Kær Vestermark as a Living Lab for the Sustainable Development Goals

The Battle Towards Everyday Goals

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7. affordable and clean energy

11. Sustainable cities and communities

6. Clean water and sanitation

12. Responsible consumption and production

15. Life on land

13. Climate action

4. Quality education

1. No poverty

10. Reduced inequlities

8. Decent work and economic growth

9. Industy, innovation and infrastructure

16. Peace, justice and strong institutions

5. Gender equality

14. Life below water

2. Zero Hunger

3. Good health and well being

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Abstract

In 2021 Sønderborg Municipality aims to develop Denmark's first Center for the Sustainable Development Goals: A place where people, flora, fauna, and sustainable technology thrive in harmony and balance with each other according to UN's 17 Sustainable Development Goals. This thesis explores how the center for SDGs can be designed as a Living Lab that engages citizens to translate and negotiate the SDGs to their own everyday life and create a behavioral change over time. The thesis gives an in-depth insight into the challenges that appear when communicating the SDGs to citizens and working with them in a local setting.

An analysis of citizens' current relation to the area and the SDGs is performed through the perspective of Actor-Network Theory, unfolding various matter of concerns and setting the foundation for understanding the field. This illustrates how current relations attached to an area can create potential controversies when changes are imposed in the establishment of new actors to the area.

Additionally, the thesis explores how the SDGs can become tangible through the explorative and experimental properties of a Living Lab. To support this, we will move away from designing things to investigate how 'Things' can make actors gather, negotiate, and experiment with the SDGs. Through a participatory design approach, essential elements of a Living Lab are explored and developed with citizens and employees of Sønderborg municipality. Here the framework of negotiation spaces is utilized to analyze how the design team has staged, facilitated, and re-framed interventions performed throughout the thesis. In addition to this, the use of online mediums as tools for online participatory design is explored and reflected upon, giving recommendations to how peers can approach such a process in the field of participatory design.

The participatory design process results in the concept proposal: "The battle towards the Everyday Goals," illustrating how the Center for SDGs as a Living Lab can be developed at Kær Vestermark and a strategy for further work.

Keywords: Designing Things, Sustainable Development Goals, Living Labs, Participatory Design, Co-Design, Negotiation Spaces, Tangible Interactives, Experimental Platforms, Sustainable Development Goals in a local context, Scenarios

Acknowledgements

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READING GUIDE

The report consists of 11 main chapters that will take you through our thesis and analyze and conclude on the findings and results gained through the process.

Quotes
Through the report, we have used quotes from our interventions to support the results. All quotes marked with ***x** are translated from Danish to English. The original quotes will be found in **Appendix 16**. An example: "I like to walk in the forest"***5** - Citizen. Quotes that are not marked with a ***** are to be seen as quotes taken from literature and will be referenced.

Appendix
The report is supported by several appendixes made during the thesis to help document our work and results. In the report, the worksheets are referred to as (**Appendix x**). In the back of the report and overview of the collection of worksheets will be shown.

Photos and illustrations
Various illustrations, screenshots, and photos are supporting the report's written work, and are referred to as (**figure x**). Own photos or illustrations are marked with (Own photo/own illustration), and borrowed photos/illustrations are referenced to the source.

Abbreviations
During the report, we have used different abbreviations. The first time we use a word that will be abbreviated, a parenthesis will follow the word with the abbreviation. An example - Sustainable Development Goals (SDG).
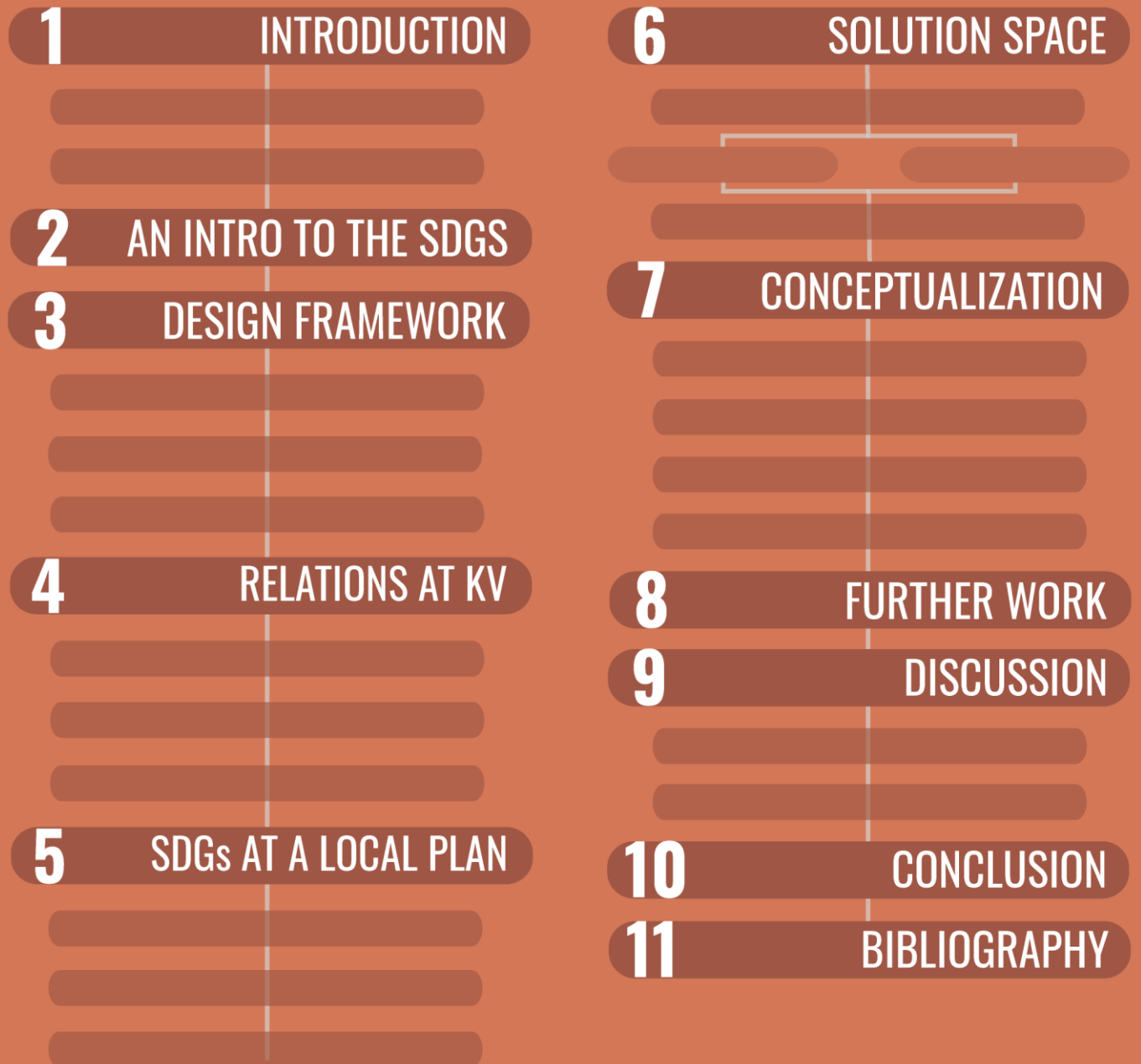
1 INTRODUCTION

In 2015 the 17 Sustainable Development Goals were agreed upon at a UN summit in New York. The goals were to take effect from 2016 - 2030 to help the world achieve global sustainable development both for the world and the people living on it. To understand the SDGs and the reason for their existence, it is necessary to understand the age we live in. Right now, the Anthropocene age is running a geological epoch, also called the age of the human (Hildebrandt 2016). Humans have had a significant impact on how the ecosystems and the geology of the world have evolved. Human activities have led to comprehensive and enduring changes in the earth system and have, among others, resulted in critical stages both within climate and biodiversity. The SDGs are an answer to how we can cope with the changes created by the Anthropocene age and an opportunity for humans to take responsibility for the imbalances that the age is an expression for. Identifying the problems is one part of the challenge, but identifying which approaches and measures needed to transition into a sustainable future is immensely difficult. Especially for the individual, it can be challenging to see and understand how they can impact these forces. Therefore, the world needs relatable tools when talking about sustainable development (Hildebrandt 2016). This is where the SDGs have had a substantial impact and have become extremely popular today. The sustainable development goals consist of 17 concrete goals with 169 subgoals, which are *"a call for action by all countries - poor, rich and middle-income - to promote prosperity while protecting the environment" (United Nations, 2019a).* Since the 17 goals are set in a global context, it can be challenging to work with them in a national or local setting. Though the SDGs are localized to make

them relatable, it is still noticeable that many municipalities and especially their citizens find it difficult to understand the SDGs, their interconnectedness, and how to act according to them. As a result, we see the SDGs are being perceived more as a menu of options, rather than a system of objectives that should be addressed integrally (Valencia 2020).

Looking towards a Danish context, the SDGs have had a tremendous impact on how we talk about sustainability both on a national level but also at a local level in organizations and institutions across the country. Especially municipalities actively work with the SDGs and use them as a common language when talking about sustainability. Though the goals are seen as a useful tool when discussing sustainability, it is noticeable that the SDGs have become a buzzword or a way to promote a business as usual approach instead of an incentive for systemic and radical change.

One of the Danish municipalities that are devoted to implementing sustainable initiatives through the SDGs is Sønderborg Municipality. They are well known for their ambitious plan on becoming CO2 neutral by 2029 through Project Zero (Project Zero 2020). Several measures have and will be taken to incorporate sustainability in Sønderborg Municipality. As part of this plan, Sønderborg has committed to teach their citizens about the 2030 Agenda and motivate them to take part in the sustainable development at a local plan. The goal is to motivate 10,000 citizens to become ambassadors for sustainability (Gassen, Penje & Slätmo 2018). To do so, Denmark's first center for the SDGs (Center for Verdensmål) will be implemented at a nature area close to Sønderborg city called

Kær Vestermark. The vision is to inform and inspire visitors on how the SDGs can become everyday goals.

In this thesis, we will, in collaboration with Sønderborg municipality, look at how such a center for the SDGs can be designed and implemented. We will investigate how the SDGs can be communicated understandably and tangibly for citizens of the municipality and how both the citizens and municipality can act upon the SDGs to create a sustainable behavioral change over time. To do so, we see potential in transforming Kær Vestermark into a Living Lab for the SDGs because of Living Labs' capability of involving a wide range of actors in alternative learning environments. We will explore how the design of 'Things' can create a space where both negotiation and experimentation are central elements to reach the goal.

We will approach these thoughts by investigating the following research question:

What elements are needed for the future Center for the SDGs at Kær Vestermark to become a Living Lab, and how can these elements be co-designed to engage citizens to translate and negotiate the SDGs to their own everyday life?

And the following sub-questions:

- How do the present and future relations affect the implementation of the Center for SDGs at Kær Vestermark?

- What are citizens' relations to the SDGs, and how can they be made tangible? (can a change in these relations help push for a sustainable behavioral change?)

- Which spaces or activities need to be co-designed in the implementation of Kær Vestermark as a living lab for the SDGs?

1.1 The initial framing of the project

As an introduction to the thesis, we will, in the following section, shortly present Sønderborg Municipality, Kær Vestermark, and the Center for the SDGs to support the framing of the project and give fundamental insights to understand the premises of the thesis. Furthermore, we will present one of the initial interventions with Sønderborg Municipality, where we, in collaboration with the department of Sustainability and Nature, framed the direction of the project.

1.2 Sønderborg Municipality

Sønderborg Municipality is the 16th largest municipality in Denmark placed in South Jutland. The municipality is known for its historical sites (Dybbøl Mølle), nature, Danfoss, and sustainable development. *"In Sønderborg Municipality, scenic surroundings go hand in hand with initiative and development"* (About Sonderborg Municipality 2020).

This project collaborates with the department of Sustainability and Nature, which is an agency within the management of Culture, Tourism, and Sustainability led by Inge Olsen in Sønderborg Municipality (see figure 1).

The department consists of 5 employees and focuses on the areas of sustainability, Project Zero, and Nature development projects. The foundation for the work within sustainability is the UN's 17 Sustainable Development Goals.
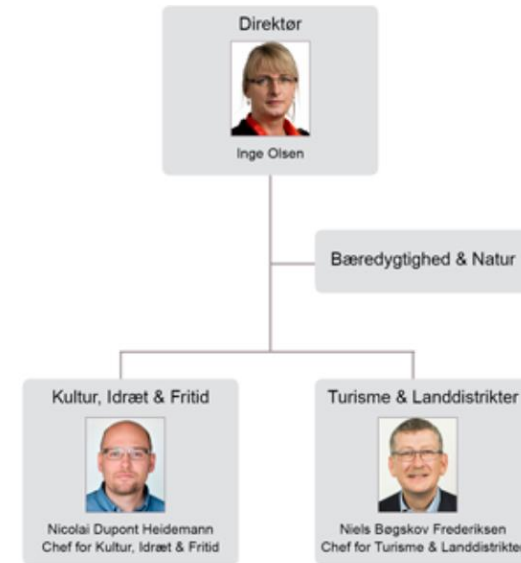
Figure 1. The Management of Culture, Tourism and sustainability in Sønderborg Municipality (Kultur, Turisme Og Bæredygtighed 2020)

Sønderborgs vision for sustainability

"Together we can ensure that sustainability becomes a natural and integral part of our everyday lives. We will work for more gentle use of our resources and our nature, so Sønderborg is a good place to live, study, work and do business for everyone - now and in the future." (About Sonderborg Municipality 2020)

The political program for sustainability has its starting point in the city council's constitution agreement from 2013. Since then, the municipality has developed a vision and strategy for how they should approach sustainability and how they will integrate it internally in the municipality to create a sustainable transition.

The goal of the sustainability program is to:

- Cherish resources and values
- Secure the future
- Be a strong competitor to other municipalities
- Frontrunner on national and global trends

The municipality wants to be a role model for the companies and citizens of the municipality and showcase how integration of sustainability can be done corporately and in everyday life.

1.3 Kær Vestermark and the Center for SDGs

Kær Vestermark is a nature area placed 3,5 km away from Sønderborg city center and owned by the Municipality (see figure 2). The area is 140 acres large containing 6 farms placed in different locations (see figure 3). It was purchased from the military in 2014 and hosted a big scout camp in 2017 (Spejdernes Lejr). This event changed the area and the function of it, and among other things secured nature conservation of certain areas as well as the establishment of shelters, stage area, and a view tower ("Fra Spejderlejr Til Byens Oase" 2017). The area can be reached easily both by walk, bike, and car.

Figure 2 & 3. Location of Kær Vestermark in relation to Sønderborg (google.com/maps) and illustration of Kær Vestermark and its six farms (own illustration)
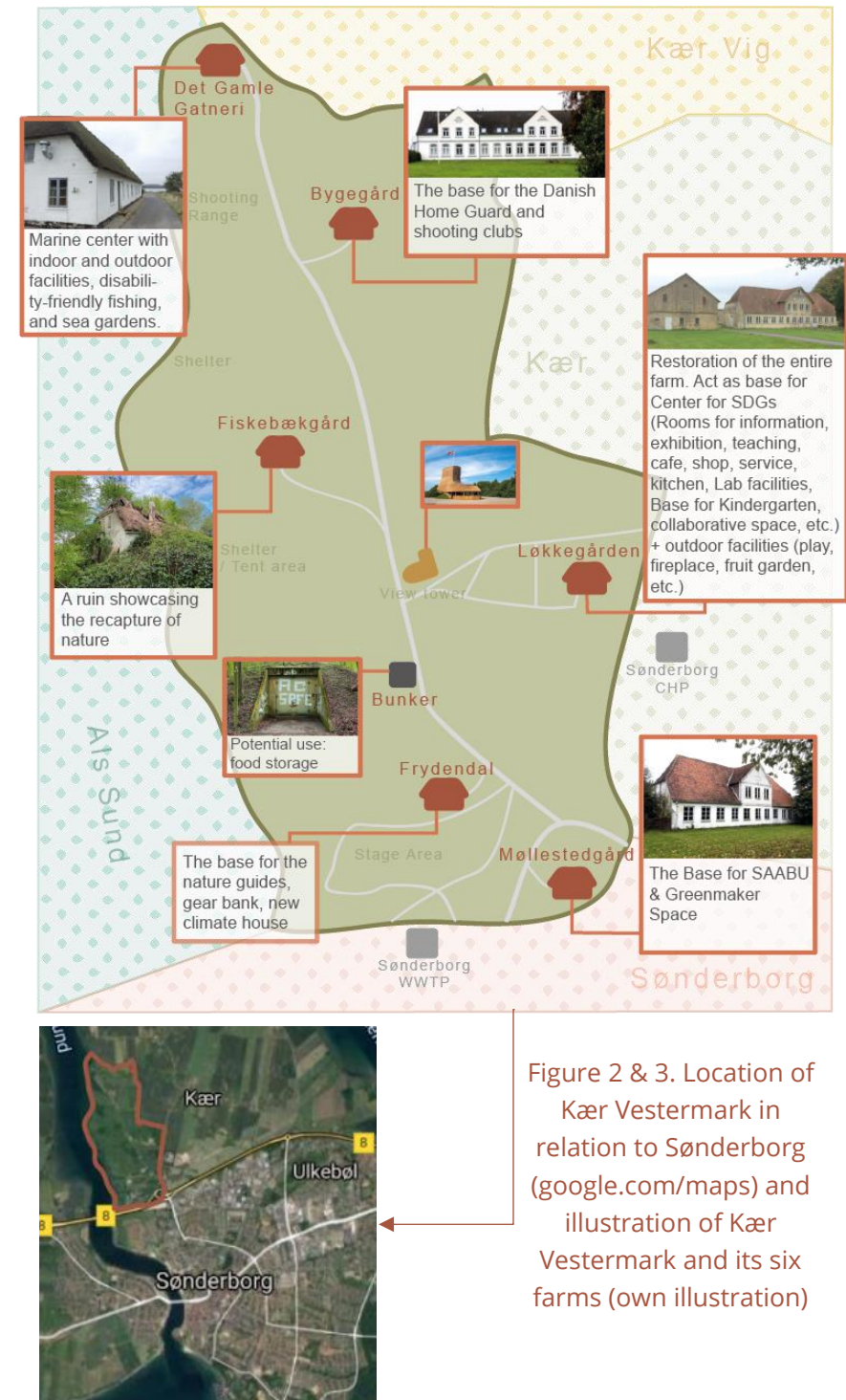
According to Sønderborg Municipality's plans, Kær Vestermark has the potential of becoming the first Center for SDGs in Denmark. The vision is to make the 17 SDGs visible for citizens, visitors, and companies in and around Sønderborg. In 2018 the city council devoted 12 million distributed over the years 2019-2021 to the project, and external funding from local organizations is also to be expected.

" Center for SDGs - Kær Vestermark will be an area where people, flora, fauna and sustainable technology thrives in harmony and balance with each other according to UN's 17 Sustainable Development Goals." (Olsen 2019, p. 5)

Figure 4. Pictures from the nature at Kær Vestermark (own photos)

On February 27. 2019 the City Council voted for four main steps in the development of Kær Vestermark:

1. Løkkegården (a farm placed on Kær Vestermark) will be developed as a place to communicate nature in the municipality's education-and learning environment.
2. Kær Vestermark will be developed as a local and national Center for SDGs.
3. The idea around the center for SDGs will be the main earmark when applying fonds.
4. The Center for SDGs will be open for possible public and private partners.

As part of the initial planning, the municipality has performed a brainstorming on the vision for the center and what activities the place could provide, as shown in figure 5. This gives an insight to the current ideas of the municipality.

The activities range anywhere from highly technological to creating facilities for health and exercise activities. In the thesis, we will deviate from some of these very concrete ideas and plans for the Center for SDGs, and take a step back to explore what the potential of Kær Vestermark has to offer and involve citizens to develop some of the elements in a participatory process.

Visions for Center for SDGs

Use of the ocean

Self-driving vehicles.

Insect farming

Kær Vestermark in its present state

health, exercise, well-being, outdoor life, dog forest, nature schools, associations, cultural history, viewing tower, natural playground, track, shelters, hiking & nature experiences

Drones

Health and exercise

Recycling store and learning room

Robot-guides

Taste experiences

Vertical farming

Sustainable food

Figure 5 Adaption of illustration made by Sønderborg Municipality to showcase the range of ideas and visions they have for the new Center for SDGs (own illustration, with inspiration taken from (Olsen 2019)

1.4 Negotiation of problem direction and framing the project

IN this section, we will present the premises for choosing the living lab approach as the project direction. To frame the project-direction, an intervention was staged with the Department of Sustainability and Nature on 25.02.2020. This was done to kick-start the process of a participatory design project and to interest, the department's employees into the design process, thus initiating the mobilization of key actors from the municipality. The intervention gave the participants an opportunity to negotiate the direction of the project with each other and the design team(us). To frame the intervention, four possible project directions were prepared and presented to them. These were:

1. Inclusion and participation with children
2. Kær Vestermark as a Living Lab
3. Participation with disabled people
4. From Sustainable Development Goals to Everyday goals

The project directions were based on initial research, material given by the director Inge Olsen in a preliminary meeting (to read more about the results of the meeting see Appendix 1, as well as our own personal interests and experiences (see figure 6).
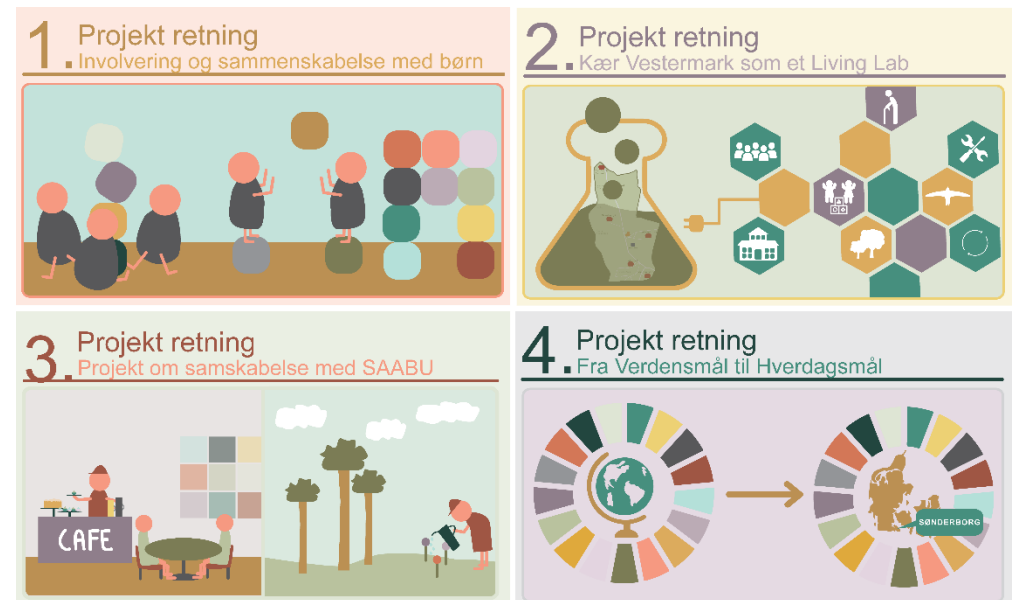
Figure 6. The four project directions (own illustrations). See appendix 17 for the full description of the project directions

1.4.1 Staging and facilitation of the negotiation space
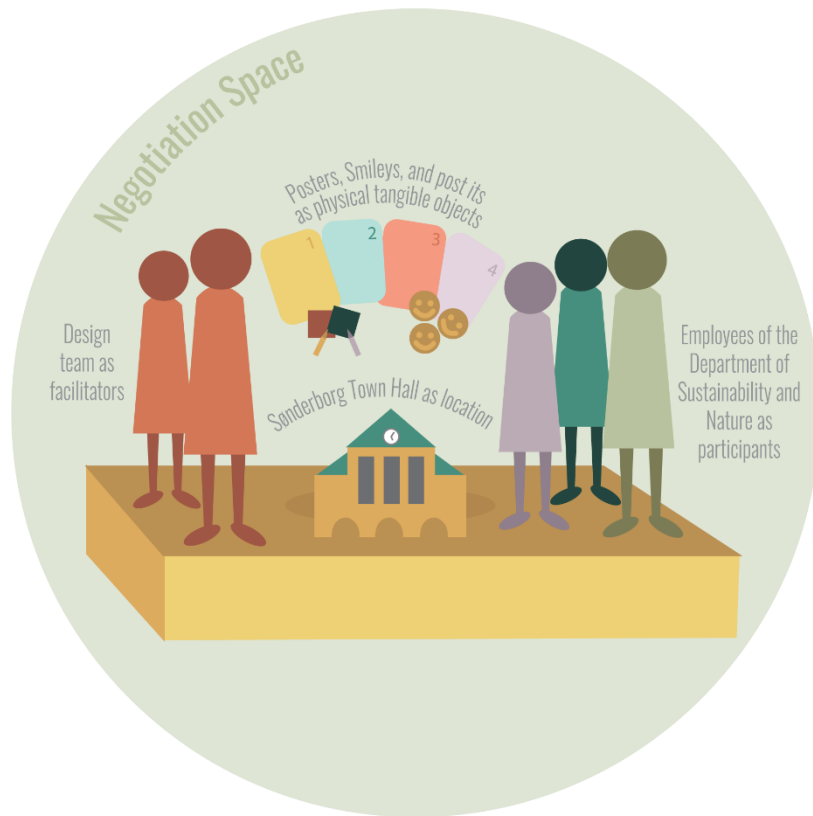
Figure 7. Negotiation space of project direction

A negotiation space was made between us (the design team), the department members, and different physical objects to negotiate through. Four physical posters were circulating while the project directions were presented individually by the facilitators. Each project direction was negotiated around potential possibilities and challenges which the participants could attach to each project direction with post-it notes. (see

figure 6). The full results of the intervention are shown in Appendix 2.

After the presentation and discussion, the participants voted and negotiated the directions they saw the most significant potential off. Project direction four (from Sustainable Development goals to everyday goals) got the majority of the votes (see figure 7). This project direction was favored among the participants because the municipality found it challenging to present and communicate the SDGs to their citizens and the future visitors at Kær Vestermark.

Figure 8. Photo from the facilitation of project direction meeting (own photo)

Quote on project direction four:

"I think this one is exciting. When we are discussing the Center for SDGs, as a communication platform, we do not agree in the group what this entails and requires? Should we physically go out into nature and show every single goal? I think that we do not need to do this to be credible; it is ok that some are taught through a poster or lecture, or experiment with the global aspects of the SDGs. There are many different learning platforms at Kær Vestermark " - Inge Olsen, Project Direction (Appendix 2) ***1**

Besides the popularity of creating a translation of the SDGs into everyday goals, the participants liked the idea of transforming Kær Vestermark into a Living Lab as an experimental space for sustainability.

"Concerning Kær Vestermark, we have mentioned that the Center for SDGs should illustrate how the world looks like in 2030 when we have achieved the seventeen SDGs, what we need to do differently or how we can do it differently... However, where does this knowledge come from?... What kind of laboratory should we develop? How do we create innovation environments that enable us to think outside the box and try something else?" ***2** - Inge Olsen, (Appendix 2)

Figure 9. Picture of results taken after ended intervention (own photo)

1.4.2 Reframing

We gathered valuable insights, perspectives, and reflections from the intervention, which were included in our thoughts when choosing the direction of the project. The early involvement of key actors was an important strategic step towards interesting them into the project as their matters were taken into account. As a result of the intervention, we choose to leave project direction 1 and 3 behind, despite these being our preferred directions preliminary to the meeting.

The participants from the municipality had objections against these directions, and it was evident that interesting and enrolling actors in these project directions would be very challenging without the support from the municipality. The negotiation, therefore, pointed us towards direction 2 and 4, which we all agreed had the potential of being merged into one project direction.

Project direction 1
Participation with children

Project direction 2
Kær Vestermark as an living lab

Project direction 3
Participation with disabled people

Project direction 4
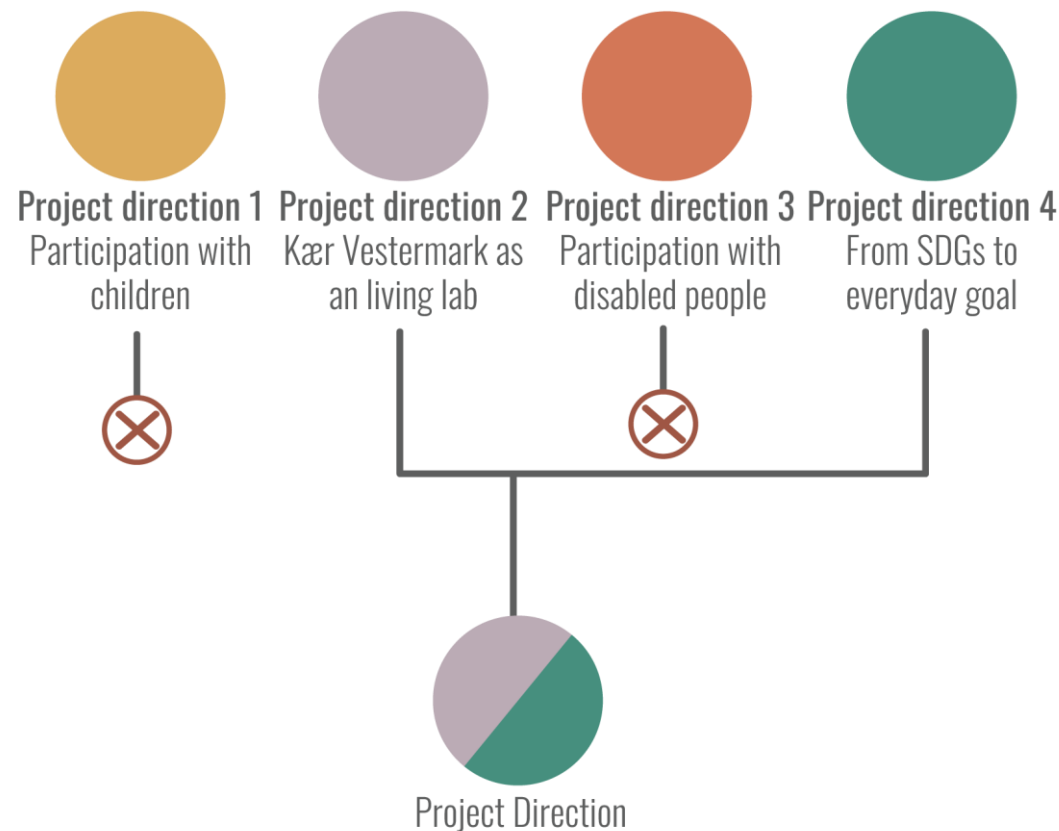From SDGs to everyday goal

Project Direction

Figure 10. Visualization of the reframing of project direction

2

AN INTRODUCTION TO THE SUSTAINABLE DEVELOPMENT GOALS
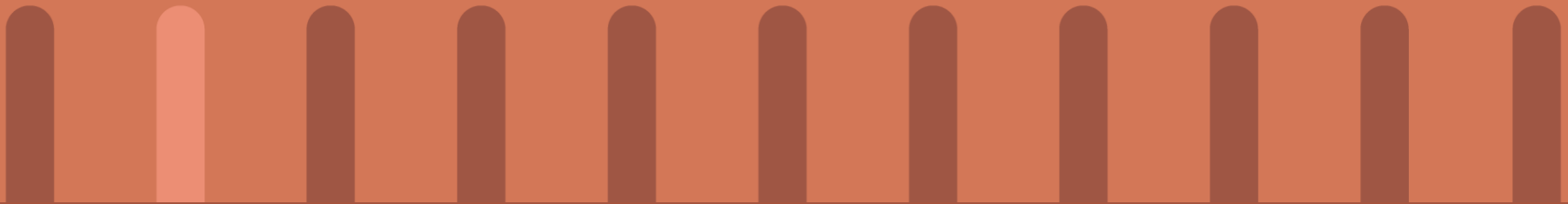
This chapter touches upon some of the existing literature and knowledge conducted on the topic of sustainable development goals. We will use this as fundamental background knowledge to the project, to complement the existing literature with a pragmatic approach to how the SDGs can be experienced through a living lab environment.

An Introduction to the United Nations' Global Goals for Sustainable Development

In September 2015, 193 countries of the United Nations general assembly signed the 2030 agenda for sustainable development. The agenda was as a sequel to the Millennium Development Goals, which needed a reframing after not being fulfilled in their 15 years of action from 2000-2015 (Mensah & Casadevall 2019). The new agenda proposes 17 Development Goals known as the SDGs and 169 underlying targets.

Figure 11. The 17 sustainable development goals ("Sustainable Development Goals .:. Sustainable Development Knowledge Platform" 2020)

These are seen as the United Nations' call to achieve a better and more sustainable future for people, planet, and prosperity (UN 2015). The goals and targets balance the three dimensions of sustainable development: the economic, social, and environmental and address global challenges such as poverty, inequality, climate, and environmental degradation (UN 2015).

We will not detail each goal and target in the report, but in summary, they seek to achieve the following objectives:

- *"Eradicate poverty and hunger, guaranteeing a healthy life*
- *Universalize access to basic services such as water, sanitation, and sustainable energy*
- *Support the generation of development opportunities through inclusive education and decent work*
- *Foster innovation and resilient infrastructure, creating communities and cities able to produce and consume sustainably*
- *Reduce inequality in the world, especially that concerning gender*
- *Care for the environmental integrity through combating climate change and protecting the oceans and land ecosystems*
- *Promote collaboration between different social agents to create an environment of peace and ensure responsible consumption and production"* (Mensah & Casadevall 2019 p. 11)

2.1 Potentials and constraints of the SDGs

The SDGs have become a prominent political and strategic device which has created a momentum in the debate on sustainable development. It has become a standard reference and language when talking sustainability both on a global, national, and local plan. We see that the SDGs are used not only in political spheres but also in an increasing number of public and private institutions and organizations working with the SDGs. Nevertheless, as more institutions and organizations are working with the SDGs, the SDGs have also been the topic of debate and criticism from peers and practitioners within sustainable development.

Gaining an understanding of the resentments behind the development of the SDGs, we need to look at how the topic is discussed from multiple perspectives. Furthermore, look at the interconnectedness of the goals to "*create understanding about the long-term view on the SDGs, synergies between them, and how they are systematically related.*" - (Randers et al. 2018, p. 12).

2.1.1 All goals are connected

The UN presents the goals and their targets separately, but simultaneously, they emphasize that they are all indivisible and interlinked (UN 2015, point 71). This interlinking means that they should not be considered as 17 standalone goals, but instead as a big complex puzzle where each goal is an indispensable piece leading to achieving the next goal (Mensah & Casadevall 2019). Although the goals are connected, there is a tendency, from institutions and organizations working with the SDGs, towards

favoring some goals over others and cherry-picking goals to fit their purpose. "Rather than treating all 17 Goals (SDGs) in the 2030 Agenda on equal footing to protect the most marginalized and vulnerable and enhance their situation, we are already witnessing some goals getting more support than others" (UN 2016)- A joint statement from the Office of the UN High Commissioner for Human Rights. However, this approach is highly ineffective if we are to reach all the agenda's objectives before 2030. Lim, Jørgensen & Wyborn (2018) have investigated the links between the goals and targets and their impact on each other (see figure 12).

