INVESTIGATING
PRACTICES IN SUSTAINABLE
COMMUNITIES: A MULTIPLE CASE STUDY DESIGN
FOR DEVELOPING SUSTAINABLE URBAN
NEIGHBOURHOODS

TITLE PAGE

Type of Thesis	Master's thesis
Project Title:	Investigating practices in sustainable communities: a multiple case study design for developing sustainable urban neighbourhoods
Programme:	MSc Sustainable Design
Department and Study Board :	Department of Planning
University:	Aalborg University, Copenhagen
Thesis Writers:	Charlotte Reyes Ernst
Study no. 20171978
	Yasna Ilhe Wiboltt
Study no. 20172166
Project Supervisor:	Andrés Felipe Valderrama Pineda
Number of characters :	182.763
Project Duration:	8th of February - 7th of June 2019

ABSTRACT

In this thesis, we explore how practices of sustainable communities, can influence and affect the practices of traditional housings in urban neighbourhoods through social interactions. This is examined through iterative experimentation processes in a site-specific neighbourhood in Copenhagen, for the ambition of achieving more sustainable neighbourhoods. The thesis is structured around five main questions, investigating how sustainable practices can change the behaviours of urban citizens, into becoming more sustainable. Further, we emphasise how these practices can lead to environmental awareness and knowledge about sustainability, to support a long term transition towards a sustainable neighbourhood and make citizens more active in this process. The research continues into acknowledging how sustainable communities offers better opportunity in attaining and sustaining the feeling of community due to the use and sharing of their common physical spaces. We will then focus on shedding light on this community feeling through the identification of the interconnections, interdependencies of materials, meanings and knowledge from practices in a socio-technical point of view. The empirical analyses are based on qualitative research methods, including surveys and interviews from representative sustainable communities, using multiple case studies from three Danish ecovillages and one cohousing community. Furthermore, a comparative study of conventional urban dwellings is conducted to gain additional learning about practices and facilities of urban citizens, and finding patterns and contrast between them. The aim is to encourage citizens in becoming more active to develop more sustainable neighbourhoods in the city, and in a broader perspective contribute to Copenhagen's Agenda 21-strategy targeting UN's Sustainable Development Goal 11: Sustainable cities and communities.

ACKNOWLEDGEMENT

TABLE OF CONTENT

The interactive timeline on the next page demonstrates the chapters that build up the thesis. By clicking on a particular chapter, it is possible to go directly down to that chapter of the thesis to ease the reading experience. At the end of each chapter, it is possible to be sent back to the interactive timeline by clicking on the 'Go back' button.

INTERACTIVE TIMELINE

1.INTRODUCTION

3.METHODOLOGY

6.DESIGN PHASE

9.REFERENCES

2.LITERATURE REVIEW

4.THEORETICAL FRAMEWORK

5.INVESTIGATION PROCESS

7.DISCUSSION

8.CONCLUSION
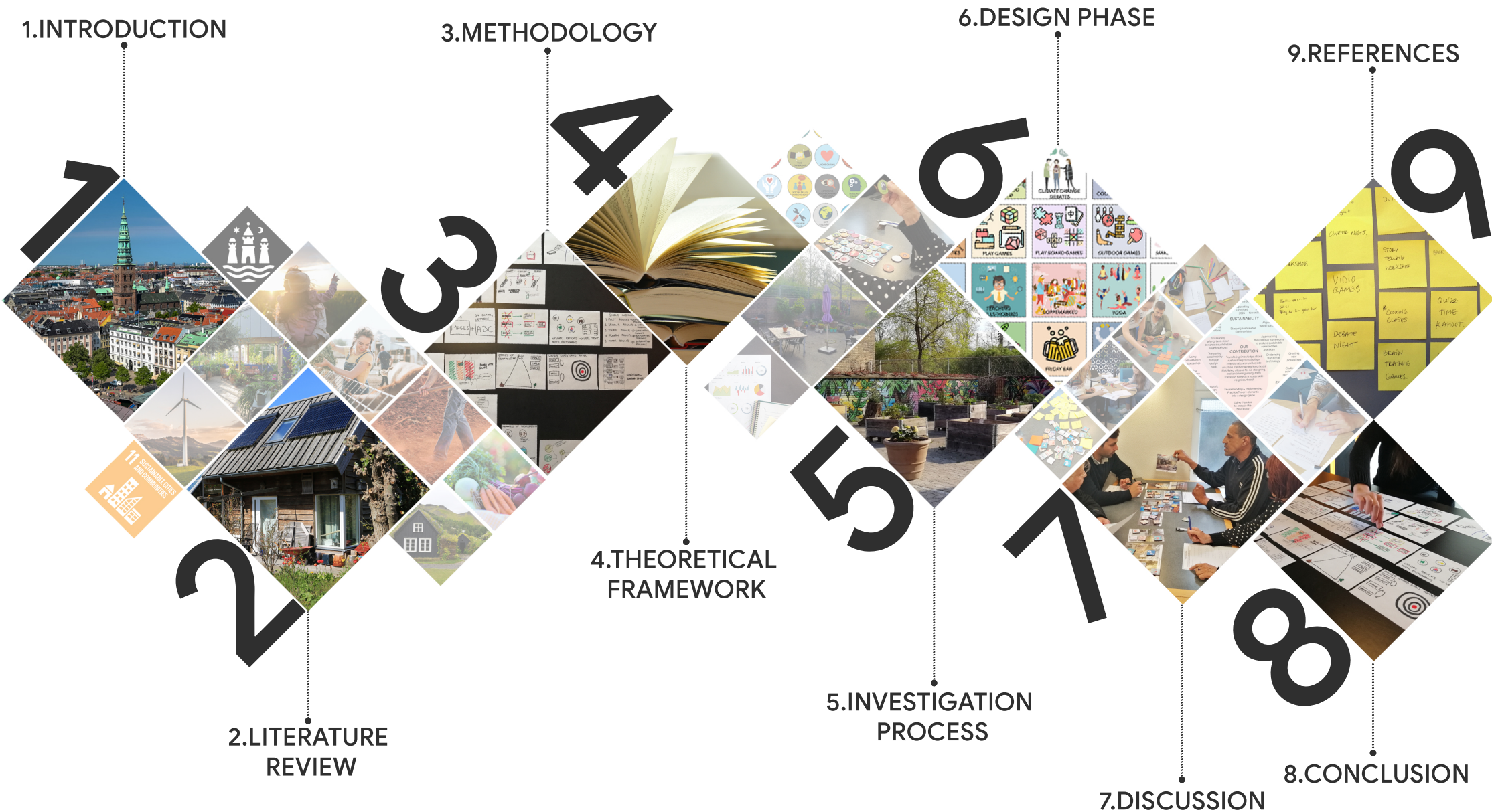
1 INTRODUCTION

THESIS INTRODUCTION

The planet is under a lot of pressure, and changes must be made to the way our resources are managed and used. Reports show that 60 to 80 per cent of global CO2 emissions are generated from household consumptions (Ivanova et al., 2016). And in Danish households alone, approximately 31 million tons of CO2 is emitted every year (okolariet. dk, n.d). The aim of greener cities is accordingly more apparent than ever, and actions in various areas are vital to resist critical issues such as climate change, air pollution, noise pollution, and other environmental concerns. The majority of people are already negatively affected by numerous social and environmental issues (Lockyer & Veteto, 2013). *"Loneliness is a big problem which we need to start to tackle. In the last few years, our communities have broken down and become atomised"* (Murphy, 2010). *"In 2016, 91 per cent of the urban population worldwide were breathing air that did not meet WHO's (World Health Organization) air quality guidelines"* (United Nations, 2019). Meaning that more than half were exposed to air pollution levels 2.5 times more than the safety standard. In 2016, an estimated 4.2 million people died because of the exposure to high levels of air pollution (United Nations, 2019).

An ambition for Copenhagen is, therefore, to be the first carbon neutral capital in the world by the year 2025 (The City of Copenhagen, Technical and Environmental Administration, 2012). To carry out this vision, authorities, businesses and citizens must, therefore, all actively and cooperatively contribute to the green transition and sustainable development (Københavns Kommune, 2016). Copenhagen will use the Agenda 21-strategy to make a holistic plan for citizen involvement in the area of environment and climate to secure a sustainable city development. The goal is to engage all the citizens of Copenhagen to take responsibility in achieving a better, greener, cleaner and healthier Copenhagen for the benefit of everyone as well as for achieving green growth, which is the basis for improving the quality of life and enhancing urban living (The City of Copenhagen, Technical and Environmental Administration, 2012).

The municipality of Copenhagen has further developed a plan explaining their strategy within each of UN's Sustainable Development Goals (SDG's). This action plan stresses on the importance of the inclusion of all actors from the public and private institutions and the participation from the citizens in its attempt of achieving the UN SDG's and being a sustainable city in 2030 (Copenhagen Municipality, Department of Finance, 2018). Copenhagen citizens need to ensure sufficient reduction in energy consumption in buildings. Otherwise, it will be much more expensive for the individual citizen to make Copenhagen CO2 neutral. A focused effort of Agenda 21 is, therefore, to give the possibility to develop and experiment with methods to make citizens involved and have a role in the sustainable development of Copenhagen. The municipality wants to promote initiatives which invite Copenhagen citizens to contribute as active participants. To make the citizens co-create and be responsible for the establishment of partnerships that can support new perspectives in ensuring aspiration for the citizens and users of the city. Further, to invite citizens and users to actively participate, in the development of the city. The Agenda 21-strategy fulfils the Planning Act section 33a and 33b requiring all the municipalities in Denmark to have a strategy on how to involve citizens and work holistically, interdisciplinary and long term with the environmental issues (Københavns Kommune, 2016).

PROBLEM FIELD

The stated environmental issues are, nevertheless, not the only problems affecting humans negatively in today's society. There is an increase in social problems such as alienation and loneliness amongst young as well as elderly in modern society because communities have been broken down and atomised (Murphy, 2010). Most housing choices isolate the family and discourage neighbourhood atmosphere (McCamant & Durrett, 2011). However, community living in a sustainable society can be an approach to steer away from these social problems, and at the same time tackle a number of the environmental issues as just mentioned (Barani, Alibeygi, & Papzan, 2018). Aligning with the Agenda 21-strategy, Lockyer & Veteto (2013) suggest engaging citizens by proposing to let activist citizens that can understand the nature of social and environmental problems lead the way because of their capability to build and share engagement about more sustainable visions. Lockyer & Veteto (2013) also state that they believe that the ecovillage movement can offer potential answers to how to create more sustainable communities as well as diminish the social problems that can be found and caused in modern housing types (McCamant & Durrett, 2011).

For that reason, we are in this thesis investigating how the interconnections and interdependencies of materials, meanings and knowledge found in practices of sustainable communities can be adopted in a conventional dwelling to develop a more sustainable urban neighbourhood. We further focus on how environmental impacts on the planet cannot be separated from social practices, especially not taking the growing capitalistic lifestyle into perspective, which demands high levels of energy consumptions, growth and enormous levels of waste (Lietaert, 2010). We, therefore, further investigate how sustainable communities offers common areas that rethink the current system and reconstruct the social practices between humans. Furthermore, we will focus on experiments, including citizens of Copenhagen in a participatory process of experimentation to actively start a change in an urban neighbourhood.

RESEARCH QUESTION

"How can we develop a more sustainable urban neighbourhood by being inspired by ecovillages and cohousing communities, residents' practices, and permaculture?"

To help answer the research question, we have created some sub-questions which we will use to help explore and discuss the complexities of the research question along the thesis process.

Sub-questions:
- Does living in a sustainable community change people's practices into more sustainable ones?
- Do environmental friendly facilities make people environmentally aware?
- How can the inspiration from ecovillages and cohousing communities help us support a long term transition towards a sustainable urban neighbourhood?
- How can we engage citizens to be active in the development of a more sustainable city?
- How can we create experiments facilitating the community building concept to help urban citizens be more sustainable?

In explaining how living in a community can contribute to the change of behaviour and practices can be found in the phenomenon of belongingness (McLeod, 2007). Our need to belong somewhere is what drives us to search for reliable, long-lasting relationships with other people. It motivates us to take part in social activities such as sports teams, religious groups, and communities because belonging to a group makes us feel like we are a part of something bigger and more important than ourselves. Belonging to a group can, therefore, lead to changes in behaviours, beliefs, and mental outlooks as people seek to comply with the values and norms of the group (Cherry, 2019).

According to the Agenda 21 plan, the experience of joining a community is a strong motivational factor about being an active citizen. This is supported by a study accomplished by the Technical and Environment Administration in Autumn 2014 (Anthropologists, Citizenship in the City 2014/15 cited in Københavns Kommune, 2016). Creating a community that emphasises on co-responsibility between resident, therefore, becomes vital for the development of a sustainable city. Sustainable development means that citizens have to adopt new habits as individual opportunities to act sustainably is not always present. The social context is often controlling the decisions taken in everyday life, as socially acceptable behaviour is formed in communities (Københavns Kommune, 2016).

RELEVANCE OF TOPIC

By studying sustainable communities in terms of practices and facilities, we aim to contribute to the vision of the UN's Sustainable Goal 11: Sustainable cities and communities. Within this goal, the local plan of Copenhagen's municipality states "Make cities and human settlements inclusive, safe, resilient and sustainable" (Goal 11: Sustainable Development Knowledge Platform, 2019). For that reason, we want to support and focus on the feeling of community because it raises a strong motivational factor which forms an active citizen. The citizens can then be mobilised and act as coalitions when it comes to sustainable transitions and the creation of more sustainable neighbourhoods in the city. The inclusion of citizens do not only contribute to the vision of UN Goal 11; it also helps to prevent the distinguished social and environmental problems in society. And at the same time increase the sustainable urbanisation by 2030, and include the capability for the participatory, integrated and sustainable human community (United Nations, 2019).

Illustration 1: UN SDG 11: Sustainable cities and communities. Source: Goal 11 : Sustainable Development Knowledge Platform. (2019). Retrieved from https:// sustainabledevelopment.un.org/sdg11

Further, Copenhagen is experiencing an increase of 10.000 new citizens every year, which stresses the demand for achieving the goals. With this growth of inhabitants in the city, there is a natural increase of neighbourhoods and a larger city in development. Copenhagen's plan for the SDG 11 is, therefore, also focused on providing equal opportunities to all the citizens and ensure that the city stays connected socially and physically. To do so, the Municipality has put its attention to five targets of the UN SDG. The chosen targets are:

- **Target 11.1:** *"By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums".*
- **Target 11.3:** *"By 2030, enhance inclusive and sustainable urbanisation and capacity for participatory, integrated and sustainable human settlement planning and management in all countries".*
- **Target 11.4:** *"Strengthen efforts to protect and safeguard the world's cultural and natural heritage".*
- **Target 11.6:** *"By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management".*
- **Target 11.7:** *"By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities" (Copenhagen Municipality, Department of Finance, 2018; P.32).*

> The way "Community concept" is understood is derived from the four parameters describing intentional communities: 1) a strong social network, 2) a shared meaning in life, 3) closeness to nature and 4) a low ecological footprint (Kitzes and Wackernagel, 2009).

With the selected targets from the UN Goal 11, the Municipality of Copenhagen has proposed five projects to focus on:

- **Social housing** to meet the 11.1 target.
- **Community Copenhagen (Fællesskab København)** to meet the 11.3 targets.
- **Municipality Plan 2015 (Kommuneplan 2015)** to meet the 11.4 targets.
- **Sustainable transport** to meet 11.6 targets.
- **Amager Ressource Center (ARC)** to meet the 11.7 targets.

Copenhagen's proposal of 'Fællesskab København' is to achieve a sustainable city by resilient, connected neighbourhoods in the creation of a community city (Copenhagen Municipality, Department of Finance, 2018). This inspired us to scope the project within neighbourhoods in the urban area. We believe that by creating resilient neighbourhoods with the community concept and sustainability as a common vision will develop and strengthen the city. The aim of our study, therefore, aligns with the Agenda 21-strategy and the SDG's for Copenhagen about involving the citizens of Copenhagen and engaging them in holistic actions and initiatives by changing habits in the home. We want to focus on supporting the feeling of community because it increases a strong motivational factor which can devote citizens to be actively responsible for the green transition and creating more sustainable neighbourhoods.

"Everyone should be able to create, contribute to and influence the future of Copenhagen" (Copenhagen Municipality, Department of Finance, 2018; P.17).

THESIS STRUCTURE (WHAT TO EXPECT)

The thesis will, from now on, be structured into seven main chapters. Each chapter presents a brief introduction to what will be explored and closing each one with a sub-conclusion that contributes valuable and relevant knowledge that is carried on to the next chapter. Starting with chapter 2, which covers the relevant articles, books and other sources that have been read and investigated to explore the field of our topic. Chapter 3 entails our theoretical framework chosen to analyse our findings. Chapter 4 contains our methodology section describing the methods chosen for conducting the empirical data to base our analysis on. Chapter 5 holds the findings and results of our empirical research and further explains how we use Social Practice Theory to understand the elements that constitute the practices identified in the visited ecovillage and cohousing communities as well as the practices conveyed in traditional dwellings. Chapter 6 explains how we use Transition Management to create a long term transition vision, and subsequently, the path forward in creating changes through minor short-term experiments in a site-specific urban neighbourhood. Chapter 7 serves an answer to our research question through the previously stated sub-questions and evaluation of our study. Chapter 8 ends with a conclusion of the entire thesis, and our contribution within this field as well as our role as design engineers.

2 LITERATURE REVIEW

LITERATURE REVIEW

In this chapter, we will present a review of scholarly articles, books and other relevant sources to form a literature base to investigate sustainable intentional communities. To investigate the topic in a Danish context, we also reviewed the national association websites related to sustainable communities. The purpose of this is to create an overview of the literature that already exists about this topic in society and to investigate other scholars' motivation, research context and findings to scope further how our thesis proposal can fill in a gap in the existing literature.

INTENTIONAL COMMUNITIES

Intentional communities are small-scale communities composed around secular or religious initiatives about how one should live. Generally, they have a shared lifestyle with common spaces, common meals, shared cultural elements such as beliefs and dedication to collaborating. And a common purpose, e.g. being environmentally friendly. Members of intentional communities are more likely to be committed, compared to the general population, in the following four parameters: a strong social network, a shared "meaning in life", closeness to nature and a low ecological footprint. Especially the last parameter is portrayed as a central part of sustainability (Kitzes and Wackernagel 2009; cited in Nelson, 2018).

Intentional communities are usually established and sustained by people who are committed to following a common purpose or intention, such as living in harmony with nature or living according to principles such as unity and grassroots democracy (Kunze, 2012; cited in Hausknost et al., 2018). To explore the progress in the direction of wellbeing and sustainability, the literature review will focus on the intentional, sustainable communities which we also refer to as sustainable communities.

Hausknost et al. (2018) investigate and evaluate low-carbon municipalities (top-down initiatives) and intentional communities (bottom-up initiatives) due to the favourable outcome of local climate governance in developed countries has been restricted. They argue that a reason for this can be because local communities focus too much on technology-oriented strategies of environmental transformation and individual behaviour change and not enough on strategies that target unsustainable social practices and their fixedness in complex socio-economic patterns.

By using Social Practice Theory as their theoretical framework, the authors identify typical traits of intervention in each of the communities. The results of this show that low-carbon municipalities face difficulties in reconstructing carbon-intensive social practices. Even when offered supplementary low-carbon choices, their capability to decrease carbon-intensive practices is not sufficient enough. Further, their aim for efficiency and individual choices show little transformational potential. Intentional communities, however, have more institutional and organisational choices to intervene when it comes to social practices. The authors, therefore, analyse in which degree low-carbon municipalities can learn from intentional communities and suggest strategies of hybridisation for policy innovation to unite the strengths in both initiatives.

The suggestion of hybridisation entails that low-carbon municipalities can encourage intentional communities to inhabit unoccupied infrastructure at a small price to help regenerate and decarbonise the community in the long term. In return, intentional communities can offer socio-ecological innovations to the municipal citizens such as common kitchen and dining hall, community gardening, car-pooling, and ecological building techniques. From this institutional learning, it can be initiated, where the active members from both communities exchange knowledge and

experiences in their efforts to create sustainable communities (Hausknost et al., 2018).

COHOUSING COMMUNITIES

The concept of cohousing pioneered in Denmark in the 1970s and focused on re-establishing many of the benefits that can be found in traditional villages but just in a modernised context. Cohousing is a grassroots movement that evolved from people's unhappiness with the increasing alienation and feeling of disconnection in today's society because most housing choices isolate the family and discourage neighbourhood atmosphere. Therefore, cohousing brought inspiration from the established and connected small towns and the engagement in shared resources (McCamant & Durrett, 2011).

The first cohousing was built outside of Copenhagen in 1972 by 27 families who wanted to experience the feeling of community which was not offered by the suburban sectors and dwelling complexes. They, therefore, decided to develop a new housing form that reconsidered the concept of a neighbourhood by joining the independence of a private dwelling with the benefits of community living. A cohousing can especially help individuals and groups of people with the community feeling and the sense of belonging (McCamant & Durrett, 2011).

"The physical design is critically important in facilitating a social atmosphere, and largely composes the behaviour of the residents. It is the participatory development process that establishes the sense of community, but it is the physical design that sustains it over time" (McCamant & Durrett, 2011, page 27).

A household situated in a cohousing facility has a private dwelling and is designed to be self-sufficient with its individual kitchen. Every household shares extensive common facilities with the rest of the neighbourhood, e.g. a common house that includes a kitchen and dining room, workshop rooms, guest rooms and laundry facilities of the common activities. The common dinners are especially important aspects of community life for both social and practical reasons. Common dinners allow residents to get to know each other, as well as creating value around the meals. On a practical level, residents get to appreciate having several extra hours each day because the cooking chore is divided between the residents. An example of cohousing in Nevada City in the United States explains how residents get the opportunity to give, to receive, to contribute and to be recognised. And explains how sharing resources gives all the residents beneficial access to an expanded selection of services at a lower cost per family. Another example in the same cohousing community shows how the residents who take care of the vegetable gardens and fruit trees, generously, share their skills, and as a result make many other residents have more appreciation for gardening and make them learn more about it daily (McCamant & Durrett, 2011).

A cohousing is a sustainable community because of the shared and common resources which can provide both practical and social benefits. For instance, a common workshop or a tool room can replace the need for each family to have individual and multiple tools of their own, and allow residents to downsize as there is a common space where they can fix different objects together.

Besides the numerous social advantages, a cohousing community provides, there are also various environmental advantages. Amongst some of them are less energy consumption as communities spend less on utilities, they own fewer cars and drive less than people who do not

live in a cohousing. Economic advantages are therefore also found in cohousing because of the common facilities. By having a smaller home that is easier to maintain and which makes it possible for families to lower their expenses on a day to day basis. Smaller homes are also more efficient in terms of heating and cooling because the operating costs are reduced (McCamant & Durrett, 2011).

In some cohousing communities, there are more priorities besides seeking a community feeling. Some communities have an emphasis on ecological concerns and usage of solar and wind energy, recycling and organic community gardens. However, the priorities are individual and vary depending on the specific cohousing.

Furthermore, Marckmann et al. (2012) examine the features of various environmental advantages of cohousing compared to individual traditional households. The study seeks to explore if a cohousing offers more options regarding sustainable technologies. It also investigates if a cohousing supports environmental behaviours between the residents as well as supporting individual norms and practices. They argue that a cohousing is perceived more environmentally sustainable than other types of housing forms because of their implementation of sustainable technologies and the downsizing of space. The authors, therefore, aim to contribute to the discussion of cohousing and sustainability. And they conducted their research based on surveys and interviews in various Danish ecovillages.

