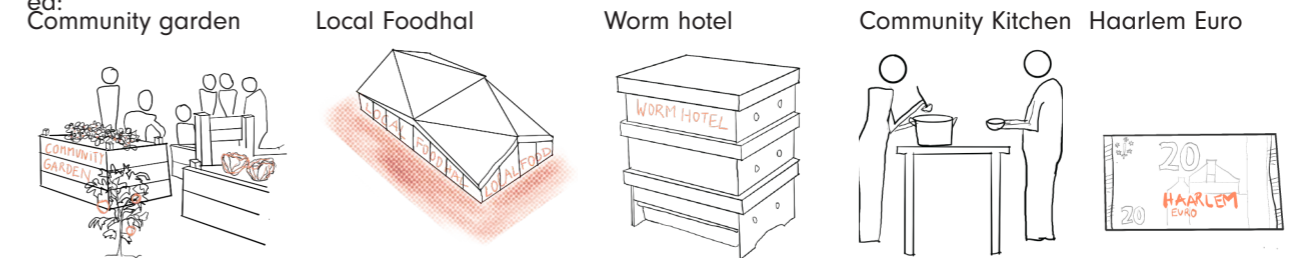


Figure 161 - Picture taken by author during co-creation workshop

Seasonality

Another topic discussed was seasonality, which is a significant consideration when contemplating the availability of food during different seasons. It's also important to consider products that could extend the viability of locally grown food. However, according to the pattern identified in 'Prosume,' the main focus was on consuming seasonal food, rather than mandarins during winter, which do not typically grow in the Netherlands. This leads to a different research topic: How can our culture, such as the consumption of mandarins during the winter or linking this citrus fruit with winter and 'Santa Claus' in the Netherlands or Germany, transition towards a more sustainable and locally-sourced diet?

Display of circular food assortment

This topic also reflects the seasonal aspect during discussions of the planned "Food hall" in Schalkwijk Midden. According to a participant's experience, the planning did not account for smaller initiatives that produce their own local and even circular foods like Oesterzwammerwijk, despite their existence. Perhaps this is why many small businesses go unseen in the public realm of the neighbourhood - the cost of securing a place there is too high for them, and the expense of having their products on display in the larger supermarket chains is also out of reach. Perhaps this is why many small businesses go unseen in the public realm of the neighbourhood - the cost of securing a place there is too high for them, and the expense of having their products on display in the larger supermarket chains is also out of reach. Consequently, even though many such circular smaller businesses exist, they remain invisible to the everyday lives of residents. Acquiring a public presence is simply too costly. A 'Local Foodhal Schalkwijk Midden' was a new pattern developed from that discussion. Another pattern - adding on the 'food sharing platform pattern' would be a 'Food sharing platform for too much harvested own food' - so that if someone grows their own food you can share it with residents that need it- without having to have a big public realm or space for that exchange. This would entail enabling a direct exchange of locally produced food that is feasible, accessible, and economical, without allowing food to spoil or go to waste.

Space unaffordable

Another topic discussed was the financial burden of securing space for organisations that integrate local food, culture, and social activities through food. The participant highlighted that small start-ups, enterprises, and social organisations face difficulties in finding affordable spaces for circular and social exchange. The Living Lab revealed a lack of space for initiatives which impacts various organizations whose rental contracts with the municipality or other organizations end. This dependency hinders complete independence and the ability to thrive.

Organic Orchard

Additionally, planting a proper organic orchard in public space was demonstrated as a potential solution. The discussed Pattern 'Organic Orchard E...' is too broad. In certain schools throughout Haarlem, there have been endeavours to establish miniature forests and food-producing trees. An instance of this is a school situated in Zuiderpolderin in north-east Haarlem, near Schalkwijk. A similar effort occurred in Molenwijk, where school children planted a tiny forest for their own benefit.

Local economy

Another topic discussed was the promotion of small start-ups and organizations in the area, based on the models of 'supermarkets as pioneers' and 'Schalkwijk Euro.' The main feedback received was that although it is a great idea, having an own currency limited to just one district would not be suitable. A Haarlem Euro would make more sense as it would help boost the entire city and encourage the exchange of goods between different neighbourhoods across the city. This was added as a people network pattern.

The primary conclusion drawn from this discussion is that finding affordable and circular space to facilitate the transition towards a circular foodscape in the Schalkwijk district is a challenge, if not impossible. Although there are circular organizations, actions, and activities present, they remain concealed and unconnected to the everyday food chain.

Exploring the seasonality

The use of the land changes over the course of the seasons. In winter, there is less greenery and vegetables growing close to the ground or in the ground. The result is less 'green' and more brownish colours. Some trees also lose their leaves, resulting in a more transparent environment. In summer, however, the leaves of the trees provide shade and in autumn the fruit trees bear fruit or nuts, which also changes the appearance of the tree and attracts people who harvest the fruit from the trees. The change in appearance over the course of the seasons is visualised abstractly in the axonometry below.

But consumption will also change with local sourcing over the seasons. As certain types of fruit and vegetables can only be harvested at certain times of the year, this leads to a rethink about what food we consume. Ultimately, consumption will be limited by eating only seasonal fruit and vegetables.

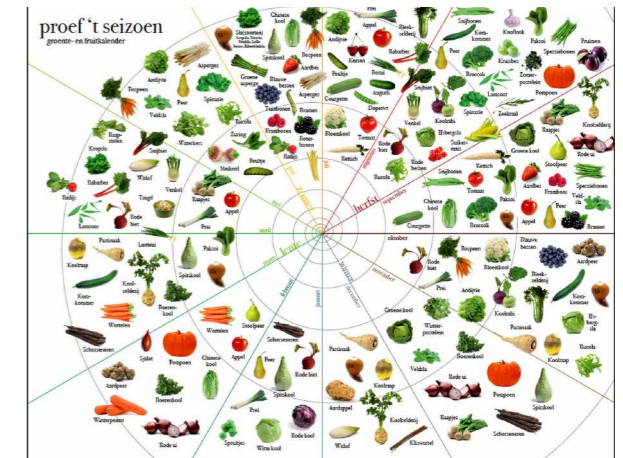


Figure 162 - Source: Jan. (2023, September 23). Seizoensgroente: welke groente is "in het seizoen"? Producten Uit De Streek. <https://www.productenuitdestreek.nl/blog/seizoensgroente-welke-groente-is-in-het-seizoen/>



Figure 163 - Axonometric of Boerhaavewijk through the seasons. Made by the author

09 CONCLUSION

This chapter concludes the project by evaluating the pattern language used as a co-design approach, evaluating spatial quality according to a framework and the SDGs, and answering the research questions in this section.

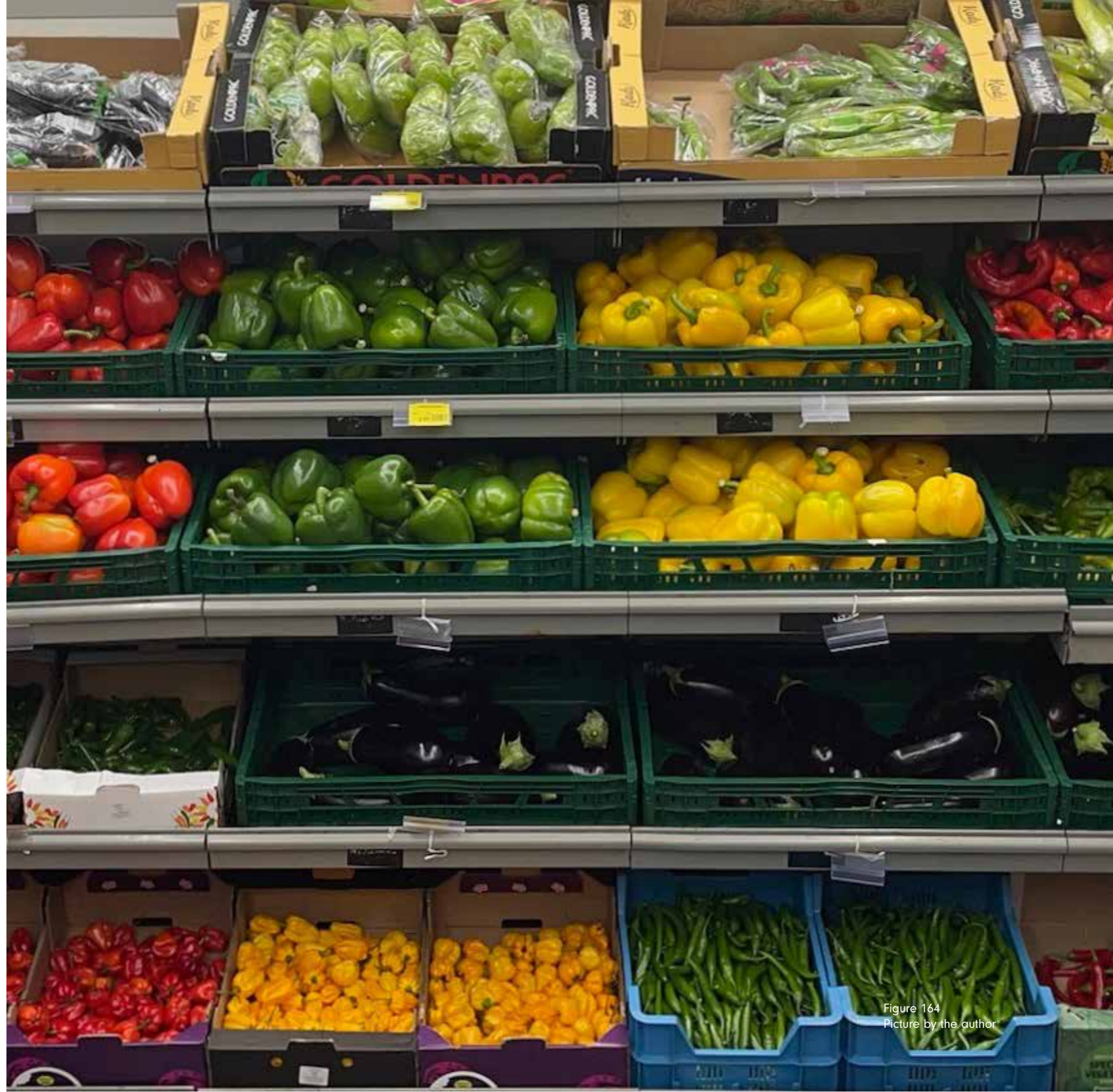


Figure 164
Picture by the author

9.1. EVALUATION

Evaluating the general conditions

The building structure is the main element that can be found in most post-war neighbourhoods in the Netherlands. The building structure is therefore one of the most important stable conditions. Depending on the historical development of the area and the municipal administration, the land ownership is similar in many post-war neighbourhoods. As they were planned as social housing areas, today's post-war neighbourhoods still have a high proportion of social housing, which is still owned by housing associations and local authorities. The soft factors are very unstable and non-authoritative conditions. They vary from neighbourhood to neighbourhood. However, for a stable, inclusive and circular transition, it

is precisely these soft factors that need to be included in the planning process by enabling residents to participate in the planning process and adapt the strategy accordingly. The ecological structure also varies from place to place, but overall the structure of the public space in the built environment is similar to most Dutch post-war neighbourhoods, which consist of a high proportion of greenery, lots of grass and old trees.

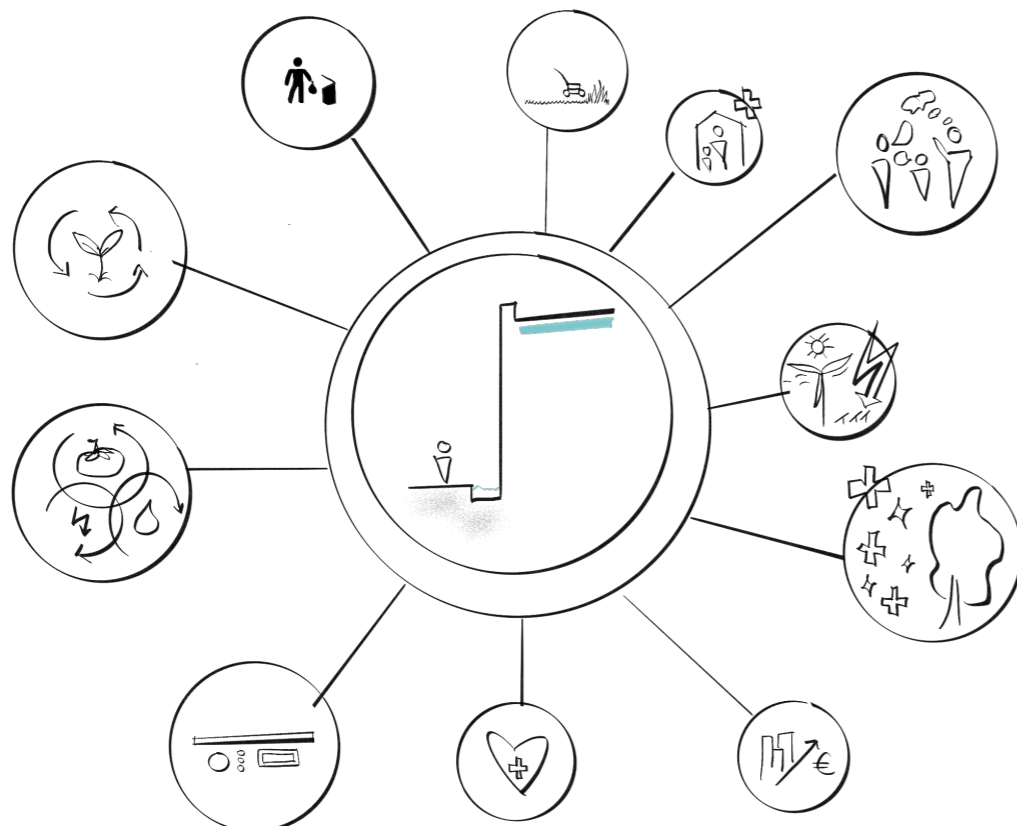


Figure 165
Conditions relating to the built environment
Sketch made by the author

Upscaling

The pattern for a circular foodscape in Dutch post-war neighbourhoods can be transferred to the post-war neighbourhoods in the Netherlands, which is reflected in the structure of the built environment. The up-scaling of the interventions can be carried out in a similarly designed urban structure anywhere in the Netherlands. However, the strategic approach will differ from place to place, as the concept developed for this neighbourhood in Haarlem is context-specific. By the existing boundaries of the neighbourhood system, the pathway to a context-specific strategy can be configured, taking into account existing stakeholders, ownership backgrounds and soft factors in the development of a strategy. Building on participation as a basis for sustainable development, the pattern list can be used as a communication tool between the various stakeholders. The spatially bound patterns are applied to the built environment and new connections between the individual patterns are developed according to the social and ecological structure.

On the map to the right top, you can see all the neighbourhoods, which were built before 2000. The darker areas are the highly urbanised areas, which go hand in hand with the post-war neighbourhoods.

As explained in the previous chapter, one step towards a more circular food system is local sourcing, which can be achieved through the introduction of food forests. There is currently a movement in the Netherlands to establish food forests throughout the country. The establishment of an edible landscape in Schalkwijk also contributes to the overall goal of food forests, and another neighbourhood is exploring the possibility of engaging in an edible and circular foodscape.