Table 1. Number of links across SDGs and subgoals. The table sets out the number of SDGs that each SDG (or subgoal) has an impact on and the number of SDGs (or subgoals) that impact on the realization of each SDG (or subgoal).

Sustainable development goals and subgoals	No. of SDGs/subgoals that this SDG/subgoal	
	has an impact on	is impacted by
SDG 1: Poverty	5	16
SDG 2 (i): Hunger, food security, and nutrition	3	15
SDG 2(ii) Sustainable agriculture	9	6
SDG 3: Health	6	12
SDG 4: Education	17	4
SDG 5: Gender equality	8	4
SDG 6(i) Water availability and sustainable management	6	4
SDG 6 (ii) Sanitation	2	6
SDG 7: Sustainable energy	9	3
SDG 8 (i) Sustained and sustainable economic growth	10	19
SDG 8(ii) Employment and decent work	8	6
SDG 9 (i) Resilient infrastructure	8	3
SDG 9 (ii) Sustainable industrialization	6	2
SDG 9 (iii) Technological innovation	6	4
SDG 10: Inequality within and among countries	6	9
SDG 11: Safe, resilient, and sustainable cities and settlements.	2	9
SDG12: Sustainable consumption and production.	7	9
SDG 13: Climate change	9	6
SDG 14: Oceans	4	6
SDG 15: Terrestrial ecosystems	6	7
SDG16(i) Peaceful and inclusive societies	5	12
SDG 16 (ii) access to justice and effective, accountable, inclusive institutions	Overarching goals that	3
SDG 17(i) Means of implementation	contribute to the realization	4
SDG 17(ii) Global partnerships	of all other goals	3

Figure 12. Interconnectedness of the SDGs impact on each other (Lim, Jørgensen, and Wyborn 2018)

As the table indicates (see figure 12), many of the goals are interlinked, and some goals are more complementary with each other than others (Lim, Jørgensen, and Wyborn 2018). According to Mensah and Casadevall (2019) some of the goals even run the risk of contradicting each other. They have found that there are some trade-offs and tensions between the SDGs and how they are approached. They emphasize that there is a mismatch between achieving high levels of economic growth that contributes to poverty reduction and preservation of the environment. Hickel (2019) points that, especially goal 8, focusing on continued global economic growth is contradicting the goals focusing on "harmony with nature" in goals 6,12,13,14 and 15. Also, Stockholm Resilience Centre, known for their work on the Planetary Boundaries, are questioning the economic growth dilemma. According to the Stockholm Resilience Center, we are far from achieving the 17 goals with the current approach. In a report from 2018, they investigate how the SDGs can be achieved within the planetary boundaries and states that *"If the world's nations continue with the same efforts as in the recent decades we will not achieve SDGs by 2030, nor 2050."(Randers et al. 2018 p. 7)* They argue that it is necessary to *implement transformational and extraordinary policy changes* to achieve the SDGs within the planetary boundaries. To do so, they propose five policy recommendations (See Appendix 3). Taking all five policy recommendation into account in this project will simply be out of our scope, but we will focus on the fourth recommendation about behavioral transformation:

> *"4: Behavioural transformation is also required, particularly in the rich parts of the world. Given current trajectories, it seems very unlikely that SDGs within PBs can be attained without a shift in mind-set and values broad enough to support the acceleration of transformational actions. 2030 is only 12 years away and it is urgent that both world leaders and citizens move into a domain where everyone not only knows the information but also acknowledges the implications. Our analysis indicates that transformational change is not only necessary and possible, but also desirable, with many positive synergetic implications for people and communities." - (Randers et al. 2018 p.8)*

2030 is only ten years from now, and the SDGs are still far from being achieved. To achieve them, sustainable development needs to be an integrated element across and within economic, social, and ecological systems (Lim, Jørgensen, and Wyborn 2018). Dhananjayan Sriskandarajah (2018) further stresses that the SDGs will not be fulfilled without an increased public engagement leading to a civil society thinking and behaving radically differently. *"The Sustainable Development Goals (SDGs) will not be achieved without significant public awareness and engagement."(Sriskandarajah 2018 p.1).* He argues that a change in behavior from the public is important as it can create an "accountability revolution," holding governments accountable to their promises of the goals (Sriskandarajah 2018). And thereby lead to more substantial systemic transformations going beyond the small everyday changes of the individual.

2.2 Taking the SDGs from global goals to local goals

The SDGs are the cornerstone for the action plans all 193 countries will have to develop and strive to enable a sustainable future. Nevertheless, the SDGs are about the global efforts for sustainable development. So how can we work with them on a national and local plan?

On a national level, the UN recognizes that countries will have to take different approaches in the implementation. *"Targets are defined as aspirational and global, with each government setting its own national targets guided by the global level of ambition but taking into account national circumstances. Each government will also decide how these aspirational and global targets should be incorporated into national planning processes, policies, and strategies".* - (UN 2015, point 55).

Although the SDGs generally apply across all countries, the UN recognizes that different measures and approaches need to be taken within each government. The fact that all goals are global means that they can seem in-concrete. Some goals can come off as not directly relevant in a national or local context. Some countries will face significant challenges in the implementation of the SDGs, where others will be closer to achieving several goals and targets before actively working with them (Mensah and Ricart Casadevall 2019). The UN proposes that *"Regional and subregional frameworks can facilitate the effective translation of sustainable development policies into concrete action at the national level."*- (UN 2015, point 22). Therefore, a national and local adaptation of the SDGs is needed.

Figure 13. From global to local

In Denmark, the SDGs have had an increasing impact in the government, public and private organizations and at a local scale in municipalities. In 2017 the government developed a plan of action on how Denmark can and should integrate the 17 goals. The action plan emphasizes that: *"all actors across the society are encouraged to engage and contribute to the achievement of the SDGs in Denmark and internationally."*- *(*Regeringen 2017 p.9)

The Danish municipalities play an essential role in the implementation of SDGs because they are the decision-makers on both short and long-termed initiatives for sustainable development at a local level within education, integration, city planning, waste management, and energy sufficiency (Deloitte 2018). Furthermore, the municipalities have direct contact with the local communities and can more directly push for

sustainable development among the citizens. Communication and interaction on sustainable development with the citizens is especially important, as Justice Mensah & Sandra Ricart Casadeval argues: *"Sustainable development thrives on the commitment of people and so in order to translate the concept into action public participation should be increased"*- (Mensah and Casadevall 2019 p. 14).

In chapter 4, we will look further into how three municipalities and one organization have worked with the SDGs on a local level and tried to engage the citizens.

2.3 The Sustainable Development Goals at Kær Vestermark

As suggested by the preliminary research on the SDGs, we find it important to incorporate some of the crucial elements of the SDGs that are often forgotten. We will therefore in the negotiation and implementation of the SDGs at Kær Vestermark have a focus on:

- Understanding the current relation between future users and the SDGs, in order to understand the challenges and opportunities we are facing when designing how they should be communicated to impact and hopefully change their relation leading to a change in behavior.

- Making sure that we do not favor some SDGs over others and thereby contribute to the issues of 'cherry-picking' SDGs
- Include the importance of understanding the interconnectedness of the SDGs when communicating the SDGs. All goals are to be seen as connected.

3 DESIGN FRAMEWORK
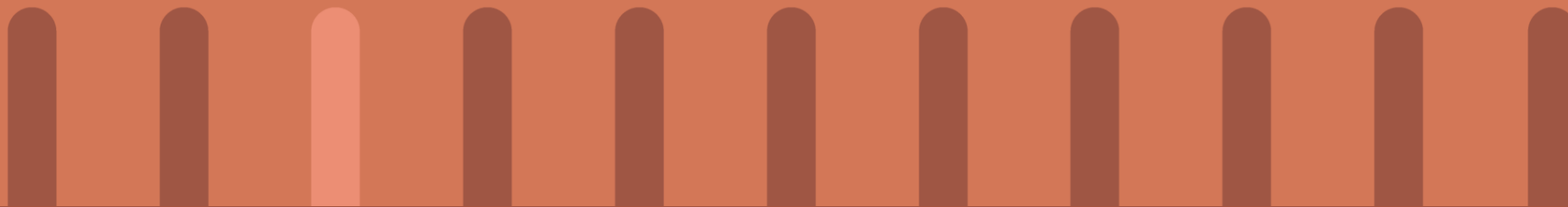
Various theories have supported the structure of the design process and contributed to the formulation and investigation of our research question. In the following, we will describe how the use of Actor-Network Theory (ANT) has helped investigate Kær Vestermark, discover relevant Matters of Concern (MoC), and map controversies in the network. Throughout the thesis, we have used a participatory design approach to accommodate the discovered MoCs in the design.

Staging, facilitating, and reframing various Negotiation Spaces have supported our approach of combining ANT and Participatory Design to enable negotiation and discussion of the MoC's and actively invite the actors into the design process. Participatory design is our approach, and we have co-designed with actors in the field. Additionally, we investigated how the use of Living Lab (LL) can create agonistic spaces, where experimentation and negotiation of the Sustainable Development Goals (SDGs) are possible. Lastly, the design process, the methods applied to investigate the research questions, and our empirical material is presented.

3.1 Actor Network Theory (ANT) and Participatory Design (PD)

The thesis has mainly been supported by the use of ANT as a theoretical and analytic tool to understand the relations and current network constructions at Kær Vestermark. By applying ANT, we can navigate in these relations and gather an understanding of potential controversies that need to be brought forward when applying changes to existing relations. It is essential to state that human relations need to be understood through the non-human actors, and the non-humans can displace, shape, and affect the human actors and relations. Therefore we do not separate the human-actors from the non-human but perceive them as equals (Shiga 2007).
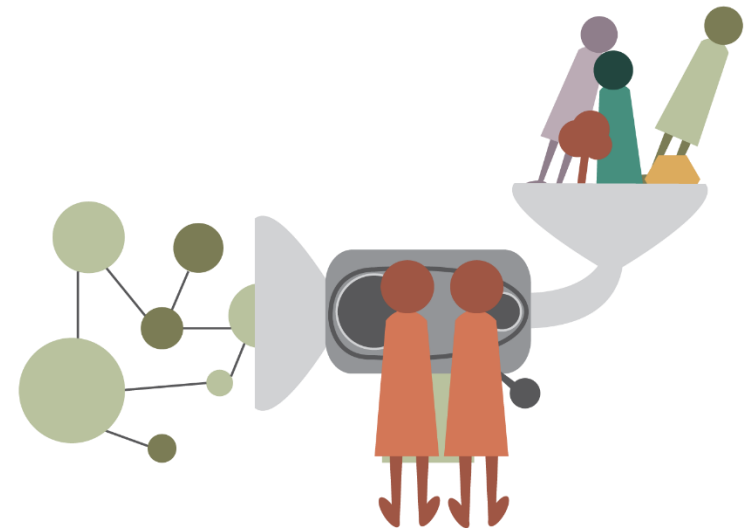
Figure 14. Visualization of the design team taking on the perspective of Actor Network Theory. Actors are viewed as network-constellations of relations

ANT appeared in need of new social theory adjusted to Science and Technology Studies (STS), where Latour (1988b), Callon (1986), and Law (1986b) formed this way of approaching social theory. *"It was at this point that non-humans - microbes, scallops, rocks, and ships- presented themselves to social theory in a new way"* (Latour 2005, p. 10). Humans and non-humans became equals in heterogeneous, continuously changeable network

relations. Central to this theoretical consideration is how to influence and change constellations (provoke change or make a difference) of network relations to humans and non-humans (Storni 2015). The network can be seen as a result of a negotiation of the actors' relations, and the network can either be stable or disturbed. *"Entities do not pre-exist in the design process as fixed, and separated actors with predefined roles and qualities but rather emerge, shift and fuse together in open-ended assemblages of humans and non-humans"* (Storni 2015, p. 169). In ANT, it is believed that the actors are nothing by themself, but are defined (what actors are and do) by their relations with other actors (Latour 1993). We believe that this theoretical approach will be rewarding when entering the field of Kær Vestermark to clarify and discover new matters.

3.1.1 Translation processes and Matters of Concern

Following Callon, translations are central to how a network occurs, negotiates, and changes. As long as the translation process is ongoing, the networks are changeable. We are using translation as an active part of our project to design new network constellations (Brodersen and Pedersen 2019). As Shiga (2007) describes, the framework of translation is used to direct attention towards the transformative processes through which actors are combined and linked with others. It is not our role as design engineers to talk on behalf of the actors' but rather facilitate the dialogue that enables the actors to speak for themselves, which we have done through a participatory design approach. The translation is fulfilled through a mobilization, which is the last moment in Callon's (1986) Four Moments of Translations:

1. Problematization
2. Interessement
3. Enrollment
4. Mobilization (Callon 1986).

We use translation as a part of our design process, to interest, enroll, and mobilize actors into the design process with the use of various non-human actors. In the first step, we use problematization to define our problem definition/agenda. Hereafter we create interessement for the actors to participate and make them negotiate relations in the new network. When the actors have been interested, we start the enrollment where the actors' roles and relations are being defined. If the translation is a success, the actors will actively act upon the new agenda. Thereby they have been mobilized.

As a part of the problematization phase, Callon presents the term Obligatory Passage Point (OPP), as a point, all actors need to go through to create alignment in the network. The OPP shows the actors' roles and relations in the network, what interests the actors, and the possible obstacles that can arise to get through the defined OPP. Instead of the OPP, we seek inspiration from Latour's (2004) concept of MoC into the translation process. We argue that the use of OPP can result in a too rapid narrowing of the design process because the actors need to passage a specific point to be interested and create a successful translation. With this approach, we do not believe that other points will be investigated further and potentially overseen. When taking Latour's MoC concept, OPP can seem somewhat unchangeable and non-negotiable through the process. In the thesis, we find the use of MoC preferable in a

translation process, because they can be negotiated and co-exist. *"I will argue that it's possible to feed, so to speak, off controversies and learn how to become good relativists - surely an indispensable preparation before venturing into new territory"* (Latour 2005, p. 16). By addressing the actors MoC, it is possible to explore and understand the real causes of how the current networks are constructed and their potential controversies. Thereby it can help guide the facilitation towards designing new networks (Latour 2004). Because we are designing within a not yet established place (The Center for SDGs), it is essential to explore the present MoCs related to Kær Vestermark and ensure that they are taken into consideration. This is done to mobilize the present actors into the new network and avoid potential breakdowns. *"Matters of concern are characterized by being rich, complex, surprising, and constructed. These characteristics make concerns political and open for discussion"* (Brodersen and Pedersen 2019, p. 966). We use the MoCs to highlight the actors' different goals and interests, navigate, and to interest, enroll and mobilize actors into the design process.

3.1.2 From designing things to Things

Another element of ANT we want to bring into the design process is the concept of 'Things' and how to create participation and negotiation within them. Following Latour (1999), 'Things' are socio-material assemblies characterized as collectives of humans and non-humans through whom Matters of concerns or controversies are handled (Björgvinsson and Ehn and Hillgren 2012). Suddenly the meaning of the word "thing" shifts from being a material object to complex-socio-technical assemblies of contradictory issues. In this thesis, we will, through our

participatory approach, move away from designing things to investigate how to design Things for sustainability (the SDGs), where actors can gather, negotiate, and experiment. We argue that designing Things as a part of the establishment of the Center for SDGs can help transform Kær Vestermark, into a space where new ways of thinking and behaving can be explored through socio-material frames for controversies (Ehn 2008). Storni (2015) describes that designing Things focuses on sustaining and facilitating dialogues and open-ended rethinking of issues. We cherish this approach and viewpoint and see an opportunity in designing a space where participants with diverse matter of concern can confront one another and explore sustainable alternatives.

3.1.3 Enabling actors to be co-designers (in a Pandemic)

To mobilize actors into the design process, we use a Participatory Design (PD) approach as a part of our theoretical framework. As Callon (1986) states, we acknowledge the actors' view as an experienced reality and do not believe in knowing the complete truth as designers. *"Participatory Design builds on a collaborative approach, where the users are seen as partners in the design process (often referred to as 'genuine' participation) (Simonsen & Robertson 2012)."* (Pedersen and Clausen 2017, p. 3). The design approach has changed over the years, moving from focusing on the artifact designed, their functions, and usability to studying the use and involvement of the users in the design process. PD started from the standpoint *that those affected by design should have a say in the design process* (Ehn 2008, p.3). Latour (2005) supports this by; *"The "task of defining and ordering the social," he argues, "should be left to the actors themselves, not*

taken up by the analyst" (Latour 2005, p. 23). PD gives a chance to actively engage with the actors' subjective meanings. Having a natural and straightforward interaction with the actors ensures accurate information and opens for matters that would potentially be overseen. In this project, we have invited employees in the Department of Sustainability and Nature, Sønderborg Kommune, and different citizens groups to be co-designers in the design process. As Storni (2015), we see that Participatory design is a way to display controversies, where PD makes actors aware of other matters than their own. *"That design for cohabitation should not be about proving someone (was) right, as in the trickle-down model, but rather about remaining open to different views, enabling collective and experimental additions and replacements, in a manner that makes their effects public, indefinitely."* (Storni 2015, p. 176). We see all types of knowledge as equal and use the term of agonism, where it is possible to incorporate the involved actors' concerns, knowledge, questions, and ideas. However, working with agonism and the involvement of various actors in a design process requires that the designer enters a navigating and facilitating role, where spaces for negotiation are carefully staged. To do so, we use the term of Negotiation Spaces (Pedersen 2020).

And then came the pandemic...

The vision of the thesis was to have a close collaboration with actors in the field and perform several interventions to explore, understand, and develop with the support of physical props and interaction. However, as the outbreak of COVID-19 shut down all physical interaction, we had to find alternative approaches to participatory design. Therefore we found it necessary to explore; *how participatory design can be performed through online platforms?* Using online platforms in participatory processes is not a general approach. The majority of methods used within participatory processes consist of face-to-face interaction involving the designers as facilitators and the participants as designers. Therefore there is limited knowledge on the subject. However, we can draw inspiration from a few experiences. From existing literature, we have found two approaches to web-based PD:

1. To develop a custom build software/tool to meet the needs of the planned interventions
2. Using already existing platforms to support the PD work.

In 2014 a group from the University of Leicester investigated the existing tools for Distributed Participatory Design and found that they did not meet some of the requirements from traditional PD (Heintz et al. 2014). They found it challenging to find a web-based platform that gives the facilitator a space that supports traditional PD characteristics such as creative exploration, drawing, interacting with material props, and collaboration. Projects such as the Open Web Laboratory Owela (Näkki, Antikainen, and Virtanen 2008) and DisCo (Walsh et al. 2012) have experimented with how web-based tools could be utilized in innovation and product design processes through their custom-platforms. Owela found that one of the advantages of utilizing online platforms was to provide an easy way for actors to participate and thereby reach people who would not take the time to engage in a physical intervention (Näkki et al. 2008). However, the participants did not get the feeling of

community and collaboration, which they suggested could be facilitated through web-camera or personal profiles. Typical for these projects were that they developed their own software to create an interactive platform for co-creation. Instead of developing our platform, we will utilize some of the existing web-based tools as our PD process platform. Reyes and Finken (2012) explored if an existing platform, such as Facebook, could create PD. They investigated how existing PD methods could be translated and facilitated on the social media platform, Facebook. Their findings showed that some users engaged eagerly, and some participated passively. Having the interaction online made it difficult for the facilitator to engage the participants who were not voicing their opinions.

In the project, we will have these experiences in mind when staging online participatory design, despite a lack of research on the subject. In the face of the pandemic, we, therefore, see an opportunity to contribute with new knowledge and experiences in the online PD field. In the project, we will utilize existing online collaborative platforms such as Conceptboard.com, Facebook.com, and Google Slides, even though they are not developed with the intention of Participatory Design.

3.1.4 Temporary spaces for Negotiation
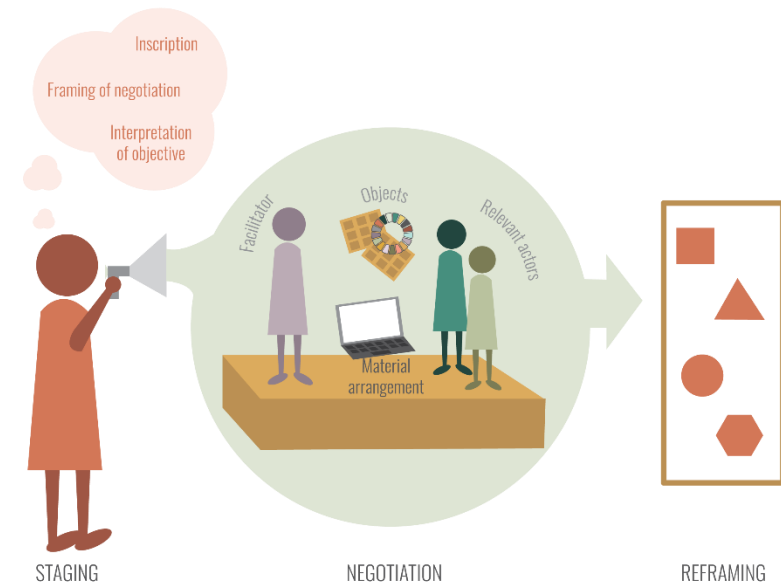
Figure 15. Key elements of staging a Negotiation space (own illustration, but inspiration taken from Pedersen 2020, p. 73)

Pedersen (2020) describes negotiation spaces as *"an analytical approach aimed to understand how designers iteratively interpret, frame, and inscribe objects to foster negotiation in a co-design process, and put into play by facilitating a process of mutual translation between the involved actors, resulting in the reframing of concerns."* (Pedersen 2020, p. 65). The negotiation spaces are temporary were a staged interaction between the facilitator and actors/participants is happening (Pedersen and Brodersen 2019). In our process, negotiation spaces helped us translate knowledge into new negotiation spaces and created negotiation between us, the involved actors (both human and non-human).

The negotiation illuminated what happened before, during and after negotiations with the actors, where Pedersen (2020) describes this navigation through the elements of *staging* (interpretation, framing, and inscriptions - 'setting the scene'), *facilitation* (facilitate negotiations by circulating intermediary objects and improvising within the space and across space boundaries), and *reframing* (the results of negotiations). The staged spaces have been used to negotiate present MoCs and to articulate the unknown MoCs. Especially when working in a pandemic, we have seen the importance of carefully staging the interventions, due to actors' different online experiences, and the ability to improvise with short notice. In this thesis, we have staged and facilitated various interventions (both online and physical) as negotiation spaces, with non-human actors such as design games, morphologies, and scenarios (these methods will be described further in the method section). The non-human actors have worked as intermediary objects (Boujut and Blanco 2003). *"Prototypes and other objects such as design games (Brandt, Messeter, & Binder, 2008) can be seen as key actors in many participatory design projects as they (if staged and navigated properly) have the ability to mediate negotiations by providing a shared or new reference point between e.g., designers and other actors, to translate actors (intentionally or not – and towards a common ground or apart) and to represent ideas, actors' concerns, i.e., as the result of negotiations. If so, they can be termed intermediary objects (Blanco, Boujut 2003; Vinck 2012)"* (Brodersen and Pedersen 2019, p. 966). Intermediary objects are changeable and can represent concerns, translate objects and actors, and mediate between actors to move forward in the design process. Staging, facilitating, and reframing specific spaces, helped us

navigate and synthesize the actors' concerns, create negotiations between the participants, and give inputs for the next interventions. Therefore, the use of Negotiation Spaces created a constant iterative design process, where reframing of the previous space gave the content to the next one, especially in the synthesis and conceptualization phase (see figure 16).
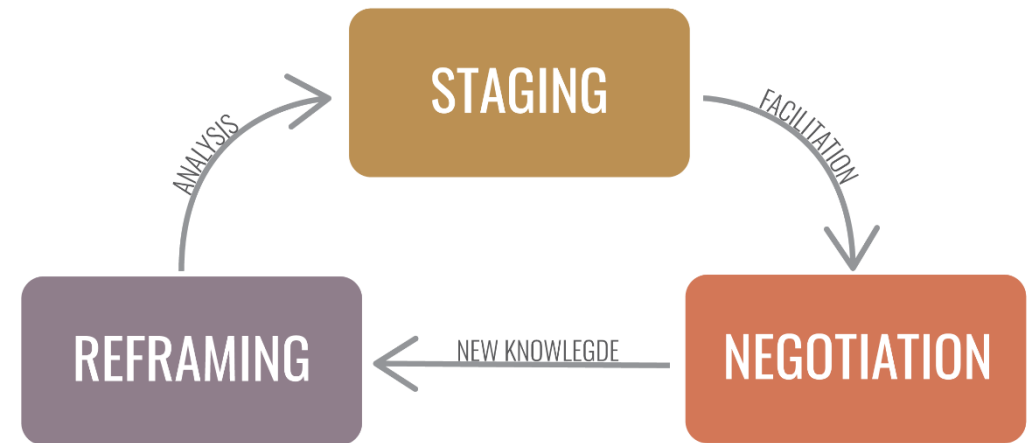

Figure 16. The iterative process of the Negotiation Space (own illustration, but inspiration taken from Pedersen 2020 p. 76)

>

Through the report, the staging, facilitation, and reframing of the negotiation spaces will be presented.

3.2 Living Lab as experimental spaces

Living Labs can create experimental spaces where sustainability and the SDGs can be experimented, negotiated, and innovated. Living Labs is a concept used within the PD field and has often been used to foster user-participation and open innovation (Leminen, Westerlund, & Nyström 2012)(Dell' Era & Landoni 2014). According to Voytenko and McCormick (2016), a Living Lab consists of the 5E's:

The 5 E's of a Livng Lab

Engagement - Engaging actors through participation

Exploration - We have to explore to understand new ways of seeing things

Experiments - We have to do things (the core of Living Lab)

Evaluation - The expertise of universities can evaluate the engagement of experimentation

Eentrepreneurs - Have to bring in companies along the ride, to anchore the Living Lab

Figure 17. The 5E's of a living lab (source: Kes McCormick's lecture on Living labs - https://youtu.be/ITjSWVcWeiE)

Leminin et al. (2012) define living labs as open-innovation networks consisting of various actors collaborating to create value in product design. *"A living lab is a network that integrates both user-centered research and open innovation. The emergence of open innovation has led to the establishment of elaborate networks in which companies team up with diverse types of partners and users to generate new products, services, and technologies"*(Leminen et al. 2012, p. 6). Living labs are physical environments where user experiences reveal future directions

for product development. These living lab networks consist of heterogeneous actors, resources, and activities that support innovation in all phases of the life cycle (Leminen et al. 2012). The article *"Living Lab: A Methodology between User-centred Design and Participatory Design."* (Dell' Era & Landoni 2014) analyses upon various definitions of Living Labs. The two primary elements that the definitions of Living Labs share are real-life testing and experimentation environments. When applying the Living Lab methodology, the designer needs to facilitate and lead co-creation processes to enrich the stakeholders' interaction capabilities and interpretive capabilities to local settings (Dell' Era & Landoni 2014). In the implementation and designing of a living lab, we must have in mind who will facilitate the living lab roles and continue making the Living Lab Living for the visitors over time.

According to Sando Battisti (Battisti 2014), Living Labs can enhance social innovation by supporting Public-private partnerships (PPP). PPP is described as being an approach to formulate innovative solutions to handle citizen's social needs. Social innovation is a large field within itself we will therefore only touch upon it. The idea of social innovation is that innovation can have social value as its goal instead of only focusing on the innovation itself. Murray et al. (2010) define it as innovations that are social both in its ends and its means. Social innovation involves co-creation and collaboration with relevant social groups and requires an active role of committed users in the project to create empowerment.

A majority of the literature around living labs describes living labs as a tool or methodology to create user-centric solutions and how to develop long-term environments for open innovation that enables experimentation with real users in real contexts (Hillgren 2013). However, in this thesis, we will focus on how living labs can be used to create a sustainable behavioral change. Instead of using Living labs to create physical things, we will investigate the potential of using living labs to create "Things" where sustainability can be discussed and negotiated among different matters of concern. We will thereby move from looking at Living Labs as a concept to produce something physical to see living labs as producing/designing spaces for agonistic experimentation (Hillgren 2013). We are interested in how the creation of a living lab can innovate upon the way citizens think about sustainability. We are not solely focusing on how new sustainable products or systems can be innovated through the living lab but we are to a larger degree interested in the relation between the SDGs and the visitors at Kær Vestermark, and how we can design a network that has the potential of creating a behavioral change in how the citizens live their life according to sustainable practices. We see this as the true innovation of the living lab we want to design at Kær Vestermark. When looking at living labs as Things; *"This helps explore these innovation environments as socio-material frames for "matters of concerns" and the alignment of controversies, ready for unexpected use, opening new ways of thinking and behaving. It also helps in inquiring into how designers may act in a public space that permits heterogeneity of perspectives to engage in alignments of their conflicting matters of concern."* (Björgvinsson et al 2010, p. 3). According to Björgvinsson et al (2010), the Living lab is an approach to enable robust learning places, where experimentation platforms are created to disturb business as usual. We see this way of approaching the field beneficial when making actors reflect and act upon the SDGs. From this perspective, we argue that to establish a living lab at Kær Vestermark successfully; we should aim at designing a space where various actors can connect on equal terms and strengthen each other's competences so we can reach the largest possible outcome (Hillgren 2013). As Per Hillgren (2013) we see living labs to be agonistic spaces for experimentation and learning where the potential of creating an innovation environment flourishes. A place where mindsets and matters of concern can be challenged, negotiated and shifted in new directions and perspectives. The implementation of a living lab in a context similar to Kær Vestermark and the SDGs has not been explored in the research so far. We, therefore, see potential in contributing to the research by exploring if Living Labs can be used to foster behavioral change rather than product development as its core.

3.3 Research strategy

Several methods have been used throughout the design process to help to answer the research question. During the project, the COVID 19 pandemic challenged our process, which led us to think in alternative directions. Under 'normal' circumstances, we would have had an ethnographic hands-in-the-field approach, but instead, we had to think creatively and seek online approaches. In the following, we will describe the design process, the methods used, what they have contributed with, and give an overview of the empirical data collected.

3.3.1 Agile and iterative project planning

In the design team, we had an agile and iterative design process, where we used inspiration from Sprint planning (SCRUM) (Sutherland 2014) as well as Double Diamond (Design Council 2020).

To lead the process and move us forward, we have used weekly sprints and sprint goals, to secure that we followed our plan. At the beginning of the project, we had a thesis office assigned, where the sprints were visually presented in front of us (See figure 18&19). However, due to COVID 19, we needed to move into Mette's apartment, which resulted in a less visual working environment.

The project was structured in sprints with time constraints of 1-2 weeks. At the beginning of each sprint, the goals were settled as well as what constraints that could occur during the sprint. It
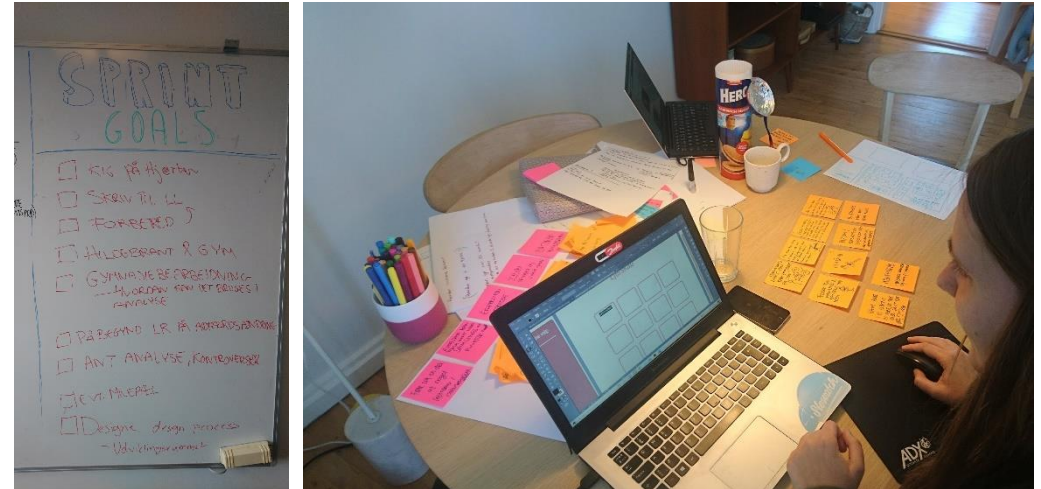
Figure 18 and 19. Thesis office vs. home office

is important to note that we have not been following this model obediently but taken the elements we saw relevant.

Additionally, we have used the Double Diamond Model actively throughout our design process to help frame our project. A method that systematically discovers the problem before starting the conceptualizing(Design Council 2020). As a part of our framework definition, we have used the four phases of Double diamond (discover, define, develop, and deliver) (see figure 20). The first part of the double-diamond is a divagating process that seeks to understand the involved actors rather than base findings on assumptions and investigate the problem. This stage is explorative and creates an emphatic view on the field we are working in and with. We are working within a complex field with a lot of different actors and internal controversies, which have been important for us to discover to be able to facilitate negotiation and possible changes in the

network. In the defining phase, we go from the exploring and investigating divagating process, towards converging the gained knowledge and interpret and explain it. The developing phase is the beginning of the second diamond. In this phase, we have initiated the conceptualization where we explore the solution space of the problematizations found in the first diamond. The last part of the second diamond is focused on testing different ideas and solutions to understand what will work and what needs improvement. Here the goal is to sharpen the final conceptualization of the concept.

To illustrate our design process, we have visualized the different interventions as well as field studies and interviews made throughout the project. Figure. 21 shows our activities in the given period from the beginning of the project to hand-in the 04.05.20. The process visualization presents an idealized overview of the process we have been through during the thesis. But our project has not been linear, as the process visualization could be interpreted, but more iterative.