Their findings show that cohousing communities are more encouraged and able to establish and experiment with technologies like solar power and compost toilets. A cohousing also seems to make space for discussion and common support and control of community residents' everyday behaviour and routines. Further, a cohousing maintains the option for more sustainable technologies and to some extent, more sustainable practices and denser buildings. However, the study does not show that a cohousing captivates small households of singles (Marckmann et al., 2012).

SOCIAL INTERACTIONS IN COHOUSING COMMUNITIES

Bouma & Voorbij (2009) investigate the challenges new residents are facing through formal and informal social interactions when joining a new community. These interactions can sometimes lead to negative experiences why this study focuses on establishing whether these problems can be controlled or solved by the physical characteristics. The study is conducted in an elderly Dutch setting. The methods used were based on the literature on social interaction and influencing factors and student projects that focused on the social and physical characteristics of five cohousing communities. The data was retrieved using semi-structured interviews and photos were collected from the buildings and common areas.

The authors found that social interactions are influenced by the physical characteristics of cohousing communities. More so, the difference between values, goals and behaviours of the respective residents in the study conducted were critical in understanding social interactions in cohousing communities for elderly.

ECOVILLAGE COMMUNITIES

Ecovillages are pre-established human communities built from a conscious an environmental-friendly mindset and living in harmony with the natural world. It entails the use of "integrative design, local economic networking, cooperative and common property structures,

and participatory decision making to minimise ecological footprints and provide as many of life's basic necessities as possible in a sustainable manner" (Lockyer & Veteto, 2013; P:15).

The origin of various ecovillages dates back to the 1960s from communes or intentional communities, but it was not until 1990 when the majority became a popular model around the world and inspiring others to redefine what a community entail from an ecotopian philosophy perspective (Lockyer & Veteto, 2013).

"The ecovillage movement has been driven by a grassroots urge to address environmental crises across the planet in very immediate, practical and everyday ways. Typical pioneers of ecovillages have decided that we need to completely change our lifestyles and our relationship with nature to live sustainably in the twenty-first century" (Nelson, 2018; P.130).

Permaculture and Bioregional mindset are usually included in the practices of ecovillages as an ecotopian aim of sustainability. Also, ecovillages generally integrate the use of techniques as agroecology or organic agriculture as well as green technology regarding energy and water supply and eco-friendly architecture approaches.

The sustainable visions of the ecovillage residents are reflected in their effort to create this kind of communities worldwide. As an example, Auroville in India or Dancing Rabbit in the United States are communities where they put sustainable solutions in practice.

Also, ecovillages are joining the Transition Movement with their surrounded cities and towns. This organisation, founded by Rob Hopkins, guides communities to change their course into sustainability in a world

damaged by the oil industry and intimidated by the unstable climate change.

Despite their effort to make a remarkable change in the world, many ecovillages have been progressing very slowly because of struggles when obtaining a property rising the physical community and preserving the united decision-making system. Therefore, ecovillages that still apply their values and practices are instructive examples and experiments of sustainability (Lockyer & Veteto, 2013).

THE CONTRASTS BETWEEN ECOVILLAGES AND COHOUSING

There are contrasting differences between ecovillages and cohousing communities. They are both considered intentional communities because of their strong social network and follow a common vision. A cohousing is characterised as transforming the built and socio-cultural nature of housing. Where ecovillages, in contrast, are defined by holistic – collective, material, bioregional and personal – transformations joined diversely and to diverging ranges. Ecovillages are therefore more likely to be experimental, diverse and determined compared to cohousings due to their aim of being holistic and transformative (Nelson, 2018).

Meltzer (2010) argues that ecovillages are mostly found in rural areas safely integrated within nature. They are commonly found in large and diverse groups that are supportive of healthy human development. Ecovillages are further innovative and inspirational and exist in the outskirts of the mainstream society. And are believed to be sustainable, explicitly green and environmentally focused.

In contrast, a cohousing is mainly found in an urban setting in smaller,

more similar groups with a focus on housing design and group processes. There is a neighbourhood design with extensive common facilities, and residents managing a participatory process. Cohousings are furthermore practical and realistic and found to be more fixed within the mainstream society with a focus on social aspects (Meltzer, 2010).

SUSTAINABLE COMMUNITIES AS EDUCATIONAL COMMUNITIES

Franklin et al. (2011) study four different sustainable communities and their initiatives within the English town Straud in the UK. This town was selected specifically because it is known to be the frontrunner when it comes to communities within sustainable development.

The study investigates the understanding of skills and knowledge for sustainable communities through more experimental and process-focused paths. This is done by exploring the practices of community members who are actively engaged in initiatives found in sustainable communities. The authors explore the relationships between knowledge and understanding of sustainability, and how they include and actively increase the ideology of sustainable communities as an active part of their daily lives. The authors justify how the necessary connection has already been made between policy circles and the improvements in skills and knowledge in regards to sustainability as the configuration and maintenance of sustainable communities entail significant advantages. However, it is also argued that the communication of what sustainability skills and knowledge are, and the approach of how to develop sustainable skills and knowledge is deficient.

The authors emphasise on how sustainable communities are fundamentally linked with the broad goals of the sustainable development. And explain how the engagement of an effective community with a strong influence is repeatedly cited within policies of sustainable communities (CLG, 2008; CRU, 2004; HCA, 2009 cited in Franklin et al., 2011).

The way the policy actors envision sustainable communities needs to be revised because they are perceived in a fixed state based on a persistent set of criteria. Instead, the authors state that sustainable communities need to be viewed as communities of learning going beyond relational practices that are continuously being created around the common vision of sustainable living. The lack of suitable skills and the need for an extensive understanding of what skills sets are have been recognised in the UK policy discourse as a critical obstacle in achieving sustainable communities (Newton et al., 2008a; ODPM, 2004; Turok and Taylor, 2006 cited in Franklin et al., 2011). The authors, therefore, propose a better social and structural understanding to be integrated into the policy agenda of sustainable communities - initially, to incorporate skills and to learn for sustainability into people's everyday lives (Franklin et al., 2011).

Daly (2016) explores the field of cohousing communities as a sustainable neighbourhood model through a case study of a Cohousing in Australia (Murundaka Cohousing with 35 to 40 residents). To collect data, he conducted interviews and anthropology observations. Within his research, he uses social practice theory to analyse everyday practices in the community and investigate sustainable behaviours. In the analysis of the practices observed, he illustrates the elements of practices from each sustainable practice in a table and dividing them into meanings, skills and materials.

The findings of his research show that the elements of practices found in the daily life practices are connected to shared activities, which have

a considerable influence in lowering the resource consumption in the houses. He also states that encouraging common areas where new elements, like sustainability, can be shown to new carriers as policy planners can inspire them to promote sustainable practices. Furthermore, highlighting the community aspect in a neighbourhood generates a strong social atmosphere where meanings and competencies are gladly shared, and practices can be reshaped into sustainable behaviours.

The paper concludes that cohousing can be a niche model to get inspiration from to face social and environmental problems that the cities will experience in the future. Finally, he stresses that there is room in the field for more research to investigate the importance on the expansion of elements from sustainable practices into Australian conventional neighbourhoods development, or to study the barriers and facilitators to implement the concept of cohousing in cities (Daly, 2016).

Lietaert (2010) claims that the cohousing movement is a solution to be more social and to live environmentally friendly in the cities. In this article, he presents degrowth theories linked to the concept of cohousing and wellbeing in the small urban frame of neighbourhoods. Thus, he criticises the current consuming behaviours in 21st-century society and stresses how the lifestyle nowadays does not contribute to degrowth. Some of his findings are presented and compared to the cohousing model. Basing his argument on the fact that degrowth is a vital point in the direction of sustainability, he states that where the capitalism lifestyle demands high levels of growth, energy consumption, and colossal levels of waste, cohousing offers effectiveness in sharing practices and behaviour.

Furthermore, he stresses that the deficiency of public areas entails infinite growth and argues that the only public places to socialise are places to consume. There is a lack of places which promote communication among people, the creation of different solutions and where neighbours can discuss sustainable solutions to their needs. In contrast, cohousing facilities offer common areas that promote the rethinking of the current economic system and reconstruct social practices between human beings (Lietaert, 2010).

Zeybek & Arslan (2017) state that ecotourism is a growing niche market in the travel industry, as ecotourism is becoming an important tool within sustainable development. There is a lot of money accumulated in annual sales, which makes it an industry that seeks to take advantage of the trends on the market. The term ecotourism means "environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature (and any accompanying cultural features - both past and present) that promotes conservation, has low negative visitor impact, and provides for beneficially active socio-economic involvement of local populations" (Wood, 2002 cited in Zeybek & Arslan, 2017; P. 226). The increasing ecovillage communities are fuelling the concept of ecotourism because it develops the communities own local economy and they can share their sustainable knowledge with others and educating people along the way (Zeybek & Arslan, 2017).

SUSTAINABLE COMMUNITIES AS GRASSROOTS INNOVATION

Boyer (2015) studied how ecovillages act as grassroots innovation and how they influence the regime with their practices. He also states, how grassroots that are in a middle position between the extreme one and the mainstream system are better facilitators of sustainable practices in the regime. Smith (2007) claims that "'intermediately' situated niche projects are best suited to translate their innovative practices to the mainstream

by serving as a cross-contextual bridge between a niche and a regime" (Smith 2007 cited in Boyer, 2015; P.333).

Besides, he describes how ecovillages within the same social purpose are better translators than others. By using a comparative case study method, he compares three case studies of ecovillages in North America. Thus, he finds how some ecovillages inspire transformations within the city growth procedures, while others have encouraged changes within a restricted niche. Furthermore, he studies three different ways of how grassroots disperse their practices.

The selection of the case studies where made with a variation case-study method from a dissertation which studied forty-six cases of ecovillages. The methods used to collect data were based on semi-structured interviews, surveys, on-site visits supported by telephone interviews (Boyer, 2015).

Bundale (2004) makes a brief explanation of the transition of ecovillages, as grassroots in their vision to be sustainable. From their origins in intentional communities and cohousing in Denmark to their worldwide growth as a movement getting into urban areas. Bundale (2004) also states how ecovillages spread their visions to the mainstream system despite their success or failures and how some urban developers in North America have taken inspiration from them to create more sustainable infrastructures. To sum up, Bundale (2004) stresses the fact of ecovillages being the most idyllic model of sustainability as they are becoming mainstream and more available to the citizens.

Boyer (2014) focuses on social transitions and more specifically on the role of local plans or planners in the transition processes. An in-depth case study is used to investigate the following of the development of an eco-cohousing model from its origins to its current status in the housing market of Ithara, New York. Diversity of data sources are used including written accounts, interviews and an analysis of local media and government documents. The study offers a theoretical framework to help understand how strategies of social transition emerge and become part of the mainstream (Boyer, 2014).

The authors Dias et al. (2017) state that despite all the focus and connections linked to sustainability, the initiatives regarding sustainability are only still developing. Ecovillages complete a variety of sustainable practices and aspire to influence society with an alternative lifestyle as they have the goal of sharing knowledge with the world. However, ecovillages face a list of complexities in attaining sustainability (both within their movement and in their attempt to influence society) because of their process of legitimisation. The aim of the paper is, therefore, to analyse the meanings related to ecovillages and their significance to discuss sustainability by examining academic literature. The research conducted is based on the social aspect as opposed to the technological aspects and explored by searching for "ecovillage" articles in a literature database in the languages Spanish, Portuguese and English. Further, selecting the ones, including empirical data.

In the past, ecovillages used to position themselves "outside" or "in opposition" to the mainstream (Dawson, 2013 cited in Dias et al., 2017), aiming to accomplish as much self-sufficiency as possible. However, today, ecovillages are increasingly involved as coalitions with other movements and institutions.

An important obstacle and limitation of ecovillages' social role in society

are that their initiatives have circulated alternative ideas and practices all over society. They are linked more with other movements and social institutions as they act as sustainability-oriented groups, to support specific actions in the construction of societal substitutions. The authors further argue how ecovillages considerably contribute to the efforts of rethinking sustainability (Dias et al., 2017).

STRATEGIES FOR SUSTAINABLE COMMUNITIES

Barani et al., (2018) plead in this research how ecovillages have become a solution to mitigate all the current problems in regards to the growth of the population and climate change. Not all the ecovillages succeed in their purpose to be sustainable. They argue that the main problems when trying to establish an intentional community relies on in aspects such as finding the right place and strategy.

Thus, they based their research on studying, with a qualitative meta-analysis method, 60 ecovillages around the world were studied to frame patterns for the existing ecovillages and develop as a sustainable community. Besides, to generate a managerial strategy that will help potential communities to turn into ecovillages and drive them in the right path.

The findings from the research were analysed strategically and coded to translate them within a meta-analysis method. Within the findings, they categorised two types of strategies as non-transferable or unique strategy and transferable strategy. They define the strategies as transferable due to its usage, trials, reiteration, creation and development in different places and non-transferable strategies which diffusion is unmanageable or tedious. Finally, they defined that transferable strategies are used to be performed to improve potential ecovillages whereas non-transferable

strategy carries a very important job by identifying powerful ecovillage characteristics within conventional communities which can achieve to be sustainable and being successful in the domain.

Non-transferable strategy is related to aspects of the environmental guard, facilitating an ecological territory, personal, social and spiritual assets and mental and physical wellbeing. Regarding transferable strategy, they refer to aspects of using less energy and resources, efficient transport arrangement, water and waste administration, sustaining the local economy, individual growth, construction skills, self-sufficiently and prudence. Non-transferable strategy aspects refers to what they describe as ecovillage identification, and transferable strategy have its place to ecovillage development.

To sum up, the study was made to promote future investigations on ways for facilitating strategies that can identify traditional communities with possibilities and capabilities to turn into ecovillages and support them (Barani et al., 2018).

SUSTAINABLE COMMUNITIES IN DENMARK

Denmark is known for being the frontrunner of sustainable communities as the cohousing movement originated in Denmark in the 1960s and from that the ecovillage movement emerged. Thus, the Danish Ecovillage network, identified as LØS (Landsforening for Økosamfund), was founded in 1993 as the first countrywide network developed out of the initiative of Gaia Trust - a project established to connect sustainable communities and projects worldwide in 1990. Besides, Denmark is also the country in the world with most ecovillages about its population. The Danish Ecovillage network has about 55 registered ecovillages and 26 upcoming (Gaia.org, 2019; Landsforening for Økosamfund, 2019).

LØS is an association with the belief that everybody should live sustainably in the 21st century. The mission is, therefore, to widespread ecology and a holistic and circulatory way of thinking within the physical, social and spiritual. The vision for Denmark's future in the year 2040 is focused on creating a harmonious and connected Denmark, which includes a transition to living differently, to be part of a community and be close to nature. Further, to be able to live life without pressure, stress and concerns - a good life.

In connection to the ecovillage movement in Denmark, Bærebo, a Danish organisation is specialising in developing wide-range ecovillages. Bærebo combines the eco-society movement and community facilities with their vision of mainstreaming sustainable communities to create appealing, sustainable living communities available to the population. Besides, they work with two of UN's SDG's. Goal 7: Affordable and clean energy, and Goal 11, Sustainable Cities and Communities.

PERMACULTURE

The concept of permaculture is linked to many of ecovillages' individual vision and aspiration for their local community because of its practical approach and synchronisation within social and environmental aspects. However, there are many diverging and various definitions in the literature about what permaculture entirely is, which makes it challenging when defining an actual description of the concept. The majority of the literature only touch upon practical environmental approaches regarding agriculture and garden design (Watkins, 1993; Corazon et al., 2012; Gilda, 2016; Jones & Kijima, 2018) which is not the path we seek to explore solely. However, the authors Lockyer & Veteto (2013) include a more holistic description of what permaculture is also involving the social aspect, which is the main reason this source is cited in this section.

The permaculture concept dates back to the 1970s in Australia when the bio-agronomist Bill Morrison and his apprentice David Holmgren settled a design frame to rethink agriculture itself. Permaculture is based on a range of tools, methods and instructions to acquiring sustainable human ecosystems and is conceived as an ecological design approach that redesigns systems.

The name permaculture initiated from the words "Permanent" and *"Agriculture", where its goal is to build "consciously designed landscapes which mimic patterns and relationships found in nature, while yielding an abundance of food, fibre, and energy for provision of local needs" (David Holmgren 2002: xix cited in Lockyer & Veteto, 2013; P. 11).*

Even though Permaculture roots in agriculture, it has spread to many other human-environment system relations to any geographical area where man has settled and created a holistic definition:

"[Permaculture] is about designing sustainable human communities and preserving and extending natural systems. It covers aspects of designing and maintaining a cultivated ecology in any climate: the principle of design; design methods; understanding patterns in nature; climatic factors; water; soils; earthworks; techniques and strategies in the different climatic types; aquaculture; and in the social, legal, and economic design of human settlement" (Mollison, 1988 cited in Lockyer & Veteto, 2013; P. 11).

Even though the Permaculture concept arose in an academic context, it became more focused on the practical competences. The sustainable design approach developed into a worldwide movement, but the theoretical background is not up to date, and the concept is, therefore,

being criticised form an academic point of view. Permaculture is said to be strong in the practical approach but weak in the theoretical framework and therefore lacks to give a clear definition (Ferguson & Lovell, 2013; cited in Lockyer & Veteto, 2013).

"Although permaculture has been taken seriously by some academics, resulting in occasional sporadic publications over the years (e.g. Jungt 1985; Kennedy 1991; Strange 1984a, b), it has largely been ignored" (Lockyer & Veteto, 2008; P:49).

Apart from its concept, Permaculture holds three ethics and twelve parameters as core principles to follow to design sustainable systems. The three ethics are defined as "Care for earth", "Care for people" and "Fair Share" and they are focused on the social and environmental synergy.

Care for Earth is the concern on the human impact on nature. This principle is about working in harmony with nature instead of against the natural world. Its goal is to nourish and give worth to natural systems to preserve the environment and avoid the industrial human impact. In summary, it is about creating a harmonious synergy between the systems found in nature and the human being with the lowest impact on the earth.

Care for people claims the necessity of human welfare and the need of a community. Access to the needed resources should be guaranteed to achieve prosperity. These resources are defined as food, water and housing. To achieve this, this ethic proposes that communal decision making will have a better impact on how we administer the resources we need. It also stresses the importance of the harmony between the human being and nature by having an ecologic way of living and behaviour and the use of adequate and reliable design to obtain the needed resources

for the community.

Fair share is the third ethic and states that everybody should have the same amount of resources they have to access. When referring to everybody is about "people, animals, plants, and, perhaps most importantly, future generations" (Veteto and Lockyer, 2013; P. 184). It also entails constant awareness and focuses on basic human needs when consuming (Lockyer & Veteto, 2013).

PERMACULTURE DESIGN PRINCIPLES & ETHICS

Illustration 2: The three ethics and the 12 design principles of peraculture. Source: Flaticon, the largest database of free vector icons. (2019). Retrieved from https://www.flaticon.com/

SUB-CONCLUSION

The literature reviewed shows that there are various visions and perspectives of what sustainable communities entail. Hausknost et al. (2018) and Nelson (2008) explore what is it that makes intentional communities sustainable. Investigating practices, social interactions and way of life, arguing that it is due to green technologies, households of low-energy impact and shared activities. Lietaert (2010) criticise today's society for the growing consumerism and capitalism and argue how sustainable communities can be a positive way of directing society through having a shared economy. Further, how communities provide common areas to interact socially and create sustainable solutions together. It is also argued how community life can have a positive effect on people's wellbeing and combat the massive environmental impact found in society right now.

Boyer (2015), Bundale (2004), Boyer (2014) and Dias et al. (2017) investigate sustainable communities as grassroots innovations and how they influence the mainstream system and how some of the communities are capable of influencing the system while others only influence the niche. Franklin et al. (2011) investigate sustainable communities as educational initiatives suggesting that traditional municipalities should get inspiration, knowledge and learn from sustainable communities' way of life. Continuing, Barani et al., (2018) identified how some intentional communities in their aim to be sustainable fail to do so because of their lack of strategy to carry out their visions. Moreover, Daly (2016) emphasises the importance of researching how to spread elements of sustainable practices in conventional Australian dwellings, from which we will take inspiration.

The literature, according to Zeybek & Arslan (2017) also shows that sustainable communities are becoming widely popular as they gain attention in the travel industry. For instance, some ecovillages offer themselves within ecotourism which is beneficial for the specific community because it increases their economy and at the same time they get to share knowledge and skills about sustainability and sustainable practices with the visitors staying.

The permaculture concept is found in multiple visions and approaches when researching individual ecovillage communities, presumably, because of its practical way of doing sustainability regarding gardening and cultivating the land. However, in the academic world, many scholars criticise the concept due to its lack of definition and academic depth. Permaculture has also only been identified twice by the other scholars in this literature review of sustainable communities. Therefore, there is a gap between what has studied academically regarding permaculture in the communities and what the sustainable communities practically do.

Further, the literature review shows that there is room for more research on the topic of how to implement sustainable practices in traditional neighbourhoods. Our aim is, therefore, to add to the existing research by influencing traditional Danish households, especially knowing that Denmark is the country in the world with most ecovillages per capita. It makes sense that we let these communities be frontrunners of sharing knowledge about sustainability and sustainable practices.

3 METHODOLOGY

METHODOLOGY

In this chapter, we will describe and discuss the chosen methodology and how we achieved all the gathered data for further analysis and scoping of the thesis. The data is collected during the months of Winter and Spring from the beginning of 2019 in diverse cities of Region Zealand in Denmark. We will throughout the methodology section, explain how we collected data in the following communities: Karise Permatopia, Hallingelille, Munksøgård (ecovillages) and Bo-90 (cohousing). As well as through a group of individual residents living in conventional urban dwellings. We did so to use the empirical data and knowledge to carry out experiments in a selected neighbourhood in Copenhagen to achieve answers to our research question of developing more sustainable neighbourhoods in the city.

RESEARCH STRATEGY

The communities were all identified and studied based on our preliminary desk research within ecovillages, cohousing and permaculture. These communities were chosen due to their sustainable visions, proximity (located in Region Zealand), green technology and infrastructures. All the ecovillages are placed in rural areas in respectively Karise, Ringsted and Roskilde. Whereas Bo-90 is placed centrally on Nørrebro in Copenhagen. For that reason, we included their community as they could provide us with a lot of valuable knowledge based on the fact they are a sustainable community in an urban area.

Theme	Ecovillages			Cohousing
Name of community and year of establishment	Karise Permatopia (2018)	Hallingelille (2008)	Munksøgård (2000)	Bo-90 (1993)
Number of residents and living groups	Approx. 120 residents divided into 3 living groups	73 residents divided into 3 living groups	Approx. 235 residents divided into 5 living groups	27 residents and no living groups.
Number of interviews and surveys conducted	1	4	3	12

Table 2: Representation of the sustainable communities we visited

All the ecovillages except Hallingelille had the same specific visiting day the first Saturday of the month, which created some obstacles when collecting data. However, the inclusion of adding surveys in combination with the other methods made us able to work around these obstacles. We visited the chosen communities to study the resident's practices around their green technologies and facilities and gain valuable information from their sustainable communities.