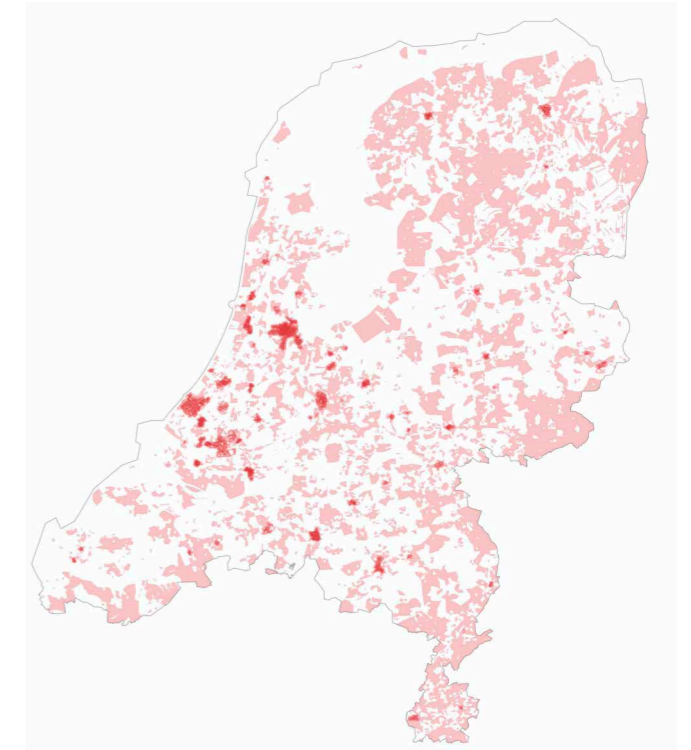


Figure 166
Map of the Netherlands with neighbourhood built before 2000, based on buurt&wijk kaart

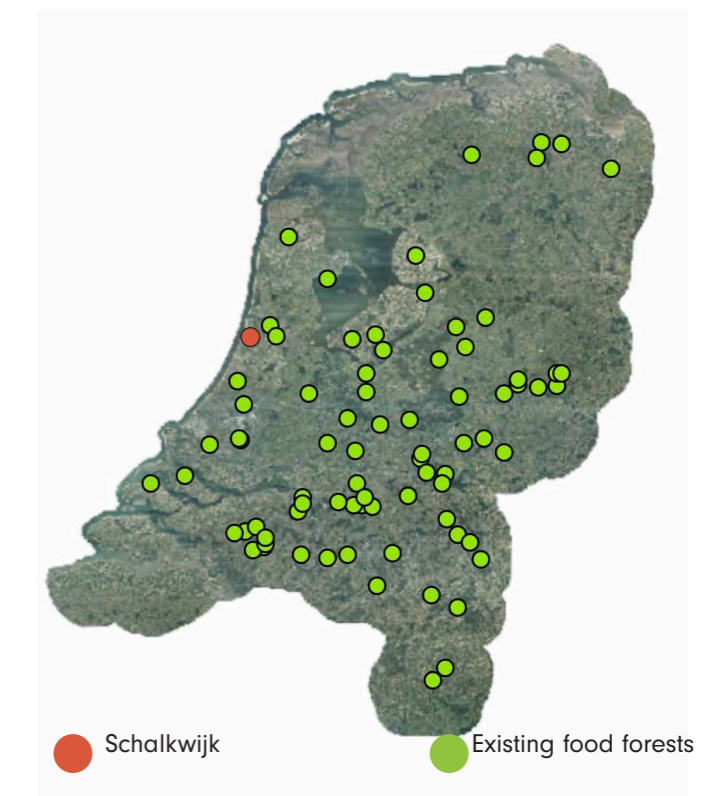


Figure 167
source: eelerwoude.maps.arcgis.com

Evaluation Tool

Taking the three patterns into account, which were designed within the pattern language co-design workshop to prioritize the perspectives and values of the residents, with a focus on convenience, ease, and simplicity for the everyday user. The three elements illustrated in Figure 168 denote the key principles for ensuring sustainable urban development. The attainment of environmental prosperity can be objectively assessed and achieved through the implementation of the 'Agro-Forest E13' pattern, which enhances biodiversity in urban areas. The second sustainable development principle pertains to the social aspect, particularly participation and resilience. The project 'COMPOSTING E2' aims to address this by locating composting drums in accordance with the design. This initiative will require the participation of the residents in displaying their food waste, and subsequently connecting with urban gardening projects or agroforestry, which necessitates social agency. These two actions bolster the 'FOOD NETWORK C13' model, which aims to fulfil the fundamental requirement of providing sustenance for all while also increasing accessibility and connectivity of the foodscape through pedestrian-friendly pathways, and simultaneously stimulating the local economy.

It is apparent that the 'COMPOSTING E2' initiative positively affects the social, environmental, and economic aspects. It supports fundamental daily needs by separating food waste and producing soil on a small scale, while simultaneously promoting social cohesion and local food production through activities such as urban gardening. All of this is achieved through the act of composting. The 'AGROFOREST E13' has a significant positive impact on the environment, while the benefits of social cohesion and economic gain are also favourable due to its low maintenance and self-sufficient nature. However, the food production aspect takes a considerable amount of time to fully develop and provide tangible benefits beyond the environmental aspect. The Food Network offers accessible food and connects it to composting and agroforestry, resulting in additional ecological benefits. But primarily, it supports the governance of grassroots initiatives and strengthens the local economy. Additionally, it enhances everyday life by im-

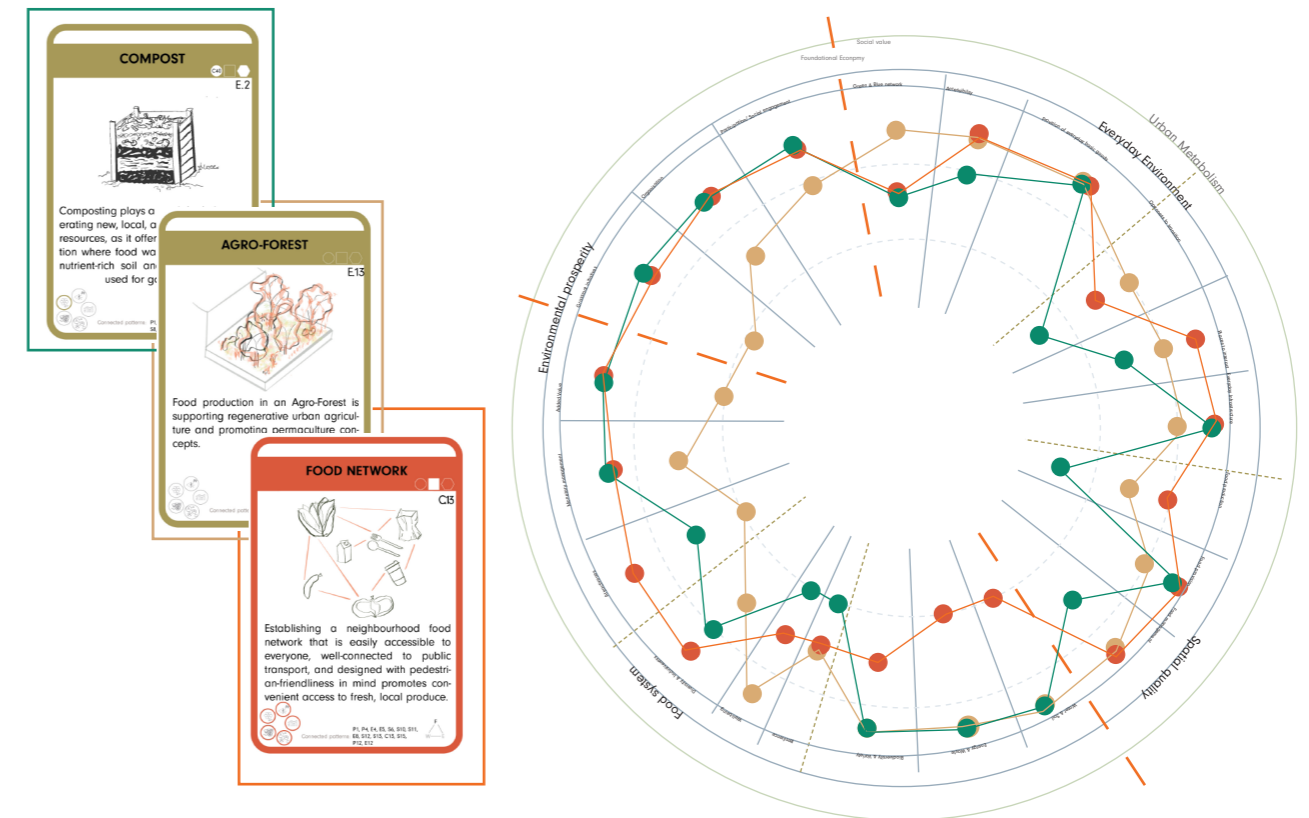
proving the spatial quality of the current foodscape.

Looking at the design that focuses more on the systemic change with the infrastructural transition: It is necessary that the value and the benefit varies quite ostentatiously, there is rarely one quality that is fully represented by one pattern intervention. However, all the patterns provide a benefit to the everyday infrastructure by separating the rainwater from the human sludge, reusing that human sludge and then turning it into fertiliser which then benefits the food system as a whole and also produces energy and uses the waste efficiently. Furthermore, these design interventions support the basic infrastructure and this shows the importance of the everyday basic infrastructure and the environmental prosperity. This shows how important its improvement is for the systemic shift towards circularity. Overall, the social value is to make the social structure more resilient by implementing a resilient infrastructure - addressing food and energy insecurity and also implementing co operations in the people network - benefiting financially from this transition and generating renewable energy locally.

Conclusion

This indicates that design interventions based on convenience, ease, and simplicity for the everyday user have a greater overall positive impact on spatial quality improvement, while also better regulating the relationship between urban quality principles. In contrast, the infrastructural approach does not have as balanced an effect on sustainable development related to spatial qualities. The qualities are mainly found in certain extreme parts, with particular emphasis on a single aspect of each quality, but mainly in the provision of food and environmental well-being.

Assessment of co-design 'convenience, ease, and simplicity'



Assessment of co-design 'infrastructural'

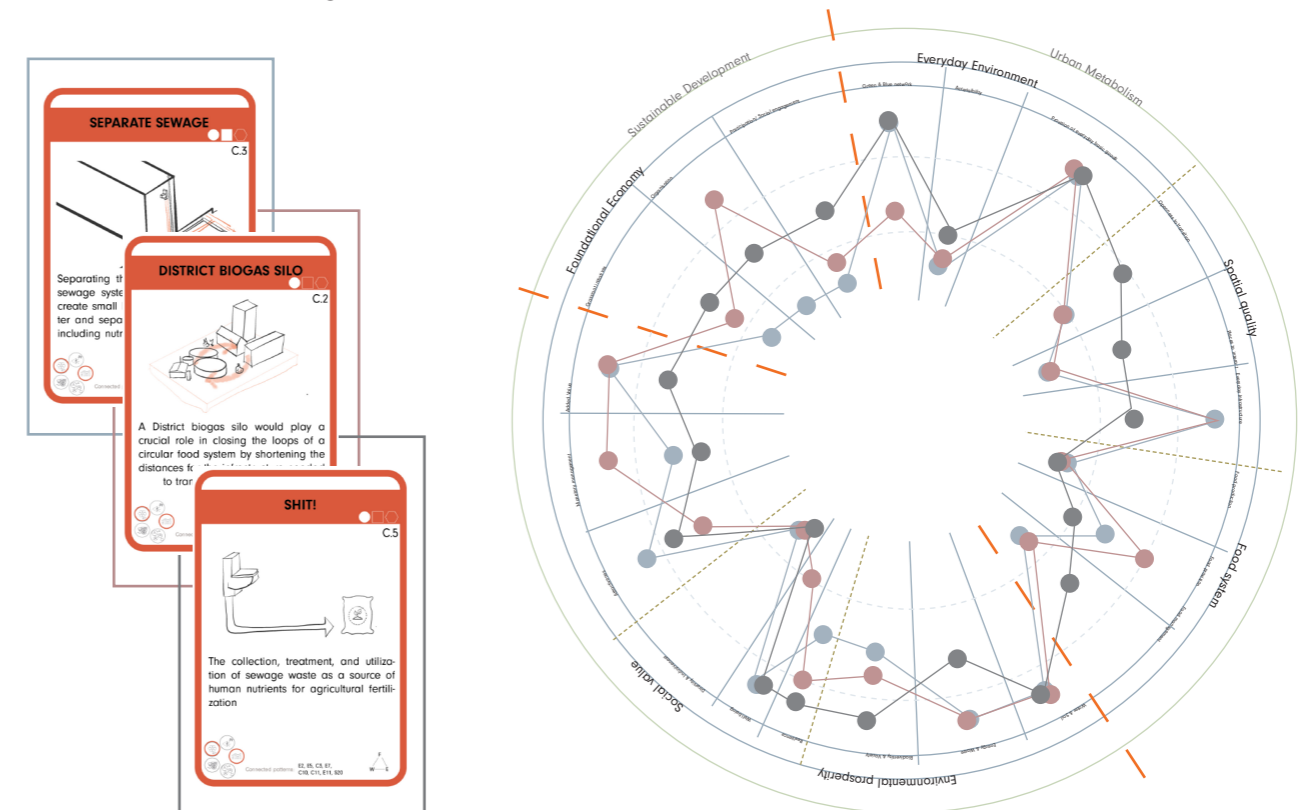


Figure 168 - Evaluation tool for design assessment
The evaluational tool was adapted according to the assessment tool in the book Food Urbanism by Verzone and Woods (2021).

Assessment according to the SDGs

The SDGs (Sustainable Development Goals) are the seventeen goals that the United Nations has set itself for sustainable development. Improving social, economic and environmental aspects while countries work together. All strive to fulfil the goals individually, but the strongest countries support the countries that need more support. The goal is to achieve more sustainable development overall. As my work deals with the transition to a circular economy, it also aims at sustainable development. The conceptual framework of this work is based on the three main pillars of sustainable development. In the figure below you can see the seventeen objectives and the assessment of each objective to what extent the project outcome and process benefits each objective. The main goal supported is responsible consumption and production, which is achieved through more cir-

cular consumption and sourcing processes. Improving and shortening production chains. Through supporting sustainable cities and communities so that the built environment and social infrastructure can facilitate this circular consumption and production. This project focussed mainly on the food system and therefore on improving health and wellbeing. But my sourcing locally and with nature-based solutions also improves life on land and in the water. By recycling and reusing food waste as a resource, affordable and clean energy can be provided. Improving soil and underground infrastructure also improves clean water and sanitation. Using pattern language, the co-creation approach also involves different stakeholders and develops partnerships. In this way, this project works on all aspects from an environmental, social and economic perspective and is part of sustainable development by transforming a circular foodscape in post-war Dutch neighbourhoods.



Figure 169
Figure Sustainable development goals. (n.d.). International Partnerships.
https://international-partnerships.ec.europa.eu/policies/sustainable-development-goals_en - adapted by author



Figure 170
Picture by the author

9.2. CONCLUSION

Conclusion

The overall research approach of this thesis was based on a systemic design, where the sub-research questions A and B map and analyse the system, C identified and developed the pattern language and D designed the co-creation approach, facilitating the workshops and testing the results of question C. All of this was evaluated throughout the process by addressing question E. To remind of the process, the Figure 40 is re shown. Hence, starting with the sub-research questions A and B, leading to answering the main research question E:

How can the transformation of Dutch post war neighbourhoods facilitate actions of our daily life towards a circular foodscape?

Sub-question A:

What is the ecological, social, aesthetically, economic, and cultural value in the neighbourhood of Schalkwijk based on the circular activities of the everyday life?