Figure 20. Illustration of the design process in a Double Diamond (own visualization)

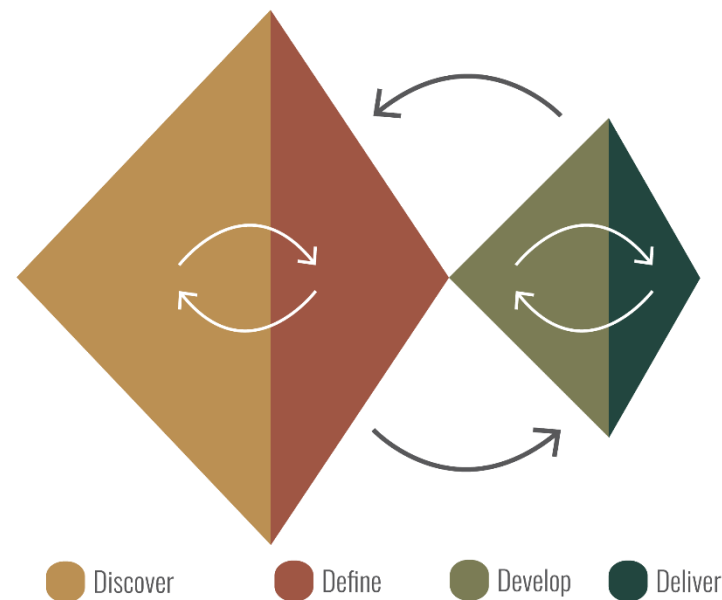| DATE	WHAT DID WE DO?	PURPOSE	PROCESS			
27.12.19	Initial meeting with Inge Olsen (Sønderborg Municipality - SM)	Get insight in potential thesis projects as well as Center for SDGs	�			
27.12.19	Initial fieldstudies at Kær Vestermark	Get an understanding of the area and future plans	■			
27.12-03.02	Desk research	Identifying problems in the field, and gain SDG knowlegde	■			
03.02-25.02	Development of potential project directions and mini workshop	Defining gained knowlegde and staging of intervention	■	■		
25.02.20	Mini workshop with Sectretariat of Sustainability and Nature (SM)	Negotiating Project Directions and Matters of Concern	■	■		
25.02-03.03	Analysing results and choice of project direction	Defing the direction of the theises		■		
01.03-04.03	Development of SDG design game	Staging negotiation space of relations to SDGS	■	■		
05.03.20	Facilitation of SDG design game with three high schools classes	Negotiation of SDGs between high school students	■			
09.03.20	Facilitation of SDG design game with two high schools classes	Negotiation of SDGs between high school students	■			
10.03.20	1. iteration of Design Specification	Translating knowledge into demands and criterias		■		
COVID 19 - LOCK DOWN						
12.03.20	Creation of facebook group for citizens of Sønderborg	Interessement of citizens into the design process	■			
16.03.20	1. post on facebook - understanding phase	Discover the citients relation to Kær Vestermark and MoC's	■			
19.03.20	2. post on facebook - understanding phase	Discover the citients relation to the SDGs and MoC's	■			
20.03-23.03	Reframing of 2. intervention and 3. post on facebook	Finding another approach to know the citizens relation to SDGs	■			
24.03-26.03	Development of online intervention with Sønderborg Municipality	Staging negotiation space for implementation of SDGs at Kær V.		■		
27.03.20	Online intervention with Lene and Bent form Sønderborg M.	Negotiation of implementation of SDGs at Kær Vestermark	■	■	■	
01.04.20	Phone interview with Jesper Steenberg from ENERGY AND WATER	Understand what is needed to design a Living Lab	■		■	
01.04-03.04	Phone interviews with Odense, Kolding, and Albertslund municipality	Understand the work with communicating SDGs to citizens	■		■	
11.04.20	2. iteration of Design specification	Translating knowledge into demands and criterias		■		
11.04-13.04	Development of Design Parameter design game DG (online intervention)	Staging negosiation space around design parameters		■		
14.04-21.04	Online interventions with five different citizen groups thorugh DG	Negosiate design parameters through own Matters of Concern	■		■	
27.04.20	3. iteration of Design specification	Translating knowledge into demands and criterias		■		
30.04-01.05	Development of stories for Scenarios	Translating knowledge into Scenarios		■		
03.05.20	Fieldstudies at Kær Vestermark	Taking photos for the creation of Scenarios				
04.05-10.05	Development of Scenarios	Making the knowlegde tangible and relatable for participants		■		■
15.05.20	4. facebook post - Questionnaire around scenarios - Develop phase	Citizent evaluation and negosiation of scenarios	■	■	■	■
20.05.20	Online intervention with Sønderborg Municipality (Scenarios)	Negotiation and evaluation of Scenatios	■	■	■	■
25.05-01.06	Development of strategy for Kær V. as a Living Lab	Translation of knowlegde into a strategy (implemtation)		■		■

Project start

Hand in

Figure 21. Illustration of the design process in from
start to hand-in (own visualization)

3.3.2 Empirical collection of data

To answer the research question, a qualitative research strategy has been performed. Our empirical data has mainly been gathered through several interventions and interviews with actors related to the subject investigated. The data has been obtained through the methods described in the following section. The visualization on the next page (figure 22) presents a brief overview of the collected data that forms the premises for the thesis. The visualization shows the different interventions and meetings conducted throughout the project. Furthermore, it shows the purpose and the derived knowledge from each activity. The involved actors include various citizens and employees from Sønderborg municipality. Furthermore, interviews with danish municipalities and an expert within Living Labs have been conducted. The collected data has been processed through the use of worksheets and transcriptions before being analyzed and used in the thesis. To support our collection of empirical data, desk-research on existing literature has also been performed on relevant subjects within the project. We will not go into full detail with the empirical data presented in the visualization as a further explanation of the individual interventions and meetings will be elaborated throughout the different chapters of the thesis.

Meeting with Sønderborg Muncipality

Meeting with the head of the sustainability department.
Outcomes: initial insights to the center for SDGs and the area Kær Vestermark which was used to frame four different project directions for the thesis

Workshop with Sønderborg Muncipality

Workshop with 6 employees from the secretariat of Culture, Turisme and Sustainability.
Purpose: negotiating the four project directions and exploring matter of concerns.
Outcomes: Framing of the project was chosen from the learnings.

Facebook Group

62 citizens from Sønderborg were gathered in a Facebook group where three rounds of online interventions were staged. The participants were facilitated through a video explaining the three rounds: 1) Understanding 2) Exploration 3) Developing.

Interviews with Municipalities

3 interviews were conducted with Odense municipality, Kolding Municipality and Albertslund Agenda Center. The purpose was to seek inspiration on how other municipalities are working with the SDGs and analyze their experiences with engaging citizens.

Intervention with Sønderborg Municipality

Intervention with Bent Aalbæk and Lene Sternsdorf through an online collaborative tool.
The purpose was to negotiate how the SDGs can be implemented at Kær Vestermark. Outcome: Learnings were used to develop scenarios.

Interview with Jesper Steenberg

To gain an insight on how living labs can be implemented we have been in contact with the head of Greater Copenhagen Living Lab in Energy and Water Jesper Steenberg. From the learnings a strategy for Kær Vestermark as a living lab has been developed.

Design Game with Highschool Students

141 high school students were invited to take part in a workshop on the SDGs, where they had to negotiate how to relate to them through a design game. Outcome: Analyzing citizens current relation to the SDGs and investigating how physical objects can support the creation of things.

Design Game with Citizens

Online Design game with four different citizen groups. 1) Family with children, 2) Elderly couple, 3) Young couple, 4) Woman living close to the area. Participants were asked to explore different elements in relation to proposed design parameters. Learnings were used to develop scenarios.

Evaluation of Scenarios with Municipality

Online intervention with Sønderborg municipality evaluating the Scenarios. Three employees participated (Inge Olsen, Bent Aalbæk, and Lene Sternsdorf). The purpose was to negotiate and evaluate the developed scenarios.

Evaluation of Scenarios with Citizens

An online intervention was set up through a survey platform. 21 citizens participated in evaluating and prioritizing the developed scenarios.

Figure 22. Visualization of our Empirical data collection (own illustration)

3.3.3 Applied methods in the design process

In the following, we will describe which methods we used throughout the design project.

Semi-structured interviews

The method of Semi-structured interviews (O'Reilly 2005) was used both during physical, online, and phone meetings. Structuring the interviews through an agenda, guide, or themes and, at the same time, having flexibility for changing the direction during the interviews, has been a fruitful approach. Thereby we do not maintain the discussion within a set of questions but create a space where participants can alter the discussion and express alternative perspectives. We used semi-structured interviews to collect knowledge with a distance from our field and gain knowledge from other municipalities' experiences around SDGs as well as Living labs.

Photographic images

When working with a location from a distance, we have used Photographic images (Pink 2007) to gain a better understanding of Kær Vestermark and to have a common frame of reference. The photos have been used internally in the group and externally with participants to make the area more relatable and tangible from afar.

Figure 23. First field visit - Mette taking pictures of Løkkegården (own photo)

Workshops

We used the method of workshops in the early design process. Several spaces were staged for participants to express themselves through physical objects and creative elements at the same time (see figure 24 and 25). The workshop format presented and framed challenges that allowed the participants to listen to each other's ideas and matters, thereby facilitating a more effective collaboration (Sanders 2000). Before the lockdown, we managed to complete three physical workshops: Two with high school students from Slagelse Gymnasium and one with the Department of Sustainability and Nature, Sønderborg Municipality.

Figure 24 and 25. Pictures of workshop with municipality and with high school students (own photos)

Online Interventions

We involved relevant actors in the design process through staged online interventions to cope with the challenges of COVID-19 and still have a participatory approach to the project. In the staging of the online intervention, we have tried to recreate some elements found in physical interventions such as having interactive elements, where participants could move elements and negotiate the presented elements. When using online interventions, we have been particularly careful with how the intervention was staged. When the facilitator cannot be in

the same physical room as the participants, it is difficult to guide participants during the intervention and read expressions.

Three different approaches to online interventions have been used:

- Using Facebook as an existing platform to reach a broad range of citizens living in the area of Sønderborg.
- Using Conceptboard.com as an existing platform developed for collaboration in work teams to set up design games and interactive interventions.
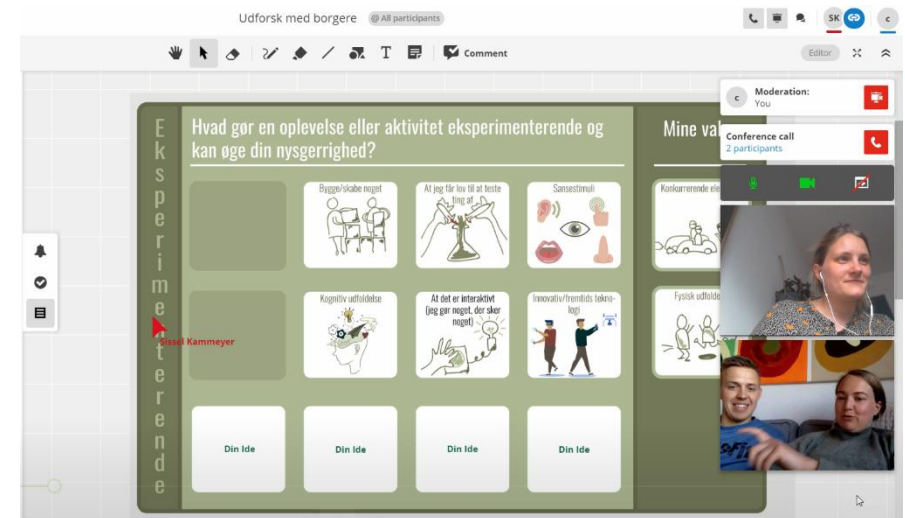- Creating videos of scenarios and presenting them in a questionnaire format.

Figure 26. Example of an online intervention via Conceptboard (own photos)

Design games

Both before and after the lockdown Design Games were used as intermediary objects between the participants and us. We have used design games as a tool to divagate our problem understanding as well as converging our focus. A design game is a platform that takes the fun, creative, and experimental elements from the game-world and utilizes these to engage the participants to take part in dialogue and interaction. According to Vaajakallio and Mattelmäki a design game has the following features: *"(1) Creating a common design language; (2) Promoting a creative and explorative attitude; 3) Facilitating the players in envisioning and enacting 'what could be'; (4) Helping to define the roles of participants in the interaction during a session"* *(Vaajakallioa & Mattelmäkia 2014 p. 66).* Design Games consist of physical elements that you bring to the table to ease communication and create alignment between the participants and facilitator. As an alternative to physical elements (after the lockdown), we used online interactive and engaging elements to create online design games.

The picture below shows a simple priority game we made with the secretariat of Sustainability and nature, Sønderborg Municipality.

Figure 27. Picture from priority game. The participants needed to vote for the project direction they saw the biggest potential in and at the same time express the possibilities and challenges they predicted. (own photo)

Design specification

To concretize and ensure that our findings are represented in our design, we have continuously been developing a design specification in the project (translating and synthesis). The specification was made with inspiration from Nigel Cross (Cross 2008) and developed through several iterations. As Pedersen and Brodersen (2019) describe, we have been using the design specification as an internal tool in the design process to make sure relevant information from the analysis is included in the conceptualization. *"In this way the design specification became an important intermediary object between the members of the team, since it represented the concerns of residents, staff and management which were translated into requirements to the future solution."* (Pedersen and Brodersen 2019, p. 970). Throughout the report, the reader will be presented with iterations of the design specification as we discover and unfold the demands and

criteria. They thereby act as small part-conclusions of important take-aways from each chapter.

Theme	Demands	Criteria	Comment

Figure 28. Design specification figure to look for in the report (own illustration)

Morphology scheme

In the conceptualizing, we took inspiration from the Morphology scheme to investigate and negotiate different design parameters found in the analysis. Morphology is a method that is used to translate demands and criteria from the design specification into concrete suggested ideas (Cross 2008). In the method, different design parameters are set up through which the designers can develop and structure morphologies into different concepts. We have used the morphology chart to unfold different design parameters in the design group internally and thereby kick-start the investigation of the possible solution space (see figure 30).

Figure 29. Morphology brainstorm, from design parameters to morphologies (own photo)

As opposed to Cross's (2008) approach, where the design engineers are the ones combining the morphologies, we have in this project, used the morphology chart as a collaborative tool with citizens. To enable the citizens, the method is altered into a format that accommodates the participants' qualifications. We created a design game, where the morphologies were used as a visual tool, for the citizens to create different concepts that included their matter of concern.
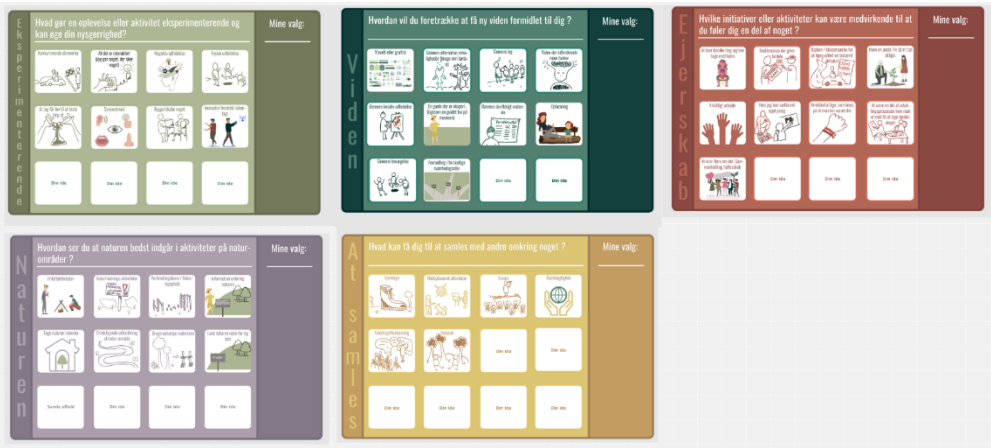
Figure 30. Screenshot of Morphologies transformed into a design game (own photo)

Scenarios

In the final part of the design process, we used scenarios to facilitate dialogue with Sønderborg Municipality and citizens around alternative uses of Kær Vestermark. Scenarios are explicit descriptions of a hypothetical use of a product, service, or system (Angreeni 2008). They make the actors able to imagine themselves in an alternative setting different from the present and reflect on new perspectives. We used the method as a communication tool in our thesis to illustrate and show alternative suggestions for Kær Vestermark and Center for SDGs in a Living lab perspective. This created a dialogue that increased our knowledge of the problematization and brought us closer to a final concept. *"Throughout these design phases, scenarios could make the process more effective by supporting communication, nurturing creativity and providing concrete situations to evaluate solutions."* (Angreeni 2008, p. 2). The Scenarios were derived from the negotiations of design parameters and SDGs on Kær Vestermark. The scenarios were visualized as small, simple animated videos, with drawings on pictures from Kær Vestermark (see figure 31).

Figure 31. Screenshot of scenario 3 (own photo)

Evaluation matrix

Moving towards a final concept, we used the method of evaluation matrix together with citizens and Sønderborg Municipality. The participants scored and prioritized the Scenarios in relation to a set of parameters to assess the scenarios against each other. We made two different evaluations. The first evaluation took inspiration from a simple questionnaire, where citizens had the opportunity to express their views on the different scenarios. The second evaluation was done with Sønderborg municipality, where we took inspiration from the relative weighted objectives method (Cross 2008). Here we used some of the essential demands from the design specification as parameters to evaluate the scenarios upon. By doing so we ensured that the scenarios were evaluated according to what we have discovered as essential elements if Kær Vestermark should be seen as a living lab for the SDGs. The methods gave us a relative score for each scenario and thereby creating a direction for the final concept.

4
RELATIONS AT
KÆR VESTERMARK

In the following, we will analyze upon the present and future relations in the network constellations at Kær Vestermark in order to identify Matter of Concerns and future controversies in the implementation of the Center for the SDGs. The chapter will help build the foundation for the first iteration of the design specification.

4. The present and future relations at Kær Vestermark

As a means to understand the field and its network constellations we are working within, ANT has been used as our analytical approach to untangle the interconnected relations at Kær Vestermark.

To get an insight into the area of Kær Vestermark, we staged a physical and online negotiation space: one with the Department of Sustainability and Nature, and one with the citizens of Sønderborg on Facebook. Firstly, we will present each negotiation space and, after that, analyze the results.

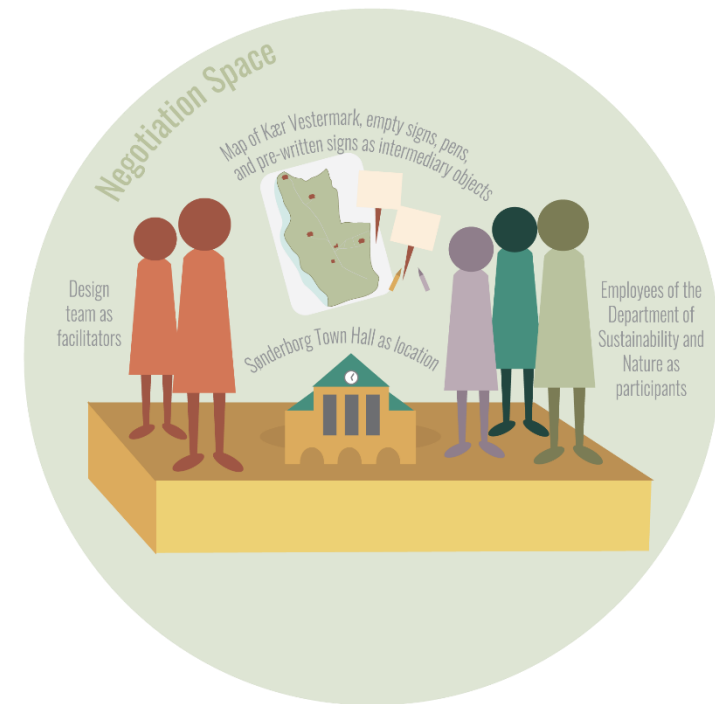## 4.1 Negotiation space - Controversies at Kær Vestermark

Figure 32. Visualization of the negation space on controversies (own illustration)

As a part of our first intervention with Sønderborg Municipality (25.02.20), we made two different negotiation spaces. The first has already been described as a part of the introduction (see p. 10). The second negotiation space investigated what challenges the municipality experienced in the development of the Center for SDGs. The figure above (see figure 32) shows the staged negotiation space.

4.1.1 Staging

The purpose of the intervention was to make the employees of the Department of Sustainability and Nature, negotiate and discuss the elements that they saw challenging, and what concerns they had when planning the establishment of the Center for the SDGs. We staged the intervention through a workshop format, where the participants went through a brainstorming session with the support of different physical objects (see figure 33). These physical objects were:

1. A large flamingo map of Kær Vestermark
2. Small empty signs for the participants to write on and stick into the map
3. Small signs with pre-written concerns to kick-start a discussion

We wanted the participants to engage with each other, brainstorm and comment on each other's concerns, write their concerns on a sign, and place them on the map. The placement could either be site-specific or random. The physical objects were brought into the space to represent Kær Vestermark in the discussion, bring the participants closer to the location, and create better circumstances for reflection. Bringing an active element to make the participants write and place signs at Kær Vestermark was to raise the engagement level and ensure the involvement of all participants. To kick start the session, we had pre-written a few challenges that were to be seen as both provoking and relatable.
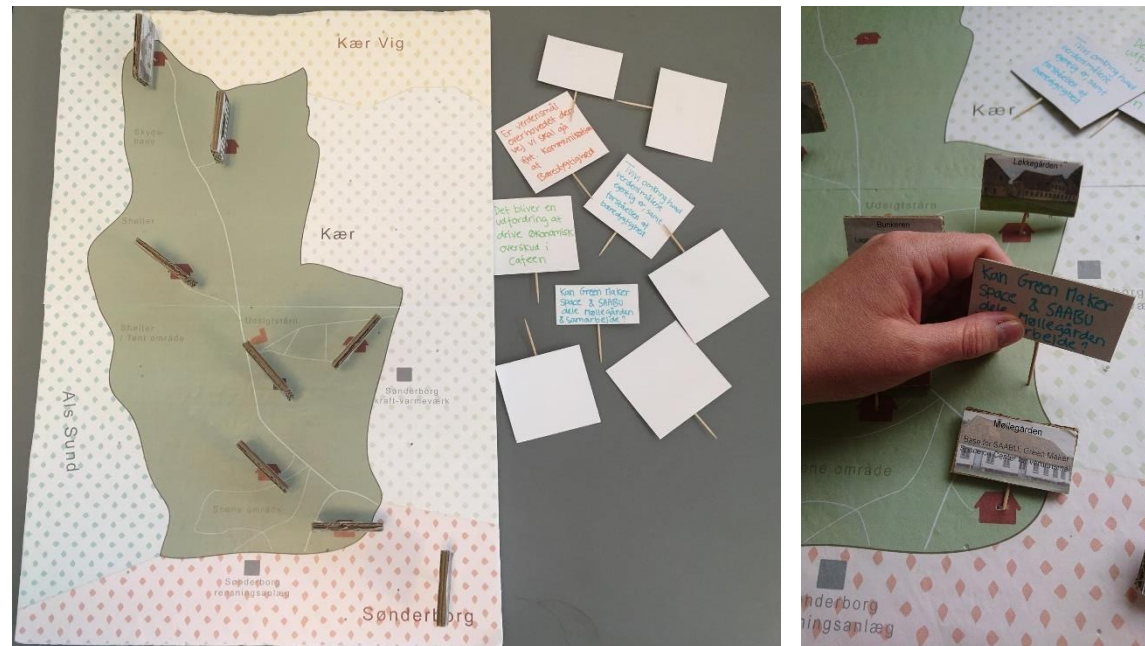

Figure 33. Physical elements in the negotiation space (own photo)

4.1.2 Facilitation

The design team (us) and six employees from the Department of Sustainability and Nature took part in the negotiation space, where both a nature guide, the head of the department and the Climate coordinator (responsible for the SDG implementation) attended. The pre-written signs were for inspirational use to brainstorm on their concerns, but instead, they used a lot of the time discussing the pre-written concerns. After some time, the participants started brainstorming on the concerns and challenges they saw in the process. This brainstorm resulted in one to four signs per participant, to add to the map. Before adding the sign, the participant had to explain the concern. After the explanation, the other participants supplemented the concern if they had written similar ones and merged them together. The physical objects gave the participants a common reference for the conversation. The session developed into a fluid conversation between the participants, where we as facilitators didn't have to manage the conversation. Instead, we could take part in the participation and ask follow-up questions if something needed to be elaborated.

Figure 34. Photo from the intervention (own photo)

4.1.3 Reframing

The negotiation space revealed several unknown challenges concerning the establishment of the Center for SDGs, where especially controversies between the present and future actors were highlighted as well as concerns about collaborative partners, financial struggles, and approval of the local plan. To see the results from the negotiation space, see Appendix 4.
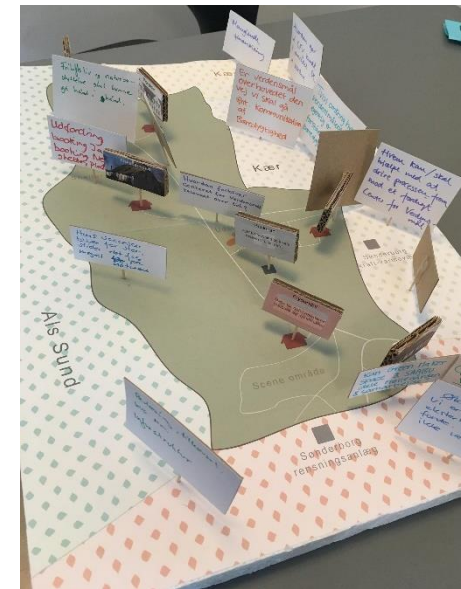

Figure 35. Results from negotiation of challenges and concerns (own photo)

We have used the results from the negotiation space to organize present and future network relations, analyze the potential controversies, and discover the MoC seen present in the field. These will be elaborated on in section 4.5

4.2 Negotiations space with citizens in and around Sønderborg

To interest the citizens of Sønderborg during the lockdown, we created a Facebook group. After a week, we had accomplished gathering a network of 62 interested actors. Through the design process, these actors were involved continuously, with simple questions or assignments concerning Kær Vestermark and the SDGs. In the following, we will be focusing on the first intervention made on Facebook, which deals with the citizens' relation to Kær Vestermark. We define the Facebook group as the location of several negotiation spaces. In this part of the report, we have only used a part of the knowledge gained from the Facebook group. Therefore we will, in the following, only describe the first out of three phases. We will describe and analyze the other phases later in the report.

4.2.1 Staging of the Facebook page

The purpose of the Facebook page was to create a forum, where actors in and around Sønderborg could gather in discussions around the Center for SDGs at Kær Vestermark. We named the group: *"Help thesis project on Kær Vestermark."*

Figure 35. Screenshot of video introducing the project and facilitating the members of the group (own photo) We recommend watching the video here: https://youtu.be/4DkABCxQxOY

As a part of the staging, we made a video (see figure 35), introducing the project and explaining why their help was needed to complete our thesis (We recommend watching the video). By doing this, we tried to engage the group members to help us through the thesis.

We divided the interaction on Facebook into three phases to structure the process and help navigate the group members to only focus on the current phase of the negotiation space (See figure 36).

Figure 36. Three phases of the Facebook interaction (own illustrations)

In the back-staging of the online interaction we had the following in mind:

- Ensure that the citizens feel they are part of a forum where every opinion is valid and valuable.
- Make the posts short, relatable, and straightforward to avoid losing the citizens' attention.
- Include photos or videos for eye-catching and engaging citizens.

- As a facilitator, interact with the citizens and provide feedback on posts by the citizens (make them feel heard)
- Have a humorous angle

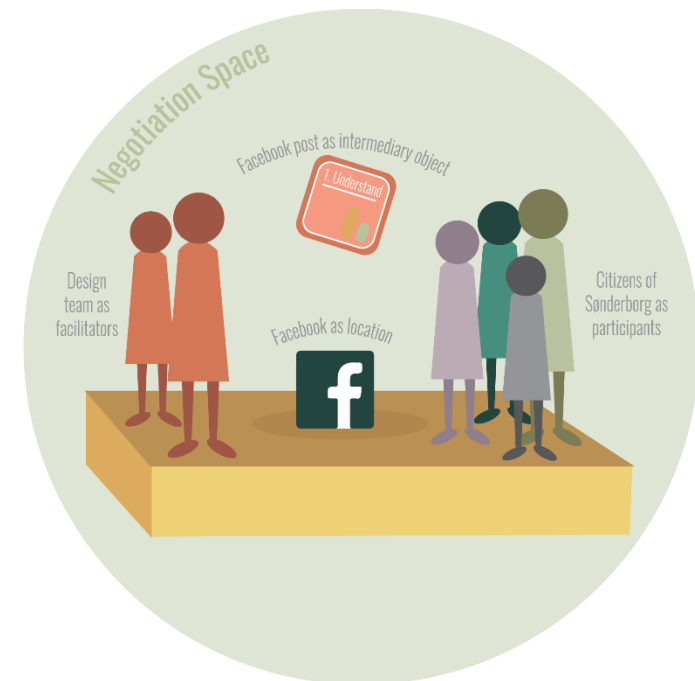## 4.2.2 Staging of the first negotiation space on the Facebook page

Figure 36. Negotiation space of the first Facebook round

The purpose of the first negotiation space was to make the citizens reflect upon their relation to Kær Vestermark. The first phase was constructed through a visual post, containing a simple question, and encouraging the citizens to share memories, photos, etc. (see figure 37)

Figure 37. Facebook post for the first phase of the negotiation space (own illustration)

Figure 38. Screenshot of the first Facebook post in first phase of negotiation space. And an example of interaction between the facilitator and the participants (Own photo)

4.2.3 Facilitation

We facilitated the first phase in the negotiation space through a Facebook post, where we elaborated the question (see figure 38). The elaboration made actors that did not have a particular relation to the area comment on the post as well. Fourteen participants took part in the post.

As a part of the facilitation and to make participants feel heard and appreciated, we chose to respond to all comments in the thread (see figure 38). Here the facilitator asked further questions to continue the attention of the participant and to show curiosity.

4.2.4 Reframing

We used the results of the negotiation space to help analyze the present network constellations at Kær Vestermark and to map matters of Concern and controversies seen with the establishment of the Center for SDGs. The results are shown in Appendix 5.

4.3 The present Kær Vestermark

We have organized an actor-network of the present human and nonhuman actors at Kær Vestermark from the knowledge found in the negotiation spaces described above. The network represents the citizens and municipalities (including the nature guides) relations to the area. The network is limited to focus within the boundaries related to Kær Vestermark. Therefore we do not focus on the relations outside.

The network shows the immediate relations identified on Kær Vestermark in its current state and is a simplification of the reality. Therefore these actors and relations can be disturbed and changed over time. We want to investigate which elements are needed to design a Living Lab for the SDGs at Kær Vestermark, and are therefore interested in the relations attached to this specific place. At the current state, the area is used by a lot of different actors (both human and non-human) who act at the same time in the field (see figure 39). The area is open for everyone to enjoy. Therefore citizens and different interest clubs use the area in their spare time to practice their interests and enjoy nature. The area is owned and maintained by the Municipality. They have rented some of the farms and facilities to the Home guard, Shooting clubs, dog clubs, and Green Makerspace (a maker-space run by retired engineers). Renting the farms have given
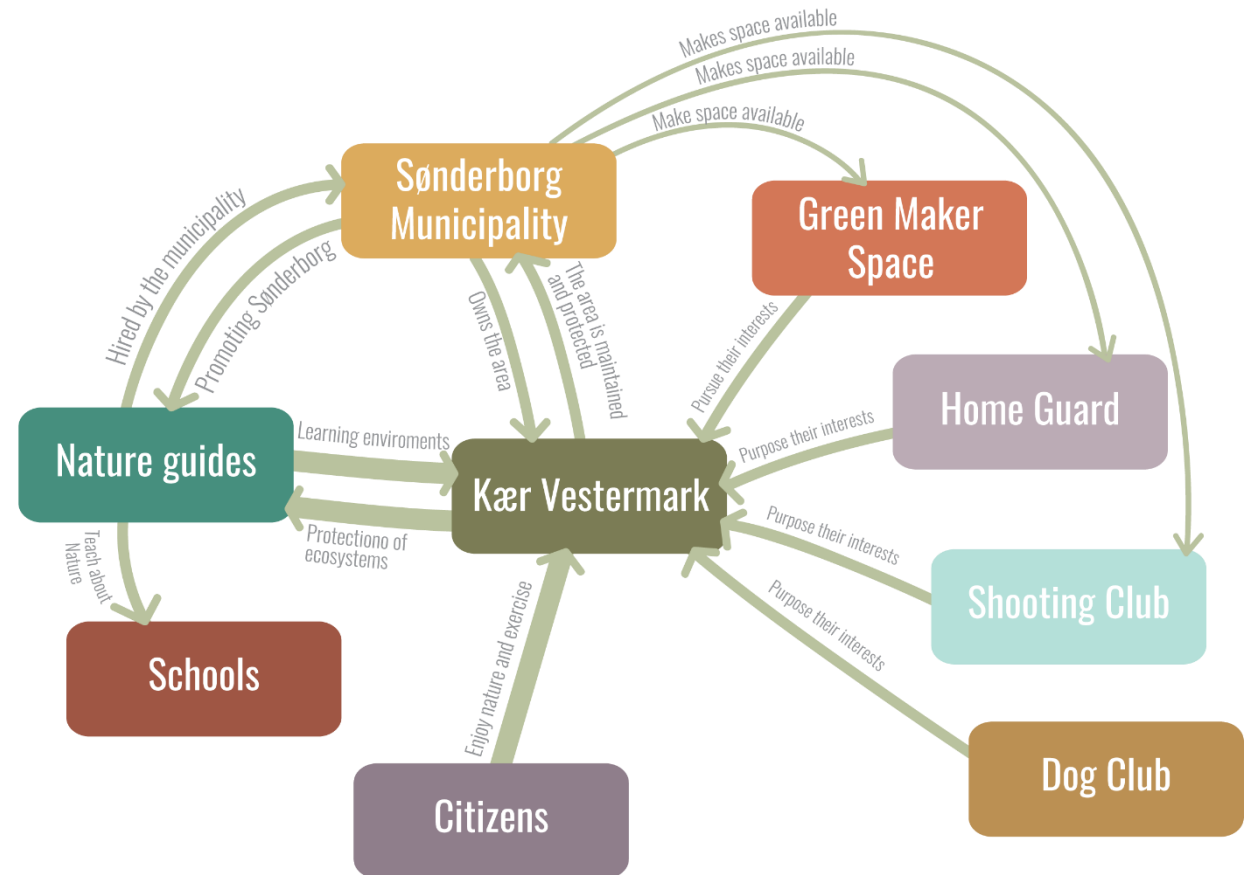

Figure 39. Present network at Kær Vestermark. The thickness of the lines illustrates if its is strong or weak relation. The boxes are not to be seen as individual actors but actor worlds of human and non-human actors

the established actors a strong relation to the area, and the farm/place they are occupying.

The analysis of the network relations shows that there, in general, are strong relations connected to Kær Vestermark. These will potentially be disturbed with the establishment of the Center for SDGs. Therefore we see it essential, with a

participatory approach, to highlight some of these strong network relations and MoCs that are seen present at Kær Vestermark to avoid breakdowns in a future concept. In the following, we will shortly describe the relations that are seen as essential for this thesis.

4.3.1 Nature, Nature guides, and Schools

The Scout Camp in 2017 at Kær Vestermark, resulted in many recreation areas created for biodiversity and Nature to thrive. The Nature and biodiversity at Kær Vestermark are actors that cover almost all of the area and have a strong and dependent relation to the area. The nature-guides are hired by the municipality and facilitate different trips for the citizens and schools where they teach about Nature and ecosystems at Kær Vestermark. From the negotiation of controversies with the municipality, we learned that the nature guides have a strong relation to Nature at Kær Vestermark, as they use it almost daily. *"We can see how Kær Vestermark is becoming relevant in primary schools. You visit Kær Vestermark because of the outdoor facilities and Nature, but as soon as there are some elements around the SDGs, we can turn the conversation towards sustainability." **3*** - Andreas, Nature guide. We see Nature as an important actorworld for how the present network constellations are constructed, and thereby for the identity of Kær Vestermark. Furthermore, we see potential in including Nature as an active part of the communication of the SDGs. Including Nature, we give the Nature-guides the possibility to use the SDGs actively in their teaching.