We, therefore, used a research strategy based on surveys, semi-structured interviews, observations, field notes and photographic fieldnotes within each of our visits. Moreover, we used some of the mentioned methods to investigate people living in conventional dwellings in the city. The purpose of this was to make a contrast and comparison between the infrastructures, practices and sustainability found in ecovillage and cohousing communities. Hereunder we will describe and explain the methods chosen and the purpose for using them.
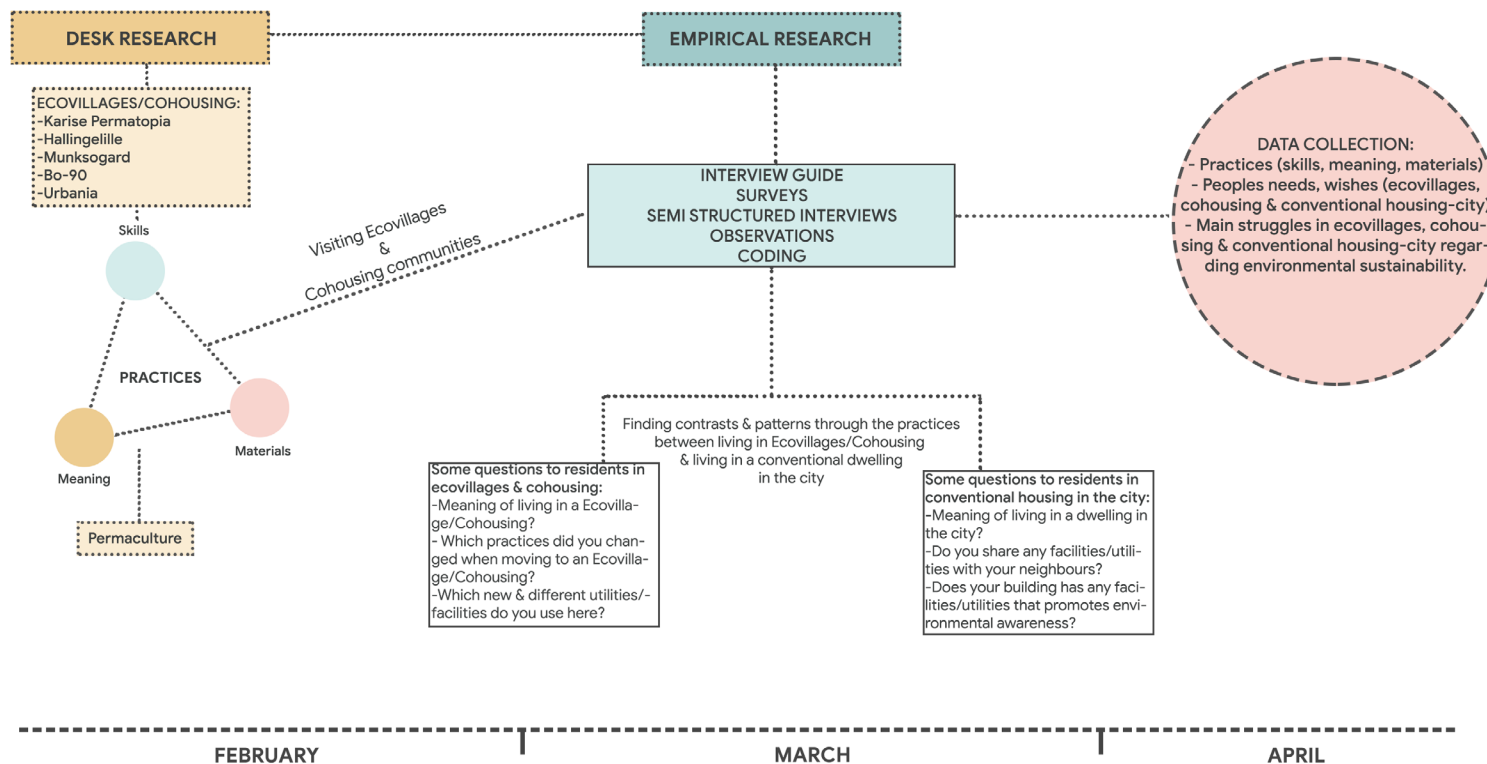
Illustration 8: Representation of our research strategy carried out in this thesis.

INTERVIEW GUIDE

An interview guide helps the interviewer encompass the subject-matter while conducting the interview. It is characterised in two ways: on the one hand, it leads the researcher slightly to the less arranged interviews to get to know the informant's viewpoint of the subject. On the other hand, it will include requirements to make sure the interviewer will accomplish the different matters of the interview. Furthermore, it holds a broad outline for the interview and gives the researcher the independence to select the questions in a different order depending on the flow of the interview. Interview guide can be a topic-based guide, and it entails different subjects within the interview regarding the researcher's interests. These subjects are structured within a framework to ensure that the researcher touches upon all the topics and get the information needed and they are based on the research question and the holistic concept that lies behind the investigation (Given, 2008).

We made an interview guide with all the needed subjects to be covered to create questions for the interview concerning the topic. The purpose of this was to include questions that helped us explore residents' practices, personal perceptions on sustainability, and in general, to achieve more information about people living in communities. Further, demographics, housing situation before the community, practices, sharing and motivation. For studying conventional urban dwellings, the interview guide was based upon these themes: demographics, living in the city, their dwelling, social motivation and environmental awareness,

In Karise Permatopia, we were only allowed to conduct one interview due to the high amount of inquiries from students and frequency of students visiting. So to not disturb the residents too much with interviews, each group of students could talk to one resident each. In Hallingelille, we conducted four interviews and were able to walk around the community, visit each of the residents' dwellings and do an interview with the people who were home. In Munksøgård, we were informed that interviews could be difficult to collect on a Saturday afternoon as not many residents would be home. We, therefore, left survey questionnaires in each of their common houses and collecting three answers from this. In Bo-90, we were invited to one of their common dinners with both residents and guests attending. This was a very successful way of conducting data as 12 residents filled out our surveys, and we had the opportunity to talk with many of the residents during a short amount of time.

All of the interviewed residents and asked respondents have been long term members of their communities except for the one resident in Karise Permatopia who just moved into the community less than a year ago.

SEMI-STRUCTURED INTERVIEWS

A semi-structured interview is a method to gather information based on open-ended questions. To create a semi-structured interview, an interview guide must be made in advance with the main subjects. This guide will help the researcher to follow the list of questions regarding the topic, but it will also allow freedom to choose the questions within the topic depending on the respondent answer. Moreover, the interviewer should avoid leading questions not to influence the respondent answers (Given 2008). Semi-structured interviews were done in the first visits to the ecovillages of Karise Permatopia and Hallingelile to get information about the mentioned topics in the interview guide. Hereunder, we present the different semi-structured interviews we conducted, and the findings

will be shown in the next chapter.

OBSERVATIONS

We used observations in our visits to the ecovillages and cohousing communities to document our experience during the visits. According to Flick (2017), it is necessary to make qualitative observations to take consideration of people, their actions and the setting involved. Also, observations always depend on the subject, the people involved, and how the observations are made. Therefore, it is crucial to involve social practices and to interact with the people. All the visits made to the communities included a guided tour and, in some cases, participating in a shared dinner with the residents or getting a cup of coffee with them afterwards. This is beneficial as it provides us with the opportunity to be in a usual scenery with them, which makes it possible to explore how their practices are naturally around common facilities and activities.

However, according to Flick (2017), observations do not equal just observing and taking notes. It also means to feel, see, listen, be present and write what you as a researcher experience within the setting. Flick (2017) further emphasised three aspects to aim for when observing: details, sequences and atmosphere. If an observer can find the different surfaces of people's performances and opinions, portrait successions in actions when performing practices and to perceive what people are not telling with words like the ambience of the situation, there would be interesting data to approach and analyse.
 Flick (2017) also states that there is always something to learn from the field, despite all the desk research made previously. Nevertheless, it is important that empirical research is supported by a prior theoretical investigation. The previous desk research led us to go to the field of Ecovillages and Cohousing communities to gain knowledge, investigate and get inspired by their sustainable practices and facilities.

SURVEY

A survey is a qualitative research method and a tool to collect data from a specific sample of the intended population that is being investigated. The collected information is gathered in a standard system or way where everybody is being asked the same questions (Scheuren, 2004). Surveys are considered a way to search for different types of data collection models without the need for a universal system. There are different kind of surveys, ways to carry them out and approaches (Blank, Fielding & Lee, 2008). Further, surveys also allow collecting data during "diverse times, with different modes for various population segments and with increasing avoidance of technology" (Blank, Fielding & Lee, 2008; P.12).

The most popular ways of conducting surveys are via telephone, mail, internet, personal interview or group administration. The choice of any of these ways of carrying out a survey will depend on the sample, subject and the accessibility to the people and facilities, as well as to costs, time, percentage of answers and questionnaire formulation (Fowler, 2013).

In our field research, we chose to conduct surveys through an online and by distributing paper surveys in one of the Ecovillages. Initially, our target population was residents from Ecovillages and Cohousing and, to make comparisons and contrast, we also sent surveys out to people living in conventional housing. The focus was to find the motivations and values of living in an Ecovillage, Cohousing and a conventional dwelling in the city.

Moreover, we wanted to find patterns and differences of environmental and social aspects within Ecovillages, Cohousing and conventional dwellings, and know if they were drivers in people's life and dwellings choices as personal values, ways of living or purpose of life. Furthermore, we wanted to understand the social practices or interactions between neighbours in their communities and their environmental awareness in their everyday life. All surveys were sent out to include all residents despite age range because we wanted to investigate people's motivations, choices and insights despite their age range.

To construct the survey we used open-ended questions to make respondents free to formulate their answers. We further combined the questions with closed-ended questions to easily and quickly conduct demographic information from the respondents (Houtkoop-Steenstra, 2000).

PAPER QUESTIONNAIRES

As stated, surveys can be submitted in different ways. If an interviewer is not needed to conduct the questions, surveys can be hand over and taken back at the moment, deliver the survey to the correspondent facility or individuals and returned within the same way or send it via the internet.

There are some advantages and disadvantages of dropping off surveys in households. The advantage is that it gives the researcher the possibility to explain the investigation in person and clarify the possible doubts that could occur. Furthermore, the response rate is likely to be the same as private interviews, and there is a higher chance for individuals to give more information and refer to other people around. Besides, an interviewer is not needed to conduct the interview. However, doing

personal interviews and dropping the surveys costs the same and an expert in the investigation is needed in both cases, either to conduct an interview or to explain the investigation or the purpose (Fowler, 2013).

After the first two visits to respectively Karise Permatopia and Hallingelille, we had conducted a total of five interviews with community residents. However, before the upcoming visit to Munksøgård we were informed by a representative and resident of the ecovillage that we would not be able to find that many residents home on a Saturday afternoon to do interviews with. We, therefore, made a questionnaire survey we could leave in each of their five common houses for the residents to fill out at any given time the following week. Further, we let the residents have the option of either filling out an online version of the survey or the paper version to meet people's preference. We wanted to include all residents despite their age, skills or knowledge with computers or electronic devices. "Those who do not possess Internet access or do not want to answer the web survey for any other reason can thus choose a traditional mode" (Blank, Fielding & Lee, 2008). Before our visit, we also sent an email to each contact person in the five different housing groups to share the survey with residents who might not have noticed the ones in their common house. We decided to make a questionnaire survey and deliver it to the residents as a backup in case we did not find residents to interview in our visit. Also, it worked as a complementary tool to gather the information that we would not be able to conduct by observations and field notes.

Internet surveys are digital platforms to tackle interviews without the necessity of a physical interviewer. The advantages an online survey provides are the quick data processing, time and cost reduction and the decrease in the possible mistakes within the transcription of data

from paper. Furthermore, it allows both investigators and interviewees the freedom of self-organisation. Interviewees can answer in the preferred time frame, device and tempo, and at the same time, it gives them intimacy. However, there are some weaknesses when using online surveys. Some of the limitations of answering online surveys from mobile phones are the dependency on system updates, screen sizes and the different operating systems that are nowadays. Another boundary when using online surveys is the non-response from the participants. This will possibly happen when rejecting the participation to the survey from the beginning, choosing the preferable questions to answer or dismiss the contribution during the survey. Offering rewards to the participants work as a stimulus and increases the number of answers (Blank, Fielding & Lee, 2008).

We chose online surveys to complement the paper surveys to include all age range of the residents as there are segments of the population that finds it more convenient with an online version. Further, the accessibility of a computer or other electronic devices bring gives freedom to the participant to choose the moment to do the survey. In addition, it brought us an easy and fast way of sharing the surveys via the internet.
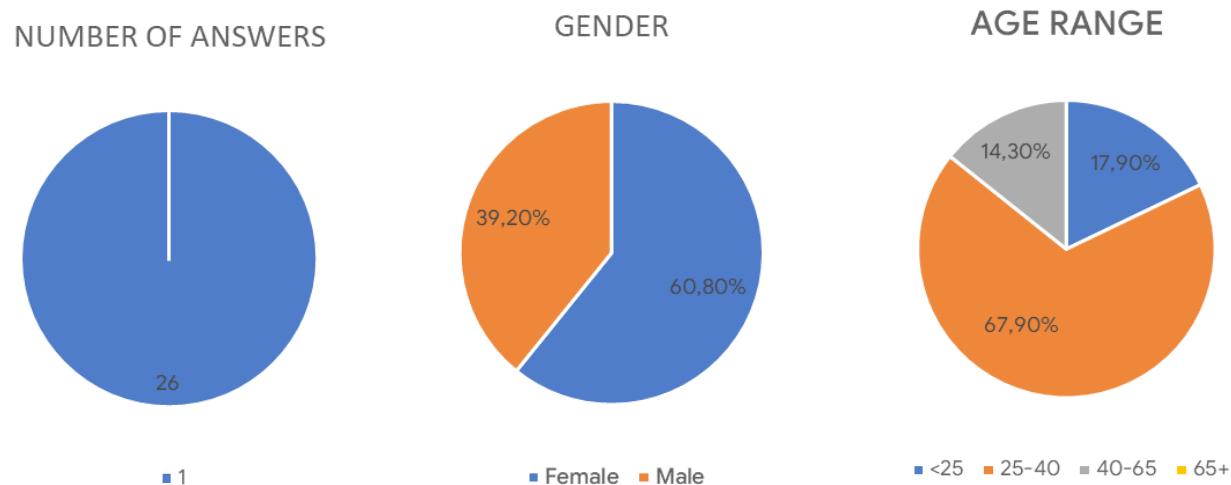

NUMBER OF ANSWERS   GENDER   AGE RANGE

Illustration 9: Info graphics of the people living in conventional dwellings answering our survey. Source: Appendix 5 - Data

collected in conventional dwellings

CODING

In coding the qualitative data, we systemised the raw data into conceptual categories to create themes and concepts. In doing so, our research question and chosen theories guided the coding process as the observations were seen through the lens of Social Practice Theory and Transition Management. The coding also helped us make sense of the data and assisted us in dividing and categorising elements of meaning in words, phrases and sentences (Lawrence, 2014). In our analysis, it helped us deconstruct the data and confine the meaning in specific contexts.

Strauss (1987) outlined three steps of qualitative data coding, which are suggested to be carried out during a coding process:

• Open coding - The first step of the coding process entails to slowly read the collected field notes, sources, or other data, to look for critical terms, central people, key even,ts, or themes. By doing this wecan locate themes and assign initial codes when condensing the data into analytic categories.

• Axial coding - This second step of the coding process, the focus moves away from the data and into the initial coded themes instead. More codes may occur, and these are noted down as well even though the primary task is to inspect and study the codes.

• Selective coding - During this third step of the coding process, the major themes have already been identified. Selective coding, therefore, begins by scanning all the data and previous codes to visually and selectively examine examples that illustrate the themes. In our case, this is done to identify and select data that supports the

categories developed throughout the analysis (cited in Lawrence, 2014).

DESIGN METHODS

Brainstorm is a method used to produce ideas on a specific topic. To achieve the expected results, a brainstorm session must follow some steps. These steps need to follow the arrangement of the session beforehand, create a sharped outline and have instructions to follow, guaranteeing efficient supervision during the session by a facilitator or supervisor. Further, finalising with an idea synthesis to classify the information acquired from the brainstorm, edit it and rate it.

An on-site brainstorming session has advantages regarding group dynamic and efficiency, providing ideas within a time frame. The role of the facilitator plays a relevant role within group brainstorming as it is essential that she or he is actively implicated and the ability to keep people engaged and safeguard the emerge of ideas. The facilitator is the one in charge of choosing the brainstorming method, facilitating the steps making sure there is a flow in the session and communication and setting the rules on the table (Kane & Trochim, 2007).

We used brainstorm method in different stages of the project as an on-site group session due to the cooperation among participants. Furthermore, due to the short sessions within different topics and the productivity that it entails when generating multiple and different ideas. The method was used when conceptualising a design game which will fulfil some demands and criteria to accomplish its purpose as well as in the second actionable experiment with the residents of Nørrebro Vænge to come up with ideas when co-designing.

Design game is a tool mostly used to engage participants for co-design at the beginning of a design phase of a project. Design games can have different intentions as for investigation, to teach design skills, to give authority to the user, or to involve numerous stakeholders. In this thesis, we will focus in the third purpose since the design game is made as a tool to engage the residents of an urban neighbourhood to further codesign a solution for one of their common areas. With this aim in mind, Vaajakallio & Mattelmäki (2014) stress that involving the final user in the design process through a design game will provide a common language between the designers to further deliberate future solutions. Furthermore, negotiations play a key role when co-designing to agree within the different perspectives, competences and thoughts. Vaajakallio & Mattelmäki (2014) also propose a list of what a design game provides such as: generate a shared language, encourages creativity and a curious mindset, enables the participants to visualise possible solutions, and facilitates the roles of the partakers.

As its name indicates, design games involve a game and the action of playing. Therefore, it can be related to different kind of games, especially to board games, but all of them differ from each other. However, all design games have some common aspects as pieces to interact with, rules, a setting, roles and performances, and a playing frame. This playing context is important because it provides a structured exchange of opinions to create empathy and understand each other's perspectives and, eventually, to later design cooperatively a set of solutions (Vaajakallio & Mattelmäki, 2014).

BOUNDARY OBJECT

A boundary object is helpful in a design process because it helps visualise, communicate and make complex data more tangible. It helps produce creative processes and conceptual phases. Furthermore, it can be useful for keeping a structured and systematic work process, and it can help facilitate interactions. Boundary objects can also ease the communication in a multidisciplinary dialogue and help the different disciplines share knowledge in a common language (Carlile, 2002).

A boundary object is also used for negotiation, as its purpose is to represent, learn and transform knowledge into finding solutions to a current boundary. Moreover, there are three characteristics of successfully using boundary objects, according to Carlile (2002). Syntax, semantic and pragmatic. The syntax boundary involves all types of boundary objects and is useful when creating a shared language for individuals to represent their knowledge. The semantic boundary comprises standardised forms and methods as well as objects, models and maps. It contributes with concrete ways for individuals to specify and learn about their differences and dependencies. The pragmatic boundary includes objects, models and maps, and facilitates a process where individuals can transform their knowledge (Carlile, 2002).

In this thesis, we used the pragmatic boundary approach through the use of a design game to help us facilitate our design process. The purpose of this was to make participants share their dependencies with the other residents/neighbours, and further make them discuss with one another on finding a solution on how to increase more social interactions in their common areas. The design game, therefore, worked as a knowledge sharing object because it transfers knowledge between the residents.

In the sense that they get introduced to each other's wishes and needs about how they want to use the common facilities.

Co-design emphasises on the fact that everybody has innovative skills and the ability to design if they acquire the right instruments and are situated in the right scene (Vaajakallio & Mattelmäki, 2014). Codesign pursue an event steered progress where interactions between participants are allocated in a pre-established setting and organised by a facilitator who will assign tasks to the participants. The result will probably not be the end solution but will reveal a co-build interpretation of the framework, insights, design ideas and wishes from the contributors (Brandt, 2001; Cited in Vaajakallio & Mattelmäki, 2014). Negotiations among participants are a core part when codesigning, as well as visualising different future possibilities that do not exist in the present moment.

Vaajakallio & Mattelmäki (2014) emphasises that codesign spaces must be organised beforehand and the arrangement of a discussion between participants, including designers, end-users and stakeholders is necessary and must be done from a facilitator, as well as encouraging the participants to focus on understanding each other. And last but not least, another codesign purpose is to steer the participant to bring ideas as portraying concepts, experiences and actions or practices (Mattelmäki 2005; Brandt 2006; Koskinen, Battarbee, and Mattelmäki, 2003; Kouprie and Sleeswijk Visser, 2009; Sleeswijk Visser, 2009; Mattelmäki, Vaajakallio, and Koskinen, 2014; Sleeswijk Visser et al., 2005; Halse et al., 2010; Cited in Vaajakallio & Mattelmäki, 2014).

It is essential to take into account the end user's vision and wishes around design as they will be the people who will interact with the final solution. When designing, it is therefore important to be empathic and put ourselves in the user's position, feelings and practices. However, it is more beneficial to involve the users in the development process to directly translate their experiences and thoughts through the constellations of their ideas.

DELIMITATION

A delimitation of our study is that we chose to conduct our surveys in Munksøgård and Bo-90 in Danish and that we facilitated all the workshops in Nørrebro Vænge in Danish. This was chosen to help and include the residents and make them more confident in expressing themselves. For that reason, all that data collected in Munksøgård, Bo-90 and Nørrebro Vænge has been translated into English by ourselves and therefore might consist of words and phrases which the residents might not have chosen to use if they were asked the questions in English.

Further, the literature review contains information from association homepages of Danish ecovillages regarding the status of sustainable communities in Denmark. These homepages have presumably not been scrutinised in the same way academic sources have been, which can lower the validity of the information used from these pages.

SUB-CONCLUSION

As we, in this thesis, seek to explore how urban neighbourhoods can become more sustainable by learning from practices from multiple sustainable communities. The data collection of this study is based on a qualitative research method, using multiple case studies as a research design.

4 THEORETICAL FRAMEWORK

THEORETICAL FRAMEWORK

In proposing an analytical framework to create sustainable development and changes in society. Various frameworks within transition theory can be mentioned. In our case, we explore transitions through the framework of Social Practice Theory and Transition Management. The reason for this is the focus on the practices in everyday life inside intentional communities to shed light on how to incorporate and understand these practice so we through a long term transition vision can develop more sustainable neighbourhoods in the city.

SOCIAL PRACTICE THEORY

Social practice theory is a response in the field of sociology to understand social actions as it is argued that theories of practice have the unused potential for understanding change. It provides an academic foundation and a conceptual framework around how to construct courses and policy interventions explicitly intended to address systemic challenges which create more sustainable routines and habits. The primary value is, therefore found within framing the way the world is understood and how problems are defined (Shove et al., 2012).

It is explained by many scholars within practice theory that unsustainable patterns of human activities are better studied and changed when developed within socially shared practices rather than in comprehensive individual choices (Hargreaves, 2011; Cited in Hausknost, 2017).

Reckwitz (2002) defines a practice as "a routinized type of behaviour which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge–in the form of understanding, know-how, states

of emotion and motivational knowledge (Reckwitz, 2002; P:7).
Adding to the stated definition, practices can be examined as groups of interconnected elements, as their interconnectedness is vital within practice theory (Kuijer, 2014).

ELEMENTS OF PRACTICES

A practice constitutes active integrations of material, competences and meanings, also known as elements. The establishment of practice refers to the behaviour that arises as a reaction to the links between the three elements: material, meaning and competence. Material affects how a practice is performed. The way it is performed affects the competences and knowledge linked to it. The meaning of why the practice is performed is also affected by the competences and material and will, therefore, influence how these are developed over time (Shove et al., 2012). This is illustrated below:
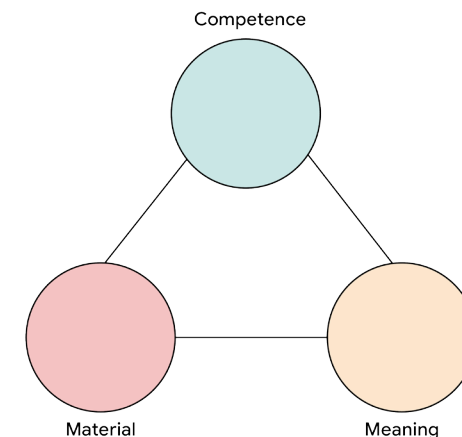
Illustration 3: The elements of a practice. Source: Own illustration based on Shove et al. (2012).