The social values of the neighbourhoods of Schalkwijk are based on the circular activities of daily living. When focusing on the everyday foodscape, there are small initiatives and start-ups that already promote urban gardening and urban agriculture in the neighbourhood. In each neighbourhood, the social initiatives, mostly located in the community buildings

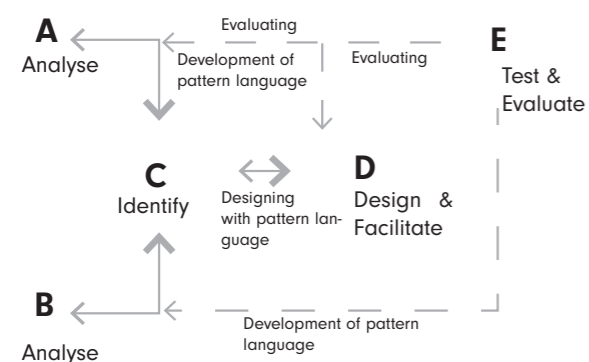


Figure 40
Drawing of the research approach made by author

in the centre of each of the four neighbourhoods of the Schalkwijk district, promote social value, which is then directly linked to the built environment, the space in which this social value manifests itself. However, looking at the spatial quality (which is now chosen for the aesthetic value), the social value of each neighbourhood is not represented or shown in the public space. It can be said that the social value is invisible in the public space of the neighbourhood, just like the circular everyday actions. The few initiatives and urban gardening organisations are located at the periphery of the entire neighbourhood. This makes sense structurally and is related to the green zoom and recreational purposes but shows that there is a lack of circular actions linked to the social initiatives at the centre of each neighbourhood. The economic value of the neighbourhood is spatially located in the 'middle': Schalkwijk Midden, the shopping centre in the center of the four neighbourhoods of Schalkwijk. The neighbourhoods in Schalkwijk are mainly residential, but there are also a few shops here and there. The cultural value stems from the area's diverse demographic background: The residents of the neighbourhoods have a wide range of different cultural backgrounds, which has an impact on the way public and private spaces are designed and adapted to personal and cultural needs. Cultural diversity is seen as a positive quality in this project but must also be given special consideration in a co-creation process when it comes to the ethics of research on human beings.

The ecological value of the neighbourhood lies primarily in the "Groene Zoom", the green space on the borders of the neighbourhoods. However, the very old tree population, which is worth protecting, and the high proportion of green spaces in the neighbourhoods, which mainly consist of "grass" due to the modernist planning structure and whose ecological value is controversial, are also appreciated.

All these values form the framework within which the pattern language was designed and for which

it was conceived. However, it must be mentioned that any set of values, created by a group of people, is subjective. These values can also be defined as qualities, as the value shifts from perspective to perspective. This is what makes the next steps and the co-creation process so interesting, as different sets of values are confronted with the qualities that the author has identified when analysing the area.

Sub-question B:

What are the current social-ecological relations of the daily food system in Schalkwijk?

The current socio-ecological relations of the daily food system in Haarlem can be described with the metabolic divide. The food consumed in Haarlem is bought in supermarkets, whereby it depends on the consumer, whether they wish to be aware of the origin, quality and ecological value of the food. The agricultural system, which has an impact on the ecological system that provides the food system, is far removed from the daily lives of the inhabitants of Schalkwijk. There are a few places, such as the allotment gardens, the urban farm, and the urban gardening project, located in the green periphery of the neighbourhood. These manage to bridge the socio-ecological gap in the food system by residents growing their own food, which may also be observed in the private gardens. But this project has not provided insight into the private sphere. Overall, it can be noted that the social-ecological food system of everyday life in Schalkwijk has some few projects and areas that have potential and serve as a good example of a networked social-ecological system at neighbourhood scale. But overall, the everyday food system is still a source and reinforcement of the metabolic divide.

Sub-question C:

What are the spatial patterns that can enable access to circular actions in the everyday life?

The spatial patterns that enable access to circular action in everyday life can be found in one of the four categories of the developed pattern language - the category "Shared Space". It is represented by the letter -S-. It contains 20 patterns that were developed for the development of public space - and the influence of these spatial interventions of each pattern on circular everyday actions. The spatial patterns focus on three different scales, the common space in the building area (microscale), such as the *Waste Collection Room S4* and *Down your Waste S5*. However, they also focus on the private realm, such as the home gardens and backyards, which have the spatial potential to support a circular foodscape. The public realm is about shared space that is either entirely public, as in the *Productive Public Place S13*, or is collaboratively maintained by an organisation such as a school, leading to a *Flexible Schoolyard S11*. At the macro scale - i.e. district scale- there are not many spatial interventions, as the chosen patterns tend to focus on the places that can be spatially remodelled. The lack of integrating spatial interventions at district scale shows that further development of the model language is necessary. Overall, these spatial patterns are not tied to a specific location, but to scale, building typology and the ownership and maintenance of private and communal space. Moreover, the spatial transitions are only part of the transition to a circular foodscape. Individually, however, they could also be used to improve the local economy by creating more space for businesses and shops, making the current spatial configuration more flexible, and consolidating functions where possible. The systemic patterns for the "infrastructure network", on the other hand, are more focussed on the separation of functions. Overall, the design interventions are planned to utilise spatial efficiency and work with the current urban layout. These spatial patterns can be the starting point for enabling circular actions, as they change the perception and activation of space. However, it also requires the whole pattern language, the complex net-

work of systemic, human and ecological networks, to enable access to circular actions in daily life.

Subquestion D:

How can the pattern language be translated to a spatial design proposal for a circular Schalkwijk?

In this project, the co-creation approach was used by using workshops as a method to translate the pattern language into a spatial design proposal for a circular Schalkwijk.

Here, it is crucial to involve stakeholders who are familiar with the area/place, as this approach is a place-based approach. By using the pattern language as a tool for a co-design workshop, the stakeholders evaluated the pattern language, prioritised the patterns based on two perspectives and mapped the prioritised patterns in the district. The involvement of stakeholders in the case work and the application of the pattern language for circular food systems in post-war neighbourhoods leads to a spatial design proposal in the case of Schalkwijk.

Subquestion E:

How can the pattern language as a co-creation approach enable circular actions?

The pattern language used in this project as a co-creation approach can enable circular action by incorporating the knowledge and values of the stakeholders in the specific case. In this way the spatial design principles are developed with the value system, the knowledge background, and the participatory power found in that specific place. It is obvious that the pattern language can be used as a communication tool, as it enables communication around the theme of a circular foodscape. One of the first steps in implementing a circular system would be for existing structures and initiatives to come together and develop a holistic, shared and adaptable strategy based on their strengths, capacities and goals. Pattern language as a co-creation approach can facilitate this process of communica-

tion in a heterogeneous system. The result is a prioritisation and discussion of which interventions are of high value and low effort - and for whom. These are the first steps in enabling the overall shift towards circularity. Pattern language as an approach cannot in itself enable circular interventions, as the individual patterns do identify specific interventions, but the overall process of creating a pattern network is the key. Using the pattern language can only be the starting point for developing an integrated, adaptive and holistic strategy that brings together different stakeholders and decision-makers. For the development of spatial design implementations that, together with the people and policy network, improve of the ecological network. While simultaneous restructuring of the infrastructure network. All of these steps or developments and restructurings can lead to enabling circular actions in our daily lives. One key stakeholder involved is the municipality and the current resource management organisation Spaarnelanden (in the case of Schalkwijk). However, as they were not part of my project workshop, this presents a missing link in the development of an integrated and holistic strategic approach. The co-creation part makes the general pattern language precise and locally oriented by developing strategies and solutions as well as proposals for the exact location. The implementation of the interventions requires participation from the beginning of the process. By improving the empowerment of local residents and stakeholders the identified solutions will become more resilient.

This leads to the general research question:

How can the transformation of Dutch post war neighbourhoods facilitate actions of our daily life towards a circular foodscape?

To initiate the process of transformation into a circular foodscape, it is key to incorporate the local knowledge by the stakeholders and residents who live and work in the post-war neighbourhoods. For the design of the transformation process, it is impor-

tant to consider Dutch post-war neighbourhoods not only as a residential area, but as a manifestation of society, circularity, well-being - hence life in its entirety. A key aspect here is to rethink the way we live and dwell and to compare our needs and wishes with those of circularity. This may lead to circular actions such as gardening. We may grow our own food - at least some of it - and buy food in small quantities. But it may also have implications for more greenery, more biodiversity, more activity in daily life, and an active and healthy lifestyle within the neighbourhood by engaging in urban gardening of the community. By giving residents and managers more flexibility and responsibility, they may design and develop their space according to their needs. Of course, these shall mainly be circular actions, as sharing and repairing are part of circularity and show that people know and care for each other. All these changes require a rethinking of the current municipal system, which is based on temporary spaces for organisations, strict rules for participation, and ambitious goals that seem unrealistic unless the way the municipality works changes at the same time. This change starts with us, with the individual. In Haarlem, the system of separating organic waste is already in place, so separating organic waste from general waste is a matter of choice and daily action by individuals. However, design and spatial organisation can make this choice and circular action easier and more convenient for each individual. However, the whole system behind waste separation must also be structured and designed in a circular way. Short distances, a renewed underground infrastructure, from the heating network to the energy network and the sewage system may be implemented in post-war neighbourhoods. It is not only the retrofitting of old buildings that needs to be modernised and adapted to new energy standards. The underground infrastructure also needs to be upgraded. The municipality, as a central stakeholder, has a great deal of influence here. However, cooperatives such as small farmers' cooperatives or possibly micro-grid cooperatives - if the whole com-

munity is committed to a larger goal - can also support the change and transition from the municipal side. A significant change would also be to value the basic economic systems by supporting the local supply of essential goods, in this case food, and thus understanding the day-to-day activities of the current food system. This would include recycling, financial and physical support for circular economies, and support for local food retailing within the existing food retailing structures. This may include newly planned shopping centres or existing supermarket chains. Our daily lives would have to change from being distant from food production, processing, retailing, and distribution to being part of the process, perhaps just observing to become aware of the process and then supporting local products. But overall, the journey towards a circular food system in our daily lives will transform ourselves from consumers to prosumers. We need to get involved in every part of the food supply chain. However, we may even start at the end: separating our organic waste or introducing organic waste bins and e.g. using the infrastructure around them at the TU Delft Faculty of Architecture or the community centre 'De Ringvaart' in the Boerhaavewijk district.

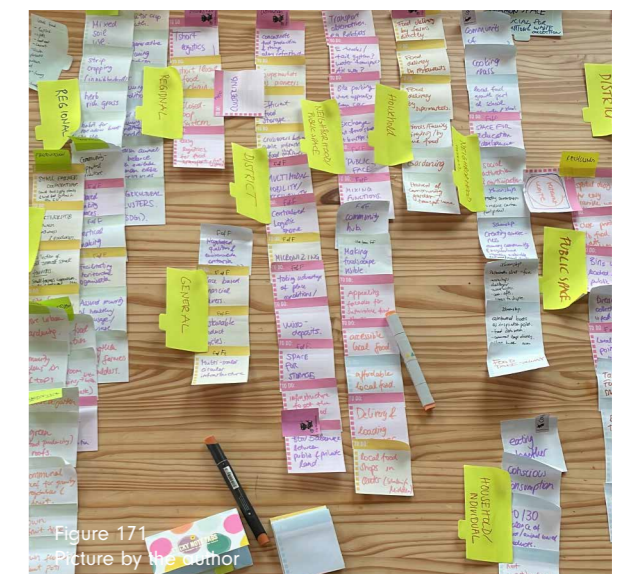


Figure 171
Picture by the author

10 REFLECTION

The process of this research and design project is reflected in this chapter.

Systemic resilience does not come without certain risks: it can lock a system in to problematic patterns. One way to counteract hard-wired resilience is to ensure that the system is also adaptive, and can find answers to its own problems.

- Eva G et al, Metabolic, 2017



10.1. REFLECTION

1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A, U, BT, LA, MBE), and your master programme (MSc AUBS)?

The connection between my thesis, 'Circularity of the Everyday: A Pattern Language for the Transition towards a Circular Food System in Schalkwijk', and the MEP studio lies in their emphasis on the systemic design and the place-based approach, specifically directed towards designing systems for places and daily life. My thesis works within the socio-ecological metabolic system, a key focus area within the MEP studio. This cooperation provides my project with valuable context for investigating ecological systems within metropolitan settings and exploring their potential to promote sustainable and circular practices.

To address the topic of systemic change towards circularity, I chose to situate the circular built environment on a neighbourhood scale. This decision enabled the integration of the studio's exploration of systemic change, with a focus on the socio-ecological system and urban metabolic flows, alongside the Master track of Urbanism. The urban fabric, everyday life, and spaces where circularity is tangible and spatially evident in daily actions, were examined through this lens.

The Urbanism track at TU Delft is currently introducing the pattern language as an intensive course. The program introduces students to Christopher Alexander's pattern language and its applications in student projects. This method has encouraged my own work. The academic environment at TU Delft provides an ideal platform for research on this topic. During my first year of studying Urbanism for my master's degree, I gained expertise in planning methodologies in the Netherlands. This understanding influenced my decision to choose the Netherlands as the focus of my project.

The connection between my graduation project, the studio topic, my master track in Urbanism, and my master program (MSc AUBS) is the shared emphasis on systemic design, place-based approaches, and the use of a pattern language as a research and design tool. This integration, combined with the

expertise gained in the Urbanism track, forms the foundation for my comprehensive exploration of circularity in a Dutch context.

2. What is the relevance of your graduation work in the larger social, professional, and scientific framework?

The aim of this project is to contribute to the ongoing discourse on circularity in the built environment by filling the knowledge gap on how the transition towards circularity can be developed on the neighbourhood scale, taking the socio-ecological aspects into account. It explores the transformation of shared spaces into resilient and liveable communities based on circular action in daily life. The project also aims to educate people about circularity through a co-creation approach that engages them in conversations on the topic.

Considering the ethical implications of participation is crucial. In my experience with this project, justifying the importance of individual participation was difficult. Therefore, I chose to focus the co-creation workshop only on stakeholders who are already active in the current food system. It is essential to ensure that all participants can comprehend the project's ethical implications. During the workshop, I encountered issues with communication between invited stakeholders and those responsible for implementing the initiative projects. There were misunderstandings and failures in clear communication. Clear communication is crucial for effective learning and is reflected in both personal and societal reflections. This highlights the importance of the social relevance and the problem using only one language (i.e. English) in a co-creation workshop setting based on the pattern language. Greater potential lies in providing the pattern language cards in Dutch and Arabic, for this specific location. The English language can be used primarily in academic and professional settings. This is demonstrated in the decision tree provided by Els Leclercq at the beginning of this thesis. She informed me early on about the difficulty of the participation process and the importance of an ethical and socially responsible research mindset to engage participants. Specifically, I chose to work in a multicultural and, according to demographic analysis, vulnerable neighbourhood, which makes clear communication of the project's

relevance and outcomes to participants a crucial aspect. While working on the HREC application, it became clear that applying thoroughly to the human research committee is ethically important. It helped me understanding how to best approach the participants and most importantly, how not to approach them. It was also a reason why I chose not to conduct workshops with children or residents, as these might be classified as "high risk" and measures would be needed that would take a long time for planning to comply with the set standards.

My topic addresses the development of an urban project that integrates the main topics of the Dutch tradition by combining landscape and spatial planning (my socio-ecological metabolism approach) with engineering and urban design. The project analyses Dutch urban areas in combination with social aspects, with a focus on post-war neighbourhoods. In my project, I integrated the concept of circular economy - which is a technical and business-oriented development - with the spatial built environment and current social demographics. This integration includes the social aspect of the everyday life of the residents in the mentioned neighbourhoods. I examined various scales and established links between the spatial effects at the neighbourhood scale and beyond, including the city, region, nation, and even on the global level. This allowed me to explore the implications of circularity in people's daily lives by connecting environmental technology with human-centred design.