4.3.2 Citizens relations to the area

When asking citizens in and around Sønderborg what their current relation is to Kær Vestermark, the typical answer is to exercise (run, bike, kayak), enjoy the nature, relax, visit the view tower, or to sleep in the shelters placed different places in nature (see appendix 5). The citizens actively use the area, and it is evident that we should accommodate these strong relations to the area, to make the most significant impact possible. By tapping into already stable network relations, we see it as an advantage for the translation process, because the citizens could be more willing to be mobilized into a network that is not much different from what they know. Therefore we see it relevant to investigate how to bring some of these strong relations into the design process and further stabilize them into the future network when establishing the center for the SDGs.

Figure 40. clips from the participatory Facebook group (own photos)

4.4 The future Kær Vestermark

In 2020 Sønderborg municipality is planning to start developing Denmark's first Center for SDGs at Kær Vestermark. The municipality's vision for the area is to create; *"a physical place where UNs SDGs can be communicated to and by everyone, so the SDGs becomes everyday goals"* (Olsen, 2019, p.3). As it is right now, it is seen that the present actors at Kær Vestermark thrive as long as their relations to the area are not being disturbed. From the workshop, we observed during the discussion that the future actors and relations would potentially provoke and disturb the present. *"They(the present actors) walk around with a constant fear that something will be taken away from them. It is probably linked with the fact that the area previously was a military area. However, when the military disappeared, they had to retain their rights with the new owner. They feel that something will be taken away every time new concepts are presented."* - *4 Ebbe, Senior consultant.* Following the municipality's vision, potential controversies will arise with the establishment of the Center for the SDGs. To understand these controversies, we have organized the future network constellations of the Center for the SDGs (see figure 41). The network relations have been organized from the given material from the initial meeting with Inge Olsen (see appendix 1) and the negotiation space of controversies facilitated with the municipality described above (see appendix 4).
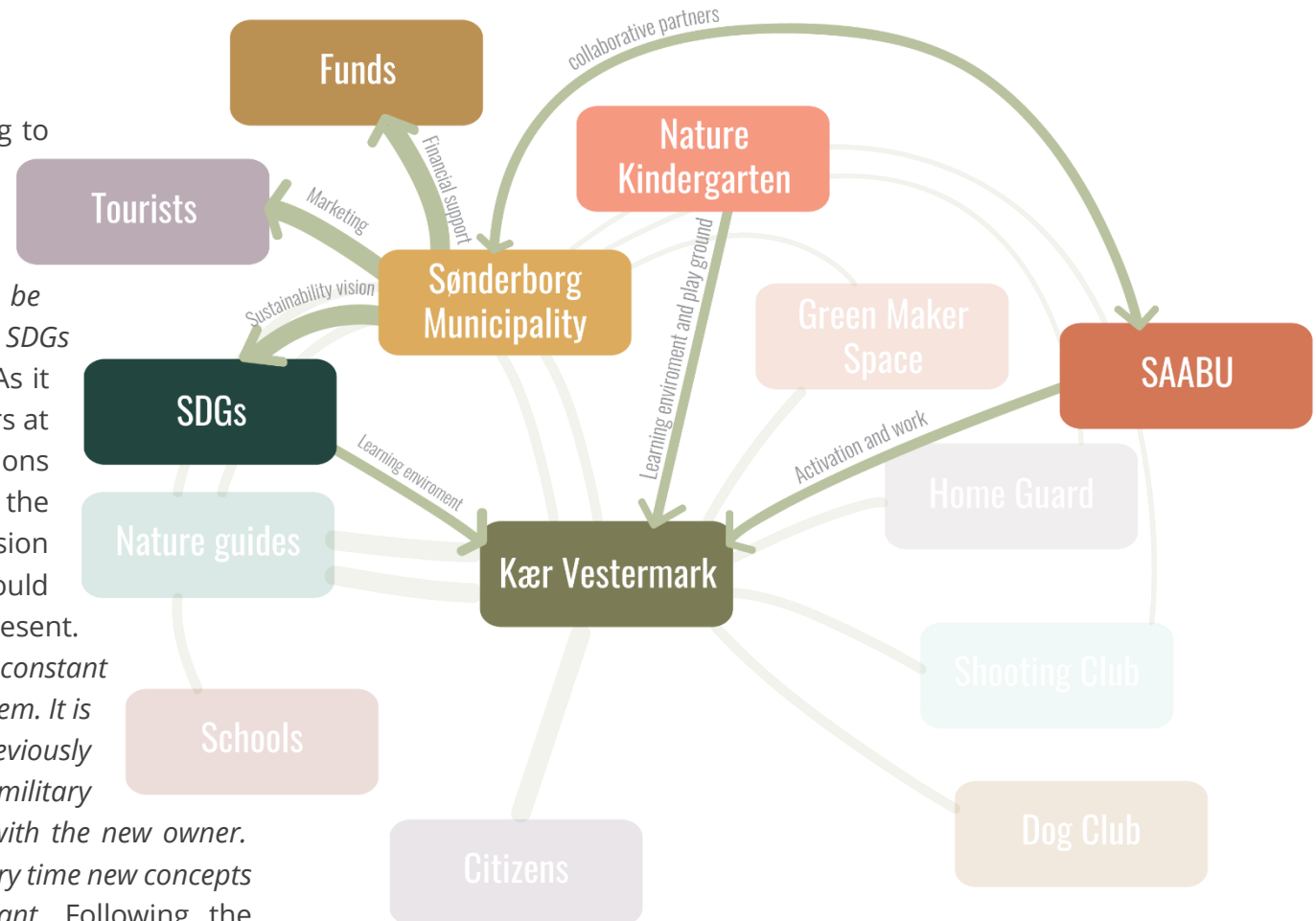

Figure 41. Network of the predicted future relations when establishing the Center for SDGs at Kær Vestermark

In the future network constellations, we see new actors such as a nature kindergarten, the SDGs, tourists, SAABU, and Funds. They are all actors that the future Center for the SDGs is dependent on both in maintenance and use. We will shortly describe the different future actors and their relations.

Tourists

With the establishment of the Center for SDGs there is an expectation from the municipality that tourists from all over Denmark, potentially the world, will come to visit the Center and explore what it has to offer. The tourists will have the expectation of exploring something new (that can not be found other places) and get an experience to take with them home. Where it needs to be relevant for both children and adults.

One of the notes that was written by the participants from the workshop was: *How do we secure that the Center for SDGs becomes a well known area in both Denmark and the world?* (see figure 42)

From the negotiation, we see a strong relation between the municipality and the tourists. Where the Center for SDGs are dependent on the tourist to draw attention to the area and the city. Especially the marketing of the Center, and the increasing number of people at Kær Vestermark was discussed (This will be analyzed upon in the MoC section at p. 52).

Figure 42. A sign written by one of the participants from the workshop (own photo)

Nature kindergarten

In the future a nature kindergarten will be placed at Løkkegården. Three different kindergartens are merged, where they 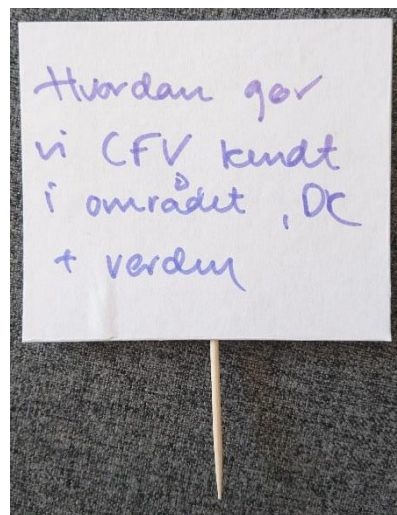from Løkkegården can explore and play in nature around Kær Vestermark. Thereby we see a future relation between the children, the kindergarten teachers, and nature, where they will use nature actively in their daily activities.

SAABU

As a part of the future Kær Vestermark, a collaboration between SAABU and Sønderborg Municipality has been established. SAABU is an activation program for disabled people to get a part-time job. At Kær Vestermark, the employees of SAABU are placed at Mølstedgård, where they will have the responsibility for the maintenance and daily operation of the area.

Financial support

An actor that is seen relevant in the future establishment of the Center for SDGs is financial support. The municipality had devoted a large amount of money to the project. However, this is not seen enough to cover the plans of the area. In the brainstorming session, a lot of the participants had concerns relating to the financials of the establishment (see figure 43)

We see a need for a strong collaboration and stabilization of a relation between the municipality and financial support to realize the plans for the Center for SDGs.
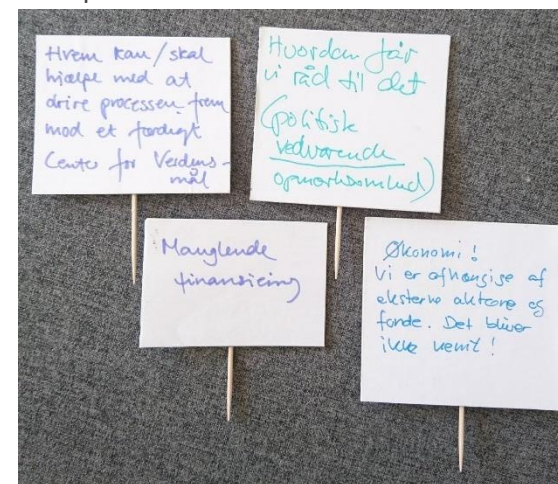
Figure 43. The four different signs concerning the same challenge, How to find financial support? (own photo)

The Sustainable Development Goals

From the negotiation of controversies with the municipality, we saw that there was an already strong relation between the municipality and the SDGs (this will be analyzed further in the next section). As a part of the brainstorm session, we tried to challenge the participants by adding signs such as: *How are the SDGs kept relevant over time?* Moreover, *Are the SDGs even the way to go when communicating sustainability?* These questions provoked the participants to take part in the discussion.*"The relevance of the SDGs will only expand. Especially the goals that concern the climate, the marine environment, and life on land"* - ***5** Ebbe Senior Consultant (Appendix 4). Among the participants, the answer was clear; yes, the SDGs are the right strategy. *"It is our common language, and we can all take part. Nevertheless, there is still some work to do"* ***6** - Lene, Climate coordinator (Appendix 4). The SDGs are already a stabilized part of the municipality's sustainability strategy. Therefore they find it difficult to see other perspectives. Though we have seen resistance of the SDGs from the academic world (chapter 2), we will, as a part of this thesis, investigate how the SDGs will be implemented the best and communicated to reach the most significant impact of their content.

"The center needs to develop over time and It should not be something stationary. If it develops with new exhibitions or learning environments then it will remain relevant" ***7** - Andreas, Nature guide (Appendix 4)

4.4.1 Scope of relations

As seen above, it is a complex network in which there are a lot of internal network constellations present both in the current state and in the future plans for Kær Vestermark. In the thesis, we have not been able to consider all relations but mainly focussed on the strong *citizen relations to Kær Vestermark, Nature,* and *the municipality's relation to the SDGs*. Though we see all the presented relations as essential to stabilize a future the network, we have due to the extent of the thesis taken a strategic decision, of only focusing on these few. These relations and actors are seen essential to interest in the process of starting a translation of some of the other relations. Fx. We see it relevant to firstly create the basis for how the SDGs are communicated successfully (and mobilized citizens and visitors), to be able to interest funds and external actors into the network.

In the following, we will analyze the matters of concern observed at Kær Vestermark as well as the potential controversies.

4.5 Matter of Concern and potential controversies

With the future network constellations at Kær Vestermark, it is seen that potential controversies will occur. We will, in the following, only analyze upon the controversies seen relevant within the scope of relations presented above and their contradicting matters of concern.

4.5.1 Controversy between citizens, the SDGs, and the Municipality

Figure 44. Controversy between the municipality and citizens

The overall MoC for the Center for SDG is *a physical place where UNs SDGs can be communicated to and by everyone.* The municipality's state that all actors will have to thrive together if they want to use the area of Kær Vestermark. At the beginning of the process (of establishing the Center for SDGs), the municipality chose to involve citizens by giving them a chance to 'wish' for what they wanted at Kær Vestermark. Despite this, they did not have any further plans of involving citizens in the development of the Center for SDGs. From a participatory design approach, we see this unacceptable and have observed that some voices have been overheard. The municipality chose to act around the citizens and present actors' opinions consciously and do not enable their voice to be a part of the establishment.

We tried to challenge the municipalities with the potential constraints of the SDGs during the negotiation of the controversies. However, it was found difficult to make the participants reflect upon other aspects of sustainability. However, though the municipality has a strong relation to the SDGs, it was still observed that they could not come to an alignment for how the SDGs should be communicated in the Center for SDGs. We see a potential controversy between the communication of the SDGs and the citizen/visitor's actual relation to the topic.

Because the municipality has not managed to enroll the citizens into the process, we fear that the translation of the SDGs will fail in practice. Therefore we see it essential to involve the citizens' matters, and with our approach interest the citizens into the design process to investigate the relations between the citizens and the SDGs (this will be analyzed in chapter 5). In this controversy, we have discovered the following MoCs:

- Creating a physical space where the UN's SDGs can be communicated to and by everyone
- Make actors act and change upon the SDGs
- Participation in the establishment of the Center for SDGs

4.5.2 Controversy between increased number of visitors and the nature

Figure 45 controversies between the nature at Kær Vestermark and future tourists

In the negotiation of controversies at Kær Vestermark (appendix 4), we observed a trade-off between nature and the tourists when establishing the Center for SDGs. On the one hand, the area has the potential of raising awareness on sustainability and bring many tourists to Sønderborg (which the Center is also dependent on). However, as more human actors will use the area, there is a fear that it may harm nature and biodiversity.
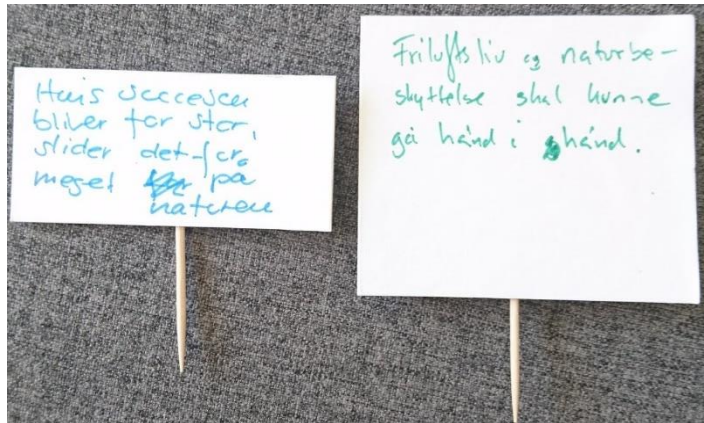

Figure 46. Signs from the negotiation of controversies at Kær Vestermark (own photo)

The picture shows two concerns from the negotiation of controversies with the municipality,: *"If the success gets too great, does it wear off nature?"* and *"Outdoor life and nature protection must be able to protect each other. "* The Center of the SDGs can create a controversy between tourists and nature. There is a need for particular guidelines because nature at Kær Vestermark is not used to having many people visiting and entering it. *"It is necessary that people know how to behave"***8**-Andreas, Nature guide (Appendix 4). In this controversy, we see the following MoC's represented:

- Seeking the best possible circumstances for nature and biodiversity to thrive and flourish
- Exploring something new and getting an experience to take home

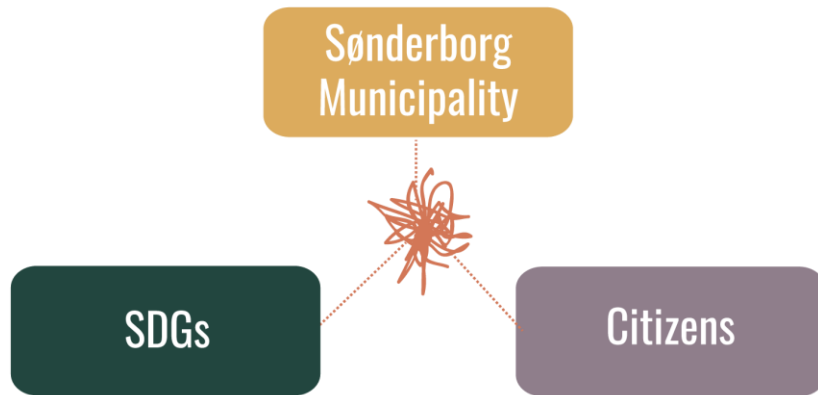## 4.5.3 Controversy between the Citizens of Kær and future Center for SDGs

Figure 47. Controversies between the SDGs, citizens and the municipality

A few days after creating the Facebook group, a private message was received. The person (L) did not wish to be quoted but to express her frustration with the municipality's plan for Kær Vestermark. The message was presenting the frustrations from many citizens living in Kær (A small village beside Kær Vestermark). From the message, an evident controversy was discovered between the citizens of Kær and Sønderborg Municipality. The citizens of Kær were afraid of losing the recreational nature areas that they care for when the Center for SDGs are being established at Kær Vestermark. This concern came on behalf of previous decisions made by the municipality, where citizens have felt neglected. The message underlines the matter of concern of protecting nature and biodiversity at Kær Vestermark as well as participation in decision-making processes. In the message, the citizens came with concrete

initiatives for the establishment of the Center for SDGs, such as integrating nature in the communication of the SDGs and infrastructural suggestions such as parking spots and new routes to the area. To represent the citizens of Kær, we have in the further design process interested L to participate in various negotiation spaces.

From this controversy, we see the following MoCs:

- Participation in the establishment of the Center for SDGs
- Involvement of nature in the communication of the SDGs
- Seeking the best possible circumstances for nature and biodiversity to thrive and flourish

4.6 Outcomes to take with us

Figure 48. An overview of matter of concerns

From the relation analysis, we have gained insight into a large and complex network containing various network constellations. Not only have the present relations influenced the area of Kær Vestermark but also the future will have significant importance. Network constellations containing strong and weak relations that will potentially result in controversies with the establishment of the Center for SDGs. The visualization above is a recap of the analyzed MoCs to be aware of in the further design process. It has also given us the following staging considerations to take with us:

- Ensure an inclusive design process to avoid potential controversies between the already established actors and the new activities at Kær Vestermark.
- Create a space for negotiation between actors in the municipality and the citizens. To negotiate how the SDGs should be incorporated in the center.

The MoCs provide an overview of the feelings, values, interests, and goals that are attached to the different relations in the network when imposing changes to the network. During the process, we expect to unfold new MoCs. Furthermore, the analysis gave us the following inputs to our first iteration of a design specification:

Theme	Demand	Criteria	Comments
Nature involvement	Nature needs to be a central actor when developing the center		
Characteristics of the Area		Retain the present characteristics of the Area	Established relations such as ensuring the area still is a good place to hike, run, bike and enjoy nature.
Broad visitor segment	The concept should be appealing both to the younger and older generation.		Citizens, tourists and school children are the envisioned users of the area
Relevance over time	Keep developing over time		The Center for SDGs needs to develop over time to stay relevant in the case of the SDGs.

Figure 49. inputs for Design specification, first iteration (own illustration)

5

SUSTAINALBE DEVELOPMENT GOALS AT A LOCAL PLAN
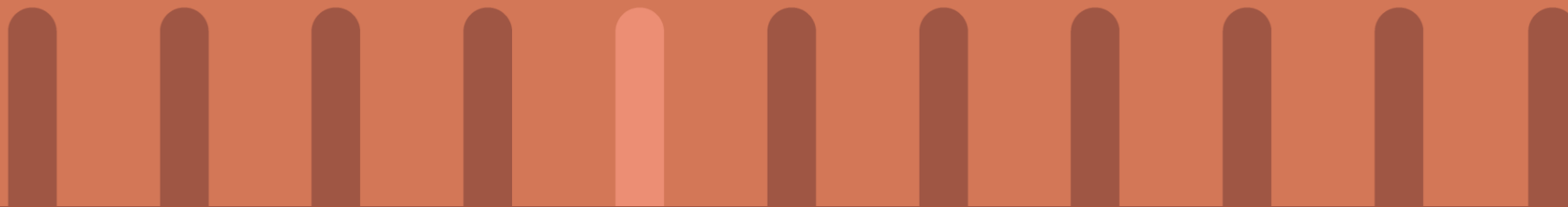
When creating a Center for the Sustainable Development Goals, it is relevant to know how citizens and visitors perceive the SDGs. If they already have a pre-understanding of them or if it is something new. From the previous chapter, we established that the municipality understands the SDGs differently within the department and that there was a need for involving citizens further into the design process of the Center for SDGs. Therefore we ask *how does citizens and young people understand the SDGs if they even do?* If young people (school children) and the citizens are the primary users of the area, it is essential to know how they relate to the SDGs, if the vision of the area is to create a space where people thrives in harmony with nature according to the 17 SDGs (Olsen 2019). Before investigating the citizens' relation to the SDGs, we have analyzed how two Danish municipalities and one organization have worked with the communication of the SDGs to bring them to a local level and engage their citizens to act.

5.1 Looking at experiences from other Danish municipalities

In this chapter, we will initiate the analysis of how the SDGs can be communicated understandably and tangibly for citizens of Danish municipalities. We will do so through an investigation of how two other Danish municipalities and one organization have been working with the SDGs in a local context. Here we will have a particular focus on initiatives that are trying to translate the SDGs to local goals for the citizens. We do this to collect inspiration and to understand successful and less successful

approaches to how a relation between the citizens and the SDGs can be translated. Many municipalities and organizations have already tried to translate the SDGs and localize them to tangible goals for each context (In the table, in Appendix 6, an overview of some of the Danish municipalities and originations working within this subject is collected.) In the analysis, we will focus on the municipalities and the organization we have been in contact with as our primary source: Kolding municipality, Albertslund Agenda Center (AAC), and Odense municipality (see figure 50). The full transcription of the interviews can be found in Appendix 7.

Agenda Center Albertslund

Agenda Center Albertslund is a small nonprofit organisation whose vision is to help citizens and residential areas with initiating sustainable activities leading to a sustainable municipality. They perform campaigns, events and activities that promote sustainable behaviour. The past couple of years they have had a special focus on the SDGs and call themselves a center for the SDGs (verdensmålscenter).

Kolding Municipality

Kolding Municipality is working actively with how the SDGs can become a bigger part of both the development in the municipality and their citizens' life. The municipality has a political vision which is 'together we design life'. This includes among others a strategy on the SDGs and a special focus on being one of the frontrunners of circular economy.

Odense Municipality

Odense Municipality has since 2018 had a council/board whose main priority is to integrate the SDGs in the work of the municipality. They have chosen to kick start the process by prioritizing six projects, where one of them is focusing on the translation to everyday goals.

Figure 50. General knowledge about the three interviewed municipalities and organization

5.1.1 Specialization of few goals rather than embracing them all

A recurring challenge when working with the SDGs on a local plan is the dilemma of to what extent all 17 goals should be included. When looking at the interconnection and coherency between the SDG, it is clear that one can not be excluded over another if sustainable development is to be achieved (see chapter 2). One thing is how the SDGs demand to be fully understood. Another is how to enable a successful implementation of this demand in a local context. We have examined how this is done through three examples (Kolding municipality, Odense municipality & Albertslund Agenda Center(AAC)).

In the interviews with the three examples, it was clear that it is not easy to work with all 17 goals in a local context. For example, AAC has chosen to prioritize six goals: Goal 6(clean water and sanitation), goal 7(renewable energy), goal 11(Sustainable cities and communities), goal 12 (responsible consumption), goal 13 (climate action), and goal 15(life on land). Odense municipality has prioritized goals 7, 11, 4 (good health and wellbeing) & 13. In AAC, they prioritized some goals because they predicted that a more significant contribution to the SDGs could be made within a few goals rather than embracing them all. They saw that a lot of the other goals were outside their scope of competencies. They have experienced that the goals can be very abstract to work with, especially when including citizens of Albertslund around the SDGs. They do think that all 17 goals are equally important, but finding their role in each goal is difficult because there is no plug and play method or solution to how the goals should be fulfilled.

In Kolding Municipality, they see the same challenge of having to find their methods for a localization of the SDGs. They do not exclude any of the 17 goals but argue that the best method for the municipality is to focus on the Circular Economy. *"The SDGs are what it takes to achieve sustainable development, but they do not tell us how to do it. So in Kolding municipality, we think that the circular economy could be one of the methods"***9** -Stella Steen Jensen, Kolding Municipality (Appendix 7). However, they still have not found the right solution for how they can work with the SDGs to create a sustainable awareness and behavioral change among their citizens. The best approach they see available right now is to translate the goals into a context that is relevant for the citizens.

From the interviews, we got the impression that it can be difficult for municipalities and local organizations to see the relevance of all 17 goals in a local context. Even though the interviewed municipalities and organization found it difficult working with all the SDGs, they all had a clear awareness of the connection between the 17 goals and their 169 targets. *"There is a correlation between the SDGs, but should we talk about them together? it's hard to reflect the connection between the SDGs, where fewer SDGs are more comfortable to relate to"***10 -** Jakob Aarøe Jørgensen, Odense Municipality (Appendix 7). They just haven't found the right way to approach this interconnectedness, and haven't figured their role in the goals that aren't as relevant for their local communities. We, therefore, see the relevance of our investigation in this thesis to not only be beneficial to

Sønderborg municipality but also as an input to other municipalities dealing with the same issues.

5.1.2 Representation of the SDGs - Translation to everyday goals

A recurring method used to overcome the challenge, of the goals being difficult for the citizens to relate to, is to translate them into everyday goals. These everyday goals are concrete actions oriented towards the small things everyone can do in their everyday life. Both Albertslund Agenda center and Kolding municipality have made small booklets for the citizens. Odense is also looking into this approach. Kolding Municipality and AAC have developed booklets concretizing each goal in a local context and translating them to everyday goals for citizens to relate to (see figure 51). Kolding municipality's motto is *"We can not leave it to 'the others' to save the world. We have to start with ourselves under the mantra 'nobody can do everything, but everyone can do something - and together we can save the world. '"* (Kolding Kommune 2019, p4).

Both Kolding municipality and AAC have had great feedback from the citizens on the booklets. However, we question whether this translation to everyday goals helps to achieve sustainable development or if they are too simplistic to have an impact. In the interview with Odense Municipality, Jakob Aarøe Jørgensen also problematized this in their current work on how the SDGs can be relevant to their citizens:

*Typically it will just become a matter of sorting garbage or having a meatless day"**11** - J*akob Aarøe Jørgensen, Odense Municipality (Appendix 7). Here Poul Markussen from Albertslund argues that it is not a competition on who does the most. We are all

Booklets on everyday goals

Figure 51. Examples of booklet inputs from Albertslund Agenda Center and Kolding municipality (own illustration)

dependent on each other in order to solve this. The important thing is to interest the citizens and get them to take part in a sustainable behavioral change. At the same time, inform them that: when making small changes, it affects the global movement as well. We see another issue within the translation towards everyday goals. When taking this approach, many of the aspects of the 169 underlying targets go missing in the reduction to simple goals. Especially the coherency and the interconnection of the 17 goals are lost in the translation to everyday goals. There is a trade-off between making the goals concrete and seeing the bigger picture and interconnectedness of the global goals.

5.1.3 Physical representation of the SDGs as interessement devices.

These booklets on everyday-goals and many other initiatives communicating the SDGs are often delivered through written material. However, Kolding municipality emphasized the importance of having physical interaction when communicating the SDGs. They prefer having events or physical representation, as it gives them better circumstances for engaging citizens in discussions around the SDGs. Their most successful event has been to transform a street during culture night into 17 islands where each goal was the theme of an island. They found it helpful to use interactive elements to interest and enroll people into the discussion. *"We try to have an interactive element every time because it helps to have things between the hands and to get it visualized." ***12** - Karin Raaby, Kolding municipality* (Appendix 7).

The focus has not been on the physical elements themselves but more on the talks and discussions they led to with the citizens. Therefore, we find it necessary to include physical objects in the representing of the SDGs as they can act as interessement devices when engaging citizens. Kolding has furthermore invested in a container called the KOMtainer. It is a mobile dialogue and meeting place for citizens and organizations to borrow for projects or activities connected to the SDGs. The container becomes a place where citizens and local organizations gather around common matters of concern within sustainability and together create initiatives. The KOMtainer works on many levels. It has an educational effect, and it gives some visibility to the public on the SDGs. We see this interesting because it, to some degree, resembles some of the elements seen in a living lab (Chapter 3).

Albertslund Agenda Center (AAC) has been part of creating an outdoor area for the SDGs called verdensmålslunden. Here they have planted 17 different trees in a circle as a symbol for the SDGs. The vision is to have Schools and families gathering in a learning environment, where the physical framing will create ownership and visibility of the SDGs. **Ownership** has been a critical term in this project. AAC created ownership by including the students in the creation, implementation, and maintenance of verdensmålslunden. The thoughts behind Verdensmålslunden have a resemblance to Sønderborg municipality's visions for Kær Vestermark just on a much smaller scale in case of the extent.

5.1.4 Engaging citizens for participation

Both Albertslund Agenda Center, Odense Municipality, and Kolding municipality had a common challenge referring to the lack of engagement from a broad range of citizens. In the last section, we discovered the importance of having physical representation. But one of the challenges with having a physical representation of the SDGs through events is that you only reach the people that come by. *"The physical communication always works better than a booklet, but the limitation of a physical place is that you only reach the people who just pass by, where a booklet can reach out a little further." ***13*** - Karin Raaby, Kolding municipality (Appendix 7) In Odense Municipality, their experiences tell us that it can be quite challenging to engage the citizens on the matter of the SDGs. Every time they have had an event on the topic, it has been the same group of people who

are passionate about the subject, showing up. They found if they frame the objective of the meetings or events to be about a different matter such as the welfare of the citizens, a more diverse group of people have been showing up.

*"We held some citizen meetings around welfare, which became more specific to people, and then 'Hr. og Fru Jensen' came to the citizen meetings. Because they could relate to the matter and it was a topic where they had the change to add to the conversation. When it becomes concrete, it is easier to get people to participate. "*14 - *Jakob Aarøe Jørgensen, Odense Municipality* (Appendix 7). Odense municipality's experience showed that concretizing the events and finding what is relevant for the citizens in their everyday life is key when reaching citizens who wouldn't otherwise participate.

Outcomes to take with us

From our analysis on how danish municipalities and organizations work with the SDGs in a local context, we discovered that each have their own approach and own way of doing it. This is, in many cases, rooted in a trial and error approach as there is no plug and play method for how it should be done. The municipalities are facing three main challenges when working with the SDGs:

1. 17 goals can be overwhelming to work with, which often leads to a specialization of few goals rather than embracing them all
2. Engaging a wide range of citizens for participation, and

3. Translating the goals into matters relevant to the citizens every day, without losing a sense of the coherency and interconnectedness of the SDGs.

Despite the challenges of working with the SDGs on a local level, we can take important learnings with us from our three examples. We, therefore, take the following requirements and criteria with us in the design specification:

Theme	Demand	Criteria	Comments
Ownership	The concept should create a sense of ownership between the citizens and the SDGs		
Communication of the SDGs	Physical place(s) for presentation and interaction with the SDGs		
		Framing the SDGs as something concrete that citizens have a relation to	

Figure 52. Demands and Criteria derived from municipality analysis (own illustration)

5.2 Citizens current relation to the SDGs

When creating a Center for Sustainable Development Goals at Kær Vestermark, it is relevant to know if the SDGs are something that visitors and citizens already have a pre-understanding. In this chapter, we will question *how citizens relate to the SDGs, if they even* do? Moreover, analyze approaches to how they can be made tangible. To investigate this, six interventions have been made: One online intervention with citizens of Sønderborg and five with different high school classes. The high school intervention was made with young students from Slagelse high school. Even though Slagelse is far away from Sønderborg, we see that these students could as well be potential visitors of the Center, and we believe that the knowledge gave a valid picture of how people, in general, perceive the SDGs.

5.2.1 Online intervention with citizens of Sønderborg
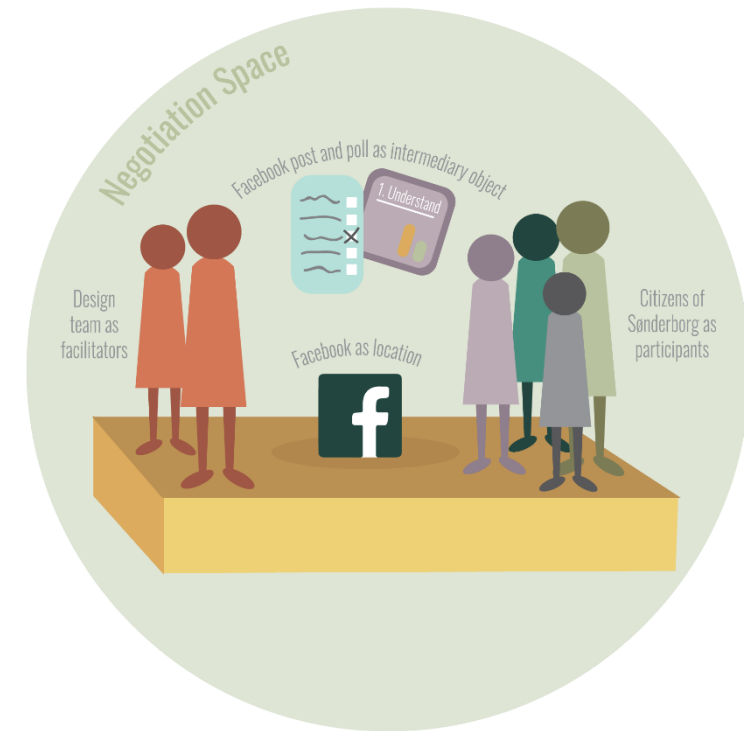
Figure. 53 Negotiation space of second post on Facebook.

As a part of our negotiation space (see figure 53) on Facebook, we developed a second post in the first round on understanding.

Staging

The purpose of the Facebook post was to get a notion of citizens in Sønderborgs relation to the SDGs. This was done through a simple question that the citizens needed to reflect upon and give an answer to (see figure 54).

Figure 54. Screenshot of intervention questions (own photo)

The post sought answers towards the citizens' knowledge of the SDGs. The post consisted of the question and a picture of the SDGs to make the citizens relate to the specific goals and discuss which they found most important in their everyday life.

Facilitation

In the facilitation, we wrote an attached message to the post, thanking the citizens for their previous engagement, and explaining why we wanted them to reflect upon this post (see figure 55).

After posting the question, it was quickly evident that the citizens were not engaged in the conversation as no one commented. To engage the citizens to participate, we made a reminder for help, this resulted in a few

Figure 55. Screenshot of facilitation of second Facebook post (own photo)

comments on the post. From this intervention, we experienced the difficulties of engaging citizens around the SDGs. Furthermore, we were challenged by the online approach on Facebook and how we had to keep the topics simple if the citizens were to engage. When comparing this post to the question asked in the first Facebook post in chapter 4.2, we can see a clear indication that citizens are more willing to engage in topics relating to personal matters, such as their relation to Kær Vestermark, than to more unknown ones such as the SDGs.