The material indicates the tangible elements arranged in a practice, e.g. technologies, infrastructures, physical entities, and of the stuff which objects are made. Material is known to be socially shared because the same types of material are available to all groups of people (Kuijer, 2014; Spurling et al., 2013).

Competences are accomplished bodily and mental routines, e.g. skills, know-how and techniques. This element is naturally shared knowledge about what is normal, acceptable and appropriate (and what is not).

Meanings are socially shared initiatives associated with the practice that gives meaning to it, reasons to engage in it, and reasons what it is e.g. symbolic meanings, ideas and aspirations. They are socially shared implicitly within groups of people.

The important part of these elements is that they interconnect in everyday life, as people incorporate them into their daily routines, and as a result, reproduce a practice (Kuijer, 2014).

To understand and describe how practices can change, Spurling et al. (2013) introduce a practice focused framework known as "Recrafting practices, Substituting practices and Changing how practices interlock".

Re-crafting practices: Decreasing the means of importance in current practices by transforming the elements of the practice.

Illustration 4: Re-crafting practices. Source: Own illustration based on Spurling et al., (2013)

As Spurling et al., (2013) describe, re-crafting practices is about analysing each element of the practice and shifting them to transform the practice into a more sustainable one. As an example, in the illustration above, the practice of washing the hair is constituted by elements as material: traditional shampoo as material; skill: cleaning the hair; and meaning: to feel clean. The image shows how the elements of an ordinary practice as washing the hair can be changed for elements towards more sustainable practice. By changing the elements of traditional shampoo to eco-friendly shampoo, the skill of cleaning the hair into the knowledge of natural ingredients, and the meaning of feeling clean to feeling clean consciously the practice changes into a more sustainable one.

Substituting practices: exchanging unsustainable practices for new and more sustainable practices.

CURRENT PRACTICE

SUBSTITUTED PRACTICE
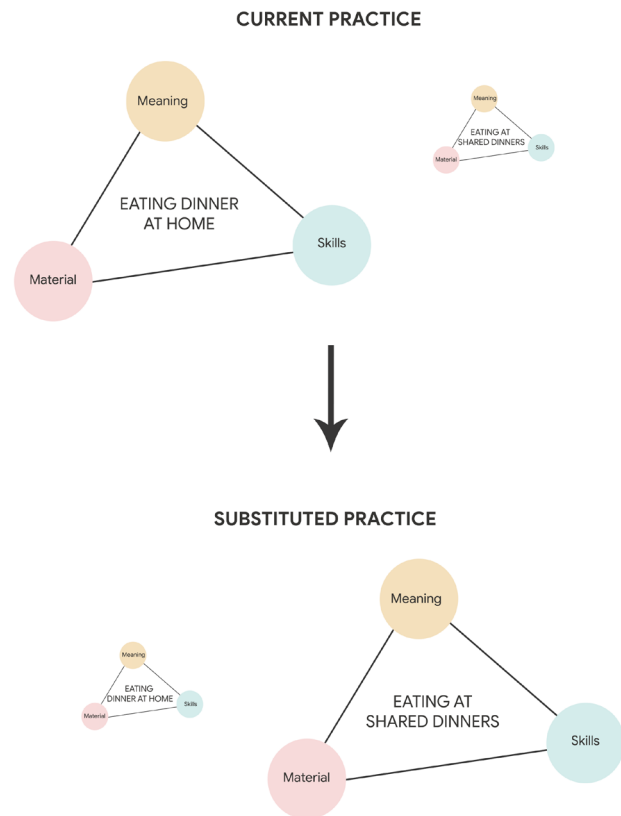
Illustration 5: Substituting practices. Source: Own illustration based on Spurling et al., (2013)

Substituting practices proposes a strategy that targets to discourage the current unwanted practices and replacing them with existing or new desired ones which is demonstrated in the illustration above. Meaning that this framework makes it possible to interfere future practices, through thinking how sustainable practices can accomplish the same needs and wishes from existing practices.

Changing how Practices Interlock: transforming how practices interconnect together. The relations among practices can fluctuate between connected practices.
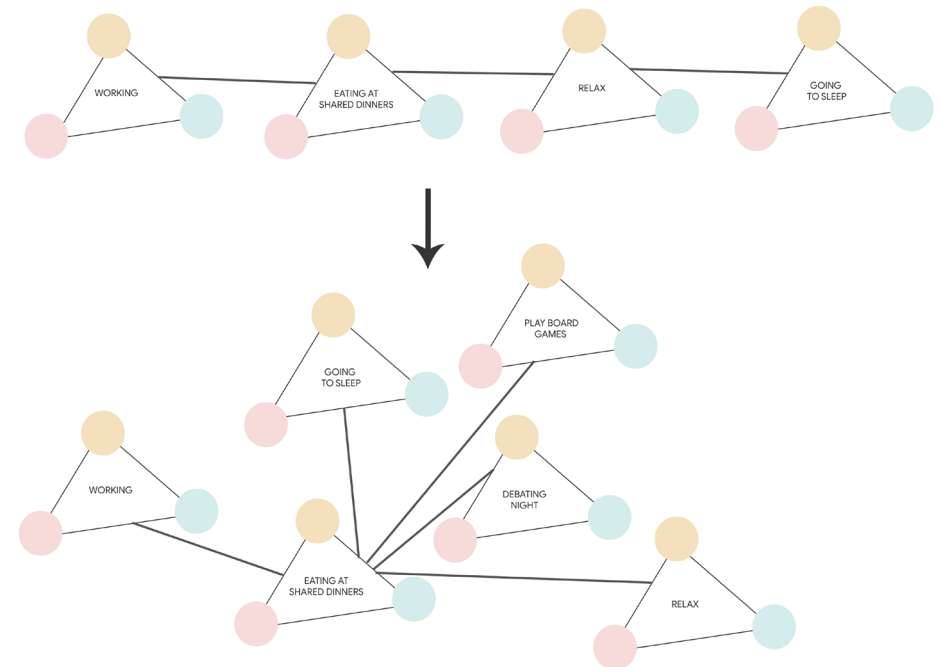
Illustration 6: Interlocking of practices. Source: Own illustration based on Spurling et al., (2013)

The interlocking of the practice identifies how practices are linked with one another. It focuses on the infrastructure of where activities are being carried out and the institutions of when activities are being carried out. This is important because it can give a more holistic overview of how to change practices when looking at the links.

To sum up, re-crafting, substituting and changing how practices are linked, can give diverse perspectives on how to examine practices, and at the same time, it presents ways to transform them.

As social theories do not lead directly to instructions for action despite the framework of how to understand and use the elements (Shove et al., 2012). We have decided to combine our theory framework with Transition Management due to its framework offers practical experiment and experience (Loorbach, 2007; cited in Loorbach 2010),

TRANSITION MANAGEMENT

Transition management is a governance framework focusing on facilitating and supporting sustainable transitions to envision, experimenting, evaluating and learning. The theory takes the perspective of creating changes within the system by generating a long term transition plan. Furthermore, its vision states that system alterations arise within internal trajectories in the response of the applied pressure to the regime (Smith et al., 2005). To do so, small moves of experimentation and learning processes are required to produce a set of short-term innovations. The iterative process of innovative experiments will develop towards a sustainable long term vision, converting and tackling the targeted societal problem (Loorbach, 2010). Transitions are lengthy, and it takes at least 25 years to generate a radical societal change. In this basis, short-term policy enhances a reflexive activity where the focus is constantly changing amongst future and present time (Frantzeskaki et al., 2018).

TM argues that it is important that strategies are cultivated within the system by encouraging pragmatic short-term experiments across long

term radical visions. Furthermore, actors with different backgrounds who affect and alters the system are an essential part of it (Frantzeskaki et al., 2018). These actors, a minor network of front runners who have diverse backgrounds, create a transition arena by reflecting upon different insights and solution paths of concrete and constant problem to create an impact in the system.

Transition management is described in four levels of governance activities and their role within the societal transition: strategic, tactical, operational and reflexive. These four governance activities are illustrated below.
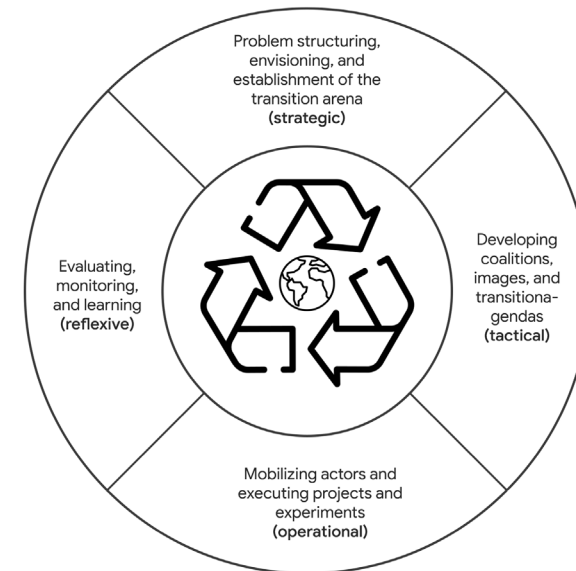
Illustration 7: The four levels of the TM cycle. Source: own illustration based on Loorbach (2010).

Transition Management Types	Focus	Problem Scope	Time Scale	Level of Activities
Strategic	Culture	Abstract	Long term (30 years)	System
Tactical	Structures	Institutions/regime	Mid term (5-15 years)	Subsystem
Operational	Practices	Concrete/project	Short term (0-5 years)	Concrete

Table 1: Transition management types and their focus based on Loorbach (2007).

The Transition Management Cycle (TMC) reflect the beginning of the transition within the strategic point by determining the structure of the problem, envision and settle the transition arena. Next, to it, the tactical level proposes to establish an agenda to detect and develop coalitions to create the transition. In the third place, the operational level suggests mobilising the actors and performing experiments. Finally, the reflective level proposes to evaluate, observe and learn from the experiments to create the long term vision. To summarise, the TMC is an iterative process that entails continuous experimentation with a variety of agendas, frameworks, and actors with diverse backgrounds and insights to ease the wished long term vision.

SUB-CONCLUSION

From this chapter, we have explored how social practice theory can be used to analyse and understand the practices in sustainable communities - and moreover, to use these sustainable practices which can after that re-craft, substitute and interlock practices in a traditional neighbourhood. From the proposed framework of TMC, we will focus on the TM Operational type as we want to focus on experimenting in a neighbourhood, and this level provides a concrete problem scope with the focus of practice.

The chapter further shows how the use of different methods helped us to acquire data in our research and support the experiments conducted.

5 INVESTIGATION PROCESS

MORE CARING

ADRESSING NEIGHBORHOOD CONCERNS

PERSONAL GROWTH

GET CULTURIZED

Højtid activities
Æblegrød
Video Games
Debate night
Storytelling workshop
Cooking classes
Bake cookies
Quiz night/kahoot
Cocktails workshop
Brain training games
(brainstormed twice)

Grow indoor herbs
Teach training skills
Shared dinners (brainstormed twice)
Candy Workshop
Cinema night (brainstormed twice)
Christmas workshop (Julestue)
Book club
Bread workshop
Solve rubik's cube
Board games night

INVESTIGATION PROCESS

In this chapter, all the results and findings collected through the outlined methodology of the previous chapter will be presented and examined in detail. This is done to explore the practices, facilities, motivation and differences between ecovillage and cohousing communities and conventional dwellings. Further, to be able to use these findings to facilitate an experiment in a selected design space. The examination of the data is therefore, vital for the continuous process of investigating the community concept to create more sustainable neighbourhoods in the city.

FINDINGS FROM CODING

The coding of all the semi-structured interviews and surveys was analysed with the focus of our research question in mind. The scanning of the data of the first part of our analysis, therefore, entailed underlining and making notes of identified words, phrases and statements. From this, we systemised the relevant data from each research context into relevant categories by colour coding and labelling the residents' actions, activities, differences and processes. These categories are compiled into an overview and presented in the table below:

Category	Ecovillages			Cohousing
Name of community	Karise Permatopia	Hallingelille	Munksøgård	Bo-90
Social practices	• Common dinners two times a week • Growing vegetables • Cooking together • Shared cleaning • Daily contact and interaction with neighbours • Yearly social activities such as Fastelavn • Sharing more goods with others • Working days together in the agriculture	• Common dinners four times a week • Growing vegetables • Cooking together • Shared cleaning • Weeding the gardens together • Daily contact with neighbours • Meetings • Yearly social activities such as school trips, building experiments, etc.	• Common dinners (varies between the 5 different living groups) • Growing vegetables • Weeding the gardens together • Cooking together • Shared cleaning • Daily contact with neighbours • Yearly social activities such as Christmas markets and animal shows	• Common dinners two times a week • Cooking together • Social meetings and interactions • Common cleaning • All residents have the function of being caretakers to make sure the building is clean and functioning • Helping each other with laundry • Gardening together • Having close contact with neighbours
Environmental practices	• Shared laundry room • Self-sufficiency in food/ vegetables • Permaculture inspired agriculture • Organic agriculture • Growing food/vegetables • Discharging and reusing wastewater from willow rinsing system • Children's clothes are shared between the residents • Consuming less products so everyone does not have one of each product • Sorting waste in more fractions	• Using swan labeled and eco-friendly soap and shampoo • Sorting waste in many fractions • Running a recycling shop in the community • Recycling clothing and materials e.g. swapping old children's clothes with the neighbours • Eating from the garden during all seasons of the year • Shared laundry room • Discharging and reusing wastewater from willow rinsing system • Purchasing environmentally friendly products	• Air drying clothes outside • Eating less meat/vegetarian food • Growing own food/ vegetables • Expanded waste sorting • Sharing four electric vehicles • Burning wood pellets for getting heat • Using less oil because the aim of becoming CO2 neutral • Shops in the community's own grocery shop with local goods • Maintaining individual dwellings according to the ecological guidelines in the community	• Shared laundry room • Not using fabric softener to do laundry • Washing clothes less often • Swan labeled and perfume free soap and detergents • Rainwater to flush the toilets and wash clothes • Sharing utilities e.g. freezer • Sorting waste in 12 different fractions • Eating less meat/vegetarian food • Reducing food waste • Buying more ecological and environmental friendly goods • Increased environmental awareness • Having more plants

Table 3: Compiled data of the practices found in the communities. Source: Based on Appendix 1 - Karise Permatopia Transcripts, Appendix 2 - Hallingelille Transcripts, Appendix 3 - Munksøgård Observations, Appendix 4 - Bo-90 observations, Appendix 5: Data from the conventional dwellings, and Appendix 6: Data from ecovillages & cohousing

The important findings to highlight regarding practices are systemised into the categories of social practices and environmental practices. The two categories represent the main differences when asked if the residents' practices changed since moving from a conventional dwelling and into an ecovillage or cohousing.

The table shows multiple social practices that the residents now do such as common dinners, common cleaning, gardening, and cooking together as well as daily contact with each other — emphasising on a committed and strong community where everyone helps out. Generally, almost all the interviewed informants and survey respondents explained how the social aspect is a very important aspect of living in a community which they value a lot.

"Our houses are small. They're functional. They're not crazy architecture like very extravagant. Their practical, functional houses focused not so much on enhancing space. it is about the community." - Resident from Hallingelille

"I know my neighbours, strong present/close community." - Resident from Bo-90

"The main thing is that people talk more together. My girlfriend was in the board meetings [in their previous conventional dwelling], so she knew most of the people there, but we didn't interact with them, there wasn't any kind of communication. Here you can go outside and talk to your neighbours, and that is a good thing- I like it." - A resident from Karise Permatopia

About the environmental practices, a lot of the changes can be related to environmental awareness, which has been increased by their fellow residents and living in a community.

"Being raised in the culture of a cohousing community I have increased my environmental awareness" - Young adult from Bo-90

"I am getting more and more aware of the environment because I have roomies that are interested in it. " - Resident from Bo-90

"Waste sorting, less meat in the diet, washing clothes less often, thinking more about food waste" - Resident from Bo-90

"We have to really think about what we put out there because the water does not go to a rinsing station it goes to the nature where the willows will soak up the water." - A middle-aged woman from Hallingelille

And continues to explain:

"So, for example, if the children have a sleepover with their classmates in the common house then we put our shampoo and our soap and say 'use that' because it can only be environmentally friendly that goes through. And therefore, everybody here grownups, children, guests etc. get used to the fact that we have to care about nature and that we cannot throw all kinds of strange liquids in our water." - A middle-aged woman from Hallingelille

However, social interactions can also support environmental and climate awareness, which was something we were able to experience first-hand during a (vegetarian) common dinner in the cohousing community Bo-90. One of the young residents suggested during the dinner that we all write down on small pieces of paper individual proposals for what we can do in our daily lives to be more climate-friendly. From this, we got important insights, viewpoints and opinions from all the residents and saw how engaged and informed they all were in this climate debate. All the proposals on the papers were then read out loud, and we all then had to decide by physically moving from one side of the room to the other based on how much we agreed or disagreed with the statement. An example of a statement could be "I think we all should eat less meat". All the residents seemed very smart and genuinely interested in the debate about climate proposals. Further, the debate seemed like a good way to share opinions amongst others and gain diverse insights on the topic in a fun way where everyone can explain their viewpoints. A resident from Bo-90 also explained how having shared dinners are more environmentally friendly as you can cook food for 17 people from one stove, instead of having 17 individual stoves cooking in the entire building (Source: Appendix 4 - Observations from Bo-90).

Another noticeable change in practices seen in many of the communities is the expanded or increased sorting of waste. They all claim that they sort their waste more now and in many different fractions compared to their previous conventional dwellings.

"We are all obligated to sort our waste. So each house will sort in 16 different fractions- I think, which is a bit more than regular households but we made an agreement with the local municipality that we would actually test ourselves on how we actually use these extra factions." - A middle-aged woman from Hallingelille

"More activity around waste sorting" - Resident from Bo-90

"Yes, mainly with the waste even though I think in Copenhagen you have a better system. We are still in the process of being self-sufficient, share more things and learn between each other" - Adult from children family, Karise Permatopia

Additional change of practice found in communities is regarding eating habits. Community residents eat more seasonal and locally food because they grow their own vegetables and try to eat from their own garden most of the year.

"We have families who only eat from the garden for the whole season, and others who only use it occasionally." - A middle-aged woman from Hallingelille

Further, they eat less meat and more vegetarian food. An example of this was made by the senior resident who gave the guided tour in Munksøgård. He explained how the seniors in their housing group had gone from having 29 % vegetarians when they moved in to now having 49 % vegetarians including himself — emphasising that most of the meals cooked in the senior common kitchen are more or less always vegetarian (Source: Appendix 3 - Observations from Munksøgård).

THE PERMACULTURE CONCEPT

Based on our preliminary research about the communities, we saw that both Karise Permatopia and Hallingelille are connected to the permaculture concept when reading through their community descriptions on their homepages. We, therefore, asked specifically what that entailed for their community and how they apply it.

During the visit to Karise Permatopia, we became aware that the permaculture concept is a work in progress. As the community is still newly established the concept has not yet been integrated, which was also explained during the tour around the community, and elaborated further by one of the residents:

"I think as Susanne [the woman who gave the tour around the community] said that we are more focused in growing organic food than applying permaculture, that is an ambition for the future" - Resident from Karise Permatopia

In Hallingelille, however, when all the resident who wanted to move into the community back in 2008 they all had to take a weekend course in permaculture. They further had the permacultural designer, Tony Anderson, from Permaculture Denmark to help them design their community and was the one who helped decide where to establish the three housing groups that exist in the community. Today the concept is not that strong and was elaborated further by:

"Over the years, the permaculture aspect is not so strong anymore. It is not something we promote as our big values. But I think that is also happened when a lot of new people moved in, and also wanted to form the package here." - Resident from Hallingelille

Evidently enough, there were no practices regarding permaculture to take inspiration from. In the future, it might be further established in Karise Permatopia in their agriculture and way of growing food, which can become a learning experience for others.

ANALYSIS

From these two initial categories of practices, we organised and divided the data into new categories to make a direct connection to the elements (meanings, material and competences) found in Social Practice Theory.

We, therefore, coded the data identifying materials (green technologies, facilities, utilities), meanings (motivation and significance for living in an ecovillage/cohousing) and competences (new skills or knowledge they mentioned they gained since moving in). This is portrayed in the table below.

Category	Ecovillages			Cohousing
Name of community	Karise Permatopia	Hallingelille	Munksøgård	Bo-90
Meaning (motivation for living in a community - the significance for the residents)	• Feeling of security • Community feeling • Living close to playmates for his daughter • To socialise more • Living sustainable	• Pride • Sustainable awareness • To care for nature • Open for diversity • Be a resource in the local community • Coexisting and living sustainable • Acceptance of others • Feeling of having an influence • To be heard • Taking decisions with others	• Animal welfare • Social aspects • To be close to nature • Community feeling • To be open minded • Empathy and caring for others • To help each other • Environmental awareness • Security • Community feeling	• Taking decisions with others • To be in a socio-political community • Social aspects • To be open minded and inviting • To be included • Increased awareness on sustainability and climate • Close contact with neighbours • To be part of a community • Living in a bigger place with other residents who have good values
Material (facilities, utilities and green technologies)	• Rainwater collection • Windmill for own electricity supply • Urine collection to fertilize fields • Willow wastewater rinsing system • Barn • Solar panels and batteries (not established yet) • Plan to have shared electric vehicles • Fields • Shared laundry room • Common house (not finished yet)	• Willow wasterwater rinsing system • Common room • Common kitchen • Sustainable building materials • Solar panels • Fields • Barn • Yoga room • Shared laundry • Rainwater collection • To have an expanded and organized waste sorting system	• Solar panels • Own heating system by burning wood pellets and therefore not connected to district heating • A small café • Urine collection to fertilize fields • Barn • Local boutique with local goods • Five individual common houses • Common kitchens • Common rooms	• Rainwater collection (60% of the water used to flush toilets is rainwater) • Common room and kitchen • Solar panels for air heating • Energy glass in windows • Water saving faucet in all the dwellings • All utilities are energy efficient with a high energy label • Shared laundry • Rooftop garden
Competence (skills and knowledge)	• To have knowledge about living sustainable • Knowledge about agriculture and growing food/vegetables • Being more aware of the environment	• More ecological behaviour around the laundry • Making room for diversity • Cooking for many people • Understanding of nature and where things come from • Learning how to cook with the seasonal vegetables from the garden • To be able to coexist and thrive • To be open • Working on social structures and decision-making	• Contribute to the democratic process in a constructive way • To be more inclusive and inviting • Being helpful • To care for other people	• Being a technical caretaker • Thinking more about food waste • Understanding of supply system in terms of water, electricity, heat etc. • Always keeping an eye out for maintenance and cleaning of the building

Table 4: Compiled data of the practices found in the communities. Source: Based on Appendix 1 - Karise Permatopia Transcripts, Appendix 2 - Hallingelille Transcripts, Appendix 3 - Munksøgård Observations, Appendix 4 - Bo-90 observations, Appendix 5: Data from the conventional dwellings, and Appendix 6: Data from ecovillages & cohousing

MEANINGS

When asking the residents the meaning for them to live in an ecovillage or cohousing community the social aspect, community feeling and security were some of the most significant and repeated answers collected from the informants and respondents. Some of the reasons are elaborated in the quotes stated below:

"I moved to this community because I do not want to die in a place where nobody knew who I was and wouldn't notice if I died or not. I want to be together with others in a valuable way." - A senior resident from Munksøgård

"I got older, and I needed a community." - A senior resident from Munksøgård

"My decision was influenced a lot by the social/community aspect. And the ecological aspect was very sensible to me, and combining those two aspects were genius to me." - A senior resident from Hallingelille

"My daughter of 2.5 years old can go outside the house and play, and there are no cars around, so she can open the door and run out and play with the other kids". - Adult from children family, Karise Permatopia

As the statements show, there are many various reasons why people seek to live in a community. For some seniors, it makes sense because they do not want to be alone. For young children families, it makes sense because they want to be in a safe area where their children can run around with other children. For others, the motivational driver for living in a community is the community feeling combined with being in nature.