Moreover, this project is in line with the ongoing research and focus of TU Delft and the Circular Built Environment Hub and addresses the 'neighbourhood' lens of the Scales to Aspect Framework. The urgency and importance of the transition to a circular economy also makes this project relevant to the national goal of the Netherlands. Furthermore, I would like to explore how the built environment and everyday space can change in the future to create resilient communities and liveable environments. Hence, this project aims to design a future that creates a sustainable and liveable environment for future generations. By analysing current systems and identifying key challenges that could be improved, the aim was to create a sustainable transition into the future, as it is currently predicted.

Also relevant to the social framework was the extent to which the co-creation approach can engage real actors and what the outcomes were. The question arose to what extent co-creation influenced the design part. The two methods - integrating the pattern language with the value flower method for integrating spatial elements - were also examined. In general, the focus was on an integrated strategy through the application of a co-creation approach that focused on integrating the social and environmental aspects into the concept of circularity. The social relevance was to create awareness of possible transitions and to communicate the strengths and opportunities of stakeholder interaction with the urban development processes. This would improve social mobility and reduce barriers to enable equal access to opportunities and circular activities.

Furthermore, the Dutch government has not yet achieved its goal of transitioning to a 100% circular economy, and recent reports suggest that there is still a long way to go in order to achieve this goal in 2050. Therefore, a rapid transition is necessary. While the circular economy has primarily focused on the regional and material level, there is an important need to implement this transition in the urban sector, particularly in the field of urban design. The aim of this project is to promote transition to circularity. However, the current pattern language is more relevant for academic and professional contexts than for everyday residents. In my experience applying the pattern language, more work needs to be done to communicate the need for a rapid shift in the development of the pattern language to make it universally understandable.

This project also contributes to the Circular Built Environment (CBE) Hub at TU Delft. The CBE hub brings together the different departments in the architecture and built environment faculty, synergising research on the circular built environment across different scales. This project was developed within the scope of the circular built environment. When examining the CBE hub framework's 'Scales to Aspect' model on the neighbourhood scale, circularity is evident in certain spaces and districts. (Scale Matters, retrieved 4.12.2023).

3. What is the relation between research and design in your graduation project?

The pattern language is used as both a design and research tool, utilizing TU Delft's research-by-design approach. This iterative process involves continuous interaction and connection through design, testing, analysis, and implementation. It enables a comprehensive understanding of the current situation and the development of diverse sustainable approaches. My project demonstrates this with help of the pattern language.

My project connects research and design in a close way, especially by using the pattern language. This project is based on a "research-by-design" approach. Testing the research outcome by designing – in this case via the development of a pattern language – the design can then be tested again in a research setting. Thus, this project could also be called a "design-by-research" approach. This project played with the interrelation of research and design and used methods for both, research and design

These were the steps I took:

1. Research: literature review, precedent studies: design by research (defining patterns that could be tested) / analysis of co-creation workshops based on the research by design approach
2. Research-by-design (workshop: testing and evaluation and valuing the proposed patterns of precedent studies and literature review): research outcome
3. Design-by-research: desk work on evaluating the research and thus designing prototypes/proposals for new patterns according to the research
4. Research-by-design: Testing and evaluating the proposals/ spatial design patterns in a co-creation setting
5. Design-by-research: Developing a framework for a circular post-war neighbourhood

4. How do you assess the value of your way of working (your approach, your used methods, used methodology)?

Another big part of this co-creation workshop was

the HREC application, which was not known to me when I started my thesis. The HREC application requires a long process of risk assessment and data management planning. On reflection, this should have been started much earlier in the process, with better support and more specific information. My HREC application is included in the Appendix 12.4. for future students to refer to, as the co-creation workshop was eventually approved.

Gaining insight and being part of the Living Lab KIEM umbrella was very helpful for the overall development of this project. The insight, knowledge and support of the Living Lab architects, the location in the neighbourhood, and their partners were of great value to my project. This shows that the Living Labs method has such a wide variety of functions, in this case inspiring the whole development of this master's thesis. It shows that there are new ways of working on urban development. And that involving stakeholders early in the process develops a completely different perspective on a project. Without the input of the Living Lab, the deep understanding of the place and the people would not have been possible.

5. How do you assess the academic and societal value, scope, and implication of your graduation project, including ethical aspects?

The academic value of my project is adding a new set of patterns - another pattern language leading to circular systemic change. We need a novel pattern language on the scale of a neighbourhood and aiming for the shift towards circularity. This need combines several hot academic topics of urban planning: i) focussing on the neighbourhood scale, ii) the need for circularity, iii) the necessity of co-creation/empowerment of stakeholders, iv) the need for addressing the societies diversity, and v) the need for sustainability and increased resilience. Hence, the value of approaching change at the neighbourhood scale is being more recognized in the academic setting than was two years ago. Therefore, the combination of a co-creation approach and the use of a pattern language for this is of great value for the current focus on change towards a more circular built environment.

Overall, the scope of the neighbourhood scale in the circular built environment is now developing, with

Buiksloterham in Amsterdam being one of the most prestige examples. However, in terms of socio-ecological development, there is still room for improvement, and although the academic world is aware of this, it still seems difficult to incorporate these values into the 'real-life' planning of circular development. To reflect on the social and ethical aspects of the methods used in my thesis, I am referring to the use of participants in a thesis. There is a fine line between how workshops use the knowledge of relevant stakeholders. It is the ethical understanding of what the impact of a particular stakeholder's participation will be. Although it was an interesting consideration to include children as participants, this would have led to a high risk in human research. The involvement of children in research would require the consent of their legal guardians. The purpose of the participation and research should also have a clear benefit to the children. This would require small projects that benefit the children and the children see the outcome. The framework of the one-year urbanism work did not allow for this added value for the children and therefore they were only involved in the Living Lab work. It is important to define the level of knowledge to be expected from the participants of a workshop, in order to make an informed choice which stakeholders to invite to run a productive co-creation workshop. It is also crucial to communicate the needs of the workshop clearly to the participants. This requires not only that the pattern language as a communication tool is clear, but also that the main spoken and written language of communication is clear. With regards to the workshop, having people as part of the research is always an unreliable factor. Even if you have the social network, different factors such as personal interests, time schedule, and in short term illness, and late arrival, can change the whole set of a participatory approach and workshop.

This is also what needs to be considered when planning participation: it is dependent on different factors and depending on which individual in which constellation you have participating in a workshop setting - the outcome and the session will always be different. The one outcome can only be a representation of many and will depend on the setting and the people present. Having said that, because my research was completely anonymised, that specific setting can never be reproduced in the same

way.

As mentioned in the introduction and framing of the scope of this thesis: "open/heterogeneous urban systems that facilitate access to diversity hold a better chance to survive different types of socio-economic crises than closed/homogeneous systems. This is a direct parallel to what in spatial terms are expressed as 'accessibility to diversity.'" (Marcus & Colding 2014). Reflecting on this quote, access to diversity also holds a higher risk of miscommunication.

6. How do you assess the value of the transferability- of your project results?

Overall, the pattern language is a method that represents a network of individual implementations for which – according to the context – the stakeholders and the place can be adapted and applied. Thus, the overall idea of the development of a pattern language in my project was to create a high value in transferability of this pattern language towards a circular foodscape. As the setting of the built environment for this project was a typical Dutch post-war neighbourhood, this pattern language can be transferred to other neighbourhoods of these typologies. I showed in my thesis that the framework for the whole 'stadsdeel' could be applied in different strategies, making use of the co-design workshop. It would be valuable to see, whether the outcome of the design workshop – with the three prioritized patterns – would also be applicable in any other Dutch post-war neighbourhood; or whether it can also be used in more traditional built structures of Dutch old city centres, for example. In general, one advantage of my thesis was that the place (here: the neighbourhood of Schalkwijk) was located at the periphery of the urban structure. Therefore, the focus of the circular food scape was logically to integrate, as the polders, with their agricultural value, was reasonable. Looking at the situation outside of the Netherlands, it would be interesting to see how the pattern language and its strategies would unfold into the design of CBE. In suburban French, English, or German cities, for example, this can be very well imagined.

7. How does the co-creation approach support or limit my graduation project?

The co-creation approach supported and facilitated the development of this project. My work demonstrates the applicability of the pattern language for the purpose of a co-creation process as it has been tested in a workshop setting in order to implement a circular foodscape on the neighbourhood scale. The process of planning and designing the workshop has sharpened and made my research project feasible and shows its applicability in different settings. One of the initial aims of this master's project was to familiarise a wider audience with the concept of the 'circularity'. The design is now the result of communicating the current situation and the urge to move towards a circular foodscape - hence it shows how this whole co-design workshop is translated into a place-based design, from a pattern card - up to eye level. The whole co-creation process was supported to show the applicability of the pattern language as a co-design method towards a circular spatial transition.

However, using the pattern language as a development strategy alone could have resulted in three different approaches according to the three drivers: 1. More Biodiversity, 2. Accessible foodscape and 3. No Food Waste. Depending on the driver and focus of the transition. Without the co-creation part, the outcome of my thesis would have been more strategy based. However, the current state of the pattern language strategies - even without the co-creation approach - would have resulted in a circular district framework that could have been designed individually for each neighbourhood.

As the prioritised patterns in the co-design workshop were not the ones that I prioritised by making the individual, more or less subjective pattern connections, based on objective background knowledge after the analysis, I had to rethink the design approach and outcome, and adapt towards the newly chosen patterns.

Moreover the strategic approach was referred and used after the co-design workshop. By drawing on the three different strategies after the workshop made it possible to connect the design with a strategy, based on the analysis.

In addition, the design and preparation of the co-creation process (the co-design workshop and the

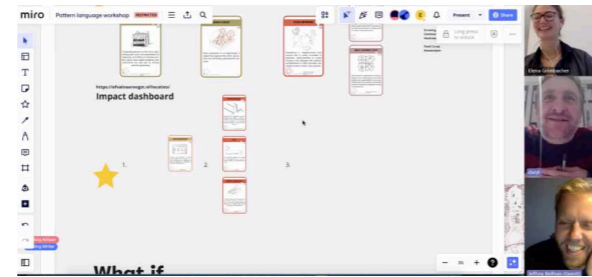


Figure 173-
Screen shot of the Co-design workshop made by the author

co-creation workshop, including the HREC application) took weeks. In this sense, co-creation supported the final project in showcasing the diversity of the pattern language's applicability. At the same time, the amount of time required to plan the workshops limited the exploration of the pattern language as an individual design strategy.

8. How can the developed pattern language support the overall transition towards a more circular built environment?

The pattern language is a great approach to combine the systemic design and co-creation approaches. The pattern language is therefore a great way to find a way to better communicate the necessary transition to a more circular built environment.

A conversation during the planned co-creation workshop showed that there are many stakeholders and organisations working on or for the same goals, in this case towards a circular food system. However, the difficult part is to get all stakeholders and different initiatives around the same table and sit together to discuss how to best make the transition to this change. Ultimately, it would be best if they were supporting each other. But for that to happen, a baseline memorandum of understanding needs to be established, and an understanding of where support is needed needs to be developed. This is where the pattern language of a circular food system can come into play. It can be very useful as a communication tool. My thesis has shown that in any conversation, the topic under discussion can be represented by a pattern card.

represented by a pattern card.

Moreover, the pattern language is adaptable. It can work as part of an adaptive process, guiding the conversation, defining needs and areas of support. It can be the basis for discussion between different and like-minded people, and then those discussions are already part of the mindset change for everyone working on the same system. Pattern language may widen the scope by involving different people who are working on transition and development in their daily lives. In that sense the pattern language did support transition. However, as mentioned before, at the current stage of development this was only conducted with stakeholders who are already part of the transition and not yet residents. So overall it can be stated that the pattern language is a great tool for communication and discussion in order to facilitate the transition to a circular built environment.

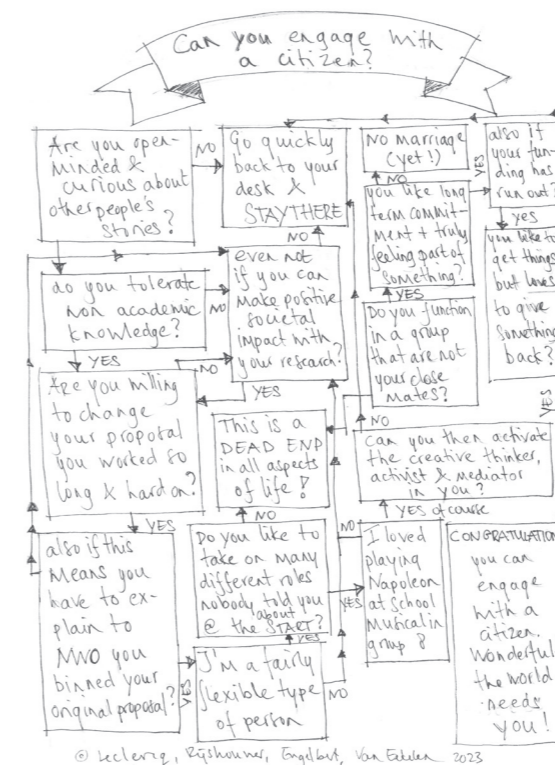


Figure 174- Beslisboom2, by Els Leclercq, Rijshouwer, Engelbert and van Eekelen 2023

9. Reflecting on citizen engagement

The way in which participation has an impact and how the participants view the process is reflected upon. As already mentioned, the process of participation must be well planned. The scheme by Leclercq, Rijshouwer, Engelbert and van Eekelen shows whether "(you can) engage with a citizen" (2023). In my work, I realised how interesting and important the contribution of citizens is, but also the benefits that citizens themselves gain from participating in research must be questioned. The whole ethical application process has shown me that engagement as a whole needs to be carefully planned and that the way I have been educated and trained in communicating my projects works well in a professional setting, but engagement with residents requires a very adaptable environment and simple, understandable language that is not fully developed in this designed pattern language. The co-creation workshop developed for this masterthesis was designed specifically for professionals and stakeholders in the current food and planning system. Not for citizens. In order to involve citizens in the co-creation workshop, the hypotheses had to be translated into Dutch and the workshop had to be planned with only one, simple task.

Personal Reflection

During my thesis journey, I have gained a nuanced understanding of using pattern language in various approaches. This has been crucial in bridging the analytical and strategic sectors. The evolved pattern language personally serves as a comprehensive mind map, guiding me through potential entry points for transitioning to an everyday circular foodscape.

The use of pattern language has facilitated a systemic design approach and enhanced my participatory process skills. It has functioned as a valuable co-creation tool. At the project's onset, my exploration of gamification methods in urban planning led to the development of pattern language as game cards. This allowed me to seamlessly integrate game methods with a participatory approach.

A significant finding was the importance of thorough workshop preparation and including participants with varying language abilities. The research explored different workshop settings, from stakeholder engagement to co-design and adaptability to a digital setting. My main takeaway is 'plan to unplan'. Being flexible in the process itself and not only planning flexibility.

Engaging in co-creation processes has highlighted the importance of open-mindedness when dealing with diverse mindsets. This is a crucial aspect in participatory processes that rely greatly on participants. Interacting with diverse individuals has broadened my perspective, fostering discussions about values and priorities, and supporting my personal prioritisation.

In this thesis, I questioned the role of an urban planner multiple times. However, it also showed me that my background in architecture helps me to understand the spatial aspects. Nevertheless, the planning and social-environmental scope remain a broad and unknown field that I explored during my graduation work. Effective communication with diverse stakeholders is a vital skill that I have developed through my studies and practical experience, facilitating teamwork and stakeholder consideration.

Attending the Urban Futures Congress in Stuttgart from the 21-23rd of June 2023 raised my awareness of the importance of the circular economy, but also highlighted that implementation of circular transition is still in its beginnings. And not yet taking the socio-environmental importance into account. This conference supported me in my aim is to make circularity accessible through small social changes in everyday aspects of people's lives. The congress also showed me that, despite the challenges, my chosen approach of using pattern language is a valuable tool that supports the development of interventions and creates connections within larger structures.