From the few results, we could not get an understanding of the citizens' relations to the SDGs. We, therefore, found it necessary to re-stage the question. The simplification was made through an opinion poll to see if the citizens were willing to give their opinion to the SDGs if they didn't have to express themselves in the comments. This gave us a substantial increase in the number of answers (see figure 56).

Figure 56. Screenshot of an opinion poll of citizens knowledge of the SDGs (own photo)

Results and Reframing

Twenty-five citizens voted in the poll and indicated their relation to the SDGs, even people that have not been active beforehand were showing their opinion for the first time. From the poll, it was clear that, in general, the citizens knew about the SDGs but did not have any further relation to them. Only 8 of the 25 found the SDGs relevant. The poll only indicates the citizens' primary relation to the SDGs, but it did not give a more in-depth insight into the citizens' thoughts behind their answers.

However, a few participants initiated a discussion on the SDGs in the comment section. (see figure 57)

Figure 57. Screenshot of discussion around the SDGs (own photo)

The discussion was about the SDGs and whether they were a scam to avoid acting on the 'real' problems or if they were meant to create sustainable development for everyone. The discussion showed two perspectives on the SDGs, where one part needed concrete actions in his life to change his behavior. The other part tried to argue that we were already doing better due to the seventeen development goals. This discussion gave a good insight into the different perspectives of the SDGs and the tensions that happen when discussing them. From an agnostic perspective, this conversation was interesting because the participants were enrolled to start a discussion on their own and negotiate their opinions. Furthermore, we see an advantage in the SDGs potential of creating discussion and potential displacements in the network.

Though the online intervention did not give much empirical data, we used the outcomes as valid information in our general understanding of the citizens' relations to the SDGs.

To gain a broader insight into citizens' relation to the SDGs, we will include knowledge gained from interventions made with high school students at Slagelse Gymnasium. These are described in the following section.

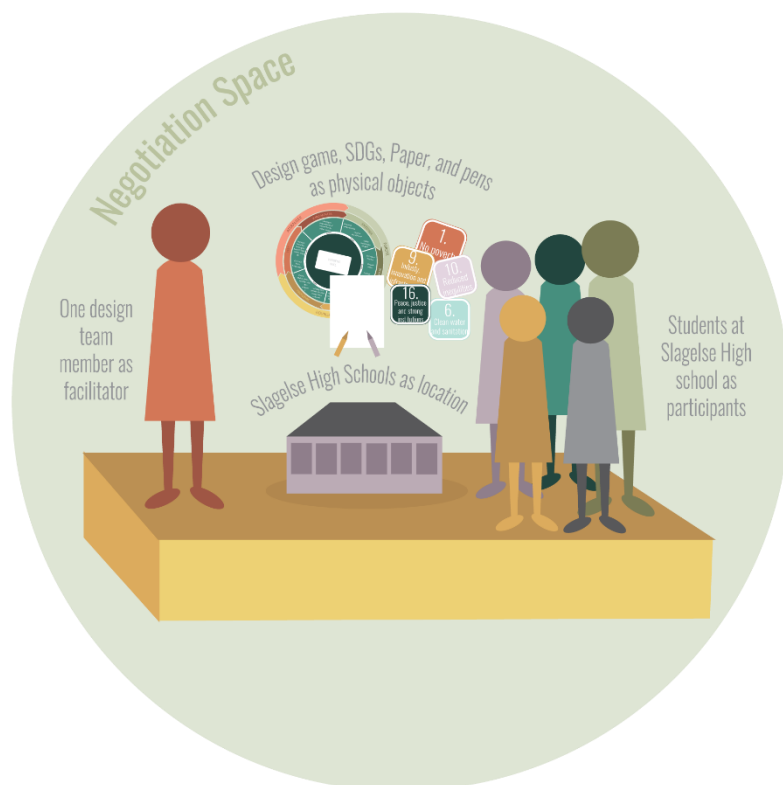## 5.2.2 High School Students Interpretation of the SDGs

Figure 58. Negotiation Space of SDGs with High School Students

Several workshops with High School were made to support the outcomes from the previous intervention. 141 High school students were invited to take part in a workshop around the 17 sustainable development goals. We see these workshops as staged negotiation spaces, where the high school students had to negotiate their relation to the SDGs through a design game (see figure 58). Slagelse High-School was chosen solely because one of the group members could utilize her teaching job at this specific school.

Staging

The negotiation space was staged as a workshop, where the participants, through a design game (see figure 59), could use their creativity to develop a concept for how a SDG could be understood in a local relatable context.

Figure 59. The SDG design game (own picture)

To structure the workshop, the design game was created with inspiration from a Design Sprint, where three different phases lead the process. The students were divided into smaller groups, each working with one randomly picked SDG. In the group, they had to do a one hour sprint, where they had to work through the three phases: Understand, Develop, and Materialize. The design phases were further divided into six-time limited rounds:

1. The Empathy round	?	The design team needs to research their SDG, what it is about, and what the part goals are. This can be done through google, diverse social media, youtube and so on.
2. The define round		The team needs to share the knowledge found in the previous round and then define how this knowledge can be translated.
3. The idea round		The team brainstorms on concepts for the defined area.
4. The Prototype round		The team selects the best concept from the brainstorm or merges concepts together. After this, the concept is further developed.
5. The test round		The team needs to prepare for a max of 5 min. pitch that explains the concept around the specific SDG. They need to decide how the concept is best presented.
6. The implemen-tation round		In the last round, the teams need to present their concept in front of the other design teams. This is done in a well-prepared pitch supported by pictures, drawings etc.

The objective of the design game was to increase the students' awareness of the SDGs as well as make them discuss and reflect upon them. To support the students' creativity, blank paper and colored pens were provided for the students to visualize the concepts.

Facilitation

The workshop was facilitated four times the 05.03.20 and two times the 09.03.20 with six different classes at Slagelse Gymnasium. The classes were mainly first-grade students (aged between 16-18 years). There was a general desire to participate in the game, but it was clear that some classes were more interested than others, which also affected the concepts created by the students. Before the presentation of the game, information on the SDGs were given as the UNs top-down vision, and how a bottom-up approach could make the SDGs more relatable to the students. Afterward, the game and its 'rules' were presented.

While the students were playing the game, the facilitator took notes of the process and documented it through photography.

Reframing and Results

Figure 60. From intervention with 1.n at Slagelse Gymnasium (own photo)

From the interventions, it was apparent that some SDGs were easier for the students to work with than others. The results and the internal discussions (during the interventions), gave a notion on the students' immediate relation to the SDGs. Figure 61. shows an overview of the SDGs the students found easy to work with and the ones that were more difficult to transform into a concept relevant to themselves.

When describing the SDGs as easy to work with, it is to be understood, as the SDGs where the groups did not need further explanation or help to complete the sprint. The difficult SDGs are the ones that were not straightforward for the students. They either needed more explanation to help relate the goal to a danish context, or they did not reach a concept during the sprint. To see the different results in detail, see Appendix 9.
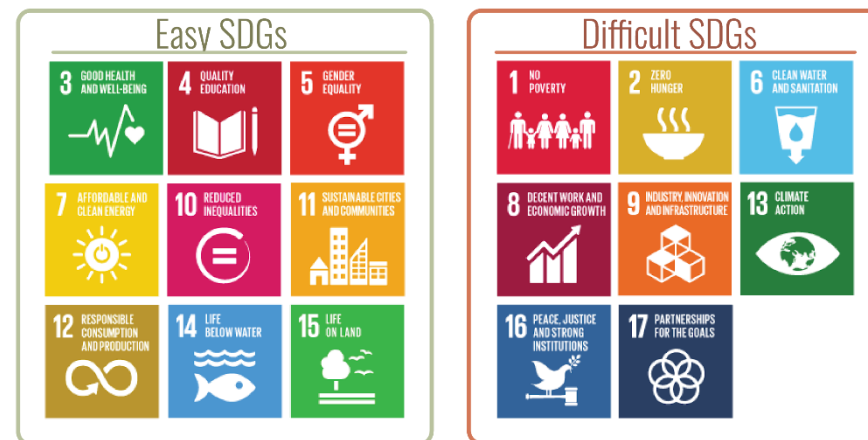
Figure 61. Results from intervention, relatable and non-relatable SDGs for high school students (own illustration)

Global goals in a Danish context

Especially three of the SDGs were challenging to relate to in a danish context. These were;

- #1. No poverty
- #2. Zero hunger
- #6. Clean water and sanitation.

These challenged the students because they could not relate to hunger or dirty, unhealthy water systems in Denmark. Since these three goals are very focused on problems in developing countries, the students' concepts were either focused on how we in DK could help developing countries get more food or secure, clean water, etc.

Some teams needed help from the facilitator, to translate the goals into a Danish context. The facilitator guided a good discussion was created in the groups on poverty as a growing problem in Denmark, pesticides and other pollution in the Danish groundwater, and how to cope with food waste as well as alternative ways to produce food in Denmark, etc.
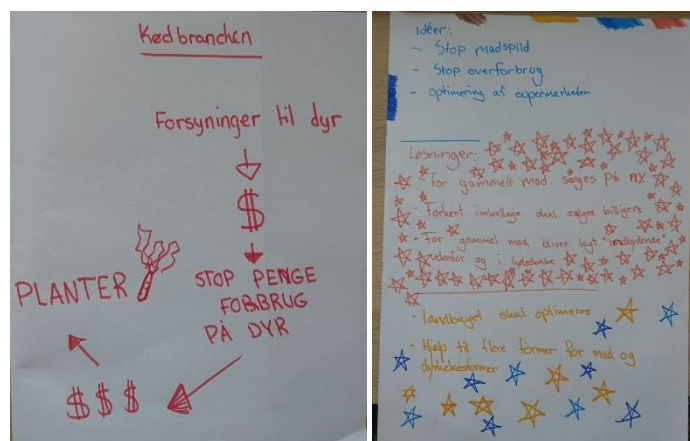

Figure 62. Two examples of concepts derived from SDG 2. No hunger. (own photos)

Broad goals with a large content

The SDGs #8. (*Decent work and economic growth*), #9. (*Industry, innovation, and infrastructures*), #13. (*climate action*), #16. (*peace justice, and strong institutions*), and #17. (*partnerships for the goals*), were all seen as difficult. When talking with the groups, it was clear that just from the goals itself and its targets, the goal became incomprehensible for the group to work with, because these goals embrace broad topics. In some cases, the facilitator

succeeded in describing some of the goals in an understandable and relatable way. This resulted in creative and concrete concepts (see figure 61).
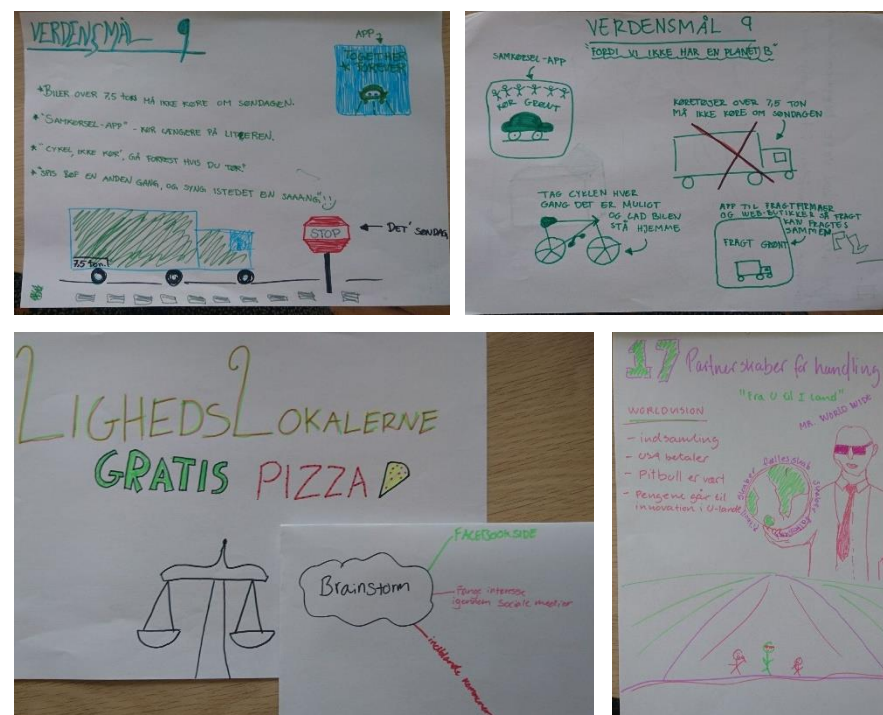

Figure 63. Drawings of concepts from intervention,9. Industry, innovation, and infrastructures, and 17. Partnerships for the goals (own photos)

From this, it was proven that even though the goals, in the beginning, were difficult to work with, they became relatable in the end.

Outcomes to take with us

We saw that it was possible to make the SDGs somewhat relatable and understandable for the students when giving them the settings of a creative and hands-on approach. Although some of the concepts were created on a humoristic note, we observed an excellent internal discussion between the different groups. We got a more in-depth insight into how actors with no further pre-understanding view and relate to the SDGs from the negotiations space. We found that creating concepts in a Danish context was not always an easy task for the students. When asking the students about their knowledge on the SDGs, everyone knew of them. However, when put to the task of working with them more directly, they needed additional knowledge on the individual goal and their sub-targets.

There is an indication that the understanding and relation to the SDGs vary, depending on the individual goal. Some goals were easy to work with, and thereby a closer relation was created. Other goals were more challenging to work with because they had a distance to a Danish context and the students' own everyday life. Furthermore, we experienced that setting up a physical frame for the SDGs had a positive impact on creating forums for discussions. The students were able to discuss the SDGs and create a space of negotiation where different matters came into play when developing the concepts (see figure 64). This resembles some of the properties in the creation of Things. These are seen interesting to take with us in the further design process. Different demands and criteria have been derived from the negotiation spaces:

Figure 64 Photos that were taken during the workshop interventions, showing negotiation internal in the groups (own photos)

Theme	Demand	Criteria	Comments
Communication of the SDGs	Facilitating different and alternative perspectives on the different SDGs		When giving different perspectives on the 'difficult' SDGs, it was seen that the highschool students had the ability to relate to the goals anyways
Creating 'Tings'	Setting up a physical frame for the SDGs to initiate spaces for negotiation and discussion		When giving different perspectives on the 'difficult' SDGs, it was seen that the highschool students had the ability to relate to the goals anyways

Figure 65. Demands and Criteria derived from municipality analysis (own illustration)

6 SOLUTION SPACE
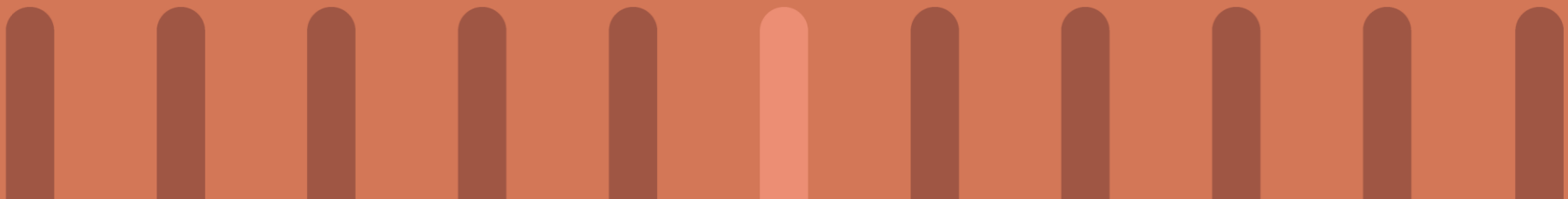
In the following chapter, we will use the results gained in the previous chapters to initiate the exploration of the solution space. The derived knowledge will be used to establish design parameters we find essential when designing the center for SDGs as a living lab. These design parameters set the foundation for the exploration of elements we should incorporate in the design of the Living Lab. In this exploration, a negotiation space was staged to include citizens in the negotiation of the design parameters. Lastly, we will investigate how the SDGs can be implemented at Kær Vestermark through a staged negotiation space with employees from Sønderborg Municipality.

But before opening the solution space and establishing the design parameters, we will present the results from an interview with Jesper Steenberg, the director of ENERGY and WATER Living Lab in Copenhagen. We chose contact with an expert in the field to collect inspiration on what we should have in mind when setting up the design parameters for Kær Vestermark as a living lab. This interview gave us valuable information to use in the exploration of the solution space.

6.1 Seeking inspiration in the development of Kær Vestermark as a Living Lab

To transform Kær Vestermark into a Living Lab for the SDGs, we found it relevant to look towards other successful Living Labs that have managed to design a collaborative and experimental space. As a part of our solution space, Jesper Steenberg, director

of ENERGY and WATER - Greater Copenhagen Living Lab was interviewed (see appendix 10).

The purpose of ENERGY & WATER is to create an alternative learning environment. ENERGY & WATER uses the SDGs to combine different actors (schools, institutions, citizens, and researchers) to create a shared understanding of sustainable cities. ENERGY & WATER have succeeded in mobilizing citizens to be an active part of the innovation processes through different experiential environments. One of the main design questions we wanted to answer through the interview was; *How is it possible to create a space where actors are interested to enter a stage of experimentation and negotiation (living lab)?*
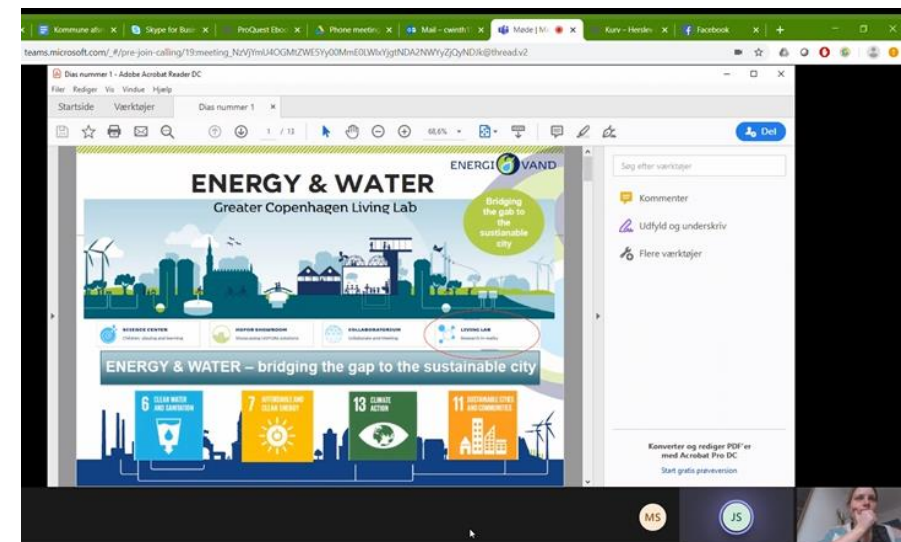

Figure 66. Screenshot from meeting with Jesper (own photo)

6.1.1 Experimental platforms through Tangible Interactives

We are investigating how Kær Vestermark can be seen as a living lab and become a space where various actors can be challenged, experiment, and negotiate their everyday behavior in relation to the SDGs. To cope with the chaos and frustration that often occurs when actors have to adapt to something they are not used to, it is important to show different opportunities to negotiate through. Here Jesper Steenberg introduces the term Tangible Interactives which can be used as a tool to create experimental and negotiable platforms (see figure 67).
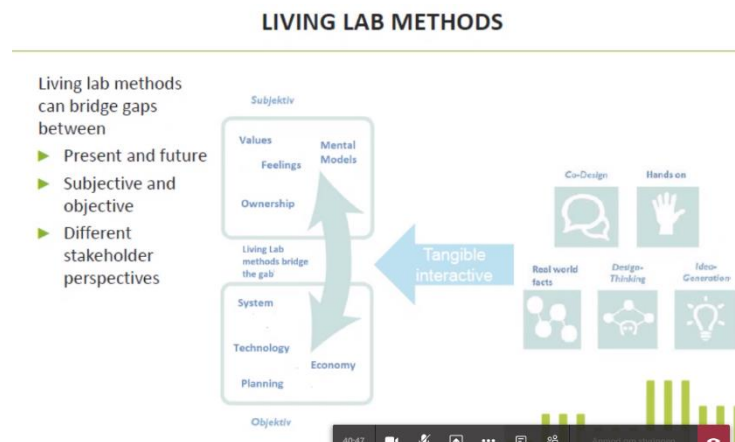

Figure 67. Screen shot from PP presentation from Jesper Stenberg (own photo)

The tangible interactives are used to create a bridge between past and future, between the subjective (values and feelings) and the objective (economy and technology), and different stakeholder perspectives. To avoid potential controversies in the process, these tangible interactives can show past and future possibilities and adequately prepare the participants before entering the negotiation of a possible behavioral change (mobilization).

Tangible Interactives

The term Tangible Interactive is in literature often used in the field of digital technology platforms used in educational contexts such as museums or experimentariums. Here it is used to describe physical objects that people can interact with "the idea of tangible interaction focuses on human control, creativity, and social action rather than the representation and transmission of data" (Kidd, Ntalla, & Lyons 2011). The tangible interactives are often related to technological user interfaces where everyday objects or environments are coupled to digital information (Wang et.al 2014). They blend design, technology, and art to create interactive spaces and experiences that spark a sense of curiosity and wonder. An example of this is multi-touch tables as seen in the picture.

Figure 68. Example of a Tangible interactive (Source: Alchetron.com)

We find the qualities of tangible interactives relevant for the project, however, we don't see a necessity of restricting our self to IT- and Techology-driven experiences. We argue that tangible interactives can come in many shapes and sizes. We will therefore, explore non-digital tangible interactives as well.

We see tangible interactives as important elements to create experimental and negotiating platforms. We will, therefore, include them in the design specification. In the following section, we will explore how such tangible interactives could be designed in participation with different citizen groups in and around Sønderborg.

6.1.2 Inputs to the design specification

For the iterative design specification we take the following with us:

Theme	Demands	Criteria	Comments
Experimentation	The concept needs to include Tangible Interactives		Facilitate experimentation and negotiation through tangible
Communication of the SDGs	Show multiple possibilities (past and future) to negotiate through)		

6.2 Co-designing elements for the living lab

To explore how these tangible interactives can be designed, we enrolled citizens into a collaborative and explorative design space. We see it necessary to make the citizens an active part of the process when designing the tangible interactives and Kær Vestermark as a living lab for the SDGs, because they will be the ones to use the future area. To do so, we enrolled citizens through a design game to explore effective, tangible interactives based on a set of design parameters.

6.2.1 Setting up Design Parameters

Throughout the report, we have presented iterative versions of the Design Specification. To ensure that the tangible interactives are designed according to the demands and criteria, a set of design parameters was developed based on the design specifications. The parameters were developed as five design questions we saw essential to explore when developing tangible interactives with the citizens. These where;

Design Parameters

- Experimentation - How is something made experimental?
  (Derived from the interview with Jesper Steenberg and Municipality analysis)

- Knowledge sharing - How is new knowledge on the SDGs best perceived and communicated?
  (Derived from the interview with Jesper Steenberg and theoretical approach)

- Ownership - How can ownership be created? When does one feel a part of something?
  (Derived from Municipality analysis)

- Nature involvement - How can nature be actively involved in the development?
  (Derived from relation analysis)

- Making a 'Thing' - What can make people gather?
  (Derived from the theoretical approach)

In the translation of the design specification, not all demands and criteria are represented. Some knowledge will, therefore, go lost in the translation. Nevertheless, we saw it necessary to simplify the design specification before involving the citizens. As design engineers, we have the competencies of using the design specification to design from, but as we involve non-designers(citizens) as designers, it can be quite overwhelming to design from a detailed design specification. The citizens will thereby not be presented with the design-specification, but we will continuously use it as an intermediary object in the design team.

6.2.2 Negotiation space of design parameters

To answer these design questions, a negotiation space was staged. The purpose of the space was to negotiate the selected design parameters as well as investigate the potential solution space. We invited different citizen groups to enter the stage of negotiating the design parameters in regards to their Matters of Concerns (see figure 68). Doing this, we ensured that their MoCs were taken into consideration as well as enabled a possible mobilization of the actors into the network around Kær Vestermark as a Living Lab.
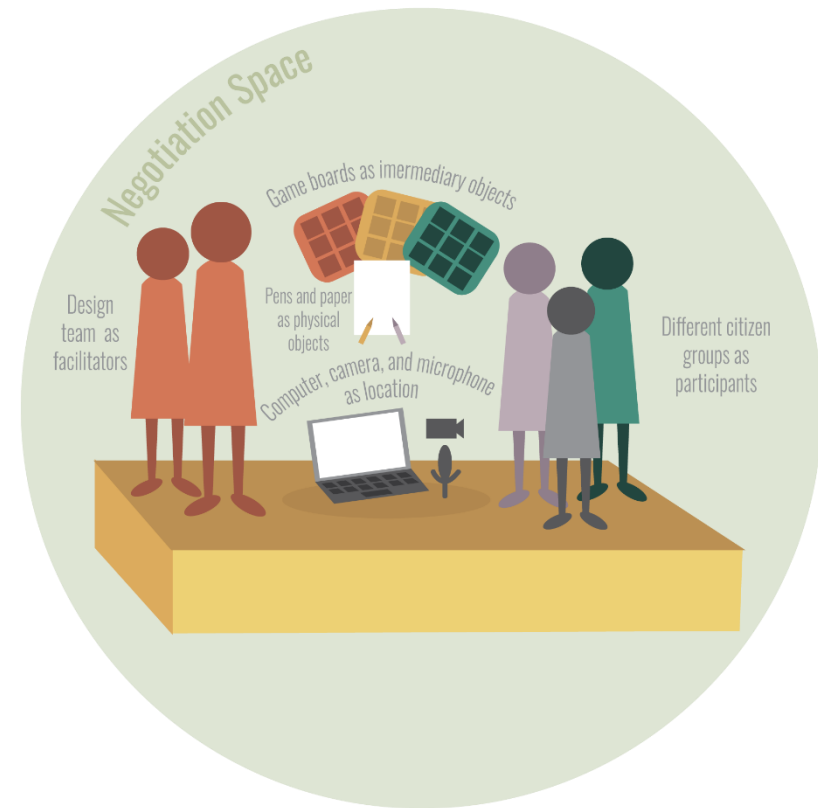

Figure 68. Negotiation space for design parameters (own illustration)

Staging

To enroll citizens, we created a Facebook post, encouraging citizens to contact us if they were interested in helping us. This was the second phase of our negotiation space on Facebook (see Section 4.2). We framed it as; *We want to learn how to create experimental and interesting activities at Kær Vestermark, which can motivate you to visit the future Kær Vestermark (see figure 69.).*

Cathrine Winther
Administrator · 14. april

Hej allesammen,

Så har vi brug for jeres hjælp igen! Vi er endelig kommet igennem vores analyse og skal nu begynde at udforske og designe, og det har vi brug for jer til 🙂

Men i denne omgang vil vi gerne blive klogere på hvordan man kan skabe eksperimenterende og interessante aktiviteter der kan motivere jer til at samles på det fremtidige Kær Vestermark.

Vi vil høre om der er nogle af jer der kunne være interesseret i at deltage i et lille online videoopkald (i behøver ikke være på video), men hvor vi kan diskutere nogle emner, så vi kan blive klogere på jer.

Hvis man er interesseret i at hjælpe os, kan man skrive en privat besked til enten Mette Simonsen eller Cathrine Winther, eller sende en mail på cwinth15@student.aau.dk

Vi håber på at høre fra jer!

2. UDFORSK - FASEN

Figure 69. Screenshot of 3. facebook post, enrollment of citizens (Own photo)

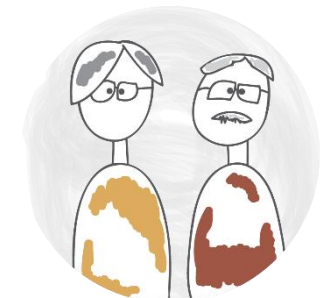From the post, we succeeded in enrolling four citizens groups:
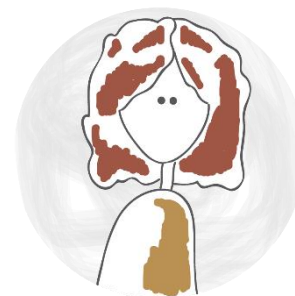
A citizen from Kær, Living just outside Kær Vestermark

A Family with young children living close to Sønderborg

A young couple, who recently moved to Sønderborg

An elderly couple living close to Sønderborg

The negotiation space was staged as a design game developed with inspiration from Nigel Cross' Morphology Scheme (Cross 2008). In the game, each design parameter was presented as a question to frame the parameter understandably for the citizens. Preliminary, we had unfolded each parameter (during a brainstorm) and presented our ideas visually as game pieces the participants could choose between. Through these game-

pieces, the participants were supposed to relate to the visual material, one design parameter at the time, and discuss, negotiate, and select which elements fitted to their Matters of Concerns.

One game board was made for each parameter with an overall theme and question (see figure 70). To secure that the participant could contribute with their own elements, empty game-pieces were provided as well. The premade game-pieces were only meant as inspiration and to kick start the negotiation.

To stage the online design game, we have used the online platform called Conceptboard, as a means to seek the physical elements and interaction that we usually negotiate through in Participatory design. Conceptboard lets multiple actors gather around a shared board where they can move, create, and draw elements in collaboration with the other participants through their mouse-cursor. Additionally, they can talk and see each other through the webcam.
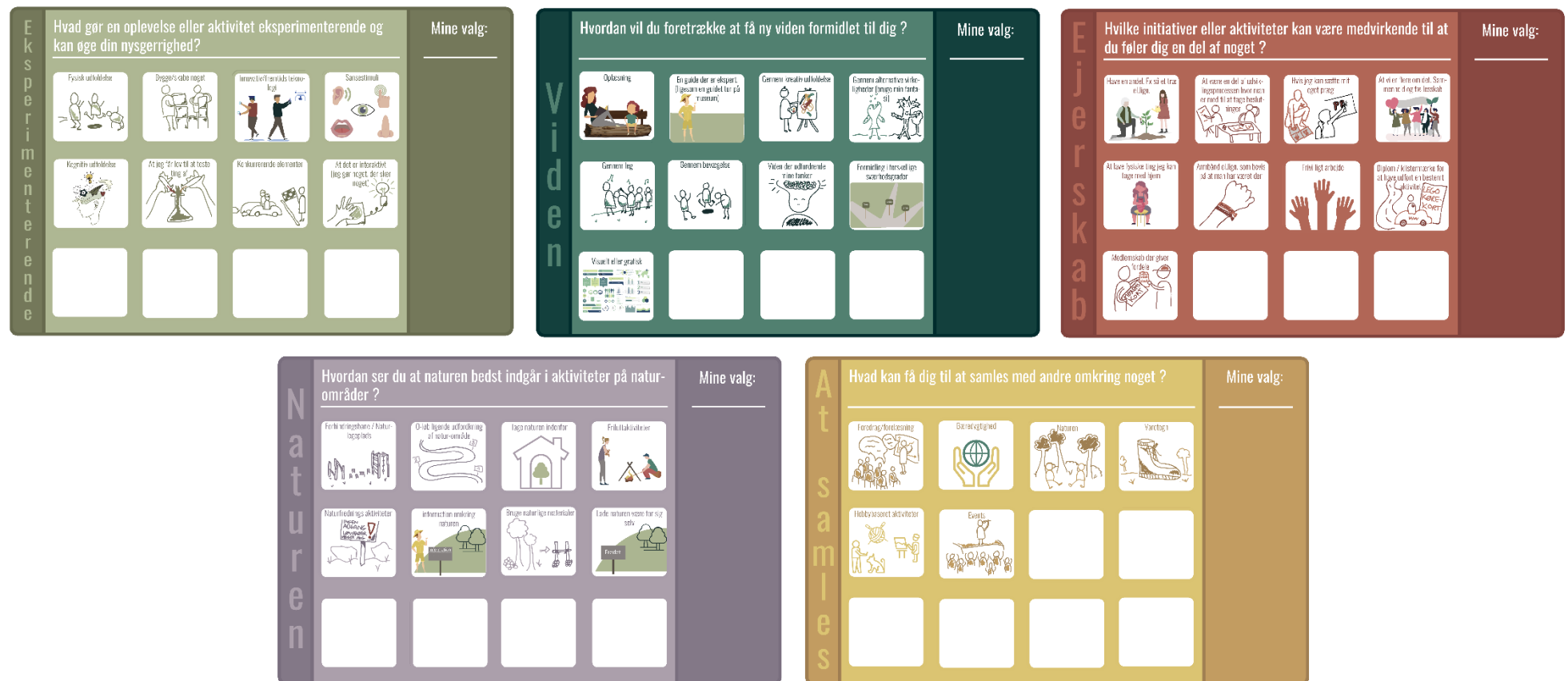
Figure 70. The five Morphology boards (own illustration)

Facilitation

The facilitator started the design-game with an introduction to the design parameters and the purpose of the game. The interventions were performed separately within the citizen groups to create less confusion for the participants, as well to focus on the individuals' Matters of Concern.

After facilitating the first two interventions, we concluded that the function of 'pick and choose' was working as intended. However, we noticed the tangible and creative aspects of PD were lost in the simplicity of the game. Therefore we choose to re-stage the negotiation space and add some physical objects, such as pens and paper (see figure 71). Elements that most people have at home. By doing so, we tried to enhance the creative aspects by giving the participants physical objects between their hands, which we under "normal participatory design" circumstances have good experiences with. During this part of the intervention, we saw a significantly better effect in how the participants were able to create original ideas. When drawing, everything is possible, it is only limited by your own imagination.
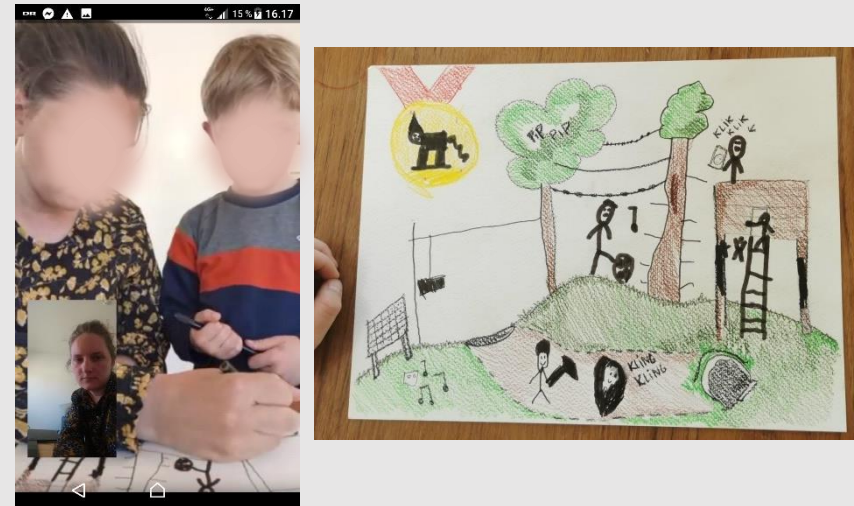

Figure 71. Picture of F and G drawing their thoughts from the choices made during the intervention as well as the final result. The family illustrated an obstacle course with different platforms both above and below the earth's surface, with different learning devices at different platforms spread throughout the area. They explained: After visiting all platforms, it is possible to get a gold medal and take a selfie to put on the selfie wall at the beginning of the track. (own photos)
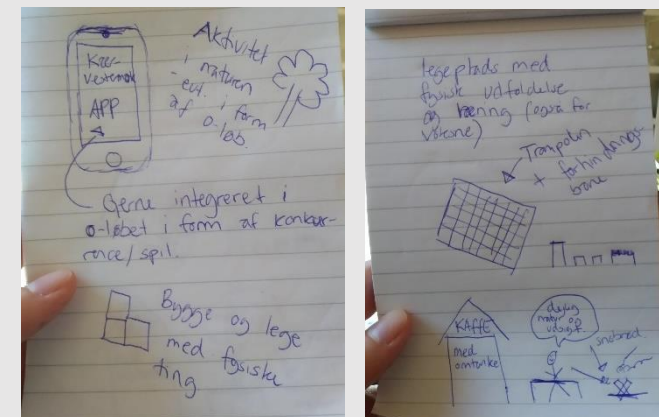

Figure 72 Picture of young couples inputs to activities at Kær Vestermark made from their choices. Most of their ideas were focused around physical exercise and competition. One of the ideas was to create an app, with a game that took you through the nature of Kær Vestermark, where it was possible to compete against each other. The other idea was a physical test where you had the opportunity to challenge yourself through a race exploring different points.(own photos)

6.2.3 Results and Reframing

To analyze the outcome of the interventions, we have outlined the similarities, tendencies, and contradicting statements from the four interventions. The aim and focus of the reframing is to translate the results into demands and criteria for the design specification. The full transcription and results from each intervention can be seen in Appendix 11.