"I wanted to be able to grow food, also I wanted to be closer to where my food comes from, and I wanted to do it in a community that was my basic search parameters. - A middle-aged resident from Hallingelille

"I think there was an urge for me to move out of the city and come closer to the nature. I believe I need that and we need that as people. As we always say if you do not really know about nature and appreciate nature, how can you devote yourself to take care of it? So the love for nature comes by being in it." - A middle-aged resident from Hallingelille

And the community feeling combined with the wish to save resources and live sustainable with good values and visions.

"Taking shared decisions. it is very important for me as an ecovillage feature. And also that you practically thrive to work and live as sustainably as you can. This includes building, waste, sewage, energy all these kind of things." - A middle-aged resident from Hallingelille

"I like small societies where you know people and share things, good and bad. And of course that we have some interests in common and values." - Middle-aged woman from Hallingelille

"I liked the visions and I believed that we could do more correct environmental and energy stuff." - Resident from Bo-90

MATERIAL

The data around the different materials show that all four communities have common facilities such as a laundry room and a common house or room with a shared kitchen. All these facilities support social activities which are showed in the table above. Further, all ecovillage communities also have gardens, fields and nature while Bo-90 has a rooftop garden where they do social activities such as weeding the garden or growing food together.

"It gives a great sense of ownership doing it, and gives a connection to nature, and you can go and weed together with your neighbours gives a social aspect as well." - A middle-aged resident from Hallingelille

However, the analysis of practices involving green technology (flushing toilets and washing clothes with rainwater; heating with energy collected from solar panels) show that practices barely changed compared to the residents' previous dwelling in a traditional house. Even though these green technologies are designed to be more sustainable, the practices around them remain unchanged. Further, the communities are still connected to the mainstream supply system. There is a systemic lock-in in terms of getting off the grid because the communities are limited by the legislation of the municipalities which are governed by the mainstream system. Therefore, even though these communities wish to be fully self-sufficient, it has not been possible yet. It takes a long time and multiple dialogues with the Municipality, also in the aim of becoming self-sufficient.

"We will never be able to be completely off grid. We asked from the beginning to have our own windmill, and they said no, that would never be a possibility. And that we wouldn't even be able to have our ecovillage. There were a lot of no in the beginning." - A middle-aged woman from Hallingelille

The significant aspect of the green technologies is that even though they do not really change the residents' practices, they provide environmental awareness, pride and self-confidence when using them.

"I can say it was a big pride also when we put up our solar cells, and we could see that we produced 102% of our own consumption. So that the meter (on the old system) actually rolled back. So in the summer we could make a lot of energy, and it would actually roll back, and we could use it in the Winter." - A middle-aged woman from Hallingelille

"We have to really think what we put out there because the water does not go to a rinsing station it goes to the nature where the willows will soak up the water." - A middle-aged woman from Hallingelille

COMPETENCES
When asked if the residents learned new skills since moving into their respective communities the answers from the informants and respondents showed firstly, knowledge gain about how to cook for large groups of people, how to live sustainably and grow seasonal food and vegetables. Secondly, personal development and growth in terms of being more social, open-minded and including of diversity as well as being respectful and empathic towards fellow residents.

"We worked a lot of the social structures and the decision making and the project work. How to coexist, how to thrive, and these kind of things, that is very important to us." - A middle-aged woman from Hallingelille

"Cooking for many people." - A middle-aged woman from Bo-90

"Have learned and hopefully also practised acceptance of relationships."
- A middle-aged woman from Bo-90

"For the children, it is also very important to see and be part of the working days to see how things grow. And knowing that from August to October we eat a lot of beetroot, for instance. And in the beginning, we looked at all the kale and all the different cabbage and thought 'how do we cook with that?'. So we also realised that according to the transition concept of all rescaling that we needed to learn a lot of new skills in order to know how to use and cook all these vegetables that are easy to grow in Denmark instead of going to the store. So we had to learn from that, and it is educational." - A middle-aged woman from Hallingelille

The main points of the analysis are that social aspect, shared values, visions and security are among the strongest motivational factors for people to choose community living. Common areas such as a dining room and kitchen support and facilitates social atmosphere and practices. And the continuous daily contact and practices of eating dinner together, cooking together, having dialogues and meetings together increases and establishes the sense of community. Further, the physical setting makes sure to support the community feeling, so it sustains over time. Living in a community also shows contribution to growing sustainable awareness and even change of practices as we saw in the increase of vegetarians in Munksøgård.

URBAN CONVENTIONAL DWELLINGS

To make the expected contrast and comparison between the communities and conventional dwellings. We coded the data in conventional dwellings in a similar way by systemising the data into themes and then dividing that data into further categories.

The practices in conventional dwellings signified very general activities which for the most part, are done individually. The respondents were therefore specifically asked if they do any social activities with their neighbours, and if the building/area their dwelling is placed in promotes any environmental practices.

Conventional dwellings (based on 26 responses)				
Everyday practices	Social practices with neighbours	Suggestions for activities to do with neighbours	Environmental habits/behaviour supported by the building's facilities/utilities Shared facilities/utilities with neighbours	Meaning and important aspects when choosing where to live
• Go for a jog/walk • Walk the dog • Watch TV/movie • Cooking • Communting • Driving to school/work • Cleaning • Eating • Reading • Social media (Facebook/YouTube) • Going to the supermarket • Walk children to school • Collect children from school • Listening to music/audiobooks/podcast • Relax • Preparing lunches • Showering/bathing • Sleeping • Socialising with friends • Drinking beer with friends • Scouts meetings • Playing sports • Afternoon activities with children	• Taking walks • Walking dogs at the same time • Shared dinners • Gardening (2 yearly yard days) • Yearly meetings about improvements of the dwellings • Annual work day to clear the backyard • Havings drinks together once in awhile • "Hygge" in common areas e.g. having a beer on the bench	• Barbecue parties in the Summer • Playing board games • Trips together to meet more people • Shared dinners in the backyard • Meeting neighbours for drinks • Inviting neighbours over for dinner • Have a 'get-together' atleast once every six months • If we had a shared recreational space (garden or such) that was not accessible by non-residents. I would like to do some shared maintenance of it	• Recycling and sorting of waste • Focus on bikes • Growing plants • Shared laundry room • Good ventilation • Having a terrrace with flowers • Bike/car parking • Waste bins and waste sorting area • Laundry room e.g. washing machine, tumble-drier • Gardens • Outdoor benches and tables • Backyard • Basement	• Central placement/location • Transportation possibilities • Nearby friends and family • Price • Nature and green areas • Security • Privacy • Safe neighbourhood • Neighbours • Accessibilty • Space • Close to supermarkets • Energy efficient building • Integrated utilities e.g. washing machine • Near good school/institutions • To have a garden

Table 5: Practices found in conventional dwelling.
Source: Based on Appendix 5 - Data from
conventional dwellings

7 out of 26 respondents answered that they do activities with their neighbours. However, several of the mentioned activities are only done on a yearly to half-yearly basis. So when asked if they would like to do more activities with their neighbours, 5 out of 17 respondents answered yes and stated:

"Yes, why not shared dinners at our backyard." - A respondent from conventional dwelling

"Yes, be nice to meet neighbours for drinks etc." - Respondent from conventional dwelling

"Yes, a bbq once in a while or invite them for dinner." - A respondent from conventional dwelling

Regarding the environmental practices, the most common answer was sorting waste, which 13 out of 26 respondents mentioned. A few respondents also stated that sorting waste is a requirement by the municipality insinuating that they sort waste because they have to. Further, the survey showed us that it is important for 21 out of 26 respondents to live in an environmentally friendly dwelling.

21 out of 26 respondents live in a building shared with their neighbours. When asked if the respondents share any other facilities or utilities, they most common answer was a laundry room and parking space.

When asking the respondents what is important for them when looking for a place to live nature and green areas were some of the most common answers as well as a good location, transportation and neighbours.

COMPARISON OF PRACTICES IN COMMUNITIES AND CONVENTIONAL DWELLINGS

The comparison of the practices in the different settings shows that there are a lot more common practices with the neighbours in an ecovillage and cohousing community in contrast to conventional dwellings. Conventional dwellings also imply more individual practices carried out inside your own private dwelling, e.g. watching TV/movies, cleaning, cooking, etc. and the socialising is presumably done outside of the residential space, e.g. going out with friends, going to the gym/playing sports. When asked which facilities and/or utilities residents in conventional dwellings share with their neighbours, most answers point out the laundry room, parking, garbage/waste sorting area and garden. Which is not exactly the setting that invites and supports neighbours to do activities together. When asked if they want to share facilities/utilities with their neighbour's many respondents from the conventional dwellings explain how they appreciate and value their privacy. However, they occasionally want to do social activities with their neighbours, e.g. barbecues, playing board games, going on trips, having drinks in the garden, etc. To conclude on some of the meanings and important aspects when finding a place to live, there are many similarities compared to communities such as nature, green areas, security and neighbours.

ELEMENTS OF LIVING IN A CONVENTIONAL DWELLING
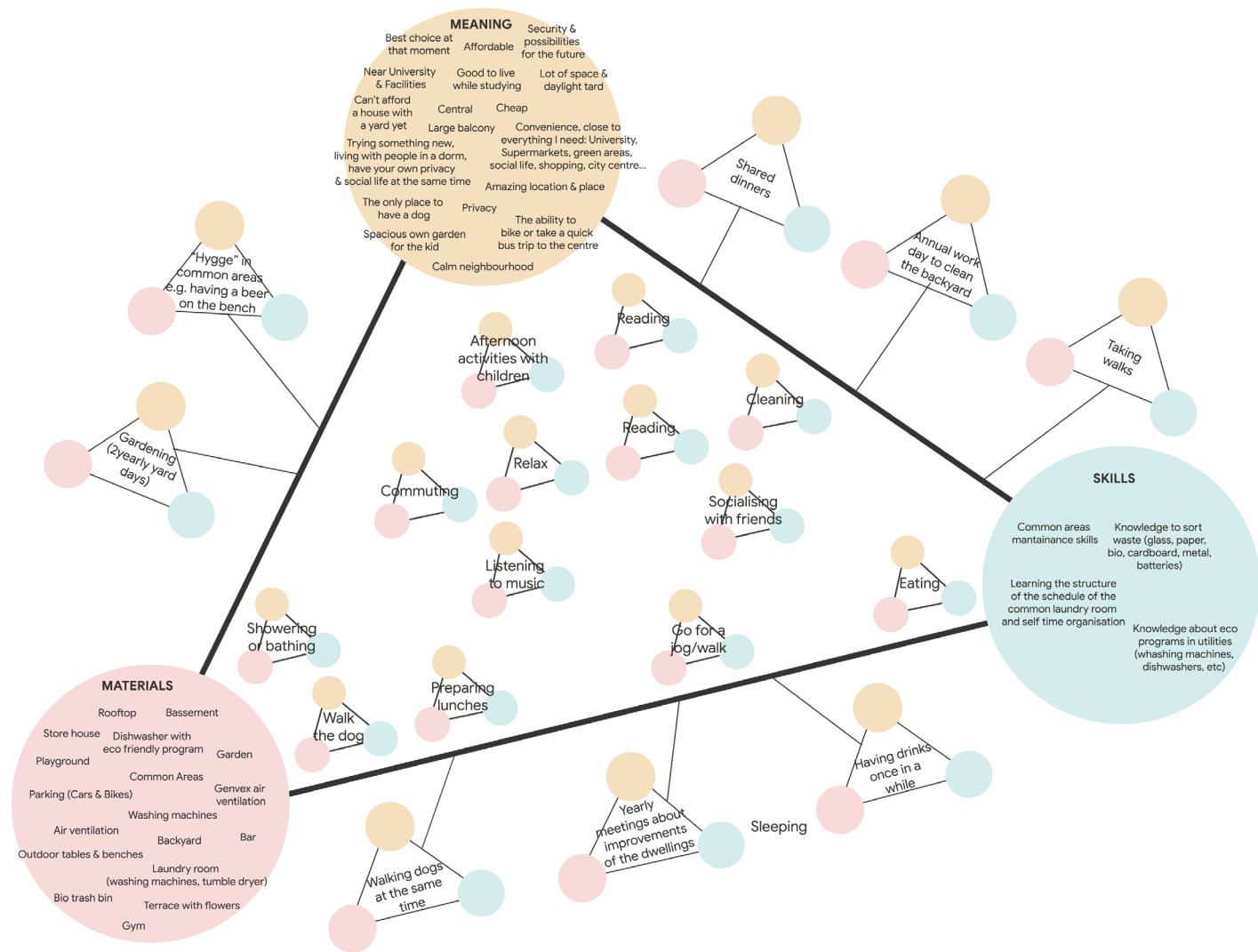
Illustration 10: Elements of living in a conventional dwellings.

ELEMENTS OF LIVING IN A SUSTAINABLE COMMUNITY
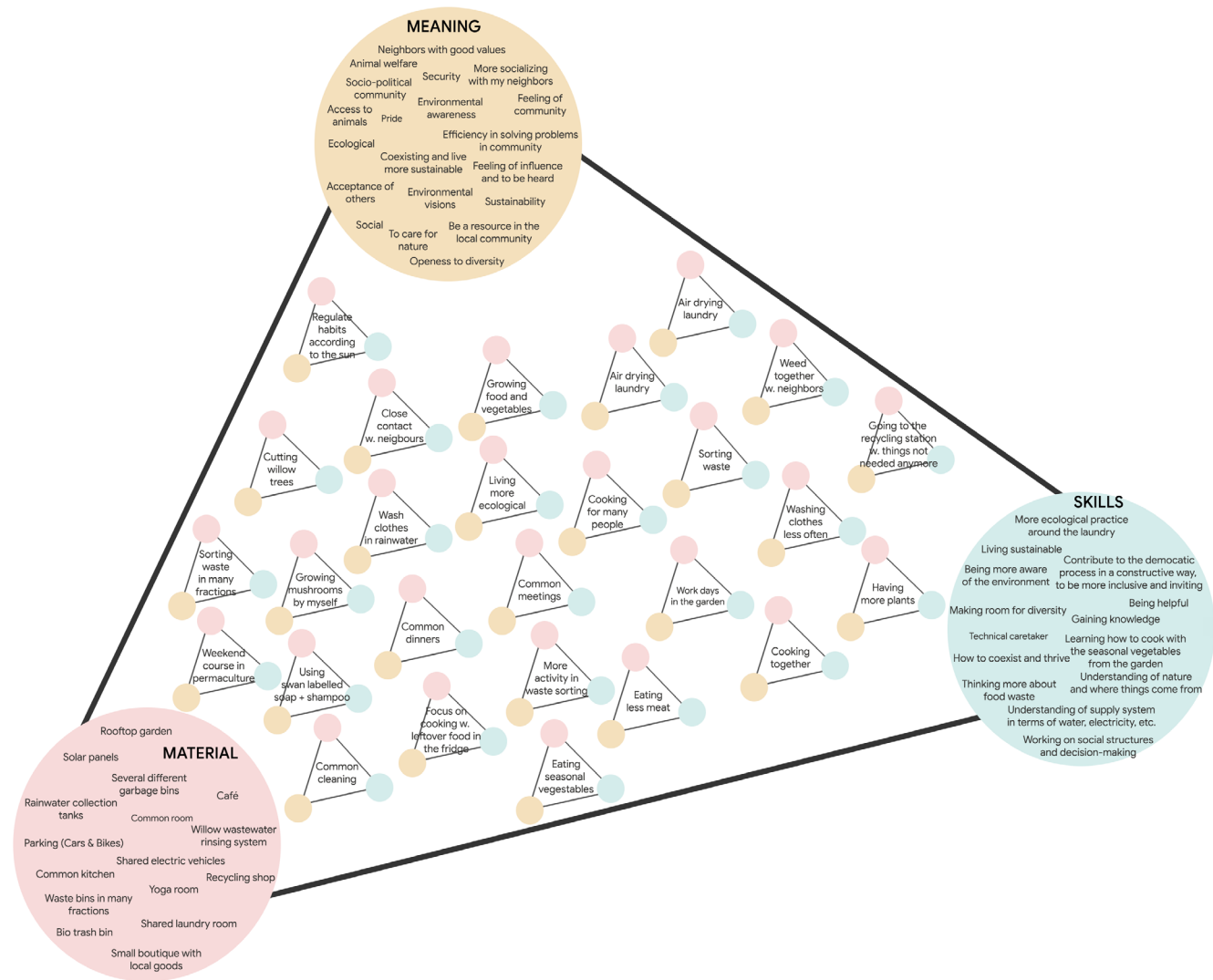
Illustration 11: Elements of living in a sustainable community.

The two illustrations sum up and portray the compiled analysis of the elements of living in respectively sustainable communities and conventional dwellings.

So how do we make shared practices take place in a conventional urban dwelling? Based on Spurling et al. (2013) if we are to understand how practices are distributed within and between societies, we need to think about how materials, meanings and competences can be re-crafted and substituted for more sustainable practices. We will explore this in the next chapter when our design phase begins.

SUB-CONCLUSION

The analysis of the collected data made it apparent that there are multiple social practices and environmental practices within sustainable communities in comparison to conventional dwellings. These identified practices made us able to analyse the elements of living in a conventional housing and the elements of living in a sustainable community. The elements identified in the analysis of community practices will be part of the next step of our process in achieving a more sustainable urban neighbourhood. The framework of Transition Management Cycle will be applied, and moreover, we will conceptualise the elements in a design game to use them more actively and experimental.

6 DESIGN PHASE
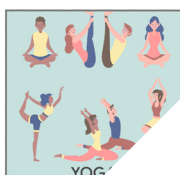
DESIGN PHASE

From understanding the elements that constitute the practices in sustainable communities and traditional housings, we now move into the design phase. In this chapter, we will use the Transition Management framework to manage small steps of visioning, learning and experimenting to make short-term experiments develop into a long term transition vision.

DESIGN STRATEGY

Therefore, we have created a design strategy to involve citizens from an urban neighbourhood to these elements through a design game. The purpose of this is to do experiments regarding how to develop a more sustainable neighbourhood. Finally, we aim to co-design a concept with the citizens to facilitate experiments that contribute to the development of sustainable cities and communities.

SUSTAINABLE TRANSITIONS

Using the framework of the operational level from Transition Management Cycle to do actionable experiments and further envisioning a long-term transition towards a sustainable neighbourhood.

Problem structuring, envisioning, and establishment of the transition arena (strategic)

Developing coalitions, images, and transitiona- gendas (tactical)

Mobilizing actors and executing projects and experiments (operational)

Evaluating, monitoring, and learning (reflexive)

DESIGN GAME
Design game as boundary object for knowledge sharing between the citizens of an urban neighbourhood and us. Also, as an engagement tool to further co-design with the aim of reating more sustainable practices.

Aim:
-Promote the *community concept* and its benefits within the social and environmental aspects to the citizens.
-Create a meaning/interest to the citizens to become more sustainable by doing social activities together .
-Generate citizens' common purpose & align their wishes to be more sustainable.
-Co-design with the citizens a concept which eventually will create more sustaina- ble practices.

Skills

PRACTICES

Materials

Meaning

The design game will be based on the analysis of the practices observed in Ecovillages/Cohouses using the Practice Theory framework.

CO-DESIGN
with the residents of an urban neighbourhood

Illustration 12: The Design Strategy.

To introduce sustainable elements from everyday practices from sustainable communities into sustainable ones, we will conceptualise the identified elements into a design game.

DESIGN GAME DEVELOPMENT

The aim of this design game is re-crafting practices into more sustainable ones in an urban neighbourhood within a long term period. Another purpose of the developed design game is to promote the community concept and social activities and interactions. Furthermore, to share knowledge about the advantages that social and environmental practices contribute with, when doing them together.

Apart from the purposes above, the design game is created to facilitate a framework of negotiations and discussions between the participants and align ideas. Furthermore, it will act as a boundary object where knowledge will be shared between the participants and us. Moreover, It will also be an engagement tool to engage the actors to further co-design a concept to create social activities. Through this approach, we will also gain knowledge, which can further help us evaluate and learn from the experiment.

To achieve the desired outcome from our design game and to accomplish its purpose, a list of requirements and criteria were brainstormed and categorised in a table. (Appendix 6: Design Game process Worksheet)

After setting up the requirements and criteria, we brainstormed ideas for each category and placed them in a chart. The structure of the morphology chart with all the brainstormed ideas enabled us to select from the different ideas within each category and make the concept for the design game.

Picture 1: Developing the design game.

DESIGN GAME CONCEPT: "FÆLLESHOOD" GAME

We created a concept which fulfils the requirements and criteria required to gain the desired outcome. This concept was selected from the process of merging two different concepts. The process of the creation of the design game can be seen in Appendix 7: Design Game process Worksheet.

DESIGN GAME ELEMENTS

The design game is based on the elements of Practice Theory and is meant to be universal. To do so, we will materialise two elements of practices into wood pieces as permanent components of the game. These two elements are meanings and competences. The elements regarding materials will constitute the potential spaces to do shared activities within or surrounding a neighbourhood. This element will be materialised as pictures of the spaces. In this way, the game can be approachable in different neighbourhoods. Thus, the materials can be materialised and added once the neighbourhood has been selected, investigated, and the spaces identified.

Regarding the conceptualisation of the elements, competences will be represented in squared pieces as activities that could be done in groups. The meanings will be represented in circled pieces as the benefits of doing activities together, as well as environmental and social advantages to provide awareness. To conclude, the element that constitutes materials will be pictures of the spaces of the neighbourhood.

A rating system is also part of the game to rate the different areas/materials.

Picture 2: The Design Game "Fælleshood".

SUMMARISING THE DESIGN GAME

The Design Game aims to transfer knowledge of the elements of practices from living in a sustainable community. The purpose is to facilitate the re-crafting of the current practices of the citizens of a neighbourhood into more sustainable ones within a long term period. By doing so, citizens can contribute to the development of a more sustainable neighbourhood.

DEVELOPING A LONG TERM TRANSITION VISION TOWARDS A SUSTAINABLE URBAN NEIGHBOURHOOD

Our long term transition vision is to develop a more sustainable neighbourhood in the city through a participatory co-design process. The purpose of this approach is to create knowledge about sustainability through our design. Therefore, we decided to investigate the common residential facilities at Nørrebro Vænge, a social housing on Nørrebro. This choice was made due to the urban setting this neighbourhood is placed in - as well as the accessibility to the area and facilities as one of the authors of this thesis lives there.

To arrange and envision a plan, our first step was to investigate the site-specific area and facilities at Nørrebro Vænge to contemplate and visualise what is possible to do within the frames of the area.

INVESTIGATING THE AREA OF NØRREBRO VÆNGE
Nørrebro Vænge is managed by AKB and consists of five buildings with 16 individual stairways and a total of 350 dwellings (akb-kbh.dk, 2019). The dwellings were originally built to accommodate seniors, but during the last few years, AKB started to offer the dwellings to young adults studying. The residents at Nørrebro Vænge is, therefore, now a mix between seniors and young adults. However, all the social initiatives that are found in the neighbourhood were all established by the senior residents before the dwellings were offered to young adults.