Looking back, this project not only deepened my understanding of systemic design and participatory processes, but also broadened my approaches and the methods used. It has equipped me to integrate diverse methodologies, refining skills in workshop facilitation, communication, and adaptation to digital contexts.

The insights gained pertain to the challenges of maintaining focus amidst diverse experiences, fostering independence, and sharpening the ability to distil main theses. It is important to recognize the limitations of co-creation, stakeholder involvement, and environmental considerations, as this can drive future research opportunities.

This research has helped me become a more adaptable and mindful researcher and urban planner, capable of navigating the complexities of interdisciplinary work and fostering impactful social change.



Figure 175
Picture by the author

10.2. ACKNOWLEDGEMENTS

During this year of working on my Master's thesis, I have been supported and accompanied by several people, without whom this thesis would not have been possible.

Firstly, I would like to thank my first supervisor, Dr. Alexander Wandl, for his time, knowledge and support. I really appreciate the insight into the circularity that he gave me and which has accompanied me throughout the year. And my second supervisor, Birgit Hausleitner, who supported me through the development of the pattern language and the co-creation processes, as she has great knowledge in working with pattern language.

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I would also like to thank Els Leclercq for meeting me and giving me the insight into her work with local communities. This was an important meeting for me personally, as I was inspired by the work she is doing in so many different areas.

I would like to thank Tamara Egger, who is currently working on her PhD on the social aspects of citizenship, with a great background in co-creation processes, and the small coffee and lunch breaks gave me the opportunity to get a bit outside of the role of academics and get a perspective on what could actually work in interactive workshops.

I would also like to thank all the different stakeholders and people I met by chance for their interest and for a small consultation that made me realise how important and also difficult it is to perform a co-creation approach.

Moreover, I would like to thank the participants in the co-creation processes and hope that there will be a great future in which work on an agricultural food system will continue. As the people working on this have a great attitude, so much good positive energy and are working to make change possible, I admire this very much.

I would also like to thank my friend Milou, who is not only my best study partner, who understands and can relate to the urban context, but also gave me great input and inspiration due to her sociology background, also giving my mental support, thank you for being such a great friend to me. Also to Guimar, who always makes me realise the other important things in life besides my studies. However, most of all my gratitude goes to Ivan, my biggest support throughout the year, with your unconditional support I managed to work so hard. With all of you I managed to get my Master's degree, but also to enjoy my last year of studies here in Delft. Also, thanks to my dear friends far away, always there to support me and able to give me a different perspective when being in my current study drill. Most love and thanks go to my family, my unstoppable source of support in many different ways. Thank you for always supporting me, no matter what.

I am so grateful for all the new connections I have made through this thesis that have enriched and challenged me. I am also grateful for the resource of all the connections I have made before and have been able to build on.



Figure 176
Picture by the author

11 REFERENCES



Figure 177
Picture by the author

11. REFERENCES

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12 APPENDIX

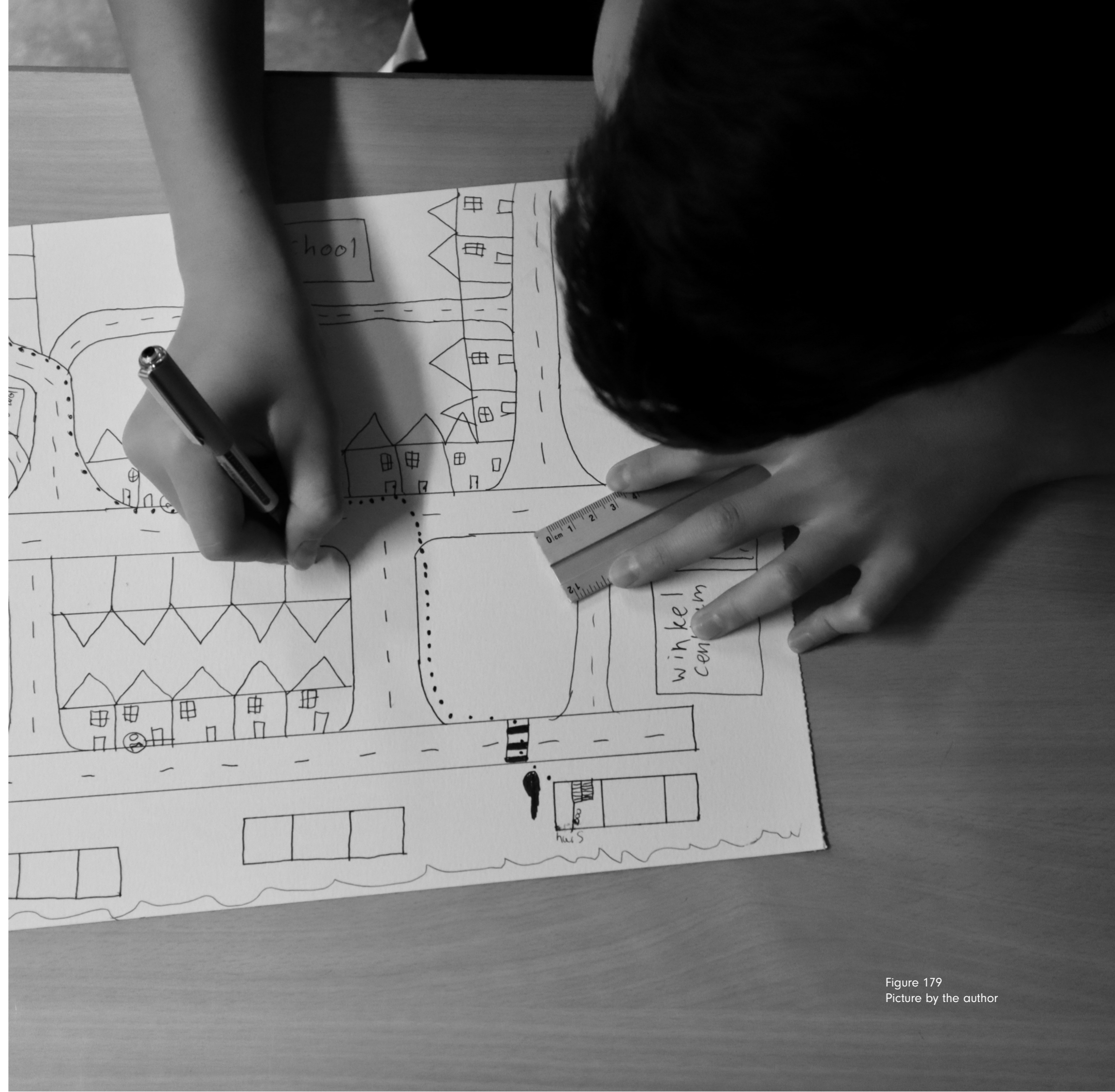


Figure 179
Picture by the author

12.1. EVALUATION TOOL

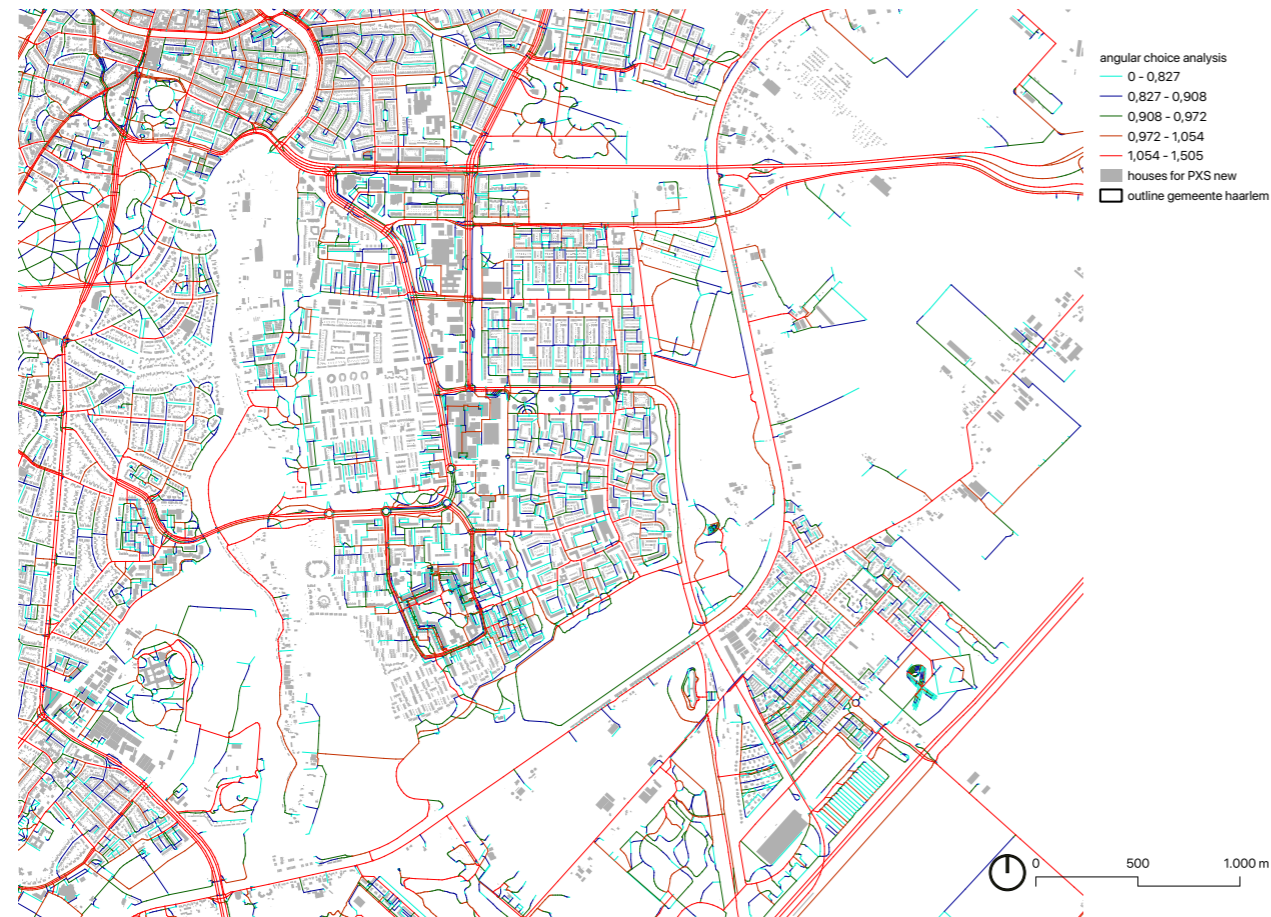


The evaluational tool was adapted according to the assessment tool in the book Food Urbanism by Verzone and Woods (2021).

12.2. SPACE SYNTAX ANALYSIS

Angular choice

Calculating the frequency with which each roadway segment lies along the most direct path between all feasible pairs of segments within a given range, known as the "radius," is the first step in calculating the "choice." (Hillier, B. & Iida, S., 2005)



Angular integration

it determines how closely each segment is related to all other segments.



12.3. PREPARATIONS COMMUNITY ENGAGEMENT

3D view on a poster for sticking dots with daily activities in the neighborhood

- repairing, sharing, recycling
- shopping/ HORECA
- living
- work / education
- recreation

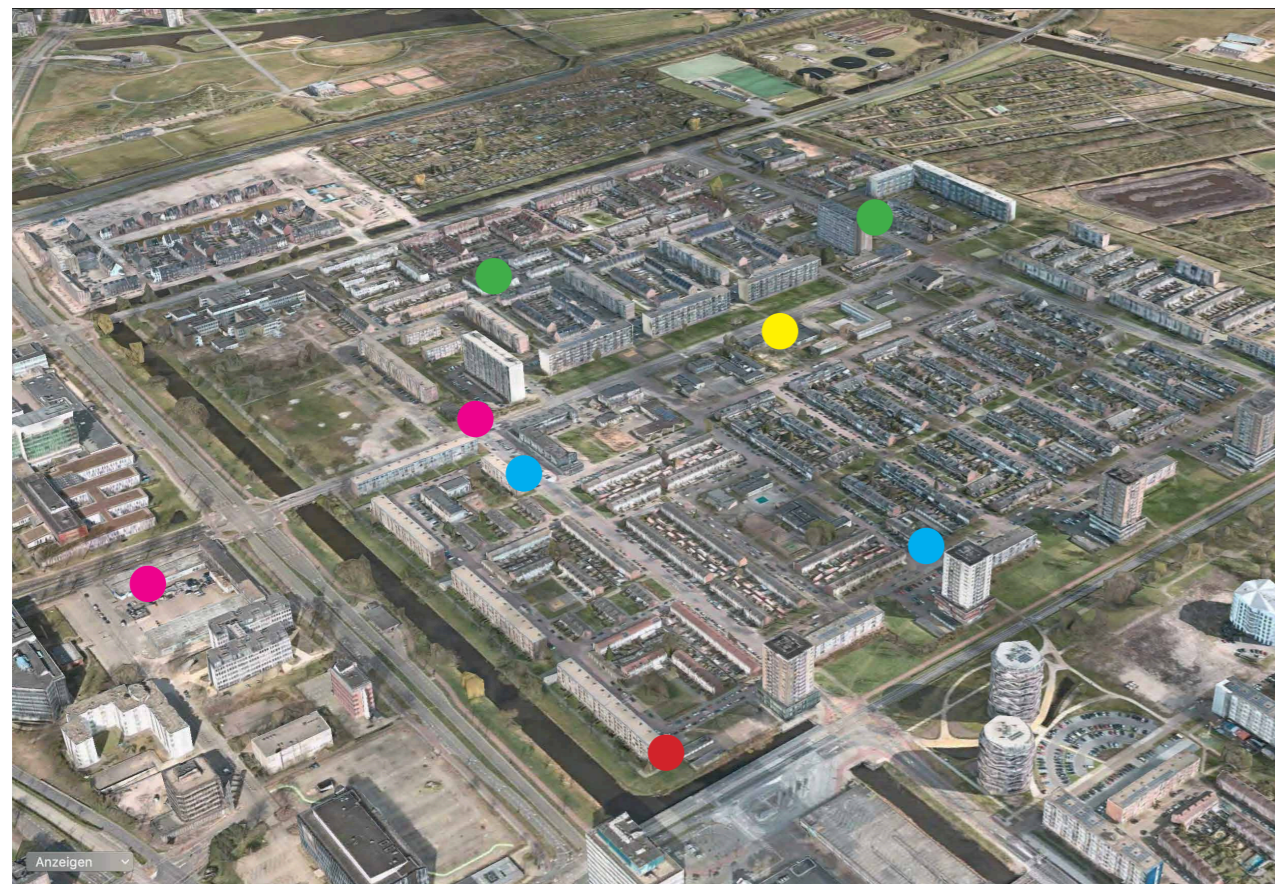
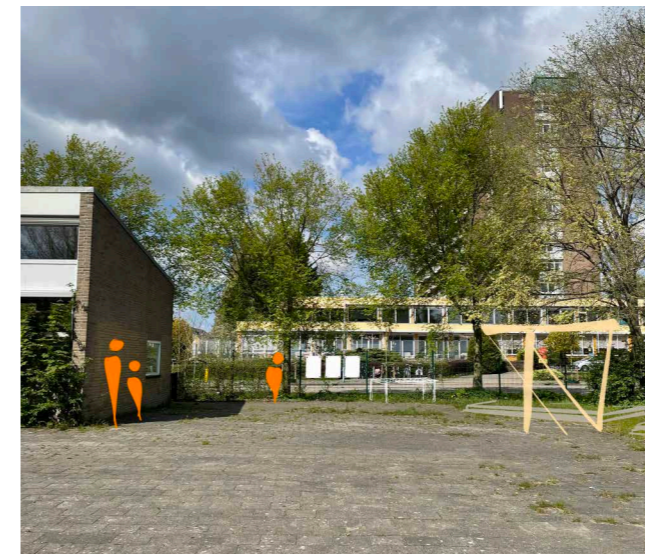


Figure - screen-shot of Apple Maps 3D view

Planning of space and poster and engagement location during the 'Day of Architecture' in collaboration with the Living Lab KIEM



Figures - pictures and sketches made by author

WAAR HAAL JIJ JOUW ETEN VANDAAN?