It has been challenging to navigate what should be brought forth in the design specification and what to set aside. When assembling the results from all five interventions as a unit, not many of the elements can be excluded, since the participants had the option of choosing as many game-pieces as they wanted. To make the results tangible, a reduction, selection, and translation need to happen. The results are divided into subsections for what we see interesting to bring further in the design process. They are presented on the following pages.

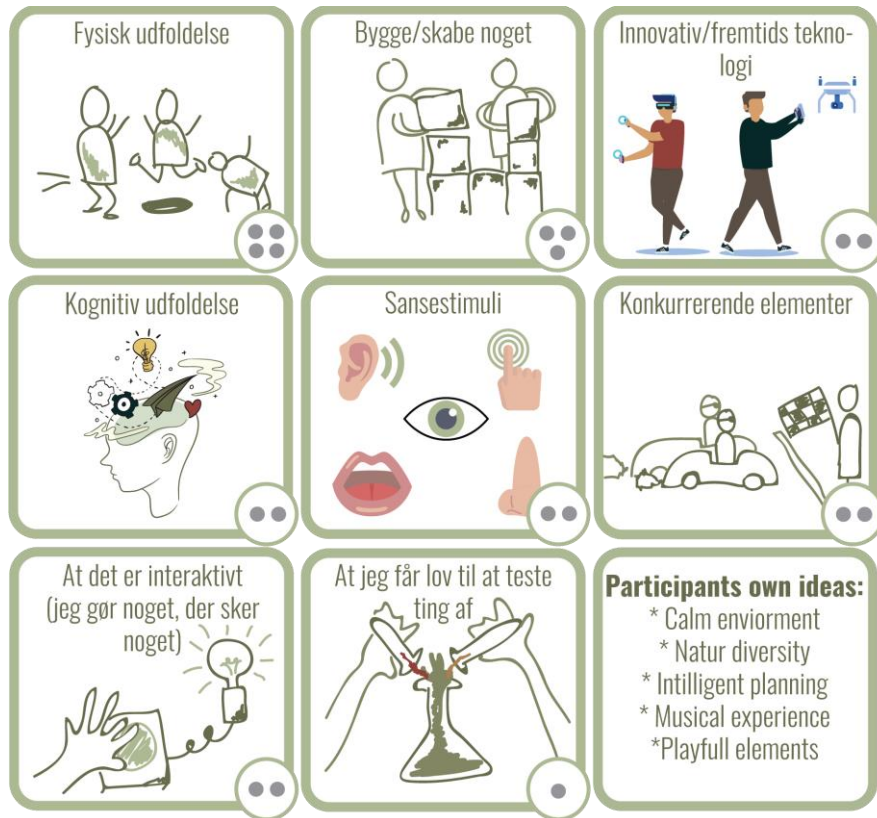# Design Parameter 1: Experimentation and increased curiosity

Figure 73. Similarities and tendencies in case of choices of what can make an experience or activity experimental? The dots illustrate how many participants choose each of the elements. (own illustration)

The participants had many different ideas on what could spark their interest and curiosity in this category. A clear tendency was that activities involving physical expression and using their hands through building elements were enjoyable for many of them: *"I like physical exploration. It is just fun to move while you are trying to learn something"*-K ***15** *(Appendix 11)* and *"We like that there is something where you can be activated "*- A ***16** *(Appendix 11).* They described the physical activities as fun and associated it with things they have experienced and liked to do in the past. In line with physical exploration, competitive elements were also appealing. Especially the young couple and the children were drawn to the connection between physical and competitive aspects: *"So we agree that the physical development and competing elements are somewhat interrelated"* -F ***17** *(Appendix 11)* and, *"competing elements are good for us, because we are both competitive people"* -S ***18** *(Appendix 11).* The only participants who did not choose physical exploration were the elderly couple. This was a result of an internal negotiation between the wife and the husband. The husband found the more playful, competitive and interactive elements appealing, and the wife found them too childish. They both agreed that it should be something where you try it yourself in an active setting, but it should not be too playful nor too physical. They deliberated the element of building something but concluded that such activities might be too time-consuming for them to dive into*: "preferably It should also be something where it goes fast, so that you do not have to spend hours building something"* - H ***19** *(Appendix 11).*

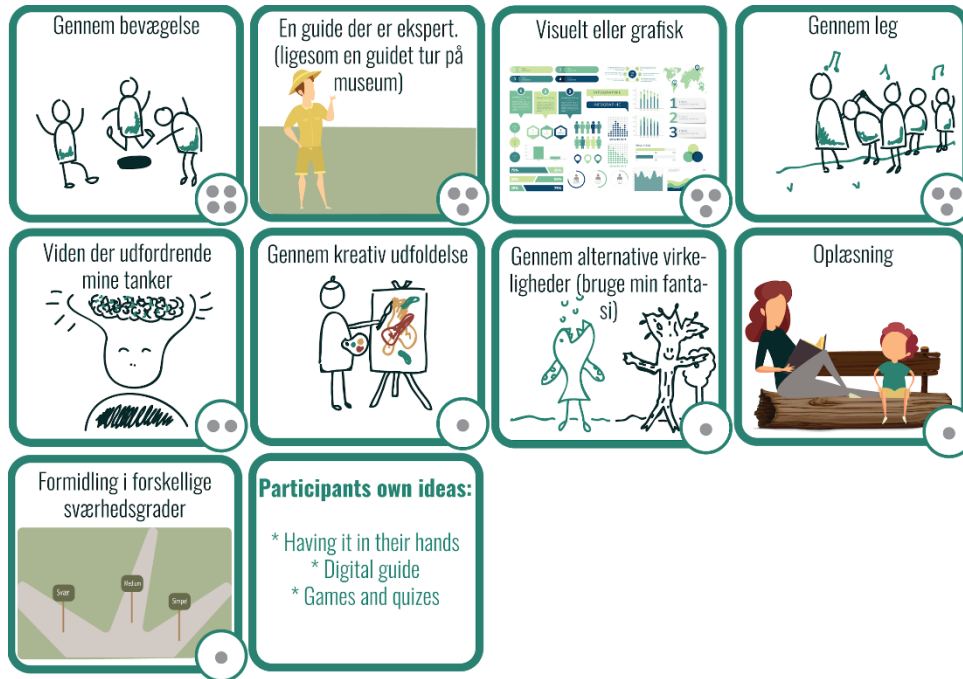# Design Parameter 2: Learning and Knowledge

Figure 74. Similarities and tendencies in case of choices of how do one prefer to get new knowledge communicated. The dots illustrate how many participants choose each of the elements. (own illustration)

The key takeaway on how the participants learn new knowledge was through movement. The citizen from Kær stressed that the activities and experiences should give her a sense of surprise and 'aha' moments. This could be done through visuals, sounds and/or through physical activities. It should give the visitor something to think about, that can change the way we see things.

Taking part and getting hands-on experience was a preferred way to learn new knowledge from all the participants. One of the children expressed that: * *"I want to learn it myself. If someone else explains it to you, you will not learn it."*- G *20 (Appendix 11), also the elderly woman expressed that she needed to have a hand-on-experience to learn new things. *"When we have to learn these new computer applications at work, I don't learn anything, because they only give you a piece of paper. You have to try it yourself"* - R *21 (Appendix 11).

A majority of the adult participants were drawn to the more classical communication approaches seen at museums, such as having written and visual material presented on signs and having an interesting guide to show them around. Some participants suggested having a digital element such as a smartphone or another electronic device that could act as a guide or to have sounds in the background while exploring the area.

Lastly, it was essential for some that knowledge could challenge them and make them think: *"It must be some knowledge that challenges my perception and can make one think of something else"* -R *22 (Appendix 11). The mother liked the idea of having different levels of difficulty, so everyone in the family will be engaged in the visit: *"There is also a point in various levels of difficulty. There must be something for everyone in the family. What G learns from is not necessarily what mom and dad learns from"* -F *23 (Appendix 11).

Design Parameter 3: Ownership

| At vi er flere om det. Sam-menhold og fællesskab	Frivilligt arbejde	Have en andel. Fx så et træ el.lign.
Hvis jeg kan sætte mit eget præg	Armbånd el.lign. som bevis på at man har været der	Diplom / klistermærke for at have udført en bestemt aktivitet
At lave fysiske ting jeg kan tage med hjem	At være en del af udvik-lingsprocessen hvor man er med til at tage beslut-ninger	**Participants own ideas:** * Taking photos * Enjoy the area in peace and quiet

Figure 75. Similarities and tendencies in case of choices of what activities can help you feel ownership? The dots illustrate how many participants choose each of the elements. (own illustration)

When discussing the parameter of ownership, we saw a clear difference in what the children found valuable and what the adults found valuable.

The children liked the idea of bringing something with them home, either a bracelet, diploma, photos, etc. The adults found these elements more of a gimmick. The adults liked the idea of being a part of a community such as volunteering: *"Having some agreements with others would be nice. It makes you feel part of something "- R* ***24** *(Appendix 11)*. However, some also questioned the necessity of being many people together to feel a part of something.

One of the popular elements was creating something and leaving it as a mark that can be visited at a later point.

Lastly, we explored how important it was to be a part of the development and planning process. The citizens living in Kær found this to be very important and thought there should be guidelines on what can be influenced and what cannot: *"Locals need to be involved. We think it is strange that we are not taken into consideration and that there is no empathy towards the people who live out here. They can't just keep expanding the city, we want to keep nature out here."- L* ***25** (Appendix 11).

Design Parameter 4: Nature Involvement
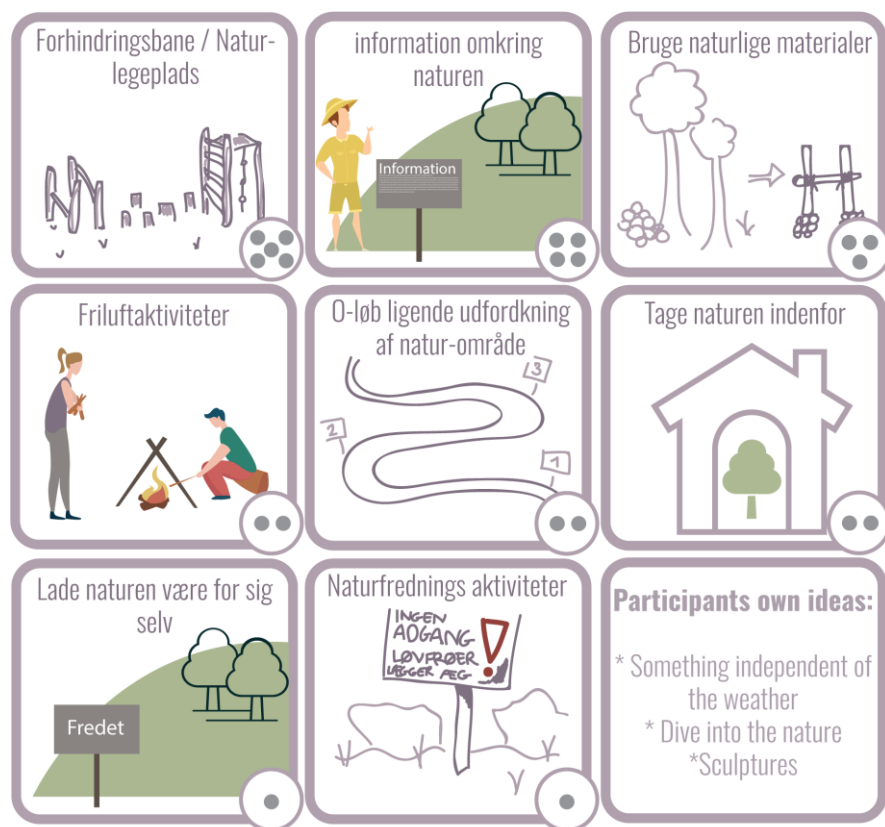
Figure 76. Similarities and tendencies in case of choices of what activities can help you feel ownership? The dots illustrate how many participants choose each of the elements. (own illustration)

The main takeaway, on how nature should be incorporated, is to have activities such as obstacle courses and nature playgrounds that are in harmony with nature and built from natural materials. Especially the children focused on the many

activities they could do involving nature such as digging and playing in the area.

Most participants found that learning information about nature they were interacting with was important. Also, the idea of spreading the activities throughout the area was popular: "Getting around in the area is important. It must either be hiking trails, bike, mountain biking. Maybe some short trips for the elderly and people in wheelchairs so you can do it as needed "- H **26** (Appendix 11).

The citizen living close to Kær emphasized throughout the intervention that nature, the maritime life, and animals must be the main priority when implementing new concepts into Kær Vesteremark. She was focused on creating a space that gave a peaceful and healing experience, where too disturbing elements such as cars or many people gathered at once were eliminated:

"It must be under controlled conditions. So there has to be high self-justification… It could be through some forums where it is okay to tell others how to act, without it becoming a snitching-business "- L **27** *(Appendix 11).* The other participants thought there should be a way to make room for both nature and humans interacting in a reasonable manner.
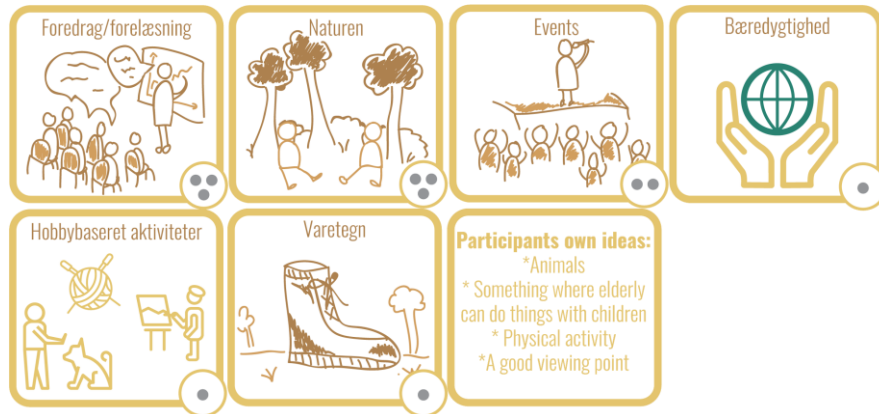
Design Paramter 5: Gathering

Figure 77. Similarities and tendencies in case of choices of what can make you gather around something? The dots illustrate how many participants choose each of the elements. (own illustration)

We choose to exclude this parameter for the interventions with the family because the child's level of abstraction was limited due to the time spent. Therefore the results are only based on three interventions made with the other citizen groups (Citizen from Kær, young couple, and retired couple). Here all participants were interested in having talks or lectures with interesting speakers diving into topics within the SDGs.

Everyone saw value in gathering around a cup of coffee, food, or just nature instead of always meeting up around activities. Being in nature was especially important for the citizen from Kær, who, multiple times stressed the importance of not gathering many people at the same time as it would disturb nature. This is also why she did not find it appropriate to have bigger events but to keep it at a limited size: *"There's something counterintuitive about*

gathering many people in a natural area. I'm not in favor of big gatherings when it comes to nature, because it destroys the natural experience. " - L ***28** (Appendix 11).

The elderly couple stressed to keep the topic on sustainability when gathering people:

*"The activities should not just be something we can go to elsewhere. It must be within the topic of sustainability and nature. It should not be too much about hobby-based activities - R ***29** (Appendix 11).* Even though they liked the idea of having a place to meet up and practice their hobbies they acknowledged that it should not take the focus away from the objective of having a Center for the SDGs.

6.2.4 Additional demands and criteria to the design specification

From the results we reframed the knowledge into demands and criteria for the further conceptualization and exploration of how tangible interactives could be designed as well as inputs for the development of Kær Vestermark as a Living Lab. These were:

Themes	Demand	Cri
Experimentation	Physical exploration needs to be incorporated (play or exercise)	
		Interactives and D-I-Y elemen
		Competitive elements cou
		Seeing things from different vi the experi
Learning environment	Learning through hands on experience (taking part of the learning)	
	Visual elements should be included in learning aspects	
		A guided tour could be a
Ownership	The visitors should be able to leave their own mark and thereby enhance the possibilities of coming back multiple times.	The visitors could be able to t h
Nature involvement	Integrating playful elements	
		Additional informa
		Nature conse
Creating 'Things'	Provide experiences that are within the theme of sustainability and can't be found any other places	Making it an unique experienc around Sønderborg. Creating
		Areas in the nature could be de for enjoyment of the natur

Figure 78 Demands and criteria for findings from negotiation of Design Parameters (own illustration)

From these demands and criteria, we gained a good understanding of what the tangible interactives should contain to create spaces for experimentation and negotiation.

6.3 A Collaborative Exploration of the SDGs at Kær Vestermark

The following describes the second parallel in the exploration of the solution space. To investigate how we can design Kær Vestermark as a living lab for the SDGs, we saw it relevant to explore how the SDGs should be implemented at Kær Vestermark. To do so, we enrolled two employees from Sønderborg municipality in the design process as experts on the field and the SDGs.

6.3.1 Negotiation space of the SDGs

IN the earlier chapters, we discovered that both citizens in Sønderborg and high school students had difficulties in relating to some of the SDGs. Further, it was evident (in chapter 5.1), that municipalities found it challenging to localize all SDGs in a relevant context for their citizens. Based on these learning, we wanted Sønderborg Municipality to negotiate how they perceive the SDGs and how these are seen implemented at Kær Vestermark. Both in relation to how they should be communicated and how they could have an impact on citizens.

To do so, we staged a negotiation space (see figure 79) where we wanted to explore the following design questions:

- Which SDGs are easy to implement at Kær Vestermark, and which are seen as challenging?
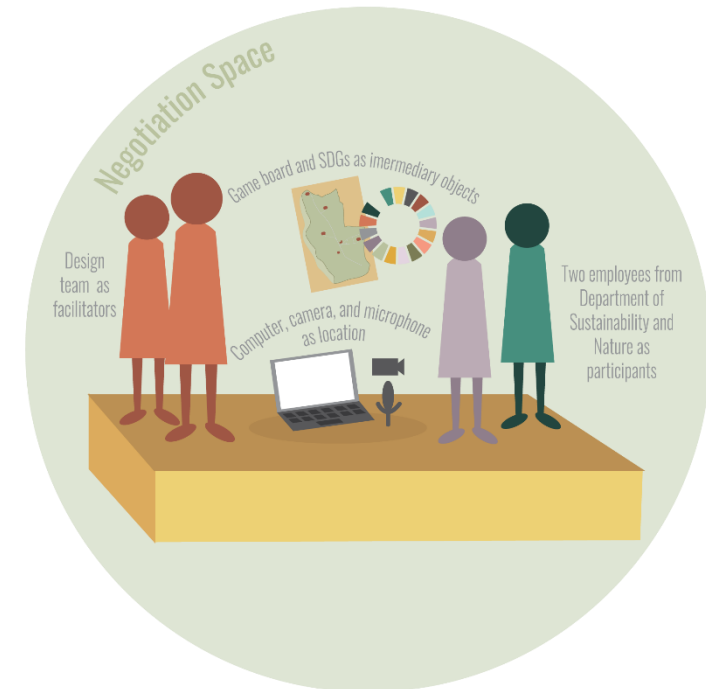- How should the SDGs be implemented and communicated at Kær Vestermark?

Figure 79. Negotiation space for the SDGs (own illustration)

Staging

The Negotiation space was staged as a design game through the online platform Conceptboard. Here a conference call was made between Bent Aalbæk (Project Leader of Center for SDGs at Kær Vestermark), Lene Sternsdorf (climate coordinator in Sønderborg municipality), and the Design team (us). We see Lene Sterndorf and Bent Aalbæk as experts in the implementation of SDGs in the municipality and the establishment of the Center for SDGs. The design-game consisted of two rounds, where different game boards were used as intermediary objects for the participants to negotiate

through. The first round consisted of placing the SDGs on a map of Kær Vestermark. Through dialog and negotiation, the participants needed to agree and place each goal individually on the map. The goals that were found difficult to place, could be dragged to the box: 'goals that are difficult to place.' (see figure 80)
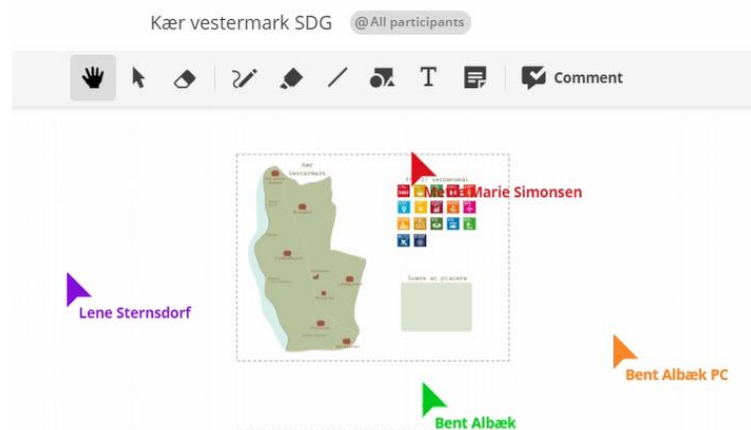
Facilitation

The design-game was held on 27.03.20. Due to technical issues, the video call was not possible. Instead, a phone call was made, where both participants could hear each other while seeing themselves moving the mouse cursor inside the online platform. (see figure 80).

Because ome of the particpants found it challenging to understand Conceptboard, the other was the one moving the SDGs but in collaboration. During the intervention, a good discussion and negotiation arose between the two participants,

who agreed before placing the SDGs. The box to place the difficult SDGs, was not used as intended. Instead, Løkkegården was used to place all the 'difficult' SDGs since they already have established this in their plans. "Some SDGs are easier to place than others. The difficult ones will probably be showcased at Løkkegården, which will act as a window into all goals." *30 - Bent Aalbæk, (Appendix 12) , results from the negotiation of SDGs). We will have this in mind in the further analysis.

Results and Reframing

In the following, the main results of the intervention will be presented as well as highlights from the negotiations between Lene Sternsdorf and Bent Aalbæk from Sønderborg Municipality (see Appendix 12). The results are divided into five subsections. Each describes important elements to take further in the design process. In the following, the SDGs will be presented by its number. We recommend looking at Appendix 13 to see an overview of the SDGs to follow along with the text.

Site Specific placements

In the figure below (see figure 81) the negotiated placements of the SDGs at Kær Vestermark are shown.

Figure 81. Screenshot of results of 1. part of intervention (own photo)

Through the negotiation, it was clear that some SDGs were obvious to place at sight specific places. Others were more difficult and therefore placed at Løkkegården. As mentioned before, there are already many plans for the development of Kær Vestermark. Plans where the SDGs are becoming a natural part of the storytelling. "At Det Gamle Gartneri they are starting the construction of a maritime center. Goal #14 is about life below water; it makes sense to have the goal here. It's one of the

only ones that fit right in. So that is determined" *31 - Bent Aalbæk (Appendix 12,). The same procedure was applied for goal nr. 11,12,13, 15, 7, 10, 8, 3, 6 and 16. Goal 13 was placed at the farm Frydendal where the plans of a climate house have been settled upon. As the farm Løkkegården will be renovated with recycled materials, goal 11 and 12 were seen as obvious to place there. Goal 15, is a goal that covers all of Kær Vestermark and is to be seen communicated everywhere in the nature around Kær Vestermark. At Møllestedgård job-activation of people from SABBU, will take place, they, therefore, agreed goal nr. 10 and goal nr. 8 would fit naturally. Just outside Kær Vestermark, a water waste treatment plant is located, where Lene Sternsdorf and Bent Aalbæk propose that the municipality could collaborate with them to communicate Clean water and Sanitation goal nr. 6. The placement of goal nr. 16 was negotiated to be at Bygegård, where the Home Guard is situated. From our previous analysis, we know that especially this goal was challenging for people to relate to. However, at Kær Vestermark there is a possibility of using the old military ground and history as part of the narrative.

Løkkegården as base for the SDGs

It was clear that some SDGs were more manageable to implement directly at Kær Vestermark (the ones described above), and the ones seen as challenging were located at Løkkegården. The participants were well aware of this but saw the potential of communicating all SDGs at Løkkegården and, thereafter exploring them in nature. *"We should try to spread some goals more across the whole area otherwise they will all end up in one farm. I imagine that you start at the løkkegården, where*

you get an introduction to all goals. From here, you go out and experience more. We have to expect that some goals will be restricted to Løkkegården and others are scattered elsewhere on Kær Vestermark " ***32** - Bent Aalbæk,(Appendix 12). The goals that were placed at Løkkegården without any further explanation was nr. 2, 4, 5, and 9. Goal nr. 1 was placed in the box 'difficult to place', but in the negotiation, they agreed on placing it at Løkkegården as well.

The interconnectedness of the SDGs

A critical point derived from the intervention was the importance of illustrating the interconnection between the SDGs. Following Lene Sterndorf and Bent Aalbæk, it is easy to choose one SDG and focus on that, but challenging to show and explain how they are connected. Especially the SDGs concerning the more global aspects, because it is challenging to illustrate how we can have an impact on them in a danish context.

"The challenge is the same as other municipalities' experiences. It is a challenge to take the slightly skewed SDGs in terms of the Danish context and make them relevant anyway. The most important task for us as a municipality is how we can make it relevant for our citizens that there E.g. is desertification in other countries. It is far from Denmark, but our actions in the West have an impact elsewhere in the world; therefore, we are a part of the cause. Because people tend to look at each goal independently, the connection between the SDGs is extremely important to include in the narrative ... To understand the context and holism, you should have that in mind" ***33** - Lene Sternsdorf (Appendix 12).

To show how the different SDGs affect each other, it is essential to understand the SDGs probably and to act responsibly to them. Lene also argues that though some SDGs are seen less relatable than others, it is essential to illustrate these as well, because Denmark is more resourceful than developing countries. However, we still have the opportunity to do a lot more. *"When you start scratching the surface of the goals and targets, you find that Denmark also has some challenges, it's not just in the warm countries ..."* ***34** - *Lene, Climate coordinator Sønderborg Municipality (Appendix 12)*

We see that the municipality has a Matter of Concern of wanting to communicate the interconnectedness between the SDGs to their citizens and themselves, but are troubled in figuring out how to do it probably.

Local, Global or Glocal?

As stressed before, it is essential that the SDGs are taken from a global to a local perspective to make it concrete and tangible for citizens and municipalities to act and understand. Nevertheless, Bent Aalbæk questions if it makes sense to create local solutions to global matters? *"At a minimum, it must be brought into a Danish context. But whether it makes sense in a local context at the municipality level, I have begun to doubt. There are many goals where we try to make municipal solutions, but if you fly up in the helicopter, it is foolish ... "* ***35 -** Bent Aalbæk, (Appendix 12). There is a point in communicating the SDGs in a global perspective but from a local context. This is where the term 'Glocal' becomes relevant, where both the local and the global matters are taken into consideration. Sønderborg municipality is doubting how the

SDGs can be communicated in a way where it creates an impact that can initiate meaningful change. This is a Matter of Concern, that is valid for a lot of different municipalities. Therefore we see the element of 'Glocal' interesting to investigate further, and we see it as a criteria in the following design process.

Breaking the framework of normality

In the negotiation of goal nr. 5, an important discussion appeared. "I had a presentation with the nature guides regarding gender equality. It was about trying to find a new approach to how we see people and loosen the boundaries of how we normally speak to each other. A way where 'He' and 'She' is eliminated and where we don't encourage separate playing-times for boys and girls. If we in the whole area could approach people through our language and doings in a way that could create equality..." - *36 - Bent Aalbæk, (Appendix 12). We see the potential of Kær Vestermark being a place that challenges the norms and ways we talk about each other and the world in general. When arriving at Kær Vestermark you enter into a new reality, where sustainability is prioritized both in the economic, ecological and social aspects and where the SDGs can be used to communicate taboos or difficult topics. Especially some of the SDGs are important to bring forth, that is normally neglected. The SDG on equal rights is often not seen as an issue in a danish context compared to other countries, but when scratching the surface, we can still find relevancy: * "What is still a problem in Denmark is that there is still violence, abuse, and rape against women. This problem is just as terrible in Denmark as it is everywhere else. I think we should break that taboo and get the young girls talking about it being no-go..." *37 - Lene Sternsdorf, (Appendix 12). They see Kær Vestermark as a place where we change the normality of how we usually act and get inspired to transit our manners and opinions.

6.3.2 Reframing results into demands and criterias to the design specification

From the negotiation space we collected new knowledge on the implementation and communication of the SDGs. This knowledge has been translated into demands and criteria to take with us further in conceptualization (see figure 82).

Theme	Demand	Criteria	Comment
Communication of the SDGs	The communication needs to illustrate the interconnected-ness between the SDGs		
		There could be aspects of glocal in the communication of the SDGs (think global, act local)	
		The concept could challenge the norms of normality	
Implementation of the SDGs	Some SDGs goals should be implemented at site specific places that fits into the storytelling of the SDG		
		Løkkegården should figure as base to gain introductory knowledge for the SDGs	

Figure 82. Translated demands and criteria from negotiation of SDGs (own visualization)

## 6.4 Design Specification for conceptualization

From our synthesis, we learned new knowledge of what a final solution could and should contain to create a successful design. In the following, we will present the design specification as a whole before entering the conceptualization phase. The design specification shows the essential findings gained throughout the whole design process and represents the involved actors' matters of concern. We want to use these elements further in the conceptualization. Where we have used the criteria and demands as a foundation for the development of four Scenarios (these will be described in the conceptualization). It is to be mentioned again that the design specification has been used as an internal intermediary object between the design team, to help us navigate through the design process.

The full design specification can be viewed on the following page:

Themes	Demand	Criteria	Devrived from
Center for SDGs	Create a physical place where the SDGs can be communicated to and by everyone		Sønderborg Municipality MoC
	Designing a innovative learning environment		
Nature involvement	Nature needs to be a central actor when developing the center		Relation analysis
	Integrating playful elements		Negotiation of Design parameters
		Additional information about the nature	Negotiation of Design parameters
		Nature conservation elements	Negotiation of Design parameters
Characteristics of the Area		Retain the present characteristics of the Area	Relation analysis
Broad visitor segment	The concept should be appealing both to the younger and older generation.		Relation analysis
Ownership	The concept should create a sense of ownership between the citizens and the SDGs		Municipality analysis
	The visitors should be able to leave their own mark and thereby enhance the possibilities of coming back multiple times.	The visitors could be able to take physical elements with them home	Negotiation of Design parameters
Communication of the SDGs		Framing the SDGs as something concrete that citizens have a relation to	Municipality analysis
	Facilitating different and alternative perspectives on the different SDGs		Workshop interventions with high school
	Physical place(s) for presentation and interaction with the SDGs		Municipality analysis
	The communication needs to illustrate the interconnectedness between the SDGs		Negosiation of SDGs
		There could be aspects of glocal in the communication of the SDGs (think global, act local)	Negosiation of SDGs
		The concept could challenge the norms of normality	Negosiation of SDGs
	Show multiple possibilities (past and future) to negotiate through		Interview with Jesper Steenberg
Implementation of the SDGs	Some SDGs goals should be implemented at site specific places that fits into the storytelling of the SDG		Negosiation of SDGs
		Løkkegården should figure as base to gain introductory knowledge for the SDGs	Negosiation of SDGs
Experimentation	The concept needs to include Tangible Interactives		Interview with Jesper Steenberg
	Physical exploration needs to be incorporated (play or exercise)		Negotiation of Design parameters
		Interactives and D-I-Y elements could be a part of the concept	Negotiation of Design parameters
		Competitive elements could be included in the concept	Negotiation of Design parameters
		Seeing things from different view perspectives could be a part of the experimental space	Negotiation of Design parameters
Learning environment	Learning through hands on experience (taking part of the learning)		Negotiation of Design parameters
	Visual elements should be included in learning aspects		Negotiation of Design parameters
		A guided tour could be a part of learning environment	Negotiation of Design parameters
Creating 'Things'	Setting up a physical frame for the SDGs to initiate spaces for negotiation and discussion		Workshop interventions with high school
	Provide experiences that are within the theme of sustainability and can't be found any other places	Making it an unique experiences that can't be found other places around Sønderborg. Creating an incentive for citizens to come.	Negotiation of Design parameters
		Areas in the nature could be designed where there is made space for enjoyment of the nature in center for the gathering	Negotiation of Design parameters

Design specification Figure 83. (own illustration)

7 CONCEPTUALIZATION
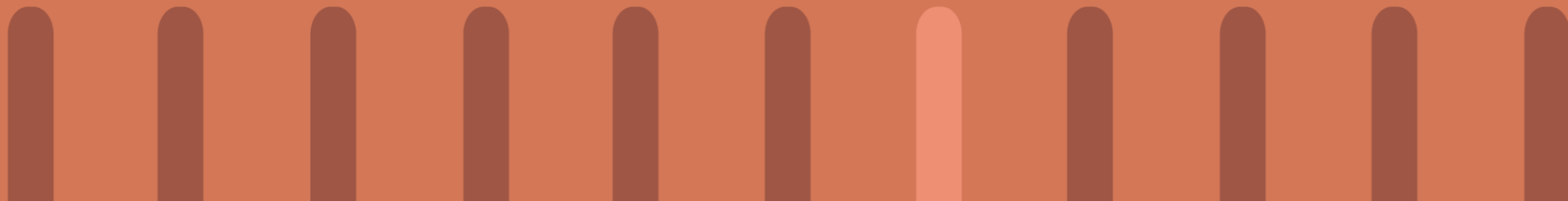
In the conceptualization, we move from investigating the solution space to concretizing our knowledge into more tangible concepts to be evaluated by citizens and Sønderborg Municipality. This chapter will describe how we have turned knowledge from the design specification into four scenarios. Furthermore, we will describe how we have involved citizens and the municipality into a negotiation space to evaluate the scenarios based on different criteria that are seen essential for the development of Kær Vestermark as a living lab for the SDGs. From the evaluations, we will present a concept proposal representing the findings of the thesis. Lastly, we will recommend a strategy for the further work needed to develop Kær Vestermark as a Living Lab.