The settings of the area are based on multiple field observations to get to know the facilities and how they are used. Eight common facilities were identified and taken into account and presented below. However, the common facility known as the 'Motions cafén' at Nørrebro Vænge was not included amongst the chosen facilities. The reason for this is our aim to engage and involve all residents to do activities together including the numerous seniors with disabilities and walkers who are not able to do physical activities which a gym facility supports residents to do.

Laundry room

The cinema

Picture 3: The various common facilities at Nørrebro Vænge.

the common indoor areas such as the shared kitchen and 'Festsalen' are not part of the residents' rent and therefore needs booking and an additional paid deposit to be used and accessed.

Further, the morning of the first observations, we met the senior woman who is responsible for the library that explained how the facilities are rarely used. In the outdoor setting, another senior was sitting on a bench in one of the green areas with his dog. Besides these two senior residents, no one else was to be seen in the neighbourhood which the pictures also emphasise.

DEVELOPING A MORE SUSTAINABLE NEIGHBOURHOOD

In establishing the transition arena, our strategic plan is to use the environmental and social practices found in ecovillage and cohousing communities to develop a more sustainable neighbourhood in the urban area using Nørrebro Vænge as our case study. Our preliminary observations of the common areas pointed out that the residents of the area do not use the common areas often. Therefore, we will introduce our design game which will act as a strategic tool for the purpose sharing knowledge about the elements of living in a sustainable community and all the benefits the social and environmental practices provide. We want to explore how experimenting with the elements of community practices can facilitate social interactions in a traditional neighbourhood. Furthermore, in the long run, contribute to a more sustainable neighbourhood.

Engaging actors

To develop coalitions for our vision, we bring together a small group of actors with various experiences and understandings to achieve the vision of creating more sustainable neighbourhoods in the city. This is done to

Picture 3.1: The various common facilities at Nørrebro Vænge.

During our first initial observations of the area, it showed that all the common indoor areas were empty and locked away. Residents are not able to access the common areas without separate keys from the administration or through booking the facilities in advance. This is because

make the actors discuss and share knowledge with one another in order to come up with proposals for potential transition agendas. The actors within our framework are the administration of KAB, the social caretaker (Monika), the board members at Nørrebro Vænge, the residents who are voluntarily in charge of three of the common facilities as well as the rest of the residents. In order to establish allies, we invited actors to join our design game through informal invitations put up inside each of the 16 residential stairways, and on Nørrebro Vænge's Facebook group. By doing so, we were able to engage actors based on their interest in making Nørrebro Vænge a more sustainable neighbourhood. The invitation emphasised on how the engagement of coming up with directions together, the residents can have more interactions and activities together and make more use out of the common areas.

To help the process of making transition agendas, we identified eight common facilities that could become potentially actionable experiments. The purpose of this was to introduce the actors to these experiments so they together could discuss and agree on which one they want to increase interactions and activities is based on the frames of the facility and the willingness to do practices together. These eight experiments are presented below.

Potential experiments	
Experiment 1	Common room / kitchen
Experiment 2	The terrace
Experiment 3	The Cinema
Experiment 4	The library
Experiment 5	The barbeque area
Experiment 6	The plant boxes
Experiment 7	The green areas
Experiment 8	The laundry room

Table 6: Potential experiments.

In carrying out the experiments, our initial experiment started with a design game session created to engage as many actors as possible to take action and to mobilise them through the community concept. Moreover, for the purpose of the design game, to re-craft current practices of the residents into more sustainable ones in a long -term period. After we identified the different common facilities as experiments, we materialised them as the element of material in the design game.

The experiment of the design game is therefore used as a boundary object to sharing knowledge between the neighbours in how they want to interact with each other based on individual needs and wishes. More so,

to create a dialogue and discussion so they together as neighbours can strengthen the community at Nørrebro Vænge. From this, we engaged the actors even further to be a part of an additional experiment about making the chosen facility support the common activities and interaction they want to do together. The actionable experiments planned are, therefore complementing and strengthening each other to establish the community feeling and move towards the long term transition vision.

FIRST ACTIONABLE EXPERIMENT

We invited the neighbours of Nørrebro Vænge to participate in a small experiment with a design game. The aim was to facilitate elements of practices from sustainable communities to re-craft the practices of the residents into more sustainable ones in the long term period. By doing so, we aimed to support the interest to do activities together, which can potentially facilitate the feeling of community. Furthermore, we wanted to gather information from the experiment to make an iteration after reflecting, evaluating and learning from it, and then propose a new experiment. We also wanted to guide the participants to reflect on the potential existing facilities which could fulfil everybody's wishes of activities to do together to become more sustainable. Eventually, by steering an open dialogue and negotiations, we engaged the residents into a future co-design process to envision new practices. in the selected common area.

We prepared a schedule with estimated time duration, different steps, a facilitation guide and provided a design game to promote the participants to interact with each other at the same time they shared knowledge.

Four seniors and one young adult attended the experiment. One of the participants is a board member and, the social caretaker of the neighbourhood also attended to observe and help with the game.

The workshop started with an introduction of us as sustainable design engineers and facilitators, a brief explanation of our thesis work, the purpose of the design game and the different steps and pieces of the game. It was essential to communicate the importance of what constitutes a community about sustainability so they could include the awareness of sustainability in their discussions.

1) Envisioning shared activities

We placed the pictures of the eight shared facilities on the table and gave them a handful of game pieces with the activities to each of the participants. We asked them to place the pieces of activities they could do together on the pictures of the facilities they thought they could be

Picture 4: Playing the design game

Later, we gave them a rating sheet and asked them to evaluate the facility from 1 to 5 based on which facility they would most like to redesign regarding the potential of the activities that could be done together in that facility and their wish to do them. This phase aimed to create interest in doing activities together in the common areas.

Picture 5: Choosing the common room/kitchen to do activities in

Once the residents had rated all eight facilities, we asked each of them to explain their favourite facility, to be redesigned to do the wished activities in it. After that, we guided them to negotiate and discuss which one should be the chosen based on their individual rating. The common area chosen to be redesigned was the common room 'festsalen'/Kitchen.

We removed the rest of the facilities and all the activities pieces and only left the chosen facility on the table, still with the activities placed on top.

2) Aligning interests
In this step, we gave them all the activity pieces again and asked them to place the activities they wish to do together in the chosen facility regarding the skills they have, and how that facility offers the option to do it. They could also change the chosen activities from the previous step of the game, and switch them for new ones.

Picture 6: All the activities they want to do in the common room/kitchen.

3) Introducing environmental and social meanings

After the participants placed all the wished activities, we gave the participants the game pieces with meanings and asked them to put the pieces on top of the placed game pieces. In this phase, the requirement was based on the question: why is it important for them to carry out these activities together? The purpose of this phase was to share knowledge with the participants about the meanings related to the social and environmental benefits of doing social interaction.

Picture 7: Interacting with 'meanings'.

Once all the activities and game pieces with meanings were placed, we explained how these common activities could create a strong community as well as contribute to social and environmentally sustainable practices. For example, shared dinners can contribute to social interaction, social skills development, empathy, learning new skills (cooking, etc.); and environmental sustainable as less energy is used on cooking as only one stove is used for cooking for a group of people, providing waste awareness, consumption awareness (awareness on needs), being more conscious about their consumption choices, footprint awareness, food waste etc.

At the end of the game, we asked the residents to be part of the next experimentto co-design the chosen space to support more social interactions and activities.

FINDINGS

The participants all agreed on redesigning the common room/kitchen at the next actionable experiment.

All the participants found the game interesting and easy with the facilitation of the steps despite one senior woman who could barely hear and struggled to understand the different parts of the game.

The participants were engaged and helped to explain the different tasks to the senior woman who could not understand the game very well.

In the first step, when placing the activities on the facilities, the residents struggled to place some of the activities as they could see them being performed in another facility that was not presented. Therefore, they placed them apart from the pictures presented. To think out of the box, we guided them to focus only on the presented facilities. Once they understood the explanation, they placed the activities in facilities that the activity could also be performed.

There were discussions and negotiations in every step of the game, and everybody was engaged.

Furthermore, all the participants were interested in doing activities together, and they discussed some barriers that limited them on not doing activities in the existing facilities. Some of the comments were related to the lack of knowledge in general about all the facilities and their use.

At the end of the game, everybody was engaged and interested in doing activities together, and three people volunteered to be part of the next actionable experiment to co-design for further re-design the chosen space.

There was a lot of positive feedback from everybody:

"This game is very interesting; it makes you think". - Middle-aged man

"This game could be sold to create more social life in the neighbours". - Middle-aged woman

"We could do all these activities here; we have the space for it". -Middle-aged woman

Also, there was a lot of support from the social caretaker, Monika, at Nørrebro Vænge. She is very interested in creating more social life in the neighbourhood. She observed during the experiment, took pictures, and was involved in how the design game communicate, including all the participants visually and actively. She even stated:

"If you want to play the design game in a different neighbourhood I can arrange that". - Monika, the social caretaker

Furthermore, the game pieces would have been easier to understand for the participants if they were written in Danish.

Illustration 13: Quotes from the participants during the experiment.

EVALUATION OF THE EXPERIMENT

To proceed with the evaluation of the experiment, we will analyse the findings and then go through the limitations to learn from them before the next experiment. The findings showed that the residents were positive about doing activities together and co-creating a concept which will increase the interactions in the chosen facility compared to now. However, during the next experiment, we will bring and reuse some of the game pieces to further explanation and understanding in the case of need. Furthermore, we will create personal invitations for the actors who attended to the experiments and to the ones who were also interested in participate., to engage more residents to participate in the next experiment.

With this small experiment, we learned that there is an interest from people to do shared activities and to create a community. The citizens of Nørrebro Vænge are committed to doing a co-design with us to increase the social interactions in their neighbourhood. This can, through many iterations and experiments, contribute to recrafting of their current practices in more sustainable ones through the social interactions done together.

SECOND ACTIONABLE EXPERIMENT: CO-DESIGNING A SUSTAINABLE CONCEPT

With the findings from the first experiment and after facilitating interest to the residents of Nørrebro Vænge to make shared activities, we had the residents on board to design a concept together.

The neighbourhood has some common areas that are not being used but based on the last steered experiment; there were wishes from the residents to make activities together in the chosen space. We also found that there are some barriers that make the residents not to use the facilities as often.

This small experiment consisted of a set of steps with different estimated timeframe, and different materials to steer the experiment Brainstorming was the main method used to co-create and we, as facilitators, guided the group, generated a fluent discourse and supported empathy and understanding among participants.

In this occasion, three residents who also participated in the first actionable experiment came to the session. Among them were one young adult and two seniors. Despite that, we advocated and invited all residents in advance to attend an upcoming event. Even some of the expected residents who voluntarily wanted to participate after the last experiment were not able to attend.

The experiment was held in the common area/kitchen of Nørrebro Vænge, so the participants were settled in the selected area to redesign. One of us facilitated the process. Meanwhile, the other one documented by taking notes, pictures, observed and helped the facilitation. To co-design, we also took part in some of the activities of the steered experiment. Each brainstorm was carried out by using multiple post-its with different

colours in order to differentiate one from the other one.

First brainstorming session: we asked the residents to brainstorm all the activities they wanted to in the selected facility. To ease the process, we wrote down in a paper the three parameters to brainstorm from as a guide to follow:

1) It needs to be a group activity.
2) It needs to be an activity that can be done related to the personal skill to offer or to contribute with.
3) The activity should be able to do in the common room/kitchen.

We brought the design game with the different pieces of activities in case they could not come up with ideas or they find difficult the brainstorm. The game pieces with activities were used as the residents asked for it after some minutes of brainstorm. All the activities were written down in yellow post-its.

Second brainstorming session: This brainstorm was made to find barriers that are limiting currently the activities in the facility. We asked the residents to write down in orange post-its the limitations or barriers and place them in the middle of the table.

Third brainstorming session: After the brainstorm and with all the barriers placed in the middle of the table, we asked the residents to Brainstorm ideas/solutions or ways for solve or redesigning those barriers and write them in green post-its. These solutions will be placed beside the related problem.

Once the brainstorm was made, we discussed which problem was the main one to solve and together we chose the final one.

FINDINGS

In this section, are the findings from our first brainstorming session during the co-design, where we brainstormed on various activities with specific parameters given. Showed in the table below are the different activities we brainstormed.

Picture 8: Brainstorming session.

Grow indoor herbs	Højtid activities
Teach training skills	Æblegrød
Shared dinners (brainstormed twice)	Video Games
Candy Workshop	Debate night
Cinema night (brainstormed twice)	Storytelling workshop
Christmas workshop (Julestue)	Cooking classes
Book club	Bake cookies
Bread workshop	Quiz night/Kahoot
Solve rubik's cube	Cocktails workshop
Board games night	Brain training games
	(brainstormed twice)

Illustration 14: Overview of the activities brainstormed

Category	Challenges
Category 1: Limited ownership	• Only the responsible of the facilities have ownership of the keys and installations
Category 2: About residents' commitment	• Lack of engagement from the residents. • Lack of motivation • Socially isolated community • Lack of knowledge about the neighbours.
Category 3: About the facilities	• Lack of knowledge of how to use/rent the facility • Lack of knowledge of the common facilities. • There is an administration which manages the facilities (intermediary actor between residents and facilities) • Accessibility • Lack of familiarity with the rooms/facilities.
Category 4: Economy	• Economy • Rent (the facility needs to be rented before using it) • Missing materials for the facilities (in order to do the wished activities)

Table 7: Overview of the challenges found.

The activities which were brainstormed twice showed a high interest in the activity and aligned the resident's insights.
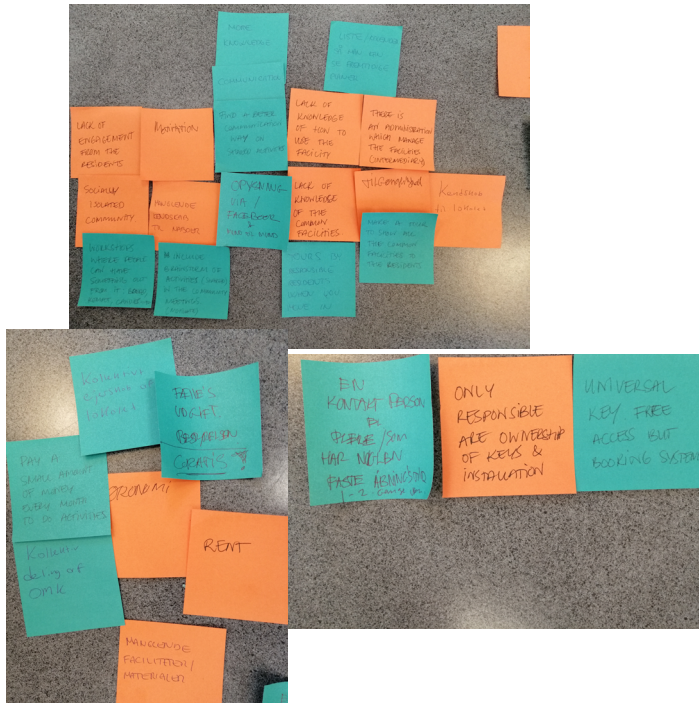
Second brainstorming session
Different challenges came out when brainstorming about the lack of usage of the facilities. The ideas were shared and discussed between the participants. Once the issues were placed and discussed, we clustered them into categories where the problems were related to each other.
Insert picture of the general iteration.

Picture 9: Compiled picture of the problems and solutions.

The residents understood the brainstorming and the issues they came up were based on their own experience. Some comments about the issues about the lack of information on the facilities were discussed. We, as sustainable design engineers and researchers, brainstormed based on all the observations and findings through the whole Design Process of the project. One of us also brainstormed as a resident of Nørrebro Vænge.

"I didn't know we have a Facebook group!"

"Is there an app where we can make tasks for the administration?"

"I didn't know the library was in this building."

THIRD BRAINSTORMING SESSION

Once the problems were discussed and written down on the orange post-its, we generated ideas on how to solve them. Some of the solutions fitted to different categories, so we place the solution among the problems.

The table below shows the findings of the picture in detail with the categories, challenges and solutions.

Category	Challenges	Solutions
Category 1: Limited ownership	• Only the responsible of the facilities have ownership of the keys and installations	• A contact person (resident) who have keys. • Opening hours 1 or 2 times per week. • Universal key with free access but with a booking system.
Category 2: About residents' commitment	• Lack of engagement from the residents. • Lack of motivation. • Socially isolated community. • Lack of knowledge about the neighbours.	• Workshops where people can have something out from it. Eg: bread, compote, candies and learn a skill out of the workshop.
Category 2 & 3 (shared solutions)		• Include brainstorm sessions of activities in the neighbourhood/community meetings. • Information via facebook and in person. • Find a better communication way on shared activities. • Communication. • More knowledge
Category 3: About the facilities	• Lack of knowledge of how to use/rent the facility • Lack of knowledge of the common facilities. • There is an administration which manages the facilities (intermediary actor between residents and facilities) • Accessibility • Lack of familiarity with the rooms/facilities.	• Tours by the responsible resident when a new neighbour is moving in. (brainstormed twice) • List/calendar to plan in advance.
Category 4: Economy	• Economy • Rent (the facility needs to be rented before using it) • Missing materials for the facilities (in order to do the wished activities)	• "Kollektiv" concept: sharing expenses/costs. (brainstormed twice) • Pay a small amount of money every month to do activities. • "Kollektiv": ownership of the facility.

Table 8: Overview of categories, challenges and solutions.

SECOND PHASE OF THE EXPERIMENT
Designing the concepts

In this stage, the goal was to design some concepts regarding the chosen problem to solve. With this in mind, we created a list of requirements and criteria that we wanted to include in the concept and presented to the residents, so they had inspiration during the next brainstorm. We brainstormed the needs for the final design to have to fulfil everybody's wishes.

A previously established set of requirements and criteria were presented to the residents to give the participants inspiration to further develop. The table below shows all the brainstormed requirements and criteria for the final concept.

REQUIREMENTS *Need to have*	DESCRIPTION
Sustainable practices	The solution needs to develop future sustainable practices/environmental awareness, (for CPH plan '25)
Ownership/Empowering individuals	The residents need to feel ownership for the future solution in order to develop the solution, to use it and sustain the solution.
Share activities	The solution needs to create interaction and shared practices between the residents.
Community concept	It needs to create the Community feeling, belongingness, common purpose, etc.
Achievable	It needs to be feasible to create/design for us.
Inclusion	It needs to include everybody's wishes and activity performance for all ages.
Autonomy	It needs to be used by the residents afterwards without our guidance.
Share knowledge	It needs to create communication between the residents.
Accessible	It needs to be accessible to all the residents.
Responsibility	It needs to create responsibility to the residents.
Format/Shape (tangible/intangible)	It needs to have a format.
Engagement	It needs to create involvement, interest and participation between the residents (interessement device)
Understandable	It needs to be easy to understand for all the residents with different age.
Inviting	It needs to make the common space inviting to be used.
Communication	It needs to improve the communication among all the residents. It needs to have a communication tool to solve the resident's doubts
Structure	It needs to provide clear structure and organisation.
Planning	It needs to be able to plan activities in advance.
Motivation	It needs to create motivation among the residents in order to participate in the activities.
Booking system	It needs to have a booking system or a sign-up system.
Information	It needs to show a standard information about the facilities. It needs to show a standard information of the residents when signing up for an activity/booking It needs to show the upcoming activities.
Availability	It needs to have an overview of the availability of the facility in order to rent it.
Reward	It needs to provide some kind of reward/ motivation in order to make people to participate.

Table 9: Shows the requirements the concept should include

CRITERIA *Nice to have*	DESCRIPTION
Funny	It could be nice that is funny to interact with.
Simple	It tould be nice that it's simple.

Table 10: Shows the criteria the concept should include

After we brainstormed the requirements and criteria, the residents felt tired and unable to continue, and the time of the booking of the room was up. Therefore, we needed to stop the experiment at that point of the co-design.

Even though the residents felt tired, they discussed about a possible concept that could fulfil some of the issues and which will promote the interactions of shared activities within the neighbourhood. However, to further develop on their proposal, we will have to continue the conceptualisation alone as we were unable to finish the codesign during the estimated timeframe of the experiment and due to time limitations, as we cannot schedule another experiment. The result of this will be presented after the hand-in due to the timeline of the thesis.

LIMITATIONS OF THE EXPERIMENT

In the first brainstorming session, the residents found it difficult to come up with ideas, so we had to use the activity pieces from the design game as inspiration to make the session going. Although the session was explained and guided with a facilitator, the participants found it a bit difficult to brainstorm with multiple ideas. In some cases, they needed examples from our participation to get inspired.

The residents were further distracted by personal conversation as they were updating each other with their common interest in sports. Even though they were not fully focused on the brainstorming session, we noticed a good atmosphere and that they wanted to interact with one another due to their common interest. The conversation continued through most of the experiment and emphasised that there is a genuine interest in doing activities together even though the two neighbours have just met.

The lack of participants also limited the creativity between the people who attend to the actionable experiment, as they could not be inspired by each others' suggestions. One of the board members could not attend the experiment, and as a consequence, a relevant and additional point of view was missing.

We had a limit of time regarding the booking of the room we were sitting in. Further, there was a language barrier between one of the sustainable design engineers and the rest of the group since the experiment was facilitated in Danish.

The residents were tired towards the end of the experiment, as they were not used to this kind of activities. Therefore, we had to stop the co-design after the brainstorm of the requirements and criteria. As a result, the next steps 1) and 2) of the co-designing process were missing due to the lack of time and tiredness of the residents.

> **1)** Create concepts. Each participant will choose one idea from one category, so everybody participates in the concepts.
> **2)** Choose a final concept. Discuss which concept is the one which suits them best and why.

We could observe that there is an interest among the residents who participated in our experiments from the very beginning, as well as the residents who answered positively in the facebook group but were unable to attend. However, generally, there is a lack of commitment and participation during the days the experiments took place. This can

be due to multiple reasons, firstly, we were told by the social caretaker, that the young residents she tried to engage did not have time to attend because they were working on finalising their own exam. Secondly, some residents had young children home, which could not be left alone. Thirdly, the residents do not read the information boards or Facebook group were our invitation to the residents were conveyed.

EVALUATION

The actionable experiment made in Nørrebro Vænge gave us information to reflect upon. The outcome and findings show us that there are an engagement and interest from the residents who attended the two experiments, the social caretaker, and one of the board members to design a concept which will facilitate shared activities in the neighbourhood.

As stated, the lack of engagement from the residents of Nørrebro Vænge, in general, is a limitation when carrying out experiments. There is a clear example of a young girl who did not want to participate in the experiment when asked. However, we can say that, once the residents take part in the design game session, they were committed and engaged. Moreover, the social caretaker, Monika, was very involved in the purpose of engaging residents through facilitating shared activities within the neighbourhood. Again, we got some very positive comments from her and the residents about the experiment and the purpose itself:

"I think what you are doing is amazing!" - Monika, the social caretaker

"I like the idea of using this common room." - Young adult

Monika further proposed a meeting with us after our hand-in and examination so we can discuss what the next steps are in this process.

The purpose of engaging people within Nørrebro Vænge through the design process is, as stated, to take the expert voice of the final user into account, to facilitate sustainable elements from our findings and ownership to the ones who will carry out the next actionable experiments in the future. Therefore, a concept that is co-designed with residents, engaged from the very beginning, is crucial. Furthermore, we consider involving the residents, the member of the board and the social caretaker, as a strategy to facilitate ownership in the upcoming design that will steer the next actionable experiments with the collaborations of the residents. More so, the decision of involving the social caretaker has been taken since she has the authority in her position to carry on the future experiment with the residents and be together on board for further social activities. Besides, her job as a social caretaker involves taking care of the residents' social well-being. It can be said then, that until the date, she has been, in collaboration with other relevant neighbours, the one that holds social activities within Nørrebro Vænge.