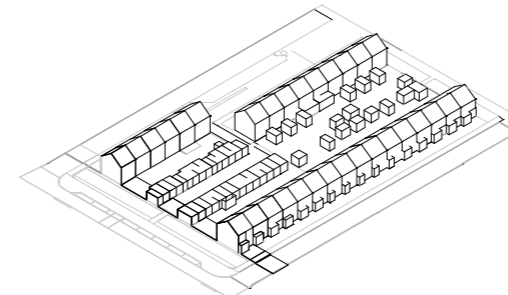
<p>↑ Waar? Plaats een sticker!</p> <p>Kweek jij jouw eigen eten?</p> <p>JA NEE</p>	<p>↑ Waar? Plaats een sticker!</p> <p>Koop je lokale producten?</p> <p>JA NEE</p>	<p>↑ Waar? Plaats een sticker!</p> <p>Composteer jij jouw organisch afval?</p> <p>JA NEE</p>	<p>↑ Waar? Plaats een sticker!</p> <p>Scheidt jij jouw afval?</p> <p>JA NEE</p>
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WAAR VERZAMEL, RECYCLE EN DEEL JIJ?

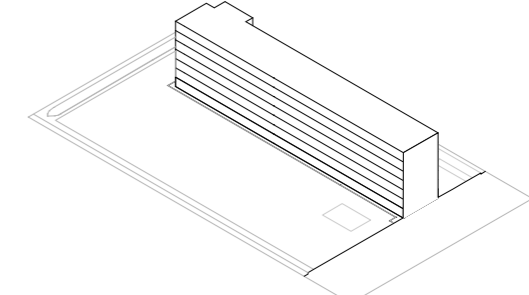
Wat is een circulaire buurt? En welke potentie heeft Boerhaavewijk om deel te maken aan deze duurzame ontwikkeling? Dit project (een stedenbouwkundig afstudeeropdracht van de TU Delft) wil begrijpen hoe jij en je medebewoners jullie buurt gebruiken in het dagelijks leven. En welke acties duurzaam zijn en potentie hebben voor systematische veranderingen. Een belangrijk onderdeel is de betrokkenheid en participatie van buurtbewoners. Niemand weet het immers beter dan de bewoners zelf. Om de analyse van duurzame acties te verrijken, kun je op deze poster laten zien welke duurzame acties er al plaatsvinden. De acties hebben momenteel betrekking op de materiële voedselstroom van huishoudelijk afval.

Afhankelijk van de woningtypologie waarin je woont, kun je je duurzame acties in de tekening **tekenen** of **schrijven** of er gewoon een **sticker** op plakken.

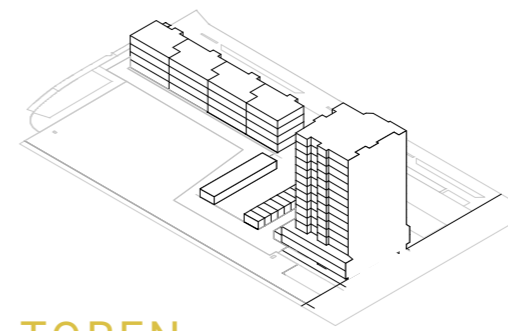
- verzamelen
- recycleren
- iets delen



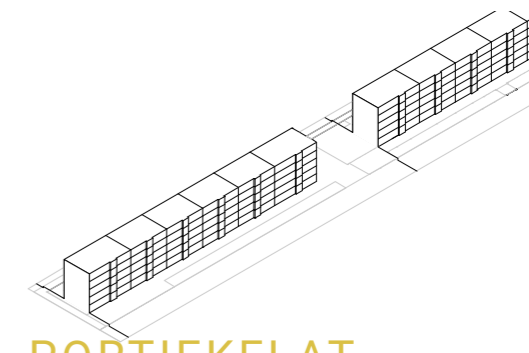
RIJTJESHUIZEN
Een huis dat in een rij staat en aan beide kanten wordt omsloten door een ander huis.



GALERIJFLAT
Een galerijflat is een flat, meestal met een lift, waarbij de woongedeur aansluit aan een galerij.



TOREN
De toren bevat appartementen in een gebouw dat hoger is dan het breed en lang is. De basis is meestal vierkant.



PORTIEKFLAT
Een portiekflat is een flat waarvan de woongedeur uitkomt op een gemeenschappelijke trap.

... **ELDERS**
misschien de Meire Ringvaart, de volkstunten.

12.4. HREC APPLICATION

Delft University of Technology
HUMAN RESEARCH ETHICS
CHECKLIST FOR HUMAN RESEARCH
(Version January 2022)

IMPORTANT NOTES ON PREPARING THIS CHECKLIST

1. An HREC application should be submitted for every research study that involves human participants (as Research Subjects) carried out by TU Delft researchers
2. Your HREC application should be submitted and approved before potential participants are approached to take part in your study
3. All submissions from Master's Students for their research thesis need approval from the relevant Responsible Researcher
4. The Responsible Researcher must indicate their approval of the completeness and quality of the submission by signing and dating this form OR by providing approval to the corresponding researcher via email (included as a PDF with the full HREC submission)
5. There are various aspects of human research compliance which fall outside of the remit of the HREC, but which must be in place to obtain HREC approval. These often require input from internal or external experts such as [Faculty Data Stewards](#), [Faculty HSE advisors](#), the [TU Delft Privacy Team](#) or external [Medical research partners](#).
6. You can find detailed guidance on completing your HREC application [here](#)
7. Please note that incomplete submissions (whether in terms of documentation or the information provided therein) will be returned for completion prior to any assessment
8. If you have any feedback on any aspect of the HREC approval tools and/or process you can leave your comments [here](#)

I. Applicant Information

PROJECT TITLE:	
Research period: <i>Over what period of time will this specific part of the research take place</i>	22. November 2023 – January 2024
Faculty:	Architecture and the Built Environment
Department:	Urbanism
Type of the research project: <i>(Bachelor's, Master's, DreamTeam, PhD, PostDoc, Senior Researcher, Organisational etc.)</i>	Masters Thesis
Funder of research: <i>(EU, NWO, TUD, other – in which case please elaborate)</i>	No funding of research
Name of Corresponding Researcher: <i>(If different from the Responsible Researcher)</i>	Elena Grimbacher
E-mail Corresponding Researcher: <i>(If different from the Responsible Researcher)</i>	e.grimbacher@student.tudelft.nl
Position of Corresponding Researcher: <i>(Masters, DreamTeam, PhD, PostDoc, Assistant/ Associate/ Full Professor)</i>	Masters at Urbanism department
Name of Responsible Researcher: <i>Note: all student work must have a named Responsible Researcher to approve, sign and submit this application</i>	Dr. Alexander Wandl
E-mail of Responsible Researcher: <i>Please ensure that an institutional email address (no Gmail, Yahoo, etc.) is used for all project documentation/ communications including Informed Consent materials</i>	A.Wandl@tudelft.nl
Position of Responsible Researcher: <i>(PhD, PostDoc, Associate/ Assistant/ Full Professor)</i>	associate professor and head of the Section of Environmental Technology and Design of the Department of Urbanism

II. Research Overview

NOTE: You can find more guidance on completing this checklist [here](#)

a) Please summarise your research very briefly (100-200 words) What are you looking into, who is involved, how many participants there will be, how they will be recruited and what are they expected to do?

Add your text here – (please avoid jargon and abbreviations)

This research project aims to use a pattern language as a tool for co-creation to explore the transition to a circular neighbourhood in Schalkwijk, Haarlem. The goal is to engage stakeholders of that area and gain insights into their interests and priorities, as well as collaboratively develop scenarios for a more sustainable and inclusive circular transition. The invited stakeholders include various organizations such as social housing cooperatives, retirement home organizations, social neighbourhood groups, urban gardening initiatives, food supply projects, social workers, city administration representatives, and researchers of the neighbourhood and architects of studio DMAU and AP+E. Stakeholders will be invited via mail, sourced from internet research, and some organizations will be contacted through an Instagram account of the thesis. The workshop will be held on 22 November at the community centre 'de Ringvaart'

For the risk mitigation plan, please contact the researcher and then it can be send as an example.

in Boerhaavewijk, the room will be provided by Living Lab KIEM. The estimated number of participants is between 5 and 15 people, who will be divided into groups of five depending on the response. The workshop will follow the format of the 'Foundries of Future' (chapter 5) of applying the pattern language and will include the five steps:

1. Prioritising
2. Assessing
3. Debating
4. Analysing & Locating patterns
5. Translation

Involving stakeholders in building a vision of a circular foodscape using pattern language game cards. They will prioritize patterns based on their needs and visions and engage in discussions to identify the most important patterns. Research results will be published in the TU repository and discussed with the Living Lab KIEM. The participants will be informed about that before the workshop.

b) If your application is an additional project related to an existing approved HREC submission, please provide a brief explanation including the existing relevant HREC submission number/s.

Add your text here – (please avoid jargon and abbreviations)

c) If your application is a simple extension of, or amendment to, an existing approved HREC submission, you can simply submit an [HREC Amendment Form](#) as a submission through LabServant.

Data Management Plan

Plan Overview

A Data Management Plan created using DMPonline

Title: Circularity of the Everyday - A Pattern language for the transition towards a circular food system of the Everyday life in Schalkwijk, a Dutch post war neighbourhood.

Creator: Elena Grimbacher

Affiliation: Delft University of Technology

Template: TU Delft Data Management Plan template (2021)

Project abstract:

This research project aims to use a pattern language as a tool for co-creation to explore the transition to a circular neighbourhood in Schalkwijk, Haarlem. The goal is to engage stakeholders and gain insights into their interests and priorities, as well as collaboratively develop scenarios for a more sustainable and inclusive circular transition. The invited stakeholders include various organizations such as social housing cooperatives, retirement home organizations, social neighbourhood groups, child-focused organizations, urban gardening initiatives, food supply projects, social workers, city administration representatives, and researchers of the neighbourhood and architects of studio DMAU and AP+E. Stakeholders will be invited via mail and organizations will be contacted through an Instagram account of the thesis. The workshop will be held on 22 November at the community centre 'de Ringvaart' in Boerhaavewijk, the room will be provided by Living Lab KIEM. The estimated number of participants is between 5 and 15 people, who will be divided into groups of five depending on the response. The workshop will follow the format of the 'Foundries of Future' (chapter 5) of applying the pattern language and will include the five steps:

1. Prioritising
2. Assessing
3. Debating
4. Analysing & Locating patterns
5. Translation

Involving stakeholders in building a vision of a circular foodscape using pattern language game cards. They will prioritize patterns based on their needs and visions and engage in discussions to identify the most important patterns. Research results will be published in the TU repository and discussed with the Living Lab KIEM which this thesis is also part of. The participants will be informed about that before the workshop.

ID: 136812

Created using DMPonline. Last modified 14 November 2023

1 of 7

II. Documentation and data quality

5. What documentation will accompany data?

Data will be deposited in a data repository at the end of the project (see section V) and data discoverability and re-usability will be ensured by adhering to the repository's metadata standards

As a master thesis report in the educational repository tu.delft

III. Storage and backup during research process

6. Where will the data (and code, if applicable) be stored and backed-up during the project lifetime?

Project Storage at TU Delft

IV. Legal and ethical requirements, codes of conduct

7. Does your research involve human subjects or 3rd party datasets collected from human participants?

Yes

8A. Will you work with personal data? (information about an identified or identifiable natural person)

If you are not sure which option to select, first ask your [Faculty Data Steward](#) for advice. You can also check with the [privacy website](#). If you would like to contact the privacy team: privacy-tud@tudelft.nl, please bring your DMP.

Yes

8B. Will you work with any other types of confidential or classified data or code as listed below? (tick all that apply)

If you are not sure which option to select, ask your [Faculty Data Steward](#) for advice.

Yes, data which could lead to reputation/brand damage (e.g. animal research, climate change, personal data) The data might include sketches and drawings of participants which are part of an organisation that has more information than the overall public and could in this research topic lead to climate change relevant data - as the research is focussing on the circular transition in the neighbourhood.

9. How will ownership of the data and intellectual property rights to the data be managed?

For projects involving commercially-sensitive research or research involving third parties, seek advice of your [Faculty Contract Manager](#) when answering this question. If this is not the case, you can use the example below.

The datasets underlying the published papers will be publicly released following the TU Delft Research Data Framework Policy.

22. What will happen with personal research data after the end of the research project?

Created using DMPonline. Last modified 14 November 2023

4 of 7

Personal research data will be destroyed after the end of the research project

Anonymous or aggregated data will be shared with others.

23. How long will (pseudonymised) personal data be stored for?

Question not answered.

24. What is the purpose of sharing personal data?

Question not answered.

25. How will study participants be asked for their consent for data sharing?

Yes, in consent form - please explain below what you will do with data from participants who did not consent to data sharing

V. Data sharing and long-term preservation

27. Apart from personal data mentioned in question 22, will any other data be publicly shared?

All other non-personal data (and code) produced in the project
All other non-personal data (and code) underlying published articles / reports / theses

29. How will you share research data (and code), including the one mentioned in question 22?

My data will be shared in a different way - please explain below

The anonymised data will be shared and publicly accessible as part of the master thesis report and presentation in the educational repository of TU Delft.

30. How much of your data will be shared in a research data repository?

Question not answered.

31. When will the data (or code) be shared?

At the end of the research project

32. Under what licence will be the data/code released?

Created using DMPonline. Last modified 14 November 2023

6 of 7

Circularity of the Everyday - A Pattern language for the transition towards a circular food system of the Everyday life in Schalkwijk, a Dutch post war neighbourhood.

0. Administrative questions

1. Name of data management support staff consulted during the preparation of this plan.

The privacy team was consulted, in a meeting with Rinus van Delen-Cost, on 9.11.2023. My faculty data steward, Janine Stouderberg, will review this DMP on 20.11.2023.

2. Date of consultation with support staff.

2023-11-08

1. Data description and collection or re-use of existing data

3. Provide a general description of the type of data you will be working with, including any re-used data:

Type of data	File format(s) or terms of use?	How will data be collected (or re-used data: source and terms of use)?	Purpose of processing	Storage location	Who will have access to the data
Filed in consent forms (including name and signatures)	paper and scan as pdf	digital scan using a printer	to confirm that consent and information about the workshop participation is given	TU Delft Project Data Storage (and paper, unremovable and then discarded)	Elena Grimbacher (master student and her responsible researcher Alexander Wandl)
Quantitative data of observation (during the workshop)	physical / digital	verbally obtained through observation during the workshop	for documenting the process and stakeholder interaction during the workshop	TU Delft Project Data Storage	Elena Grimbacher (master student and her responsible researcher Alexander Wandl)
Pictures	jpg, heic, png	pictures are taken with a camera - and of the group not individuals and preferably from the back so the face is not visible on the picture, only pictures where faces are not clearly identifiable are used in the thesis report which will be published	to document the workshop	TU Delft Project Data Storage	Elena Grimbacher (master student and her responsible researcher Alexander Wandl)
Mapping sketches	paper and scan as pdf	digital scan using a printer	to evaluate and assess the workshop outcome	TU Delft Project Data Storage	Elena Grimbacher (master student and her responsible researcher Alexander Wandl)
Report (thesis)	pdf	Serves as record of the process as well as the documentation	long term documentation	Project Storage and repository tu.delft	Elena Grimbacher and publicly accessible

4. How much data storage will you require during the project lifetime?

< 250 GB

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During the active phase of research, the project leader from TU Delft will override the access rights to data (and other outputs), as well as any requests for access from external parties. They will be released publicly no later than at the time of publication of corresponding research papers.