7.1 The Four Scenarios

From the results of the interventions and negotiations described earlier in the report, four scenarios were designed. In the solution space, we investigated the two negotiation spaces 1) Design of tangible interactives 2) Implementation of SDGs at Kær Vestermark. The four Scenarios should be seen as a merge of the results gained from the two negotiation spaces. Our role as design engineers was to enable navigation between the two parallels, where we have tried to express relevant Matters of Concerns through the scenarios. We saw an advantage in developing scenarios over concepts as they have the ability to create relatable environments for the ones evaluating them. Scenarios are often described through a storyline which the viewer can identify themselves with. When creating scenarios, complexity can often get lost compared to a traditional concept

description because it is not possible to describe the technical details in the same way. Despite this, we were at a place where we did not see every detail necessary and therefore saw scenarios beneficial. In the development of the scenarios, we found it challenging to keep the scenarios simple, and at the same time, show the differences between them.

All the scenarios take their offset in the same family that visits the Center for SDGs. (see appendix 14, for stories for each scenario) (see figure 84).
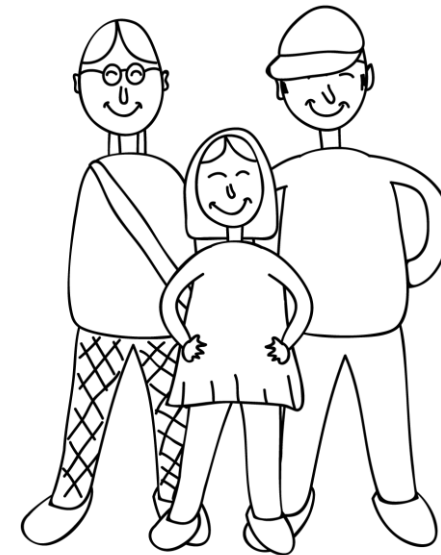

Figure 84. Scenario family consisting of Grandmother, Trine, and Dad (own illustration)

We designed this family to make the scenarios comparable. Every scenario revolves around different SDGs. We have in the selection of the SDGs showed versatility by choosing SDGs identified as easy to work with and some that were difficult to

work with, discovered from past chapters (see Chapter 5.1 and 5.2). This is not to be seen as SDG cherry picking but rather to show diversity in our work with the SDGs and show that there are possibilities in the communication of them all. The four scenarios were developed as short movies, where simple drawings were placed on real pictures of Kær Vestermark (see figure 85.).

This was done, so the participants could recognize and relate to the surroundings without being there. Furthermore, a voice-over, subtitles, and simple animations were added, to create a more complete experience.
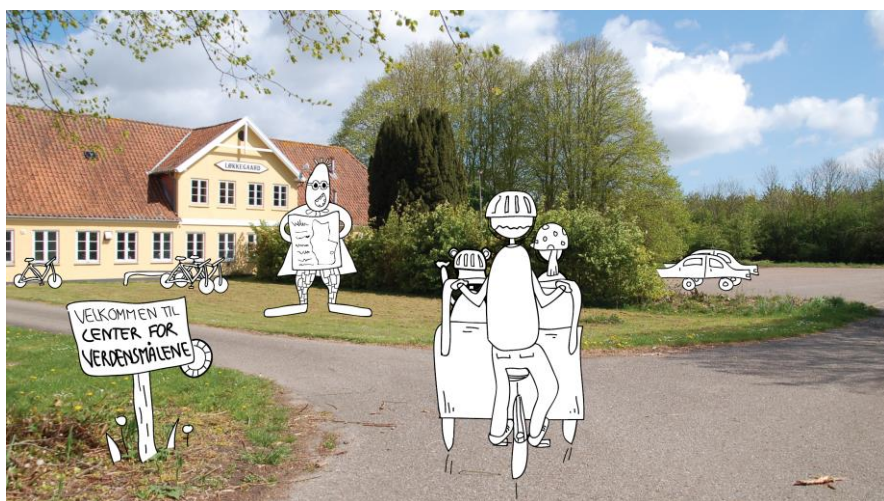
Figure 85. Example of the development of Scenario (own photo)

In the following, the different scenarios are shown, as well as a description of their characteristics. We recommend watching the scenarios through the provided link to get the full impression.

7.1.1 Scenario 1 - Giant SDG heroes

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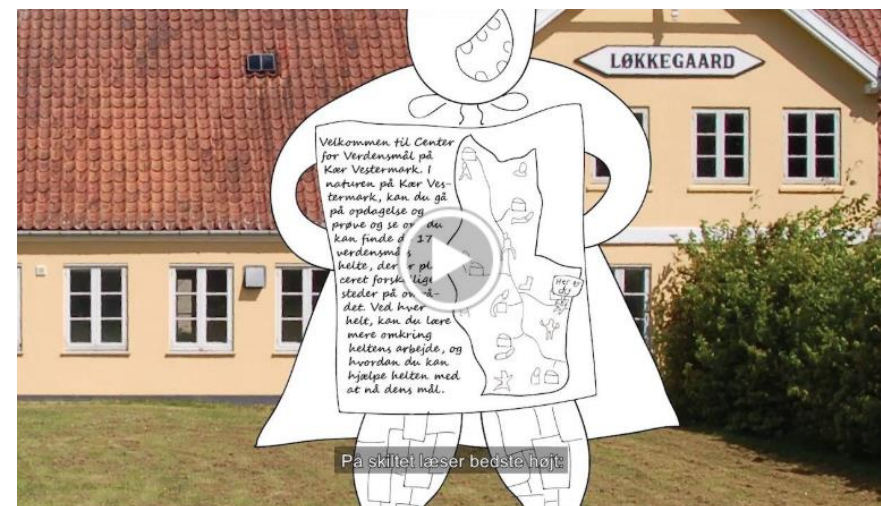
Scenario 1 addresses families with young children, where it is possible to investigate the SDGs through 17 different giant heroes in the nature of Kær Vestermark. The heroes are a part of a narrative focusing on how the visitor can help the heroes accomplish their goal. At each hero, there is an illustrative sign describing the goal and what the visitor can do to help the giant solve its given assignment.

It is possible to interact with the heroes in different ways, where children and childish souls can crawl and play on them. In this scenario, a hero is lying on top of an old bunker, representing goal number 2 — zero hunger. Inside the bunker, it is possible to learn about the giant's achievements, represented by alternative ways to grow food. Furthermore, it is possible to interact with different boards showing the amounts of food a person eats a day around the globe. Furthermore, it is possible

to help the hero grow mushrooms, that can either be saved for a later visit or donated to the cafe a Løkkegården. The SDGs are communicated through play and storytelling, as well as practical hands-on experiences through this scenario.

7.1.2 Scenario 2 - The big SDG quiz

https://youtu.be/i_be49acEDM

The big SDG quiz scenario centers around competitive elements. Here, cognitive and physically challenging tasks make it possible to compete against each other, revolving the different SDGs. Through a mobile app, the visitor will be guided around Kær Vestermark to 17 different posts. At the post, a GPS tracker will activate a question on the phone, where the answer can be found in the area or solved through managing different tasks. Each post has a theme centered around an SDG. At Løkkegården, there is a grand interactive scoreboard connected to the app. At the scoreboard, it is possible to see one's own and other competitor's positions. In the scenario, the family is

visiting post number 16, Peace, Justice, and strong institutions, placed at the home guards base at Bygegård. A visual sign welcomes them, where a question appears on their phone. The quest visits a Syrian refugee camp in Turkey with the use of VR glasses. The scenario challenges the visitors to take a stand concerning matters typically far away from their own lives.

### 7.1.3 Scenario 3 - Nature protection

https://youtu.be/GfhqYUo08_o

The third scenario favors nature and the present actor's relation to Kær Vestermark, where conservation and protection of nature are in high priority. The main activities are placed in and around Løkkegården. From here, it is possible to enjoy nature at Kær Vestermark from paths raised above the ground. The raised paths are to protect the biodiversity below the paths. At Løkkegården, various activities are happening, where the employees of SAABU are facilitating and maintaining it. Around Kær Vestermark, several benches are placed on the raised paths

for the visitors to enjoy. In each bench, an SDG is engraved together with the goals it is affected by, as well as matters to reflect upon when sitting there. In the scenario, the family is having fun at Løkkegården, and decide to enjoy their lunch in nature. They find a bench at the water and start discussing the elements engraved in the table. This example concerns goal number 5 (Gender Equality), where the family is challenged to talk with gender-neutral pronouns to each other when sitting at that table. Furthermore, they are discussing how the goals are connected internally and how gender equality can be related to their own lives. The communication of the SDGs is done through various explorative activities at Løkkegården and discursive elements around nature.

7.1.4 Scenario 4 - Take a Stand

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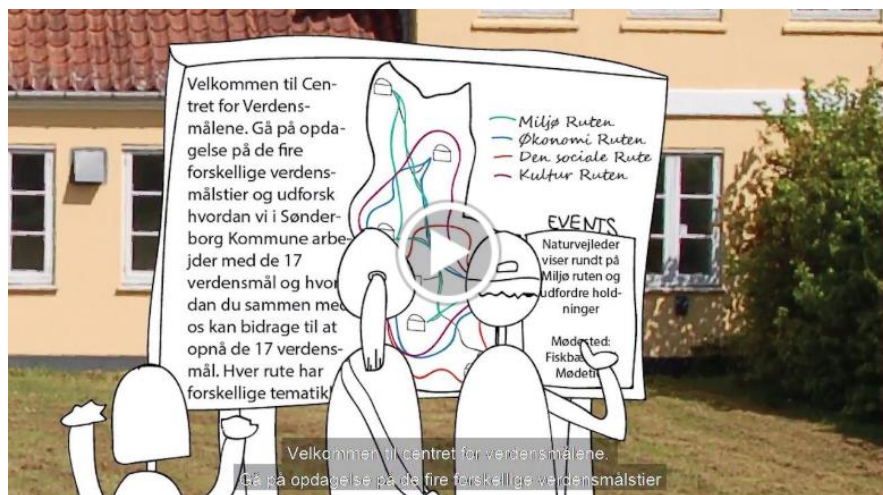
The last scenario revolves around a facilitated guided tour and challenging assessment exercises. From Løkkegården, four different trails are marked, each with a different sustainability theme. 1) Environment, 2) economy, 3) social, and 4) culture. It is possible to explore the trails alone or join a guided tour. Once a week, there is a guided tour of the different trails facilitated by the local nature guides with incorporated exercises. When following one of the trails, different pavilions containing interactive installations and visual posters presenting different SDGs within the theme of the trail will appear. The scenario shows the family attending a guided tour at the environmental trail, starting at Fiskbækgård (an old ruin). At the farm, a pavilion is placed, which represents goal number 15—life on land. The guide explains the goal and its importance. After the presentation, the nature guide facilitates an assessment exercise, where the visitors need to show their immediate opinion by moving physically around to show their stands on the matter. Establishing these exercises forces the participants to take a stand on matters that they usually do not think about.

7.1.5 How do the scenarios resemble living labs?

We argue based on previous knowledge that all scenarios contain elements that define them as being potential living labs. Our interview with Jesper Stenberg and our theoretical framework shows that it requires more to create a 'living' living lab than the scenarios illustrate (this will be described further in chapter 7.4.2). The Scenarios are only to be seen as a negotiation device to explore the potentials of Kær Vestermark as a living lab. Therefore the scenarios only illustrate elements of living labs rather than well-defined living labs. However, all

scenarios show different ways of creating experimental 'Things' for the SDGs. Where the SDGs can be negotiated and reflected upon through tangible interactives. Below, we will briefly describe the elements in each scenario that makes them potential future living labs.

Scenario 1

By creating a space where it is possible to learn the SDGs through play and hands-on experimentation and presenting multiple solutions for the visitor, we believe that the first steps of a living lab are created. We expect that this way of designing a space will make the visitors reflect on what they can do to achieve the SDGs, and create discussion and negotiation between people of all ages.

Figure 85 Examples of living lab elements in Scenario 1 (own illustrations)

Scenario 2

When adding virtual spaces, to explore, we believe it can bring the visitors closer to the unrelatable elements of the global sustainable goals, and thereby accommodate the disconnection we have observed between citizens and the SDGs. Bringing the visitor closer to the SDGs will hopefully make them reflect on matters that generally are very far away from their own everyday life, and think and innovate on their behavior concerning what they learn and experience in the virtual spaces.
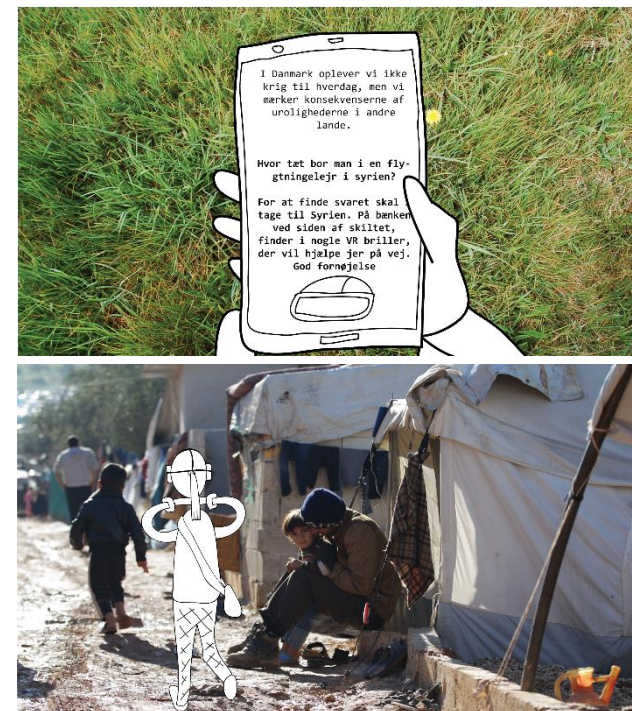

Figure 86 Examples of living lab elements in Scenario 2 (own illustrations)

Scenario 3

By highlighting the interconnectedness between the SDGs instead of the individual SDG, it is possible to visualize aspects that visitors have not thought of before and make them innovate and negotiate their own behavior according to how it affects the different SDGs internally. This scenario also challenges the way we talk to each other. By forcing the visitors to talk differently in different spaces, it makes them reflect upon how we normally talk and hopefully negotiate how we should communicate.

Figure 87. Examples of living lab elements in Scenario 2 (own illustrations)

Scenario 4

When joining a tour, the visitors will be 'forced' to take a stand on different matters (around the SDGs) where they though physical placement need to show their opinion in front of each other. Doing this creates a space where negotiation and discussion can flourish among each other, and innovative thoughts can arise on how things could be done differently.

Figure 88. Examples of living lab elements in Scenario 2 (own illustrations)

7.2 Negotiation and evaluation of scenarios

To evaluate the scenarios, we have set up a negotiation space where citizens and the municipality could score and discuss the scenarios compared to each other. The objective was to have the participants negotiate the scenarios and get closer to a final design. To do so, we staged two different spaces—one for the municipality and one for the citizens. See figure 89.

The intervention with the municipality included the head of department Inge Olsen, the project manager on the center for SDGs Bent Ålbæk and the municipality's SDG expert Lene Sternsdorf as the participants. We staged the negotiation space as an online meeting where the participants were presented with the scenarios and then asked to compare and evaluate them from different evaluation parameters taken from the design specification.
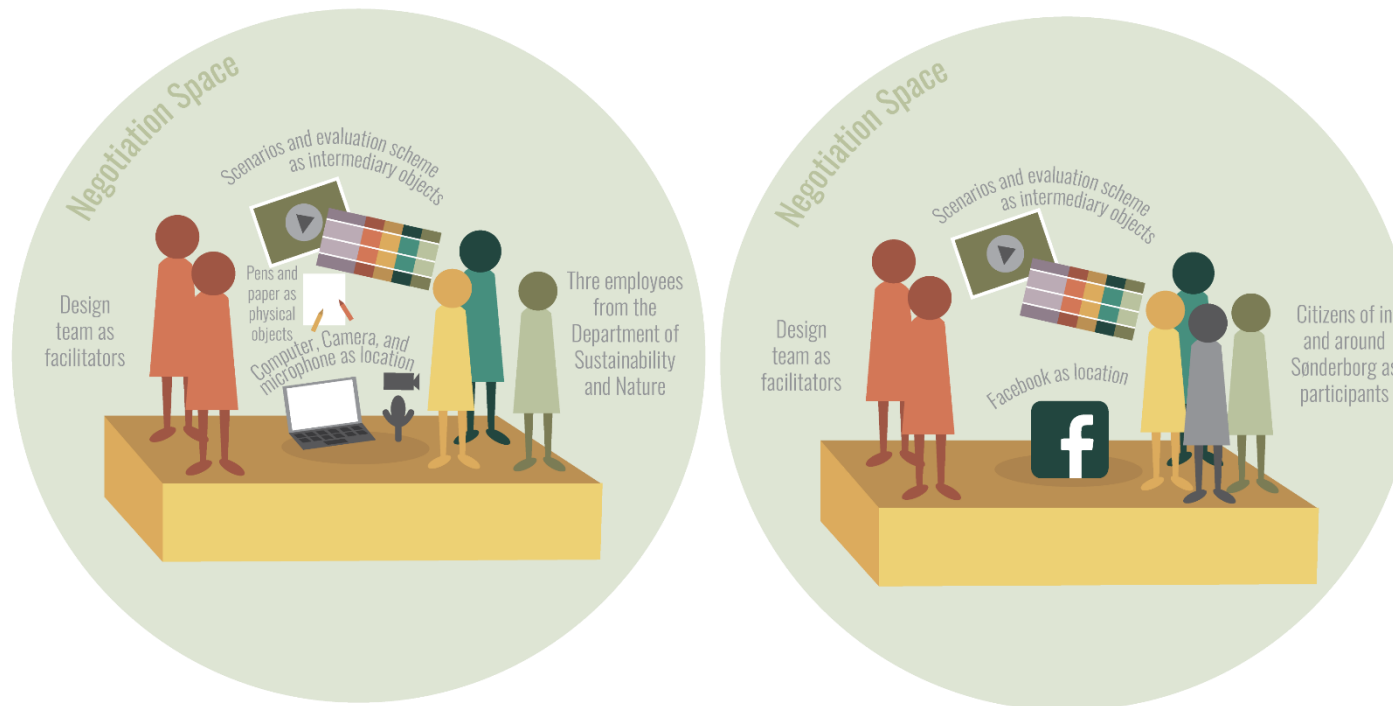

Figure 89. The two negotiation spaces for the evaluation of the scenarios

Evaluation parameters	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Potential of pushing to citizens' current relation to sustainability				
Incorporation of Nature				
Elements that can enhance knowledge learning				
Communication of the SDGs				
In total				

Figure 90. Evaluation scheme (own illustration)

Figure 91. Alternative set up for facilitation of negotiation space with municipality (own photo)

Before the intervention was held, we asked the participants to bring a piece of paper to write on. On the paper, the participants wrote their score for each scenario giving them 1-4 points based on how good they fulfilled the parameter. Bringing paper and pens into the negotiation space, was to make the participants reflect on the scenarios themselves and afterward share their evaluation with the rest of the participants.

We facilitated the evaluation through Skype. However, due to technical issues, we had to improvise an alternative setup (see figure 91). The issues resulted in less time for the actual evaluation, as the participants had other appointments. However, we still managed to go through all parameters, but without the in-depth discussion, we had staged.
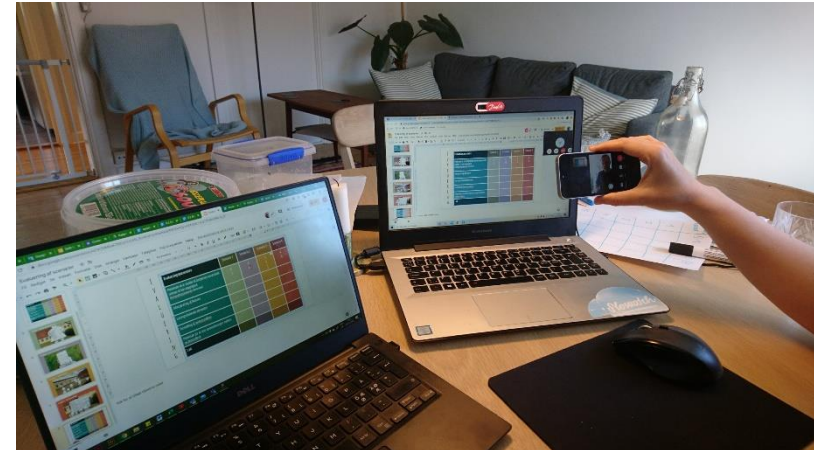
7.2.2 Staging and facilitation of the evaluation with the citizens

In the evaluation with the citizens, we experimented with an online format where no online call with the facilitators was needed. We staged the evaluation in the format of a questionnaire where the participants had the opportunity to watch the scenarios, give feedback on them, and compare and prioritize them. The questionnaire was disseminated through our Facebook group as a part of the third phase of our negotiation space, focusing on the development phase (see figure 92)

Figure 92. The post inviting participants to take part in the evaluation of the scenarios

Twentyone citizens participated in the evaluation and engaged both when having to write feedback on each scenario and when asked to prioritize them against each other. In the questionnaire, we asked the participants to compare and prioritize the scenarios according to the following questions (translated from danish):

- Which scenarios challenge your current thoughts and initiate a change in how you think?
- Which scenarios can best increase your curiosity?
- Which scenarios do you prefer when it comes to your learning on sustainable development goals?
- Which scenarios did best concerning your overall impression and your ideas on what will fit best in the area of Kær Vestermark?

The reasoning for evaluating with the citizens separately from the municipality was because the citizens would not be qualified to evaluate the same design parameters as the municipality and vice versa. The advantage of doing the intervention in the questionnaire format was that we could involve more participants over a shorter period. Furthermore, we could enroll participants who would not otherwise participate when having to perform via webcam/phone meetings. (To see the full questionnaire go to appendix 15)

7.2.3 Results and Reframing

In the figures 93 & 94 on the following page we have summed the evaluation from the municipality parameters and the citizen's parameters. The citizen prioritization has been translated into a point-scoring on the same basis as the municipality, four being the best and one being the worst. We will, in the following elaborate on the evaluation and highlight the positive and negative comments for each scenario.

Municipality's

Evaluation

Evaluation paramter	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Potential of pushing to citizens' current relation to sustainability (Negotiating elements)	2,5	4	3	4
Incorporation of Nature	2,5	3,5	3,5	4
Elements that can enhance knowledge learning	3,5	4	3,5	4
Communication of the SDGs	3,5	3,5	3	4
I alt	12	15	13	16

Figure 93. Results from municipality. (own illustration)

Citizens's

Evaluation

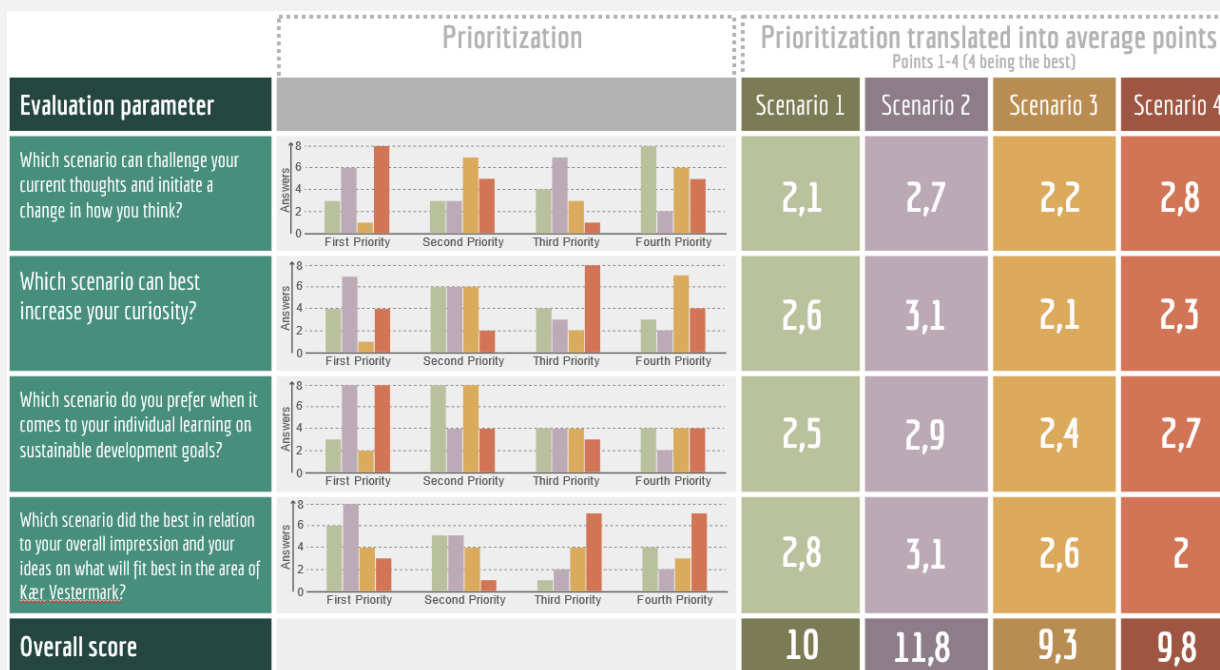| Evaluation parameter	Prioritization	Prioritization translated into average points Points 1-4 (4 being the best)			
		Scenario 1	Scenario 2	Scenario 3	Scenario 4
Which scenario can challenge your current thoughts and initiate a change in how you think?		2,1	2,7	2,2	2,8
Which scenario can best increase your curiosity?		2,6	3,1	2,1	2,3
Which scenario do you prefer when it comes to your individual learning on sustainable development goals?		2,5	2,9	2,4	2,7
Which scenario did the best in relation to your overall impression and your ideas on what will fit best in the area of Kær Vestermark?		2,8	3,1	2,6	2
Overall score		10	11,8	9,3	9,8

Figure 95. Results from citizens (own illustration)

Scenario 1

Many citizens found this scenario attractive because of the childish perspective enabled by the giant heroes. From the evaluation, we see that the citizens highly prioritized the first scenario. The physical elements and the giant heroes were by multiple citizens seen as an exciting element that is fun for the children: "*nice idea with seventeen different giant heroes, especially the children will like this and find it inspiring*" ***39** - Citizen (Appendix 15). Moreover, the mushroom laboratory was also highlighted as a creative and interactive learning environment. *The fact that you can come back and see that what you have done has grown is really nice. I think kids can learn a lot from that. It is an experience that the child does not immediately forget because you can talk about it afterward and follow up on the growth together. Then you can take your mushrooms home and cook them, that is really cool! "****40** - Citizen (Appendix 15)

However, the municipality did not find the same qualities in the scenario as the citizens. In their perspective, it did not push enough to how we think on sustainability and was too focused on the children. Throughout all parameters, the municipality scored scenario 1 as the lowest, but in the citizen parameters, it was evaluated to be in the better half.

Scenario 2

The second scenario was evaluated in the better half of the scoring on both the citizen parameters and the municipality parameters. The element of competition was interesting, motivating, and fun for many of the citizens. One citizen liked: "*That the experience is interactive and there is a competitive*

element. There is an opportunity to organize the day and avoid "traffic jams" ***41**- Citizen (Appendix 15). Another pinpointed the use of VR glasses as an excellent tool to make the experience memorable: "*I think VR is a fantastic way to get an insight into a world we don't know off. It makes the experience more intense and presumably remembers it better*" ***42** -Citizen (Appendix 15.) The municipality also liked the idea of using VR to show the SDGs in a different perspective. However, they also saw a challenge in facilitating a quiz that could appeal to different age groups. Some citizens did not like the idea, as it took too much focus away from the present experience of Kær Vestermark and nature. "*The competition is about something that is not present at Kær Vestermark. If I go out into nature, I would like to be there and enjoy it*""***43**- Citizens (Appendix 15).

Scenario 3

The third scenario was scored in the lower half, both from the municipality and the citizen's perspective. Some saw the value in having raised trails to protect nature. However, some also saw it to have the opposite effect and felt it would have a more significant interference with nature than having people move throughout the whole area on the land. Interestingly, the topic of gender triggered an element of frustration from some of the citizens: "*Discussion around gender and educational quality and growth is out of scope. I wouldn't discuss this with my family in whatever context it may be*" ***44** *Citizen (Appendix 15).* Not all are comfortable with taking up these kinds of discussions with their families. However, some didn't see this as a problem. They liked the idea of having small tasks that could initiate a discussion on topics they otherwise would not talk about: "*It's really good that*

*there is an assignment that starts the Discussion on gender. That children at first don't understand is just fine"**45**- Citizen (Appendix 15)*

Scenario 4

The last scenario was evaluated very differently within the municipality parameters and the citizen parameters. The municipality gave this scenario the highest score on all parameters. They highlighted the small interaction where the citizens had to take a stand as an interesting way to create a dialogue. *"It's best when there's a possibility of having a dialogue - We can learn all day long - Men our own view and thoughts are best pushed to through dialogue" **46** - Bent Aalbæk (Appendix 15.).* However, some of the citizens saw this interaction as very intimidating and not easy for children or tourists to take part in.*"The fact that you have to talk about why you chose to stand where you stand is really good. However, it should be noted that not everyone wants to be exploited and forced an answer. There must be space to not participate actively in the discussion"**47** Citizen (Appendix 15).*

Both the citizens and municipality liked the idea of guided tours as it gives a good learning environment and the possibility of focusing on specific topics. This also gives the visitors an incentive to come back and participate in tours on new topics *"It is exciting that you can participate on different guided tours and learn what the SDGs mean right here as we stand. And that you can return and experience new tours" *48 - Citizen (Appendix 15)*

7.2.4 From scenarios to concept proposal

From the evaluation, we can conclude that scenarios 2 and 4 were favored in both of the evaluations. Therefore, we see potential in merging elements from these two scenarios into one concept proposal (see figure 96).
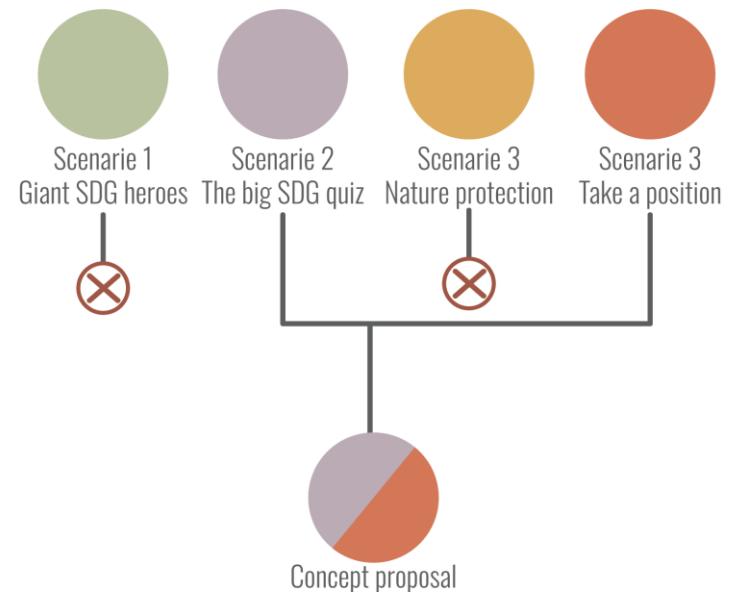

Figure 96. Illustration of the process from four scenarios to one concept proposal

Evaluating like this makes it challenging to satisfy everyone's wishes, and there will always be positive and negative opinions of everything. That is why we choose to merge the two scenarios that scored the highest in the total score to accommodate as many as possible.

It is not to be said that we exclude all elements from the other scenarios, but they will not be our prior focus.

7.3 Concept proposal

In the following, we will describe the concept proposal derived from elements of scenario two and scenario four, as well as the demands from the design specification. The concept proposal is not to be seen as a final design, but rather as a suggestion for how a concept from the research performed in the thesis could potentially look like.

7.3.1 The battle towards the Everyday Goals

The foundation of the concept proposal - *The battle towards the Everyday Goals*, is made through the elements of competition to enroll the visitors to participate and innovate their own everyday goals, based on knowledge given from the Sustainable Development Goals. To innovate their own everyday goals, the visitors will be challenged on their opinions through tangible interactives where both physical movement, virtual realities, and questions are key elements in the innovation process to create negotiation. By doing so, the concept seeks to disturb business as usual by presenting alternatives perspectives for the visitor. Around Kær Vestermark, several experimental platforms will be established, where visitors can solve various tasks through competition and creation. When making simple experimentation platforms, everyone interested can innovate. The concept is not to be seen as an actual battle against each other, but instead, a battle against own presumptions and prejudices.

Figure 97. Concept proposal - The battle toward the Everyday Goals

Løkkegården as the starting point

Løkkegården is already planned to be the base for the Center for SDGs. We will tap into this relation and add elements to stabilize the network around Kær Vestermark as a Living Lab for the SDGs. At Løkkegården all goals are represented at once, here it is possible to play and interact with the interconnectedness of the SDGs. To fully understand the SDGs, the visitors are asked to interact with the 'interconnectedness board' (how this is developed, will be investigated towards the oral exam). At Løkkegården it is also possible to explore several virtual worlds, to serve a perspective on the global aspects of the SDGs that are seen far away from our everyday lives.

Site-specific exploration of the individual goals

After exploring the interconnectedness of the SDGs, it is possible to investigate individual SDGs further. The SDGs are placed at Site-specific places on Kær Vestermark to support the storyline of their connectedness. Some goals are placed inside the farms, and others are placed in nature. Thereby it is also possible to interact with the SDGs when the Center is closed. The figure 98 shows where we see the most significant potential of implementing the different SDGs, as well as ideas for experimental platforms.