A concept will be designed with the brainstormed requirements from the second workshop and tested with the residents of Nørrebro Vænge. The design aims to then facilitate small experiments (social interactions) within the chosen space in the neighbourhood. This will lead to further facilitation of the community feeling in the neighbourhood through the social aspect and where residents can interact and influence each other. Eventually, these experiments will substitute current practices for more sustainable ones as the social interaction will be there, and the actors will be aligned in the intention of a long term vision for a more sustainable

neighbourhood.

SUB-CONCLUSION

The actionable experiments showed us that more engagement from the residents is needed to carry out social interactions. Also, there is a lack of knowledge in general about the common facilities and their usage. However, there is an interest from the participants that joined the experiments, and we got positive feedback from all of them.

Both experiments were done to transfer knowledge about social and environmental practices into a traditional urban neighbourhood. From these experiments, we will further develop the co-design concept, which will support social interactions in the existing common facilities of Nørrebro Vænge and redesign the way they are currently used. Furthermore, the concept will support the long term vision of developing Nørrebro Vænge into a more sustainable neighbourhood.

SL
ng
an
towards
ABILITY
Alignir
within sust
ustainable
nities

Approaching
theorethical frameworks
to analyse sustainable
communities
practices

UR
BUTION

owledge about
practices from
mmunities into
l neighbourhood.
s for co-designing,
g a long-term
ds a sustainable
ourhood

Challenging
traditional
technology

Creating
new
possibilities

Challer
conv
nei

EN

& implementing
ory elements
sign game

heories
yse the
study

7 DISCUSSION

DISCUSSION

In the following chapter, we will, firstly, give a response to our research question by discussing and answering the sub-questions stated at the beginning of the thesis. Secondly, there will be an evaluation of our study. Thirdly, there will be a proposal for future research within this field and limitations.

ANSWERING THE SUB-QUESTIONS:

- Does living in a sustainable community change people's practices into more sustainable ones?
- Do environmental friendly facilities make people environmentally aware?
- How can we create experiments facilitating the community concept to help urban citizens be more sustainable?
- How can we engage citizens to be active in the development of a more sustainable city?
- How can the inspiration from ecovillages and cohousing communities help us support a long term transition towards a sustainable urban neighbourhood?

DOES LIVING IN A SUSTAINABLE COMMUNITY CHANGE PEOPLE'S PRACTICES INTO MORE SUSTAINABLE ONES? AND DO ENVIRONMENTAL FRIENDLY FACILITIES MAKE PEOPLE ENVIRONMENTALLY AWARE?
Concerning the fact of living in a sustainable community, we can say that it does change people's practices into more sustainable practices. As described in the literature review, intentional communities are usually established and sustained by people who are committed to following a common purpose or intention, such as living in harmony with nature or living according to principles such as unity and grassroots democracy (Kunze, 2012; cited in Hausknost et al., 2018). Our findings show that being a part of a community with a common social or sustainable vision, influence, and inspire people through their fellow residents. There is a clear example found in the ecovillage Munksøgård in how many of the senior residents changed their eating habits since moving into the community and the numbers of vegetarians raised. This is further underlined by how the residents in Bo-90 described how their environmental awareness increased by growing up and living in a community or with roommates that are interested in the environment. So, it can be said that living in a community where the neighbours are regularly influencing each other with their practices, change people's behaviour. As described by Daly (2016), the elements of practices found in a cohousing community are connected to shared activities which have a considerable influence in lowering the resource consumption in the households.

Having a common purpose, as sustainability in the case of the visited ecovillages, influenced residents' behaviour. However, using green technology does not change people's practices. The utility or technology itself is certainly more environmental friendly as it consumes less water, uses less heat, or it is more energy efficient. Nevertheless, the practices carried out while using these utilities remain the same. Having green technologies or utilities increase awareness and make people care more about nature. In the ecovillage Hallingelille, there was an evident example of how having a willow wastewater system made the whole community more environmentally aware, which lead the residents to only using eco-friendly and swan labelled soaps and shampoos. The fact of having the willow rinsing system make them aware of what products to use, because it will eventually end up in nature.

In contrast, the findings from traditional dwellings show the lack of answers concerning environmental awareness and the only responses are regarding waste sorting, which is embedded in their installations. In that sense, regarding if an environmentally friendly house or setting makes people environmentally aware, the answer is yes. Further, the interviewed people in ecovillages and cohousing communities emphasised how it made them proud knowing how the supply system works and how it is connected to nature which gives them a purpose to keep going in this direction.

However, it can be argued that it is the community feeling and social atmosphere that drives the influence and change of practice more than it is the sustainable, designed utility or technology. As Daly (2016) states, the community aspect in a neighbourhood generates a strong social atmosphere where meanings and competences are gladly shared, and practices can be reshaped into sustainable behaviours. Also, Kitzes and Wackernagel (2009) argue that members of intentional communities are more likely to be committed, compared to the general population, in the following four parameters: a strong social network, a shared "meaning in life", closeness to nature and a low ecological footprint. Especially the last parameter is portrayed as a central part of sustainability (Kitzes and Wackernagel 2009; cited in Nelson, 2008). The activity regarding climate change that we experienced in our visit to the cohousing. Bo-90 is a good example of how residents influence each other within the social interactions in the community.

The common areas play a large role in the communities. If the visited communities did not have the physical setting to gather people to support social activities, it is questionable that the development of new practices will occur or even sustain. As acknowledged at the beginning of the thesis, the physical design is important in assisting the progress of a social atmosphere where the sense of community can be established. According to Lietaert (2010) is important to have places which promotes communication among people, the creation of different solutions and where neighbours can discuss sustainable solutions about their needs. Compared to conventional dwellings, the lack of common areas within the neighbourhoods is connected to the lack of social practices among the neighbours and therefore no common purpose and community feeling between the residents.

We can say then that the common areas within a community are important for including social interactions. When the sense of community is present, this can drive the social interactions among residents, to further influence each other. Thus, regarding green technology, it does not change people's behaviour directly, but they are important drivers in people's environmental consciousness. To conclude, when the meaning of community (which drives social interaction between the residents in common areas) and environmental awareness are present, it can change people's behaviours into more sustainable ones.

HOW CAN WE ENGAGE CITIZENS TO BE ACTIVE IN THE DEVELOPMENT OF A MORE SUSTAINABLE CITY?

To make citizens active in the aim of developing a more sustainable city, they must have a purpose that gives them motivation. We explored this by experimenting with the community concept as we know from multiple sources that being a part of a community is a strong motivational factor. Being an active citizen and creating communities with emphasis on co-

responsibility between residents is essential for developing a sustainable city (Københavns Kommune, 2016). Additionally, our findings support these descriptions as we identified that social interactions, common values, visions and security are amongst the strongest motivational factors when it comes to community living.

We, therefore, planned and carried out two actionable experiments focused on supporting and developing social interactions by collaborating with the residents of Nørrebro Vænge. Firstly, we engaged the residents of the area by using a design game as an engagement tool to ease the progress of sustainable and communal meanings. When the residents played the game, all the participants were able to explore what is important for them personally when it comes to doing activities together. And in which of their common facilities, they would want to increase social interactions based on their choice of activities. Through our second experiment, we mobilised the residents through a co-design session where they were able to influence the act of activities to share with others based on their own skills and abilities inside the common area chosen in the first experiment. The purpose of making the residents part of the development process was to actively involve and take ownership so they could continue the progression of increasing social activities even after the thesis' ending.

The emphasis on the common areas was also an important aspect when it comes to supporting the community feeling, as the social atmosphere aspires from how the common areas are used and shared between the residents. Our findings also show how the common areas are used, for instance, a shared dinner in the dining room and kitchen, facilitate and support social activities and practices. Continuous daily contact and dialogues increases and establishes a sense of community. Further, social interactions supports environmental and climate awareness, which can inspire and motivate fellow community members in changing practices. This is something that was also emphasised in multiple of the visited communities. Therefore, it can be said that common areas support social interactions and sustain a social atmosphere through the way they are used and shared in a social context. This is also elaborated by Bouma & Voorbij (2009) who also emphasise that social interactions are influenced by the physical characteristics.

We will, therefore, argue that the community concept can engage citizens to be active if we help them settle in a common facility that can make social interactions prosper. Belonging to a community can after that lead to changes in behaviours as people seek to conform to the values found in the community (Cherry, 2019). Further, communities make people more committed in a strong social network which can inspire other people through sharing knowledge and which also help citizens adopt new habits (Nelson, 2008).

HOW CAN THE COMMUNITY CONCEPT HELP CITIZENS IN THE CITIES TO BE MORE SUSTAINABLE?

The community concept can be used to help citizens be more sustainable because a community helps inspire and influence members through a common vision. An important aspect of being part of a community is the sharing of resources. Understood in the sense that every household does not need to have multiple, individual appliances. Instead, all the equipment can be shared between the community members whenever needed. The community concept, therefore, contributes to the sustainable development of the community because of shared resources. A common

workshop or tool room can, for instance, replace the need for each family to have individual and multiple tools of their own (McCamant & Durrett, 2011). This also gives the residents the opportunity to downsize their individual homes, which is sustainable as smaller homes are more efficient in terms of heat and cooling because the operating costs are reduced (McCamant & Durrett, 2011). Having shared dinners together can also lower the consumption in households because having one stove cooking for 17 people rather than 17 individual stoves cooking in a neighbourhood will, in the long run, have a positive impact on the environment which was explained by a resident in Bo-90. At the same time, it gives a reason for social interaction, which makes environmental awareness prosper. Daly (2016) also discloses that every day, practices in communities are connected to shared activities which have a considerable influence in lowering the resource consumption in the households. He further argues that the creation of a community in a neighbourhood causes a strong social atmosphere where meanings and competences are gladly shared, and practices can be reshaped into sustainable behaviours.

HOW CAN THE INSPIRATION FROM ECOVILLAGES AND COHOUSING COMMUNITIES HELP US SUPPORT A LONG TERM TRANSITION TOWARDS A SUSTAINABLE URBAN NEIGHBOURHOOD?

The findings from our field research show that shared practices can be sustained if there is a common purpose or meaning, which is the driver to create the community feeling, and if it is supported by a facility where the shared activities can be carried out.

The actionable experiments carried out in Nørrebro Vænge were done to design a concept which can contribute with sustainable practices, facilitate and support common activities among the residents in their existing common space for a transformation within the neighbourhood. The concept will help the residents to envision a future engaged community within a social and environmental approach towards a long term vision.

According to Barani et al., (2018), not all the ecovillages succeed in their purpose to be sustainable. It is important to promote future investigations on ways of facilitating strategies that can identify traditional communities with possibilities and capabilities to turn into ecovillages and support them. We believe that Nørrebro Vænge has the potential to become a sustainable urban community in a long term vision as it offers common facilities where shared activities can be carried out and through which residents can inspire and influence each other in becoming sustainable.

The strategy of identifying and involving actors in Nørrebro Vænge was to further establish the area for transition and developed alliances. Further we determined eight experiments. These small experiments can potentially lead to the creation of community feeling. The next step was, therefore, to engage the identified actors through the experiment of our design game, which transferred knowledge about social and environmental practices from the sustainable communities. Further, we evaluated and learned from our experiment and findings, which lead us to another experiment.

The second experiment was to further mobilise the actors through a co-design to carry out an additional experiment in favour of achieving the long term vision of a sustainable neighbourhood. As this strategy is an iterative process, we also reviewed and learned from the execution of

this experiment, which will lead us to a concept development of a new experiment.

The learning points from the two experiments in Nørrebro Vænge showed that the residents are so used to being alone and private within their own dwelling and neighbourhood. This made it very difficult to engage them to participate in our experiments and socialise with each other. The participants who took part in our experiments represented a majority of seniors, even though we through Nørrebro Vænge's Facebook group were able to mostly gain interest from the young adults. However, it was a passive interest as only one young adult showed up to participate during both experiments.

We further acknowledged that there is a gap in terms of communication between the administration and residents. The lack of knowledge regarding the existence of the multiple common areas, the usage of them, and the awareness of the communication tools such as the Facebook group and information boards that can provide this knowledge. Even though there is a Facebook group to connect and share knowledge between the residents of Nørrebro Vænge. Most of the residents do not know about the placement, availability and accessibility of the existing common areas. Further, there are even residents who are not aware there is a Facebook group or an app where it is possible to communicate with the administration. The consequence of this could have had an impact on our experiments in terms of engaged participants. This affected the codesign process as people struggled during the brainstorming sessions because they lacked knowledge about what is possible to do in the common areas, how to access them and where they are placed in the neighbourhood. Some of these findings are stated in the quotes below:

"I didn't know we have a Facebook group!"

"Is there an app where we can make tasks for the administration?"

"I didn't know the library was in this building."

The social caretaker became a very important actor for us to include and engaged in terms of our experiments, as she plays a big role in this neighbourhood. Further, she has a different background and position in Nørrebro Vænge because of her job. This makes her a relevant actor to include because she can contribute with different insights and agendas, and she can potentially be an actor that continues carrying out future experiments and aligning more actors.

Our concept will support a redesign of how these common areas are used to create a link between the physical setting and change the way they are used, to support social interactions. Our findings show us that the common areas are used very rarely; our concept will, for that reason, focus on emphasising how to use the common areas together. It is through these social interactions that sustainable practices can potentially emerge. The concept will, therefore, be part of the desired long term transition towards a more sustainable neighbourhood.

WHAT ABOUT PERMACULTURE?
The permaculture concept was not an apparent practice found in either of the communities visited, not even in the two ecovillages, Hallingelille and Karise Permatopia, where we expected it due to their descriptions of their communities. Firstly, the community of Karise Permatopia was established less than a year ago, and the community is in general, still

settling into their new surroundings. Further, the vision of using the permaculture principles is still there, but as of right now, they focus on growing organic food whereas permaculture is an aim for the future. However, it was understandable that the asked resident did not have the prevalent insight into the general permaculture approach. This can also be a reason why we did not get to fully know what their plans are for the future when using it. If we were able to interview a different member of the community or the employed farmer, we might have gotten to know more. However, this was a limitation of our study in Karise Permatopia as we were not allowed to interview more than one resident during our visit to the community.

In Hallingelille, we were explained how the design of their community is based on the permaculture principles and how they had an external permacultural designer help them with that. Each resident even took a course in permaculture before moving into the community. Nevertheless, today, the concept is not an as strong part of their vision because new residents have moved in who also wanted to influence the community. And most seemingly, not required to take a course in permaculture before moving in.

As elaborated in the literature review, permaculture is being criticised in an academic context due to its lack of scientifically documented sources about how permaculture has been applied and the outcome of this. However, from a practical perspective, the permaculture approach is widely popular because of its practicality and flexibility to be applied in many diverse settings. However, we did not find permaculture in our case studies during our field research even though it is claimed that permaculture is strong in a practical sense. For these reasons, we

were not inspired by any practices regarding permaculture through the sustainable communities visited.

EVALUATION OF OUR STUDY

It is critically to evaluate if our study will lead Nørrebro Vænge to become a more sustainable neighbourhood. One of the main focus areas within our thesis was that practices could be reconfigured and substituted in traditional neighbourhoods, through a design game and a participatory co-design process carried out within actionable experiments. One of the most critical elements of making this happen is to mobilise actors within Nørrebro Vænge to be a part of the experiments. Without them, it is not possible to uphold the progression towards a more sustainable neighbourhood. Coalitions are an important aspect of the transition management process and just in general for sustainable design engineers because we need allies who can help integrate our sustainable interventions and create new ways of thinking. However, we did experience that there was an interest in participating in the experiments, but on the actual day of experimentation, it lacked support. Thereby, the experiments had passive but not active support by the actors of the neighbourhood. The same passive support was experienced in one of the communities when we delivered numerous surveys and only got a few answers.

Further, we applied and actively experimented with transferring and implementing the knowledge conducted about sustainable practices into an urban neighbourhood. In relation to scholars such as Marckmann et al. (2012) and Dias et al. (2017) who simply study sustainable communities and conclude on the findings without experimenting. However, our investigation and experiments were able to create the frames for a future

proposal that can increase social interactions in an urban neighbourhood to support the integration of sustainable practices.

PROPOSALS FOR FUTURE RESEARCH

The literature on sustainable communities is still new and progressing, and in accordance to scholars such as Daly (2016), Hausknost et al. (2018), and Franklin et al. (2011) we agree with their proposals of more research within how traditional neighbourhoods can learn from active sustainable communities and their practices. Generally, there should be more focus on how we can let active citizens who have knowledge about social and environmental problems become leaders and whom citizens of conventional dwellings can learn from. Therefore, we especially recommend researchers to investigate how passive support can be turned into active support to be able to mobilise a large number of people. For future references, it will be beneficial to use an interessement device to engage actors in accordance with Callon (1986).

It is likely that practices from sustainable communities can be successfully implemented in conventional neighbourhoods if the elements of practices are shared through social interactions and that the physical characteristics exist to support and sustain the common activities and social atmosphere.

Therefore, we suggest future researchers to continue testing in multiple traditional dwellings where common areas are already available to facilitate and carry out actionable experiments. For the purpose of studying if the community concept can prosper in the physical frames if there to support social interactions.

LIMITATIONS

Studying sustainable communities is complex, and to understand these complexities, the theory and methodology need to be strong. Sustainable communities have, in this case, been examined using social practice theory and transition management and quantitative methods. We also believe that quantitative methods could have a positive impact on the study. E.g. for making hypothesis out of the results gained from our qualitative study.

The limitations we experienced in our thesis process was furthermore that there was a language barrier between us and the interviewees who did not express themselves as richly in English as they would have in Danish. They struggled to explain themselves during the interviews. For that reason, as also mentioned in the delimitation section in our methodology chapter, we decided to conduct our future interviews and surveys in Danish. Further, it was difficult to evaluate beforehand if an interview, meeting or visit would give a valuable outcome in contrast to the time and money invested. The lack of engagement was also a large limitation as to the involvement and mobilising of actors was needed much more time to be fully successful.

8 CONCLUSION

CONCLUSION

"How can we develop a more sustainable urban neighbourhood by being inspired by ecovillages and cohousing communities, residents' practices, and permaculture?"

Our results show that there are multiple social and environmental practices which support and, facilitates, both social interactions and environmental awareness. The expected outcome was to find inspiration in the ecovillages and cohousing communities about how to live a more sustainable life based on more conscious practices. However, we also expected to see more emphasis and integration of permaculture which we did not. The physical setting is important for having a space where the social atmosphere can prosper and which makes it possible for community members to share knowledge between each other. To conclude, sustainable communities do help to develop discussions, communal support, and influence individual resident's practices when living together.

Using transition management as a strategic framework to develop a long term transition, provided us with the prospect of carrying out short-term experiments for mobilising the residents to be a part and take ownership of the future changes of their residential area. Researching the various sustainable communities, therefore, provided us with valuable knowledge in how to conceptualise the community concept and to define the actionable projects for the long term vision. Through the experiments, we proposed from the perspective of the identified social and environmental practices to mobilise the residents of Nørrebro Vænge. The experiments have the potential of supporting the creation of social interactions and making the social atmosphere prosper as the common facilities exist but are only used very limited. In continuation

hereof, more board members need to be mobilised to further encourage other residents as they are capable of distributing information during residential meetings. The experimentation will, therefore, continue as an iterative process, emphasising on mobilising more actors.

Our thesis further supports the statements by other scholars of how sustainable communities can be a remedy when it comes to diminishing environmental issues and social problems related to modern society (United Nations, 2019; Ivanova et al., 2016). This can be stressed further when it comes to creating continues experiments in Nørrebro Vænge to achieve a more sustainable neighbourhood. Further, Copenhagen's local plans are all in favour of both being carbon neutral and to have active citizens adopt new habits for sustainable development.

According to the Agenda 21 plan, the experience of joining a community is a strong motivational factor concerning being an active citizen. This is supported by a study accomplished by the Technology and Environment Administration in Autumn 2014 (Anthropologists, Citizenship in the City 2014/15; cited in København, 2016). Creating a community that emphasises on co-responsibility between residents, therefore, becomes vital for the development of a sustainable city (Kommune, 2016). Therefore, by translating the key findings into a design game to share knowledge with the citizens of Nørrebro Vænge about social and environmental practices and the elements of these. If the elements of practices are shared through social interactions, it can lead to sustainable awareness and potentially contribute to the re-crafting and substitution of practices. Furthermore, co-designing a concept with the residents which will encourage the action of social interactions as small experiments in the selected common kitchen and room of the neighbourhood in order to achieve the aim of

becoming a sustainable community in a long term vision.

Manzini and Vezzoli (2003) highlighted that design for sustainability is necessary to shift from product thinking to system thinking (Cited in Ceschin, 2014). Therefore, we believe that the co-designed concept plays a relevant role in the transition of Nørrebro Vænge. The concept will contribute with sustainable communities meanings and values to engage and mobilise all the residents who will carry out a social experiment to later pressure the administration in need for a change to achieve the long term vision for being a sustainable community.

Local communities focus too much on technology-oriented strategies of environmental transformation and individual behaviour change. And not enough on strategies that target unsustainable social practices, and their fixedness in the complex socio-economic pattern. Even when offered supplementary low-carbon choices, their capability to decrease carbon-intensive practices is not sufficient enough (Hausknost et al., 2018).

By developing urban sustainable communities in which elements of sustainability can be shown to new carriers as policy planners can inspire them to promote sustainable practices (Daly, 2016). In the case of Copenhagen and the carbon neutral plan, by creating communities with sustainable practices in urban areas, it is possible to mobilise citizens to be an active part of the sustainable development of the city. Furthermore, sustainable communities need to be viewed as communities of learning going beyond relational practices that are continuously being created around the common vision of sustainable living (Franklin et al. 2011). Thus, we believe that sustainable communities can offer a learning framework to the citizens of Copenhagen to gain knowledge of sustainable

practices and visions. Intentional communities can offer socio-ecological innovations to the municipal citizens such as common kitchen and dining hall, community gardening, car-pooling, ecological building techniques. This institutional learning can be initiated, where the active members from both communities exchange knowledge and experiences in their individual efforts to create sustainable communities (Hausknost et al., 2018). In this way, sustainable communities can play a big role in what the Municipality of Copenhagen argue "Everyone should be able to create, contribute to and influence the future of Copenhagen" (Copenhagen Municipality, Department of Finance, 2018).

This knowledge sharing among citizens can advance sustainability in the way of communal living within a continuously growing city like Copenhagen. Moreover, it can contribute to the Municipality's proposal of "Fællesskab København" to achieve a sustainable city by resilient, connected neighbourhoods in the creation of a comunity city through the Goal 11 of the UN SDGs, Sustainable cities and communities.