10. Which personal data will you process? Tick all that apply

Other types of personal data - please explain below
Data collected in Informed Consent form (names and email addresses)
Signed consent forms
Photographs, video materials, performance appraisals or student results
Email addresses and/or other addresses for digital communication
Sketches and drawings on maps

11. Please list the categories of data subjects

Researchers, Architects, Social workers and representatives of organisations in a certain neighborhood, Schalkwijk, city of Haarlem, the Netherlands.

12. Will you be sharing personal data with individuals/organisations outside of the EEA (European Economic Area)?

No

15. What is the legal ground for personal data processing?

Informed consent

16. Please describe the informed consent procedure you will follow:

All study participants will be asked for their written consent and signature with the informed consent form provided by TU Delft for taking part in the study and for data processing before the start of the workshop.

17. Where will you store the signed consent forms?

Same storage solutions as explained in question 6
Informed consent forms are stored separately in the Project Storage from research data to minimise risk of re-identification.

18. Does the processing of the personal data result in a high risk to the data subjects?

If the processing of the personal data results in a high risk to the data subjects, it is required to perform [Data Protection Impact Assessment \(DPIA\)](#), in order to determine if there is a high risk for the data subjects, please check if any of the options below that are applicable to the processing of the personal data during your research (check all that apply).
If two or more of the options listed below apply, you will have [regulate the DPIA](#). Please get in touch with the privacy team: privacy-tud@tudelft.nl to receive support with DPIA.
If only one of the options listed below applies, your project might need a DPIA. Please get in touch with the privacy team: privacy-tud@tudelft.nl to get advice as to whether DPIA is necessary.
If you have any additional comments, please add them in the box below.

None of the above applies

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VI. Data management responsibilities and resources

33. Is TU Delft the lead institution for this project?

Yes, the only institution involved

34. If you leave TU Delft (or are unavailable), who is going to be responsible for the data resulting from this project?

Dr. Alexander Wandl, Department of Urbanism (a.wandl@tudelft.nl)

35. What resources (for example financial and time) will be dedicated to data management and ensuring that data will be FAIR (Findable, Accessible, Interoperable, Re-usable)?

N/A

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Consent form



U wordt uitgenodigd om deel te nemen aan een onderzoek getiteld 'Circularity of the Everyday - Een Pattern Language voor de overgang naar een circulair voedselsysteem in het dagelijks leven in Schalkwijk' op 22 november 2023.

Dit onderzoek wordt uitgevoerd in het kader van het masterproefonderzoek van Elena Grimbacher in Urbanisme aan de TU Delft.

Het doel van dit onderzoek is om een 'pattern language' gebruiken als een instrument voor co-creatie om de overgang naar een circulaire buurt in Schalkwijk, Haarlem te verkennen. Het doel is om belanghebbenden te betrekken en inzicht te krijgen in hun belangen en prioriteiten, evenals om gezamenlijk scenario's te ontwikkelen voor een duurzamere en inclusievere circulaire overgang. De enquête duurt ongeveer 45 minuten om in te vullen.

Uitgenodigde deelnemers zijn onder andere diverse organisaties zoals sociale huisvestingscoöperaties, bejaardentehuizen, sociale buurtgroepen, stadslandbouwinitiatieven, voedselvoorzieningsprojecten, maatschappelijk werkers, vertegenwoordigers van de stadsadministratie en onderzoekers van de buurt, en architecten van het Living Lab 'KIEM'.

De gegevens - die volledig geanonimiseerd zullen worden - worden gebruikt voor de ontwikkeling van de masterproef, vervolgens gepubliceerd door de TU Delft in het repository en publiekelijk gepresenteerd aan het einde van dit project.

Wat gaat u doen?: Deelnemen, prioriteren, bespreken en in kaart brengen met mededeelnemers in kleine groepen over de 'pattern language' (ontwerpprincipes voor een circulair voedsellandschap in Schalkwijk) en de resultaten samenvatten in verklaringen, tekeningen en kaarten. De sessie zal worden geregistreerd via geschreven aantekeningen en er worden foto's genomen. Het doel is vooral gericht op co-creatie en ontwerpresultaat, aangezien de verzameling van persoonlijke gegevens irrelevant is voor dit onderzoek. Uw deelname aan dit onderzoek is volledig vrijwillig en u kunt op elk moment terugtrekken. U bent vrij om vragen over te slaan.

Als u vragen of twijfels heeft, neem dan contact op met het onderzoek: Elena Grimbacher - e.grimbacher@student.tudelft.nl of Dr. Alexander Wandl, A.Wandl@tudelft.nl



Explicit Consent points

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
A: GENERAL AGREEMENT – RESEARCH GOALS, PARTICIPANT TASKS AND VOLUNTARY PARTICIPATION		
1. I have read and understood the study information dated 22.11.2023, or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	<input type="checkbox"/>	<input type="checkbox"/>
2. I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	<input type="checkbox"/>	<input type="checkbox"/>
3. I understand that taking part in the study involves: Engaging and discussing with fellow participants in small groups and conclude the outcome in statements drawings and mappings. By prioritise the patterns (which are small gamecards that will be provided to you at the beginning at the workshop, assessing it in a group with other stakeholders, which can include drawing and defining own patterns that are missing according to your opinion then debating about the prioritising in a small group and then locating the patterns via drawing and mapping on material which will be provided to you to translate a possible transition towards a circular Schalkwijk. The session will be recorded via written notes and photos will be taken. It will be aimed to focus mainly on the co-creation and design outcome – as the collection of Personal Data is irrelevant to this study.	<input type="checkbox"/>	<input type="checkbox"/>
B: POTENTIAL RISKS OF PARTICIPATING (INCLUDING DATA PROTECTION)		
7. I understand that taking part in the study also involves collecting indirectly identifiable research data (PIRD) such as visual ethnography (pictures) with the potential risk of re-identification.	<input type="checkbox"/>	<input type="checkbox"/>
8. I understand that the following steps will be taken to protect my identity in the event of such a breach: The outcome of the research is completely anonymised. The data collection is completely anonymised. You will be only recorded as a number and no personal data will be collected nor shared.	<input type="checkbox"/>	<input type="checkbox"/>
9. I give permission to have pictures taken during the workshop, being aware of the risk of re-identification.	<input type="checkbox"/>	<input type="checkbox"/>
9.1 If my answer above was no, would you be okay with pictures taken during the workshop where your face is not identifiable?	<input type="checkbox"/>	<input type="checkbox"/>
10. I understand that there is no personal information collected about me that can identify me, such as my name or where I live.	<input type="checkbox"/>	<input type="checkbox"/>
C: RESEARCH PUBLICATION, DISSEMINATION AND APPLICATION		
12. I understand that after the research study the information I provide will be anonymised and used for the master thesis report which will be published on the educational repository of TU Delft and presented publicly in the medium of a presentation at the end of the thesis.	<input type="checkbox"/>	<input type="checkbox"/>
13. I agree that my responses, views, or other input can be quoted anonymously in research outputs.	<input type="checkbox"/>	<input type="checkbox"/>
15. If written information or other works are provided by me (e.g. a reflection, other diary, or as images etc.) I give permission to be used in the research by being	<input type="checkbox"/>	<input type="checkbox"/>

Feedback form

PATTERN CO-CREATION WORKSHOP

FEEDBACK

Please fill out this form. It will help the evaluation of this workshop and is very useful for the further evaluation of the pattern language as a co-creation tool for the transition towards a circular neighbourhood.

- 5 – very much
- 4 – somewhat
- 3 – neutral
- 2 – not really
- 1 – not at all

FEEDBACK WORKSHOP

Was the workshop well prepared?

5	4	3	2	1
---	---	---	---	---

Did you understand what you were required to do?

5	4	3	2	1
---	---	---	---	---

TOPIC

How familiar were you with the topic(s)?

5	4	3	2	1
---	---	---	---	---

PATTERN LANGUAGE

Have you ever worked with the pattern language before?

5	4	3	2	1
---	---	---	---	---

Was the pattern language usable?

5	4	3	2	1
---	---	---	---	---

Did the pattern language help you to better understand the subject (in relation to the design)? (1-5)

5	4	3	2	1
---	---	---	---	---

Was the pattern language adequate / complete enough?

5	4	3	2	1
---	---	---	---	---

Would you use the pattern language again?

5	4	3	2	1
---	---	---	---	---

Do you think the pattern language is a suitable tool for co-design? & please state why:

5	4	3	2	1
---	---	---	---	---

COMMENTS

What I liked in the workshop:

What could be improved:

Other comments:

THANK YOU VERY MUCH FOR YOUR PARTICIPATION!



You are being invited to participate in a research study titled 'Circularity of the Everyday- A Pattern language for the transition towards a circular food system of the Everyday life in Schalkwijk' on the 22nd of November 2023.

This study is being done under the scope of Elena Grimbacher's Master thesis in Urbanism from the TU Delft.

The purpose of this research study is to use a pattern language as a tool for co-creation to explore the transition to a circular neighbourhood in Schalkwijk, Haarlem. The goal is to engage stakeholders and gain insights into their interests and priorities, as well as collaboratively develop scenarios for a more sustainable and inclusive circular transition and will take you approximately 45 minutes to complete. Invited participants include various organizations such as social housing cooperatives, retirement home organizations, social neighbourhood groups, urban gardening initiatives, food supply projects, social workers, city administration representatives, and researchers of the neighbourhood and architects of the Living Lab 'KIEM'.

The data – which will be completely anonymised - will be used for the Master thesis development, then published by TU Delft in the repository and publicly presented at the end of this project.

What will you do?: Engaging, prioritising, discussing and mapping with the fellow participants in small groups about the pattern language (design principles to a circular foodscape in Schalkwijk) and conclude the outcome in statements drawings and mappings. The session will be recorded via written notes and photos will be taken. It will be aimed to focus mainly on the co-creation and design outcome – as the collection of Personal Data is irrelevant to this study.

Your participation in this study is entirely voluntary and you can withdraw at any time. You are free to omit any questions.

If you have any questions or doubts, please contact the research: Elena Grimbacher – e.grimbacher@student.tudelft.nl or Dr. Alexander Wandl, A.Wandl@tudelft.nl



PLEASE TICK THE APPROPRIATE BOXES	Yes	No
anonymised and in case of copy-right issues the information will not be included in the research outcome.	<input type="checkbox"/>	<input type="checkbox"/>
D: (LONGTERM) DATA STORAGE, ACCESS AND REUSE		
16. I give permission for the anonymised data of drawings and views in form of statements that I provide to be archived in education repository of TU Delft so it can be used for future research and learning.	<input type="checkbox"/>	<input type="checkbox"/>
17. I understand that access to this repository is open.	<input type="checkbox"/>	<input type="checkbox"/>

Signatures		
Name of participant [printed]	Signature	Date
Elena Grimbacher		
Researcher name [printed]	Signature	Date
Study contact details for further information:		
Elena Grimbacher, e.grimbacher@student.tudelft.nl		