Place	SDG	Experimental platforms	Site specification
Løkkegården	1. No poverty, 4. Quality education, 9. Industry, innovation and infrastructure, 11. Sustainable cities and communities, 17. Partnerships for the goals	Investigate the SDGs interconnectedness through a sizeable interactive platform. Here it is possible to reflect on the SDGs and investigate which SDGs affect each other. Løkkegården will provide several virtual worlds (VR), where the visitor can investigate the global aspects of the SDGs (such as visiting a Kenyan slum or attending a lesson in a Nepali public school) and look into the future and discover how a sustainable community could be. There will be space for giving suggestions to what we can do to accomplish the SDGs.	Løkkegården is the largest farm at Kær Vestermark beside Frydendal, and because it is to be the base for the Center for SDGs, we see it obvious to place all the SDGs and their interconnectedness, as well as the global aspects of the SDGs here.
Mølstedgård	8. Decent work and economic growth, 10. Reduced inequalities	Through a great puzzle game, the visitors need to compete against each other to fit the pieces into the right order. The competition challenges them with different disabilities, such as blindness, missing limbs, and mobility difficulties. Furthermore, it is possible to innovate on how to cope with unemployment in Denmark and state an opinion through a buzz board.	SAABU will be (activity center for disabled people) connected to Mølstedgård. Therefore we see it interesting to place activities that support social sustainability.
Frydendal	6. Clean water and sanitation, 7. affordable and clean energy, 12. Responsible consumption and production, 13. Climate action	Play with the water levels in Denmark and build elements to prevent floods. Investigate different solutions for how energy can be produced in the future, and try to innovate other solutions yourself. Delve into the content of water wells done in Denmark and compete in who can guess what the most common trash in the wastewater treatment plants is. Furthermore, it is possible to follow the routes of your garbage by entering the last thing you throw into a garbage route machine.	Frydendal is to be a climate house. Therefore we see it relevant to merge the SDGs that have a significant impact on each other and the climate at the same place.
Outside Frydendal	3. Good health and well being, 5. Gender equality	Challenge yourself on the way we talk to each other and how gender still plays a role in different situations. Furthermore, it will be possible to compete against each other in a simulated intoxicated condition.	The nature consultants will, in the future, work at Frydendal because a lot of young people will appear around the farm. We see these goals relevant to the site outside Frydendal.
Bunkeren	2. Zero Hunger	Inside the bunker, it is possible to learn about alternative food productions in Denmark and how we can better use our food resources. It is also possible to grow and preserve your future food.	Inside the bunker, the humidity and darkness make it possible to ferment, store, and grow alternative kinds of food.
Fiskbækgård	15. Life on land	Take a look at the flourishing biodiversity and the power of nature. Create your very own ecosystem and discover the distribution of the land in Denmark. From this, you can give your perspective on how the division of the area should be.	Fiskbækgård is an old ruin where nature is allowed to grow and develop ecosystems on its own.
Bygegård	16. Peace, justice and strong institutions	Learn about war, and why it is essential to maintain peace in the world in case of sustainability. It is possible to visit a refugee camp and a home placed in a war zone through VR.	The home guard owns Bygegård. We see a potential in a collaboration between the Center for the SDGs and the home guard.
Det Gamle Gartneri	14. Life below water	Investigate the sea's hidden treasures, both the eatable ones and the ones that help the ecosystems thrive. Discover what overfishing is contributing to in Denmark and try to innovate on what you can do to reduce pollution of the water.	Det Gamle Gartneri will house the maritime center where it is possible to learn about underwater life.

Figure 98. Table of the site-specific exploration of the SDGs

Engaging visitors through tangible interactives

At each 'station' several tangible interactives will be placed to engage the visitors to innovate and negotiate their behavior and presumptions. A lot of the tangible interactives contain elements of competition and the possibility to anonymously express one's opinion and compare it to other standpoints.

Possible tangible interactives:

- Interactive interconnectedness board of the SDGs
- Innovate on possible everyday goals by writing them down for others to see (here it is possible to come back one day and see how the goals have evolved).
- Buzz boards, where the visitor needs to take a stand to a statement, and afterward see what others have answered.
- Help each other make pieces fit a frame to create a solution or behavioral change.
- Physical exploration through games with incorporated challenges.

Network displacements of the concept proposal

With the concept proposal, we are tapping into several matters of concern that were seen as essential to have in mind when designing the Center for the SDGs. Involving citizens and the municipality into the design process have already resulted in enrolments of several actors, where we both have experienced curiosity, to try some of the elements described in the scenarios, and willingness to use our work in the establishment of the Center for the SDGs (this will be described further in chapter 8).

By designing an area where most activities are placed in site-specific places, a lot of the area of Kær Vestermark will remain untouched, and open for the citizens of Kær (and other citizens) to use as they always have. Thereby we are designing an alignment between Sønderborg Municipalities visions for the area and the present relations that were observed at Kær Vestermark. The department of Sustainability and Nature had a hard time figuring out how to communicate the SDGs understandably for the visitors. With this proposal, we have communicated the SDGs through elements that the citizens see most appealing in case of experimentation and learning. By this, we argue that it is possible to create a displacement of the citizens' general relation to the SDGs through the Center for SDGs and our proposal. By enabling stabilization of the relation between citizens, visitors of Kær Vestermark, and the SDGs, we believe it will mobilize a behavioral change in the long run, because the Center has the opportunity to push innovating ideas towards everyday goals, and make the SDGs relatable for the visitors. Creating an experimental interconnectedness platform for the SDGs will further help promote the actual purpose of the goals, and make it visible for visitors that the SDGs are to be seen as a system, not as individual objects. We predict that this will make visitors aware of their actions and hopefully reflect and act upon them.

"At the beginning these three universes were separate and had no means of communication with one another. At the end a discourse of certainty has unified them, or rather, has brought them into a relationship with one another in an intelligible manner." (Callon 1986, p. 19)

As Callon (1986), we foresee that the Center for SDGs will be the intermediary that unifies citizens, the municipality, and the SDGs into a stabilized relation.

7.4 Strategy for Kær Vestermark as an Living Lab

Throughout the thesis, one of the main objectives has been to discover, define, and develop what elements are needed for Kær Vestermark to be designed as a living lab for the SDGs. As we move into the final stage of the thesis, we must ascertain that there still is a long way to go before Kær Vestermark can be considered a Living Lab. In the thesis, we have explored some of the essential elements needed in a living lab, but numerous actors and elements still need to be explored, developed, and mobilized before the environment of a living lab is fulfilled. We will, in this section, propose a simple strategy to how such can be accomplished. The strategy should be seen as an inspirational tool to Sønderborg Municipality to guide them in a direction where the full potential of Kær Vestermark as a living lab can be implemented and stay 'living.'

To gain an insight on how living labs can be implemented we will again draw on the knowledge gained from the interview with the head of Greater Copenhagen Living Lab in Energy and Water Jesper Steenberg. (Appendix10).

7.4.1 Seeking inspiration for the strategy.

When implementing a Living Lab Jesper Steenberg emphasizes that it is essential to create trust and common understanding among the actors to create a space where complex problems can be understood.

"There must be a facilitator who creates a friendly space showing that we take the citizens seriously. It is important that you qualify and give the citizens the competencies to talk on equal footing with the experts" ***49*** (Jesper Stenberg, see Appendix 10)

As we have learned through our own work with living labs, he also emphasizes that the implementation of a living lab is not something that happens overnight. His proposal for the further work is to divide the implementation into the following four phases.

1) Mobilize children and young people through education (Start the process)
2) Mobilize adults through showcasing and storytelling (who is going to pay)
3) Mobilize expert collaboration with companies (involve collaborative processes)
4) Mobilize researchers (to keep the living lab living)

In his strategy, he proposes to begin with the educational environment because it is relatively easy and brings economic support. Therefore it is important to interest and mobilize schools and kindergartens first. Thereby young people and children are 'forced' to enter the living lab through their

institutions and learn about the SDGs. This gives a good foundation for a consistent number of visitors in the living lab. Hereafter it makes sense to start the process of mobilizing adult visitors through showcasing. Showcasing is about setting up a physical place where the SDGs are showcased and communicated in an explorative and exciting way to the visitors. Jesper finds it essential to do these two steps first. It gives a valid room of knowledge and experience, which is an important foundation when attracting and involving experts such as companies in a collaborative process. You want to create an attractive playground where companies working within sustainable innovation can explore, develop, and test their ideas in a setting where future users of the innovation are available to interact with them. The fourth step would be to connect researchers to the area. To involve universities, you need an established space which takes time to create. The mobilization of researchers is essential because they play an important role

in keeping the living lab living and relevant over time. They are the experts of different areas and are the ones who can consistently add value to the elements of a living lab. First when the researchers are mobilized, the living lab is at a level where it can be called a living lab.

We see his proposals as essential inspirational inputs. But we need to translate this strategy to fit the context and field of Kær Vestermark.

7.4.2 The Strategy for Kær Vestermark as an Living Lab

To establish Kær Vestermark as a living lab we propose the following strategy: The strategy consists of 6 different stages we see necessary for the living lab to thrive.
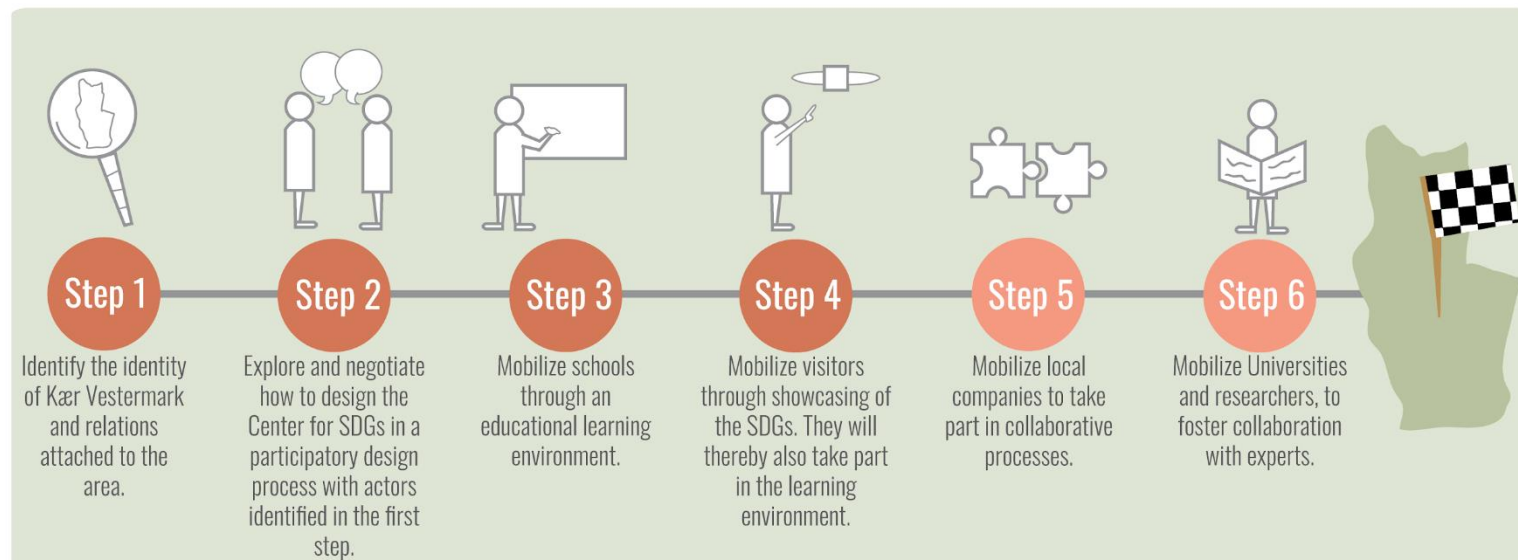
Figure 99. Strategy for the establishment of Kær Vestermark as a Living

1) **Identify the identity of Kær Vestermark and relations attached to the area.**

The thesis gives a good insight into the network constellations in the field of Kær Vestermark. We have identified actors and their relations to the area and explored some of the matter of concerns we are dealing with when imposing changes to the area.

2) **Explore and negotiate how the center for SDGs should be designed in a participatory design process with actors identified in the first step.**

The thesis has initiated the design process of the center for SDGs in collaboration with potential users and the municipality. The result of this is a loosely defined concept proposal. However, the concept still needs to be developed in a greater degree of detail before it can be implemented. The outcomes of the thesis will be delivered to the municipality where we see a potential of mobilizing them and bring our results and into their future work on the center for the SDGs.

3) **Mobilize schools through an educational learning environment**

It is essential to ensure that the center for the SDGs is designed to create an educational environment for school-visits to the area. In the thesis, we have not been in direct contact with schools, but we have engaged children in the design process. We already see that the municipality has mobilized children by placing a nature-kindergarten at løkkegården, which will ensure a constant flow of both children and their parents.

Furthermore, the municipality has decided to establish a base for the nature guides in the area. The nature guides already have an excellent relation to the local schools through their current courses. Therefore, we see the potential in using this strong relation when mobilizing schools to incorporate the center for SDGs as a part of their curriculum.

4) **Mobilize visitors through showcasings of the SDGs. The adults will thereby also take part in the learning environment.**

To mobilize citizens living in and around sønderborg, we propose that the municipality maintain a participatory approach initiated in this thesis to establish a close collaboration with the future users of the area. This collaboration will ensure that the showcasing of the SDGs is designed as an attractive learning environment where citizens are motivated to participate and engage in the experimental platforms. This stage is crucial if we are to see a behavioral change towards sustainable actions in the citizens' everyday life. In the thesis, we have given our take on how this showcasing can be conceptualized and which elements we find important to incorporate.

5) **Mobilize local companies to take part in collaborative procceses.**

Sønderborg has a strong network of local companies collaborating and supporting local initiatives. If companies become mobilized into a collaborative process, an innovation environment on a larger scale will

start growing. Therefore we see them as an essential element in the living lab. With the establishment of the previous stages, we see that it will become attractive for companies to engage, by giving them a large test-bed where they can explore, develop and test their ideas with future users. Here citizens can add value to the innovations by giving their insights and learning about how companies develop solutions to the issues addressed by the SDGs. We propose to mobilize some of the more prominent companies such as Danfoss and Linark to give economic support and to push powerful actors to innovate within sustainability. We also see a potential in helping small start-up companies with promising visions as this can allow for new and alternative innovations within sustainability.

6) Mobilize universities and researchers, to foster collaboration with experts

With the mobilization of citizens and companies, we see that the Center for the SDGs can become a fruitful place for new research on sustainable innovation, social innovation, and behavioral change towards sustainability. Syddansk University has a department in Sønderborg, which would be an ideal actor to involve in the Living Lab. Researchers and students can use the Center for SDG as a platform for research projects within various topics and help the living lab stay relevant over time.

In this project, we have only touched upon some of the elements in the strategy. We have initiated the work needed in stage 1, 2,3 and 4 and enrolled some of the central actors in these stages (see figure 99). However, we also acknowledge that many elements still need to be put into place before a final design of the area, and mobilization of actors can occur.

The strategy leaves an unanswered question: *Who should have the responsibility of completing this strategy when the design team leaves the project?* We had a close collaboration with Sønderborg municipality throughout the project, where they were interested and enrolled in the project. As we deliver our outcomes to the municipality, we hope we have accomplished mobilizing them so they will take the outcomes from the thesis and incorporate them into their planning process in the future. We believe in having good reasoning for this, as our contact to Sønderborg Municipality has shown interest in the outcomes of the thesis and wishes to contact us when they start the actual development of the area.

*"It is a precious project you have made, and I hope you will send me a copy of the entire thesis report. Furthermore, I hope you will be interested in being contacted regarding the continued development of the Center for the SDGs, as we need your ideas and creativity."***50** - Project leader on the Center for the SDGs, Bent Ålbæk

8 FURTHER WORK
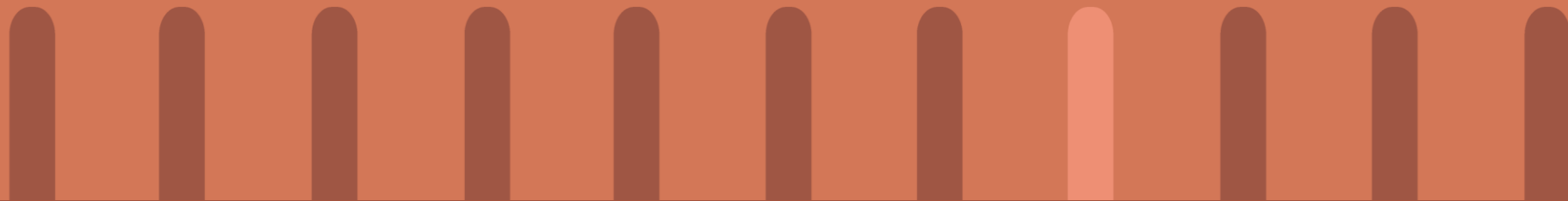
We have discovered elements essential in the development of Kær Vestermark as a Living Lab for the SDGs through our thesis. In the beginning, we had a vision of making a prototype based project at Kær Vestermark, but due to COVID 19, we needed to change this vision. In connection with the gradual opening of Denmark, we have gotten the opportunity to use the workshop and build physical objects. We will use the time between hand-in and the oral exam to investigate some of the physical aspects of our thesis that we see missing.

The interconnectedness between the SDGs has been a recurring topic throughout the report. It is seen as one of the most challenging elements for municipalities to communicate to their citizens. In the time remaining, we will conceptualize and materialize how interconnectedness can be communicated to the citizens and thereby detailing elements of the concept proposal.

Furthermore, we want to design a booklet with all the relevant results gained throughout the thesis to Sønderborg Municipality as well as the other danish municipalities that have shown an interest in the project. In the booklet, we will present the concept proposal and how to create experimental spaces as well as the strategy to create a living lab for the SDGs. Furthermore, we will present how the interconnectedness of the SDGs can be communicated to citizens. The booklet will be discussed with the Secretariat of Nature and Sustainability in Sønderborg Municipality and delivered so that they can use the booklet as an inspirational tool in the development of the Center for SDGs at Kær Vestermark. The final results will be presented at the oral exam.

9 DISCUSSION

9.1 Creating business as usual or radical change?

Do the SDGs just create business as usual or can they be a part of creating radical change?

When working with the SDGs in the academic world, we have often been met with concerns about the SDGs ability to create radical change. In our research, we found that the SDGs have been used as a menu of options to choose between, rather than a system of objectives that should be addressed integrally. Furthermore, they have been considered to oversimplify different sustainability matters or even seen contradicting in case of creating sustainable development (Lim et al 2018).

In the project, we approached the SDGs with respect to the work done in the UN. We have investigated different perspectives and how they could be communicated to show the essence and potential to push for behavioral change. In the project, we have not been able to test the elements of our results. It is difficult to tell if we have mobilized citizens to innovate upon their own behavior. Nevertheless, we can reflect upon the actors' curiosity to investigate the SDGs through different experimental platforms. Making citizens aware of the essence of the SDGs and giving them the right tools to reflect upon the goals, we argue it is possible to negotiate business as usual and potentially innovate the change needed to adjust their behavior in relation to the SDGs.

The SDGs can quickly be perceived as silo oriented due to their black-boxed representation, where minimal cross-referencing across the goals and limitations in case of the potential conflict

between them are visualized (Lim et al. 2018). We have explored how the SDGs could be communicated to and by everyone to give the SDGs a different value than just 17 colored boxes, to which no one without a preunderstanding of the SDGs can relate to. It is first when the SDGs are considered as an integrated whole, that transformations for sustainable development can happen (Lim et al. 20018).
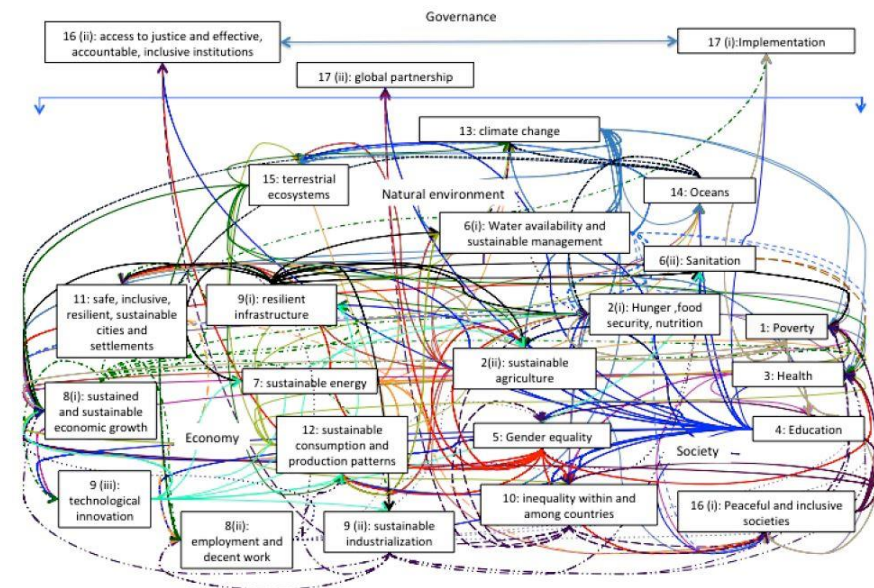

Figure 100. Illustration of the internal relationships of the SDGs. The arrowheads show the goals that are affected, and the arrow lines show the relationship between the different goals and sub-targets. Identified through the subsystems of governance, natural environment, economy, and society. (Lim et al. 2018)

In the thesis, we have not been able to illustrate the real complexity (see figure 100) of the SDGs but instead illustrated the problematizations that occur when approaching it. In this way, we experienced ourselves, why the SDGs seem so tricky to

work with both at a national and local plan. We should have chosen to do a thesis dedicated to this if we were to focus even more on the complexity and systematic aspects of the SDGs.

This thesis has managed to interest several actors in working actively with the SDGs and negotiating them on behalf of their matters of concern. By this, we see potential in the future Center for SDGs to enable more actors' awareness of the goals and their interconnectedness.

9.2 Co-designing in a pandemic - Our experiences with online participatory design

The participatory design approach is traditionally heavily reliant on physical objects and close collaboration with external actors and face to face interactions. The thesis was built on the premise that we could have physical interactions with the municipality and users of Kær Vestermark. Engaging them in interventions with design games, physical objects, and testing our ideas with low fidelity prototypes. However, this approach took a drastic u-turn with the outbreak of Covid-19, leaving it impossible to have face to face interactions. As a result of the pandemic, we turned towards the exploration of how online mediums could be used as tools for co-designing. There are many examples of using online mediums to collect knowledge such as surveys and skype-meetings however, the field of online participatory design is still somewhat undeveloped from an academic perspective (Chapter 3). We see that our experiences can be used to expand the field of online participatory design. We will, in this section, reflect on the outcomes and learnings of this process.

In the project, we have explored three different approaches to online participatory design.

- Using Facebook as an existing platform to reach a broad range of citizens living in the area of Sønderborg.
- Using Conceptboard.com as an existing platform developed for collaboration in work teams to set up design games and interactive interventions.

- Creating videos of scenarios and presenting them in a questionnaire format.

From our experiences, we can conclude that there are a few advantages but definitely also many challenges when performing online participatory design. We have collected an overview of our experiences in the following table:

Advantages	Challenges
It is possible to reach actors who otherwise wouldn't engage in participatory projects.	It is challenging to create an explorative space that invites the participants to express themself creatively.
It is possible to gather actors who otherwise couldn't participate because of logistic hindrances. Reach actors from a distance.	The physical 2-way interaction is difficult to recreate in an online setting.
Participants tend to have a more direct tone when communicating online and give their true honest opinion. Discussions and topics that perhaps otherwise wouldn't have touched the surface, arise and are dealt with.	Participants' knowledge and skills in technology have to be taken into account. Not everyone has access or the skills to use online platforms.
It is easier to reach a bigger audience because some elements of online PD can easily be shared.	The framing and staging of the interventions have to be very simple and straightforward. Otherwise, participants will lose the overview.
Some activities within online PD are not time-determined. Participants can participate on their own terms.	Online PD demands a clear and straightforward facilitation. The facilitator doesn't have the same possibilities of showing and telling and participants don't have the same opportunities to ask follow-up questions.

Figure 101. Advantages and challenges of Online participatory design (own illustration)

When setting up an online design space, we are faced with different circumstances and surroundings. First of all, the technical aspect can be very challenging for both the facilitator and the participants. The simplest activities, such as setting up a meeting through webcams, have been a challenge. For example, in the final intervention with Sønderborg Municipality, half of the time was used to fix technical issues. These circumstances are very unfortunate, and since they are difficult to predict, they can end up affecting the results of the intervention.

Learnings from the use of conceptboard as a collaborative platform.

One of the biggest hurdles in the process was how to translate the interactive and creative space we recognize from 'regular PD.' These elements were not present in the interventions using Facebook or the questionnaire format. However, we managed to recreate some of the interactiveness in the interventions using the platform Conceptboard.com. Here we were able to gather more actors at the same time and interact through the webcam and the shared board. The participants could see each other's cursor and interact with each other by moving and adding elements on the shared board, which could be seen in real-time. To give the participants hands-on experience, we also experimented with using simple tools such as pen and paper to unfold their thoughts creatively. This was successful in some cases but very challenging for the participants that aren't used to drawing. The interventions staged in the platform conceptboard.com had the best resemblance to some of the aspects we know from 'regular PD' compared to the other approaches we tested in the project. But it was also very demanding from the participants' point of view, and much time

was set aside to help participants set up the online platform. This puts some demands on the participants, such as a good sense of patience and motivation.

Learnings from the use of Facebook

In the staging and facilitation of the Facebook interventions, we experienced that it was easy to gather a large group of people around a topic that has relevance to them. However, engaging them to take part in posts outside their comfort zone was challenging. 61 people attended the Facebook group, but only 24 people showed activity throughout the project. Our experience tells us that it has to be very simple tasks or activities to engage people on Facebook. Because of this, the empirical data you gather can quickly become superficial as the participants tend to give short and simple answers. Here it is important as a facilitator to engage in the comment section and ask follow-up questions. This both creates more in-depth conversations and makes the participants feel heard. We do not see Facebook as the perfect medium for PD, as people's attention span is very short in this format. However, we do recommend using Facebook or similar platforms as a forum where you can attract and gather participants in a space where smaller interactions among the participants can happen. A Facebook group gives good circumstances for problematizing and interesting actors into the project, which can help you enroll participants to take an active part in interventions outside the Facebook group.

Learnings from the use of survey platforms

We presented the scenarios through a platform used for surveys and questionnaires. This approach has advantages because it is possible to reach a large number of participants who can participate on their terms. Furthermore, a facilitator is not needed for each intervention as the participant is self-facilitated through the carefully staged questionnaire.

A concern when setting up the questionnaire was that participants would not take the time to give in-depth, written feedback on the scenarios. However, we were surprised to observe that a majority of the participants took the time to relate to the videos presented and give in-depth responses.

We discuss whether this approach can be categorized under the term participatory design or merely a survey. Furthermore, we argue that it is essential not to look at it as a traditional survey. By this, we imply that it should not have the same methodological approach as when a survey is developed.

9.2.4 Final Remarks

As an overall reflection of our work with the online participatory design, we believe that we have gained valuable insights and results in the design process. However, we would not recommend framing a whole project using the online participatory approach if physical interventions are possible. Online PD can be used to support PD's physical aspects, but it can not replace it. The online approach can create gatherings of people that are more challenging to recreate in a physical setting, which we see as beneficial. However, elements from the physical interaction in PD are lost, such as the hands-on

approach where the participants can materialize their ideas, values, and opinions. Furthermore, it is easier to facilitate complex tasks and issues to the participants in face-to-face interventions because it is easier to show and tell. In online PD, it is needed to follow a very strict and straightforward staging if the participants are to follow along.

Additionally, we have seen a change in how participants communicate when they are participating in online interventions. Participants tend to have a more direct tone and give their honest opinion despite it being controversial. This has been the case, in the Facebook interventions, the scenario intervention, and some degree in the interventions using concept-board. Discussions and topics that perhaps otherwise would not have touched the surface arise and are dealt with. We can not conclude why this dynamic happens, but we hypothesize that the participants' surroundings have an impact. They are in the comfort of their own homes and hidden behind the computer screen, which leaves them more open to share. We see it interesting to conduct further research into this as the use of online participatory design perhaps can open spaces of comfortability that can be lost in physical interventions.

10 CONCLUSION

In this thesis, we have sought to understand what elements are needed to create a living lab in a participatory process with citizens and employees from Sønderborg municipality. The exploration of this has revolved around transforming a local nature area (Kær Vestermark) into the center for Sustainable Development Goals. With the vision of engaging citizens to translate and negotiate the SDGs into their everyday life. Through the thesis, we have achieved new knowledge

that we, with a participatory approach, have translated into a concept proposal and strategy for how Kær Vestermark can be established as a living lab for the SDGs. Here we have accomplished to navigate among inputs from citizens, employees in municipalities, and literature on the topics of Living Labs and the SDGs. This navigation was done to locate the elements needed for the Center for SDGs to become a Living Lab. Notably, we found that the elements of tangible interactives, experimental platforms, and alternative perspectives were essential for a Living Lab implementation.

The thesis gives an in-depth insight into the challenges that appear when communicating the SDGs to citizens and working with them in a local setting. To design a space where citizens are engaged to translate and negotiate the SDGs into their own everyday life, we investigated what the citizens' current relations were to the SDGs, and how to make them relatable and tangible. Based on our findings, we have found that many citizens know the SDGs and have seen them in different constellations, but they do not reflect further upon them. We often observed the interconnectedness and purpose of the goals get lost in the communication of the SDGs towards citizens at a municipal level

and that it can be overwhelming for municipalities to work with all goals, which results in a specialization of few goals rather than embracing them all.

Moreover, we found that when establishing spaces for actors to negotiate the SDGs, interesting discussions appeared. From a negotiation space with high school students, we learned that some SDGs are easier to work with than others. However, when setting up a physical frame with creative and hands-on approaches, it was easier for the student to discuss, relate and negotiate the SDGs to come up with their creative solutions to the SDGs on a local level. By doing so, the properties of creating a 'Thing' have resembled. To support this, we have moved away from designing things to investigate how 'Things' can make actors gather, negotiate, and experiment with the SDGs.

Through the perspective of Actor-network Theory, we can conclude that Kær Vestermark is a complex heterogeneous network consisting of a lot of internal network constellations in both the current and future state of Kær Vestermark. We discovered that controversies would occur when the future and present relations are merged in the establishment of the Center for SDGs. This analysis illustrates how current relations attached to an area can create potential controversies when changes are imposed in the establishment of new actors to an area. Therefore we found it essential to accommodate the Matters of Concern that reflect these controversies. The accommodation was done with support from Participatory Design, where we interested the relevant actors in the design process to avoid potential breakdowns and to stabilize relations in the new network. In the process, we managed to make citizens and

employees for the municipality co-designers and enable them to reflect and discuss their roles and relations in a future network through various negotiation spaces. For the design of the Living Lab, we have found that tangible interactives were essential in the creation of experiential learning environments. Through our participatory design approach, we sought to investigate how these spaces could be co-designed. We learned that from the negotiation of design parameters, citizens preferred the following when engaging in the future center for the SDGs:

- Experimentation through physical exploration, competition, and creation
- Learning through movement, play, guidance, and visual material
- Creating ownership, by being feeling a part of something bigger, and leave a mark
- Involving nature around natural materials, play, and information
- Gather around events, the possibility to enjoy nature, and specific knowledge

Furthermore we investigated how the SDGs were to be implemented at Kær Vestermark though a negotiation space with Sønderborg municipality which resulted in these principal points for the implementation:

- Site-specific placement of the SDGs to support the storytelling
- Løkkegården as the base for the SDGs

- The importance of communicating the interconnectedness of the SDGs
- Incorporation global and local aspects of the SDGs
- Breaking the framework of normality - communicate taboos or difficult topics

We turned the knowledge from the two negotiation spaces into four scenarios for how activities and experimental platforms could be attached to the area. From an evaluation with both citizens and the municipality, we concluded that two scenarios were favored. Based on these findings, a concept proposal and a strategy for Kær Vestermark to become a living lab were developed. The Concept Proposal - *The battle towards the everyday goals*, has the purpose of challenging the visitors to innovate their own everyday goals. Through several experimental platforms, the visitors will be presented for elements that will challenge their opinions and presumptions. The experimental platforms are created through the use of virtual realities, alternative solutions, creation, and competitive elements. To support the concept proposal, a six-stage strategy to enable the living lab to stay 'living' was developed as an inspirational tool to Sønderbog Municipality (see chapter 7.4).

Through the design process, we succeeded in enrolling both citizens and employees of the municipality. We have experienced curiosity towards elements described in the scenarios and willing to use our work in the future establishment of the Center for the SDGs. We have designed a concept proposal that taps into the present strong relations at Kær Vestermark and thereby tried to create alignment between

Sønderborg Municipalities visions for the area and the actors living close to Kær Vestermark. With the proposal, we have communicated the SDGs through elements that the citizens see most appealing in case of experimentation, learning, ownership, nature, and gathering. All central elements in the creation of a living lab at Kær Vestermark. We argue that the concept will create a displacement of the citizens' current relation to the SDGs. By enabling stabilization of the relation between citizens, visitors of Kær Vestermark, and the SDGs, we believe it will mobilize a behavioral change in the long run, because the Center has the opportunity to push innovating ideas towards everyday goals, and make the SDGs relatable for the visitors. It is difficult to tell if we have succeeded in mobilizing the citizens to innovate upon their behavior. Nevertheless, making citizens aware of the essence of the SDGs and giving them the right tools to reflect upon the goals, we argue it is possible to negotiate business as usual and potentially innovate the change needed to adjust their behavior concerning the SDGs. As a part of our further work, we want to deliver the outcomes from our strategy and concept proposal to Sønderborg municipality. By doing so, we hope to accomplish mobilization for Sønderborg municipality to incorporate our findings into their planning process of the establishment of the Center for the SDGs.

Lastly, we have reflected on our work with an online participatory design where we supported our participatory approach through Facebook, Conceptboard.com, and questionnaires. Through our work with online PD, we have found that it can not be used as a replacement for physical PD. Nonetheless, we do see some advantages in online PD, such as the opportunities to gather actors in forums that they otherwise would not have been a part of. Furthermore, it can potentially create a more comfortable environment for participants making them more willing to share views and opinions. We recommend the use of online PD as a supportive tool that can be used in some stages of a participatory process, to support physical interventions when not possible.

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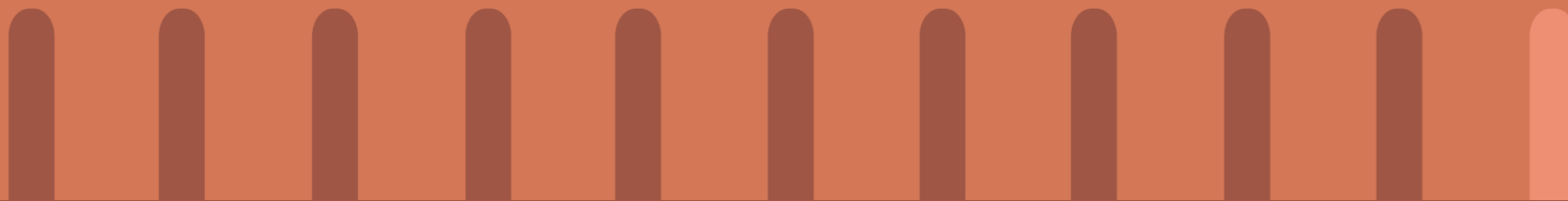
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Appendix list

Appendix 1: Initial meeting with Inge Olsen

Appendix 2: Results from negotiation of project direction.

Appendix 3: The five policy recommendations from Stockholm resilience center

Appendix 4: Results from negotiation of controversies

Appendix 5: Results from negotiation of relations to Kær Vestermark

Appendix 6: Table over Danish initiatives for the SDGs

Appendix 7: Transcriptions of phone interviews with the three municipalities

Appendix 8: Results from second Facebook post (citizens relation to the SDGs)

Appendix 9: Results from high school interventions

Appendix 10: Results from the interview with Jesper Steenberg

Appendix 11: Results from negotiation of design parameters

Appendix 12: Negotiating SDGs at Kær Vestermark

Appendix 13: Overview of the SDGs

Appendix 14: Storylines for the scenarios

Appendix 15: The full results of the questionnaire

Appendix 16: Original quotes

Appendix 17: The four project directions