Within the literature of sustainable communities, there are various approaches to how the field can be studied, and how much important value they add to the existing literature of research within these communities. Scholars such as Daly (2016), Franklin et al. (2011) and Hausknost et al. (2018) all stress on the importance of learning that these sustainable communities can provide to society. Furthermore, Daly (2016) proposes that more research should be done regarding how to implement sustainable practices in conventional neighbourhoods.
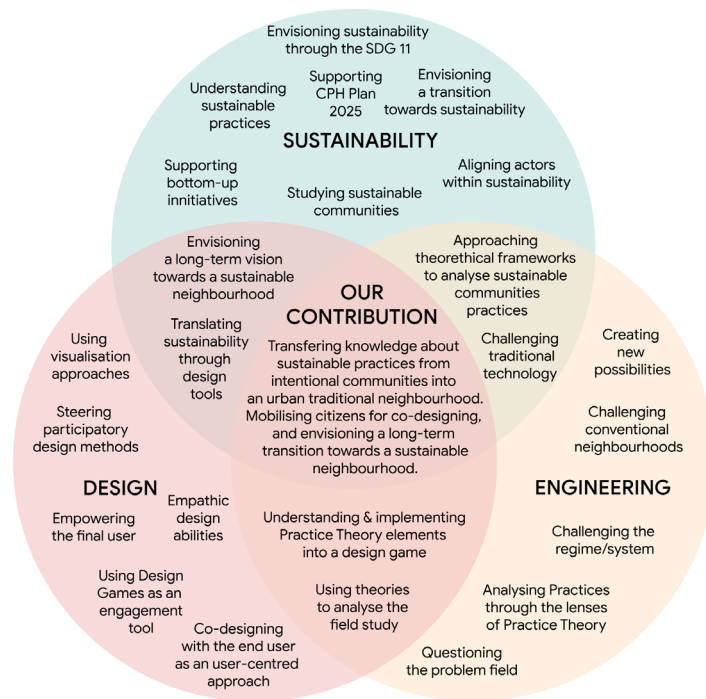
Envisioning sustainability through the SDG 11

Understanding sustainable practices

Supporting CPH Plan 2025

Envisioning a transition towards sustainability

SUSTAINABILITY

Supporting bottom-up innitiatives

Studying sustainable communities

Aligning actors within sustainability

Envisioning a long-term vision towards a sustainable neighbourhood

Approaching theorethical frameworks to analyse sustainable communities practices

OUR CONTRIBUTION

Translating sustainability through design tools

Transfering knowledge about sustainable practices from intentional communities into an urban traditional neighbourhood. Mobilising citizens for co-designing, and envisioning a long-term transition towards a sustainable neighbourhood.

Challenging traditional technology

Creating new possibilities

Challenging conventional neighbourhoods

Using visualisation approaches

Steering participatory design methods

DESIGN

Empathic design abilities

Empowering the final user

ENGINEERING

Challenging the regime/system

Understanding & implementing Practice Theory elements into a design game

Using Design Games as an engagement tool

Analysing Practices through the lenses of Practice Theory

Using theories to analyse the field study

Co-designing with the end user as an user-centred approach

Questioning the problem field

Illustration 15: Our contribution as sustainable design engineers.

As Daly (2016) proposed, we took inspiration and focused our thesis in actively trying to change something in a society based on our findings. We studied the interconnections and interdependencies of the elements within community practices, to see how their facilities are shared and used to create social interactions. Further, we experimented with the transferring of knowledge of sustainable practices between intentional communities and a traditional neighbourhood to explore how we as sustainable design engineers can implement social and environmental practices to support a more sustainable neighbourhood. By proposing a starting point, where social experiments can be carried out to support a long term vision of becoming a sustainable community through bottom-up initiatives. As we believe that global unsustainable practices cannot be changed within a short period. We, therefore, think it is important to focus on people's practices through a more experimental approach. Communal practices were our approach to rethink how to engage traditional communities towards more sustainable practices.

Furthermore, sharing knowledge about the elements of social and environmental practices is beneficial. The reason is that if the elements of practices are shared through social interactions, it can lead to sustainable awareness and potentially make citizens re-craft and substitute their old practices with new, more sustainable ones. In that way, citizens can become an active part of the sustainable development of the city through SDG 11: Sustainable cities and communities.

This thesis reflects the skills and knowledge acquired during the Master in Sustainable Design (MSc). Ceschin (2014) defines very accurately what being a Sustainable Design Engineer entails. Sustainable design engineering involves bringing, backing and positioning community-based innovations. Furthermore, embracing user-centred approaches to comprehend the challenges and favourable circumstances. Steering participatory methods with the use of visualisation approaches and co-design tools; generating ownership for participants and communities to support them in establishing and leading new initiatives (Jégou & Manzini, 2008; Mulgan, 2009; Cited in Ceschin, 2014).

RESEARCH QUESTION

"HOW CAN WE DEVELOP A MORE SUSTAINABLE URBAN NEIGHBOURHOOD BY BEING INSPIRED FROM ECOVILLAGES AND COHOUSING COMMUNITIES, RESIDENTS' PRACTICES, AND PERMACULTURE?"

"In 2011, CO2 emissions in Copenhagen were approximately 1.9 m tons" (Kommune, 2012).

"60 to 80 per cent of the global CO2 emissions, are generated from household consumptions" (Ivanova et al., 2016).

"To achieve carbon neutrality in 2025, Copenhagen must use less energy than it does today and also switch to green energy production" (Kommune, 2012).

PROBLEM

By focusing on how environmental impacts on the planet cannot be separated from social practices, especially not taking the growing capitalistic lifestyle into perspective, which demands high levels of energy consumptions, growth and enormous levels of waste (Lietaert, 2010).

Investigating how sustainable practices can change the behaviours of urban citizens, into becoming more sustainable.

"With the Agenda 21 strategy, section 33a and 33b, which requires all the municipalities of the country to have one strategy for how they will involve citizens and work holistic, interdisciplinary and long-term with environmental issues" (Kommune, 2016).

"The global framework for dialogue and shared objective that the SDGs have created constitutes a unique opportunity to involve Copenhageners in the city's sustainable development and create momentum around the key challenges faced by Copenhagen and other metropolises" (Copenhagen Municipality, Department of Finance, 2018; P.4).

"Everyone should be able to create, contribute to and influence the future of Copenhagen" (Copenhagen Municipality, Department of Finance, 2018; P.17).

WHERE?

SUSTAINABLE COMMUNITIES

Studying how sustainable communities offers better opportunity in attaining and sustaining the feeling of community due to the use and sharing of their common physical spaces.

"There is a place for further research that explores how important elements of sustainable practice can be spread into more standard [...] neighbourhoods and housing developments" (Daly. 2016; P.13).

HOW?

Analysing and understanding the elements of practices from sustainable communities in Denmark.

Putting emphasis on how these practices can lead to environmental awareness and knowledge about sustainability, for the purpose of supporting a long term transition towards a sustainable neighbourhood and making citizens more active in this process.

Our contribution as Sustainable Design Engineers:

Transfering knowledge about sustainable practices from intentional communities into an urban traditional neighbourhood: Nørrebro Vænge as a case study.
Mobilising the residents for a co-design process & envisioning a long-term transition towards a sustainable neighbourhood.
Shedding light on the *community feeling* through the identification of the interconnections, interdependencies of materials, meanings and knowledge from practices in a socio-technical point of view.
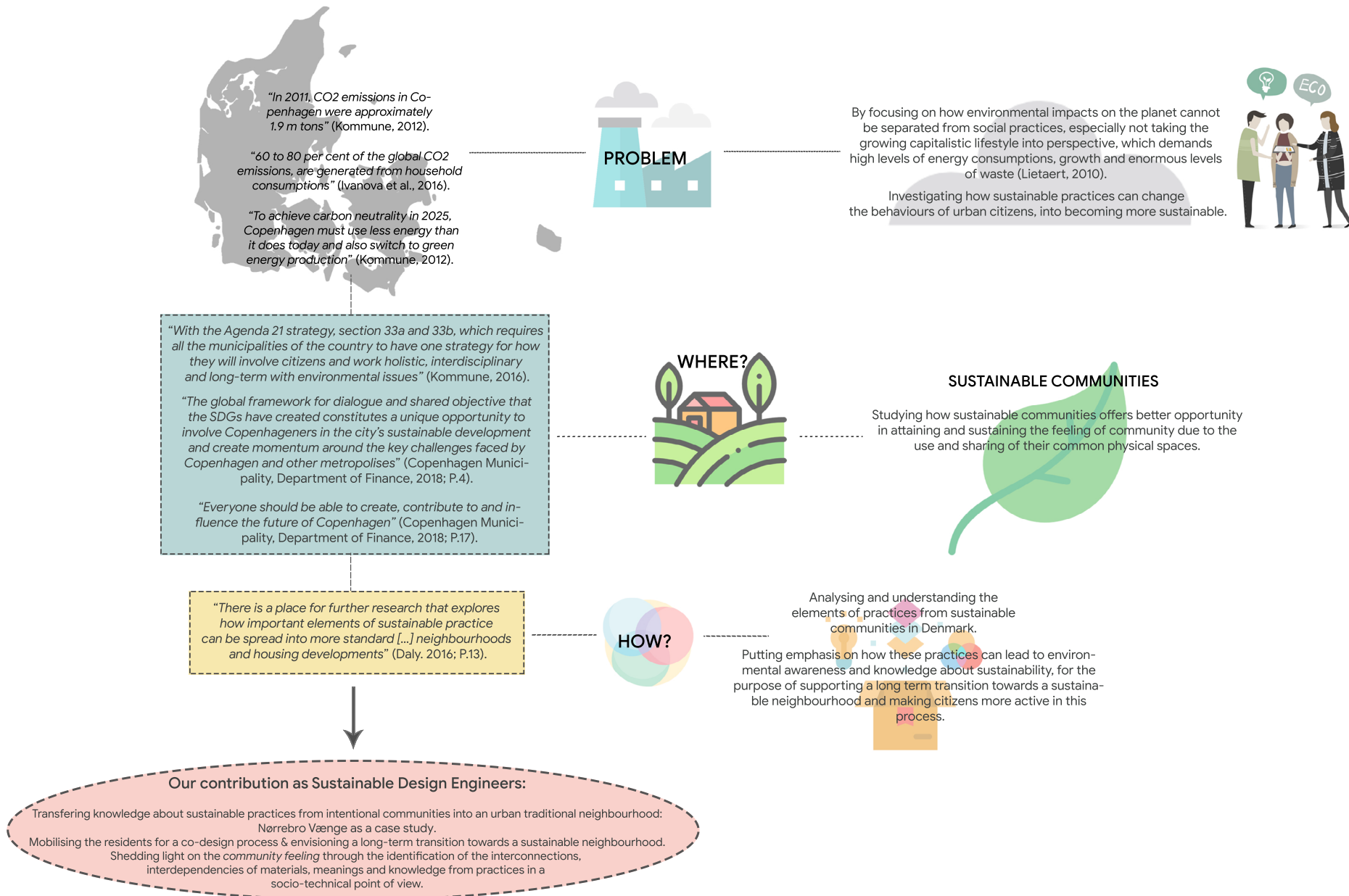
Illustration 16: Our contribution as sustainable design engineers.
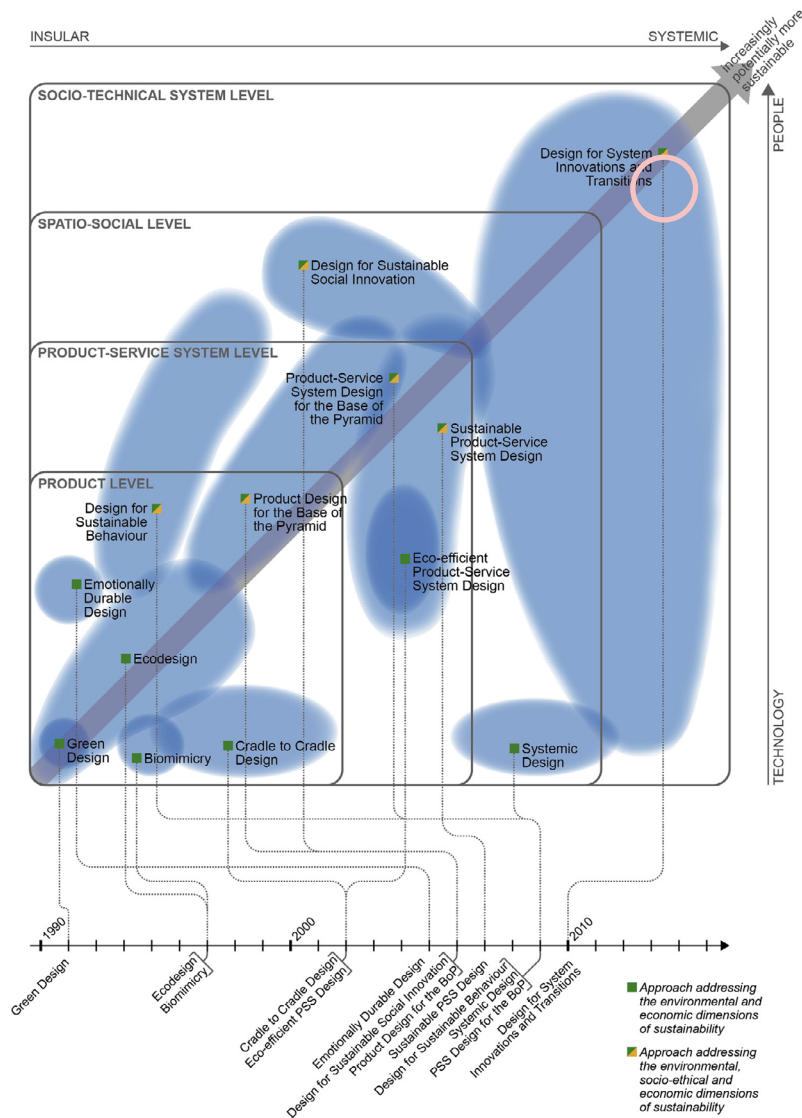
Illustration 17: Our placement in the "Evolution of design for sustainability". Source: Based on Ceschin & Gaziulusoy (2016).

According to the framework illustrated by Ceschin & Gaziulusoy (2016), we place ourselves in the Design for System Innovations and Transitions as our thesis approach is addressing the environmental and socio-ethical dimensions of sustainability. Throughout our study, we have focused on translating the meaning and values of environmental and social practices in a traditional neighbourhood to develop a long term transition vision. We have proposed how the understanding of practices in sustainable communities can remedy many of the environmental and social issues found in modern society, as well as conceptualising this in a design game to engage and mobilise residents in a site-specific area. All to facilitate experiments which can develop a more sustainable neighbourhood. By doing this, we as sustainable design engineers have used our abilities to change beliefs, behaviours and mindsets through the community concept. We have worked iteratively and committedly with our experiments through a long timespan. We have used or ability to apply to codesign methods recognising the importance of designing with the user and not only for the user. We are capable of developing strategic plans and executing them. We, as sustainable design engineers, can mobilise and align actors to establish allies. We are capable of influencing and producing new practices in society. We can identify how a single design is just one step in a longer transition towards a future vision. All these abilities make sustainable design engineers valuable. Specifically, because a sustainable design engineer is innovative, modern and radical. The purpose of being this is to encouraging revolutionary innovations that support the processes of sustainable transitions.

9 REFERENCES

REFERENCE LIST

Barani, S., Alibeygi, A. H., & Papzan, A. (2018). A framework to identify and develop potential ecovillages: Meta-analysis from the studies of world's ecovillages. Sustainable cities and society, 43, 275-289.

Boyer, R. H. (2015). Grassroots innovation for urban sustainability: comparing the diffusion pathways of three ecovillage projects. Environment and Planning A, 47(2), 320-337.

Boyer, R. H. (2014). Sociotechnical transitions and urban planning: A case study of eco-cohousing in Tompkins County, New York. Journal of Planning Education and Research, 34(4), 451-464.

Bundale, A. (2004). Greening together: the ecovillage movement grows from grassroots to mainstream. Alternatives Journal, 30(5), 16.

Carlile, P. R. (2002). A pragmatic view of knowledge and boundaries: Boundary objects in new product development. Organization science, 13(4), 442-455.

Ceschin, F. (2014). How the design of socio-technical experiments can enable radical changes for sustainability.

Cherry, K. (2019). How the Need To Belong Influences Human Behavior and Motivation. Accessed May 13th 2019. Retrieved from https://www.verywellmind.com/what-is-the-need-to-belong-2795393

Corazon, S. S., Stigsdotter, U. K., Moeller, M. S., & Rasmussen, S. M. (2012). Nature as therapist: Integrating permaculture with mindfulness-and acceptance-based therapy in the Danish Healing Forest Garden Nacadia. European Journal of Psychotherapy & Counselling, 14(4), 335-347.

Daly, M. (2015, December). Practicing sustainability: Lessons from a sustainable cohousing community. In State of Australian Cities (SOAC) Conference. SOAC.

DIAS, M. A., Loureiro, C. F. B., CHEVITARESE, L., & SOUZA, C. D. M. E. (2017). The meaning and relevance of ecovillages for the construction of sustainable societal alternatives. Ambiente & Sociedade, 20(3), 79-96.

Ferguson, R. S., & Lovell, S. T. (2014). Permaculture for agroecology: design, movement, practice, and worldview. A review. Agronomy for Sustainable Development, 34(2), 251-274.

Fielding, N. G., Lee, R. M., & Blank, G. (Eds.). (2008). The SAGE handbook of online research methods. Sage.

Flick, U. (Ed.). (2017). The Sage handbook of qualitative data collection. Sage.

Fowler Jr, F. J. (2013). Survey research methods. Sage publications.

Franklin, A., Newton, J., Middleton, J., & Marsden, T. (2011). Reconnecting skills for sustainable communities with everyday life. Environment and Planning A, 43(2), 347-362

Gilda, J. M. (2016). Narratives of the Permaculture Home: A Case Study on Northwest Residential Permaculture (Doctoral dissertation, Prescott College).

Given, M. L. (2008). Semi-Structured Interview. In L. Ayres, The SAGE Encyclopedia of Qualitative Research Methods (pp. 811-812). Thousand Oaks: SAGE Publications, Inc.

Global Ecovillage Network - Community for a Regenerative World. (2019). Accessed May 16th 2019. Retrieved from https://ecovillage.org/

Goal 11 : Sustainable Development Knowledge Platform. (2019). Retrieved from https://sustainabledevelopment.un.org/sdg11

Grinde, B., Nes, R. B., MacDonald, I. F., & Wilson, D. S. (2018). Quality of Life in Intentional Communities. Social Indicators Research, 137(2), 625-640.

Hausknost, D., Haas, W., Hielscher, S., Schäfer, M., Leitner, M., Kunze, I., & Mandl, S. (2018). Investigating patterns of local climate governance: How low-carbon municipalities and intentional communities intervene in social practices. Environmental Policy and Governance, 28(6), 371-382.

Houtkoop-Steenstra, H., & Houtkoop-Steenstra, J. P. (2000). Interaction and the standardized survey interview: The living questionnaire. Cambridge University Press.

Ivanova, D., Stadler, K., Steen-Olsen, K., Wood, R., Vita, G., Tukker, A., & Hertwich, E. G. (2016). Environmental impact assessment of household consumption. Journal of Industrial Ecology, 20(3), 526-536.

Jones, P., & Kijima, K. (Eds.). (2018). Systemic Design: Theory, Methods, and Practice (Vol. 8). Springer.

Kane, M., & Trochim, W. M (2007). In Generating the ideas. Applied Social Research Methods: Concept mapping for planning and evaluation (pp. 49-66). Thousand Oaks, CA: SAGE Publications, Inc. doi: 10.4135/9781412983730

Københavns Kommune. (2018). CO2-Regnskab for 2017. Accessed May 13th 2019. Retrieved from https://kk.sites.itera.dk/apps/kk_pub2/index.asp?mode=detalje&id=1804

Københavns Kommune. (2016). Teknik- og Miljøforvaltningen. Bæredygtige Sammenhænge Agenda 21-strategi for 2016-2019. Retrieved from https://www.kk.dk/artikel/baeredygtige-sammenhaenge-koebenhavns-kommunes-agenda-21-strategi

Kuijer, S. C. (2014). Implications of social practice theory for sustainable design.

Lawrence Neuman, W., 2013. Social Research Methods: Pearson New International Edition: Qualitative and Quantitative Approaches, Pearson Higher Ed.

Lietaert, M. (2010). Cohousing's relevance to degrowth theories. Journal of Cleaner Production, 18(6), 576-580.

Lockyer, J., & Veteto, J. R. (Eds.). (2013). Environmental anthropology engaging ecotopia: bioregionalism, permaculture, and ecovillages (Vol. 17). Berghahn Books.

Lockyer, J. & Veteto, J. R., (2008). Environmental anthropology engaging permaculture: moving theory and practice toward sustainability. Culture

& Agriculture, 30(1–2), 47-58.

Marckmann, B., Gram-Hanssen, K., & Christensen, T. H. (2012). Sustainable living and co-housing: evidence from a case study of eco-villages. Built Environment, 38(3), 413-429.

McCamant, K., & Durrett, C. (2011). Creating cohousing: Building sustainable communities. New Society Publishers.

McLeod, S. (2007). Maslow's Hierarchy of Needs. Simply Psychology, 1

Meltzer, G. (2010). Ecovillages and cohousing: A personal take on their similarities and differences. Living together–cohousing ideas and realities around the world. Stockholm: Royal Institute of Technology, 105-113.

Middlemiss, L. (2011). The power of community: how community-based organizations stimulate sustainable lifestyles among participants. Society & Natural Resources, 24(11), 1157-1173.

Morgan, D. & Guevara, H. (2008). Interview guide. In L. M. Given (Ed.), The SAGE encyclopedia of qualitative research methods (pp. 470-470). Thousand Oaks, CA: SAGE Publications, Inc. doi: 10.4135/9781412963909. n238

Munksøgård. (2019). Retrieved from http://www.munksoegaard.dk/en/about.html

Murphy, C. (2010). Young More Lonely Than the Old. Accessed May 5th 2019. Retrieved from http://news.bbc.co.uk/2/hi/health/8701763.stm

Nelson, A. (2018). Ecovillages: Sustainability and System Change. In Small is Necessary: Shared Living on a Shared Planet(pp. 130-158). London: Pluto Press. doi:10.2307/j.ctt1zk0mpz.12

Okolariet. (n.d.). Vind med klimaet. Accessed May 31st 2019. Retrieved from http://www.okolariet.dk/media/92974/Vind-med-klimaet-PRINT_hele-haeftet.pdf

Reckwitz, A. (2002). Toward a theory of social practices: A development in culturalist theorizing. European journal of social theory, 5(2), 243-263.

Scheuren, F. (2004, June). What is a Survey?. Alexandria: American Statistical Association.

Smith, A., Stirling, A., & Berkhout, F. (2005). The governance of sustainable socio-technical transitions. Research policy, 34(10), 1491-1510.

Spurling, N. J., McMeekin, A., Southerton, D., Shove, E. A., & Welch, D. (2013). Interventions in practice: reframing policy approaches to consumer behaviour.

The city of Copenhagen, Department of Finance. (2018). THE CAPITAL OF SUSTAINABLE DEVELOPMENT: THE CITY OF COPENHAGEN'S ACTION PLAN FOR THE SUSTAINABLE DEVELOPMENT GOALS. Copenhagen. Retrieved from https://international.kk.dk/sites/international.kk.dk/files/the_capital_of_sustainable_development_sustainable_development_goals_2018.pdf

The city of Copenhagen, Technical and Environmental Administration.

(2012). CPH 2025 Climate Plan: A green, smart and carbon neutral city. Copenhagen. Retrieved from https://kk.sites.itera.dk/apps/kk_pub2/index.asp?mode=detalje&id=983

The Danish Ecovillage network - Gaia.org. (2019). Accessed May 16th 2019. Retrieved from https://gaia.org/global-ecovillage-network/danish-ecovillage-network/

United Nations. (2019). Goal 11 .:. Sustainable Development Knowledge Platform. Accessed May 12th 2019. Retrieved from https://sustainabledevelopment.un.org/sdg11.

Vaajakallio, K., & Mattelmäki, T. (2014). Design games in codesign: as a tool, a mindset and a structure. CoDesign, 10(1), 63-77.

Warde, A. (2005). Consumption and theories of practice. Journal of consumer culture, 5(2), 131-153.

Watkins, D. (1993). Urban permaculture (No. 338.9 W32).

Watson, M. (2012). How theories of practice can inform transition to a decarbonised transport system. Journal of Transport Geography, 24, 488-496.

ZEYBEK, O., & ARSLAN, M. Ecovillages: The Place Where Ecotourism Turns Into Educational Tourism.