12.5. VALUES AND ACTIONS MAPPED

CULTURAL VALUE



TRANSFORM



SCHALKWIJK LIBRARY

CONSUME
DISTRIBUTE



SHOPPING CENTRE
SCHALKWIJK MIDDEN

CONSUME

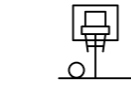


FOOD DIVERSITY

CONSUME



HALAL DIET



PLAYGROUNDS



AESTHETIC VALUE



CONSUME

DISTRIBUTE



LOCAL SUPERMARKET
FAÇADES

TRANSFORM



GRASPHALT

TRANSFORM



NEW NEIGHBOURHOOD

POST-WAR
ARCHITECTURAL
STRUCTURE



ECONOMIC VALUE



DISTRIBUTE



LOCAL
SUPERMARKETS

TRANSFORM



INITIATIVES



DENSIFICATION
OF DISTRICT

TRANSFORM



NEW NEIGH-
BOURHOOD WITH
OFFICE BUILD-
INGS PLANNED

DISTRIBUTE

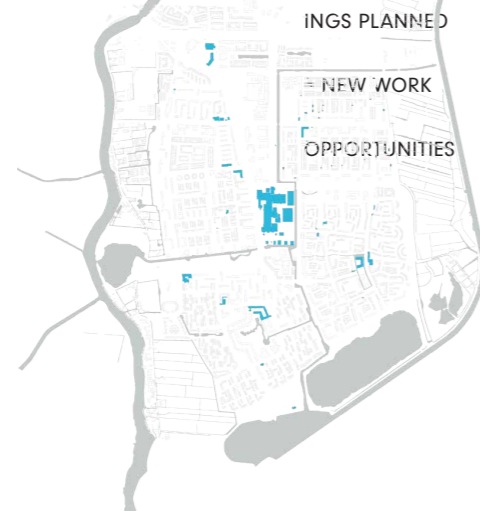


TUESDAY
MARKET

DISTRIBUTE



INFRASTRUCTURAL NODE
AT SCHALKWIJK MIDDEN



SOCIAL VALUE



DISTRIBUTE

TRANSFORM



SOCIAL
INITIATIVES



OPENHUIS/
COMMUNITY
CENTERS IN
THE NEIGH-
BORHOODS

TRANSFORM



RESI-
DENTS
ARE
SOCIALLY
ACTIVE



RESI-
DENTS
KNOW



HAARLEM
FOOD
FUTURE



DIVER-
SITY IN
RESIDENTS



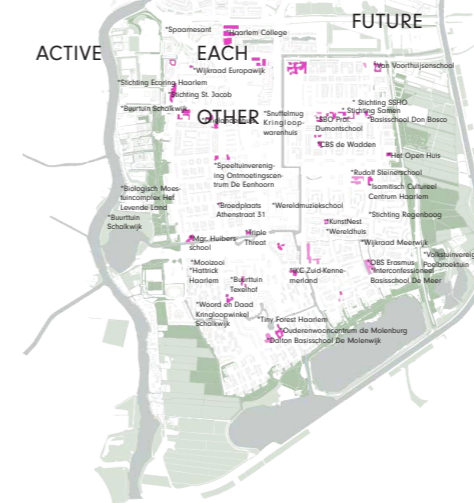
FAMILIES



SOCIAL
HOUSING

TRANSFORM

THE NEIGH-
BORHOODS

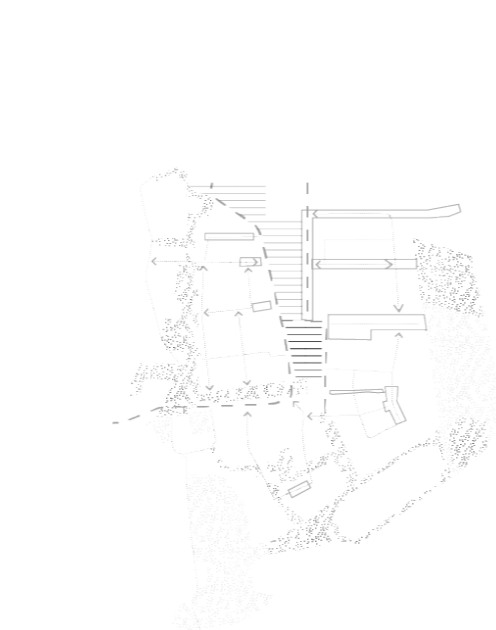


12.6. ANALYSIS MAPS FOR CO-CREATION WORKSHOP

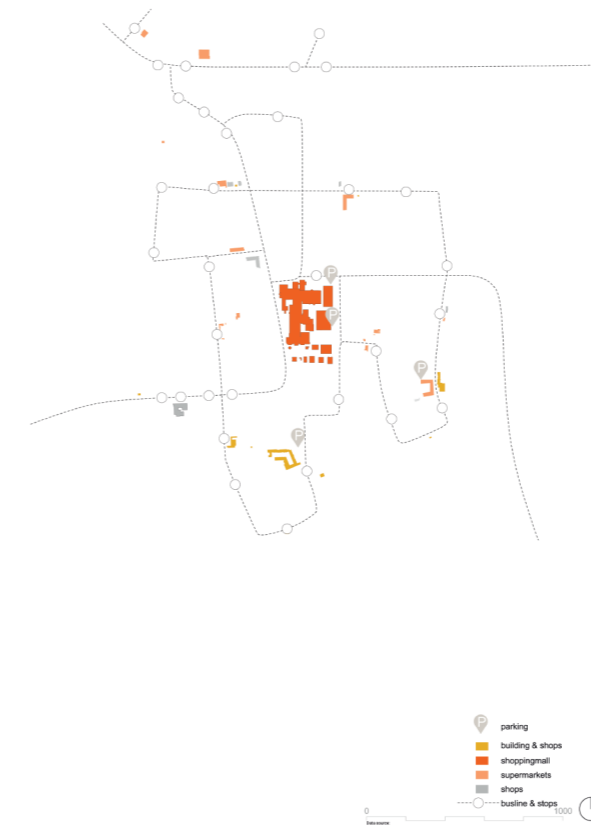
GFT bins



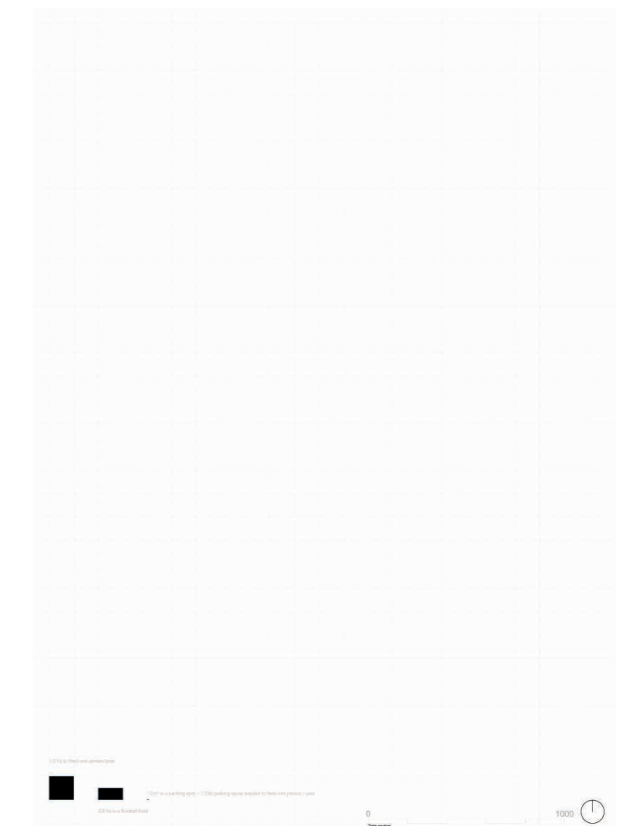
Function structure



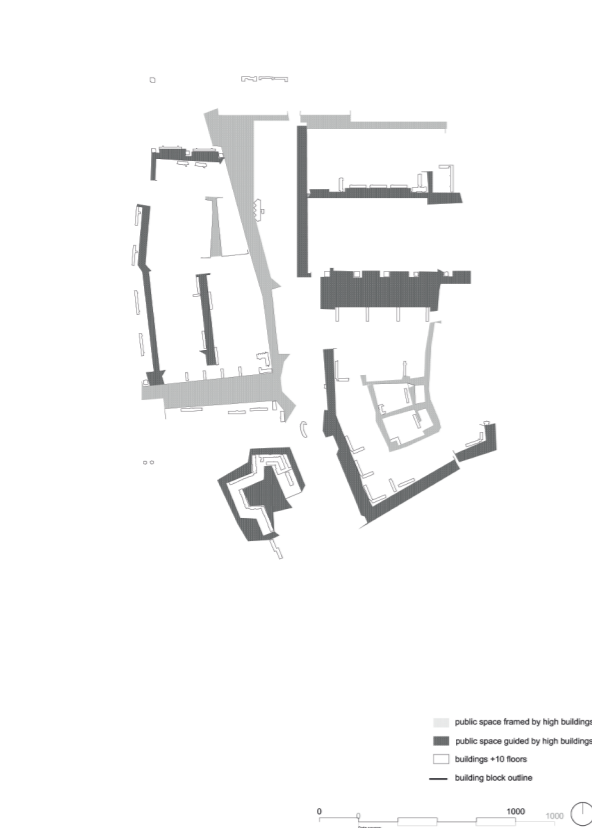
Foodscape & Bus stops



Grind to feed one person



Public space along high buildings



Food production spaces



Green structure



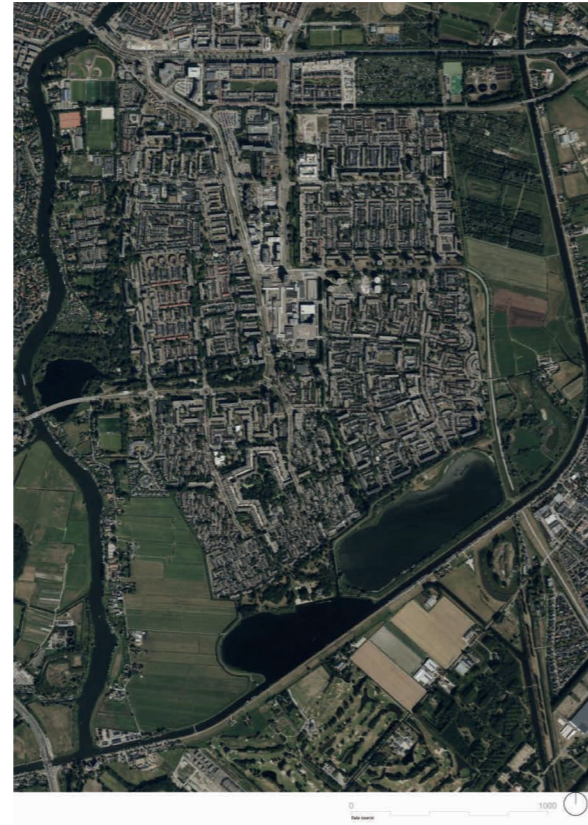
GFT waste bins and residential street network



Sewage system and waste water facilities and water structure



Google Maps View Map



Potential Green Map



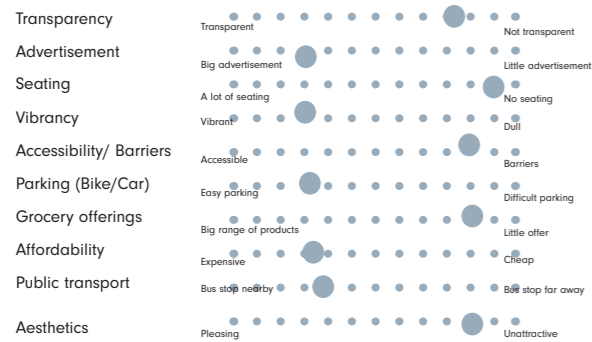
Food Shops mapped



12.7. SNAPSHOT ANALYSIS

1.

Spar at motorway

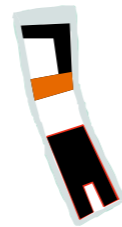


13:20-13:25

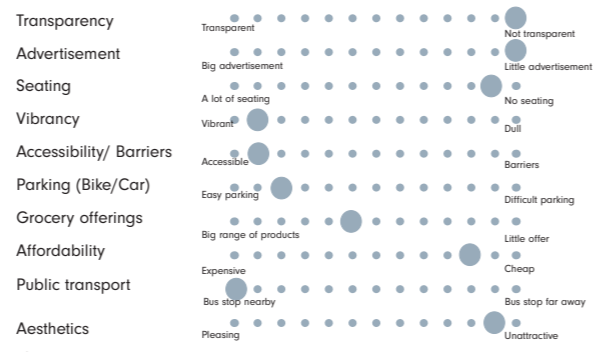
Spar/ Esso gas station
 Loud because of cars
 Unfriendly, scared working person, not letting me take pictures on the property
 Bringing out trash around the building to the back to trash can
 7 cars(1 to pump up tires, 2 men for refuelling, 2 man 1 woman for getting something in the shop, 1 parked the whole time on the gas refuel spot)
 9 bikes passed on the bike lane next to the spar/ gas station
 2 pedestrians (1 old man , one young woman) walking on the bike lane
 Bus stop without any people just before the Spar

2.

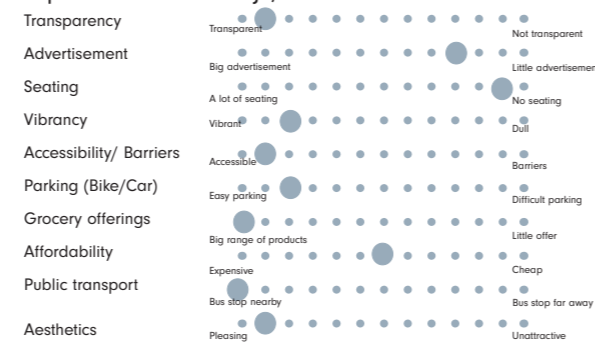
Vormar in Meerwijk & Supermarket Meerwijk



Vormar 14:44-14:49



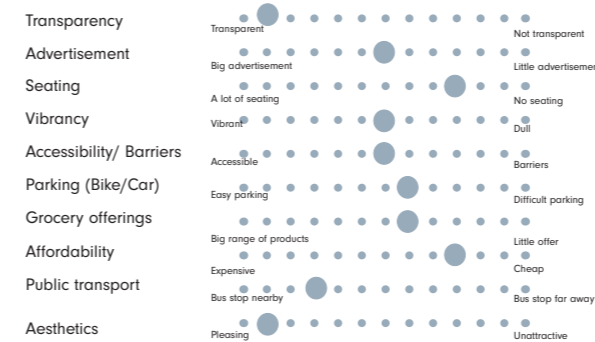
Supermarket Meerwijk, 14:44-14:49



Vormar and Supermarket Meerwijk
 Vormar is in a shopping centre building which you first need to enter with a Kruidvat a postal office and a pick up box storage and access to the car parking
 Supermarket Meerwijk is directly accessible from the square with a vegetable display in front
 Both are located on a square dedicated for shopping / consumption surrounded by a canal that you need to cross via bridges
 7 women exiting & entering Vormar 3 Supermarket Meerwijk , half of them identifying themselves to have Muslim religious background, two with a kinderwagen
 6 men walking into the shops with an empty plastic bag in their hand
 11 men entering & leaving the shops (one of them waiting on his phone , one with their teenage son)
 9 children (2 alone, 4 with parents, 3 on bikes)

3.

Schalkwijk Midden Shoppingcenter

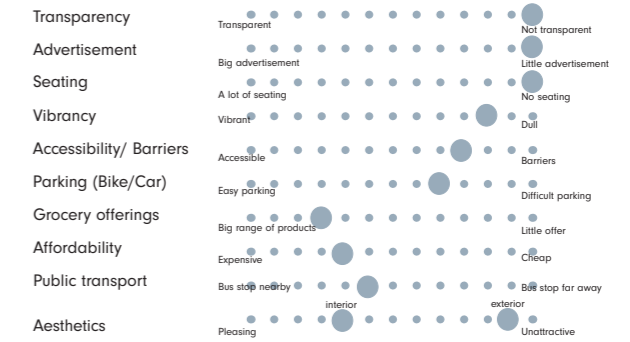


- Only Tuesdays 9:00-17:00
 - Local & international products
 -Cloths / household ware/ food
 - Not much places to sit down and eat
 - Getting food locally and from global market, depends on market store
 - Do not have products that go to waste/ sell them before they get bad / or throw them away - not part of food waste projects

Figure 81.1-81.4 Locations of Observation
 Pictures from Apple Street view, floor plan made by author

4.

Jumbo in Molenwijk



In an arcade, poor building quality, feeling of unsafe
 - Liquor shop, bakery, Jumbo pickup, kiosk, laundry and flower shop in arcade. Ice cream shop at other entrance with seating next to bikes and trees, Flower shop bakes entrance of Jumbo a bit more aesthetic.
 - Part of a big building complex
 - Not easy to find the entrance from street side
 16:35-16:40

Jumbo in Molenwijk

7 men walking in/out (mostly with plastic bag empty and full out)
 5 women (1 with bike and one with rollator)
 1 child going grocery shopping

Very quiet, two children playing on the roof of the supermarket and then going to the water

5.

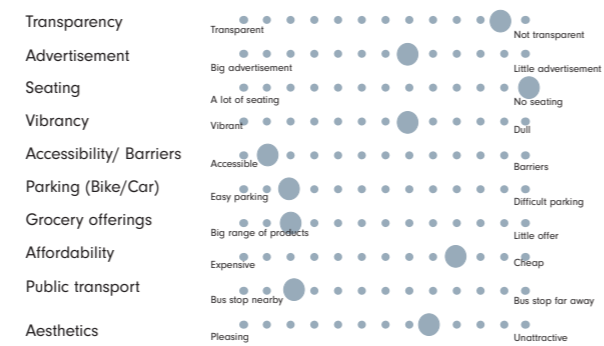
Jumbo in Molenwijk



Friendly, owner stands in front of supermarkets and talks with customers
 Children are working also in shop/helping out
 - Vendor is friends of owner
 - Throws away food when it gets bad
 - Fridge make store super hot
 - Just opened a new takeaway place at the shop entrance but people were on vacation

6.

Lidl Boerhaavewijk



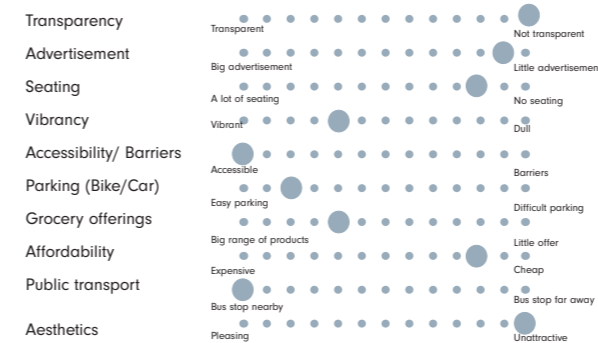
Meeting point for local people, main meeting point in Boerhaavewijk
 - Easy accessible by food/ bike & public transport
 Affordable groceries and local products
 Concept is to buy a lot and come by car but most people entering the store only came with one bad or did not have a full shopping cart when they arrived by car

7.

Vormar Europawijk



Vormar Europawijk 17:30-17:35



Fish vendor Europawijk
 17:30-17:35: closed

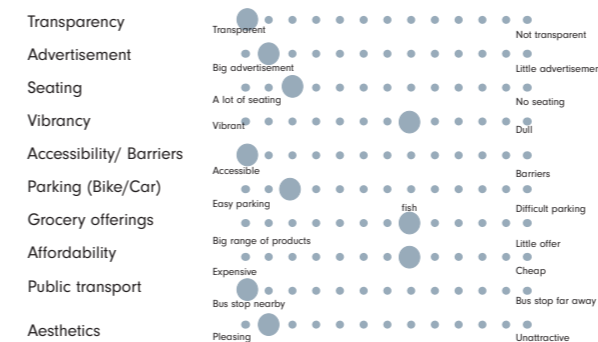


Figure 81.5-81.7 Locations of Observation
 Pictures from Apple Street view, floor plan made by author

