

The background features several thin, dark teal lines that meander across the page. One line starts from the bottom left, moves upwards and to the right, then turns and goes towards the top right corner. Another line is more horizontal, with some small peaks and valleys, crossing the first line. A third line is more jagged and irregular, located in the lower half of the image. These lines create a sense of movement and depth, framing the central text.

Between fjord and sea

Peripheral potentials





Illustration 5.2: Vejlerne nature sanctuaton





Illustration 7.2: The pedestrianized zone, Brevst





Illustration 9.2: View from the road to the Limfjord



Illustration 10.1: View to Klim Mountains from shelter point



Illustration 10.2: Driving towards Brovst from the village of Attrup

About 13 billion years ago Mother Earth was born in a rough labor by the universe (Space.com, 2011). She was conceived by turbulence.

Mother Earth had a difficult childhood until she found her balance in the universe circling around her major energetic brother the Sun. Now Mother Earth is getting older and feels tired with limited resources. Even her children do not pay much attention to her anymore and they do no longer fulfill her with appreciation.

This hurts her old heart with all what she has done for her many children. Mother Earth hope she and her children will reestablish their close relationship again soon.

Between fiord and sea

Master thesis:
Spring 2019
MSc04 Urban Design

With contribution from:
Jammerbugt Kommune

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Project report: 207 pages
Appendix: 57 pages

Project period: 1/2 - 7/6 2019

Submission date: 23/5 2019

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Illustration 14.1: Driving through Jammerbugt on highway 11

Abstract

This thesis seeks to explore a nature-based approach to manage contemporary demographic changes and climatic challenges in a strategy and physical design located in Jammerbugt.

Urbanization and political structural reforms have increased demographic shifts from rural to urban. Recently, the term double-urbanization was introduced to the Danish planning debate addressing internal demographic changes in municipalities thus revealing that growth and shrinkage occur across scales globally and locally. Furthermore this reveals growth in some rural municipalities otherwise denoted as “the outskirts” thus potentials for development.

The site for this thesis is Jammerbugt Municipality a place with unique qualities, breathtaking nature, communities and stories waiting to be told. However the place is challenged by increased water level predicted to rise 1m towards 2100 thereby changing the geography of Jammerbugt.

Through analysis, imagined scenarios and strategy, the thesis aims to accommodate changes related to urbanization in Jammerbugt Municipality thus utilize the potentials of internal demographic shifts and enhance nature to reestablishment relations between the built, the grown and humans.

A physical design, the Fjord Center, is created to manifest the narrative of unique grown environments in Jammerbugt and reconnect humans hereto. Furthermore, the design is located on the future edge between land and water caused by raised sea water levels. Visitors can experience, examine and learn about nature, the Limfjord and climate challenges. The physical design is created to establish an understanding of a common future for everyone; a sustainable future.

Preface

This project is a Master Thesis in Urban Design, School of Architecture, Design and Planning, Aalborg University. The theme for the project is nature as a quality to process urbanization-related challenges in rural Danish municipalities.

Before the commencement of this thesis our knowledge about the site, Jammerbugt Municipality was limited. Despite five years education in Aalborg the place where far away in our consciousness. The acquaintance was bound to Svinkløv Sea Side Hotel unaware that the hotel actually was placed in Jammerbugt.

On a cold day in January we visited Jammerbugt for the first time. In advance we had planned interviews with four municipal planners. After the interviews a perception of an internal indistinctness occurred to us regarding the identity of Jammerbugt as a leisure or outdoor municipality. One interviewee mentioned it was a type error describing Jammerbugt as leisure-municipality whereas another interviewee corrected us when referring to this “title”.

Now, due to our increased knowledge about the innumerable unique and characteristic nature-qualities this thesis seeks to communicate the unique potentials found in Jammerbugt. Creating a common understanding of the identity can create focus for municipal development. This thesis seeks to create an unique narrative to strengthen the identity and awareness of a place otherwise perceived as the outskirts of Denmark.

The report will present theoretical discussions, analytical findings and perceptions observed during study trips to Jammerbugt. Furthermore the thesis will present three scenarios for envisage futures of the place to develop a strategy and physical design. The design show cases a potential future of a selected site in Jammerbugt.

Acknowledgement

We would like to express our gratitude to our supervisors Ida Sofie Gøtzsche Lange and Jes Vollertsen for helpful supervisions, fruitful discussions and constructive critique during the process of this thesis. The process would not have been the same without their engagement and questions.

Additionally we would like to express our deepest thankfulness and respect to Ida Jensen, Lars Haagensen, Kell Agerbo and Jesper Runge Madsen from Jammerbugt Municipality for your time and valuable knowledge which has been essential in the project development. Thank you for your interest and engagement – we are deeply overwhelmed and humble for this.

Furthermore, we would like to thank all the people, stakeholders and interviewees we have met during our visits in Jammerbugt Municipality. Especially Kathrine and Mads Nissen who made our journey truly inspiring and instructive.

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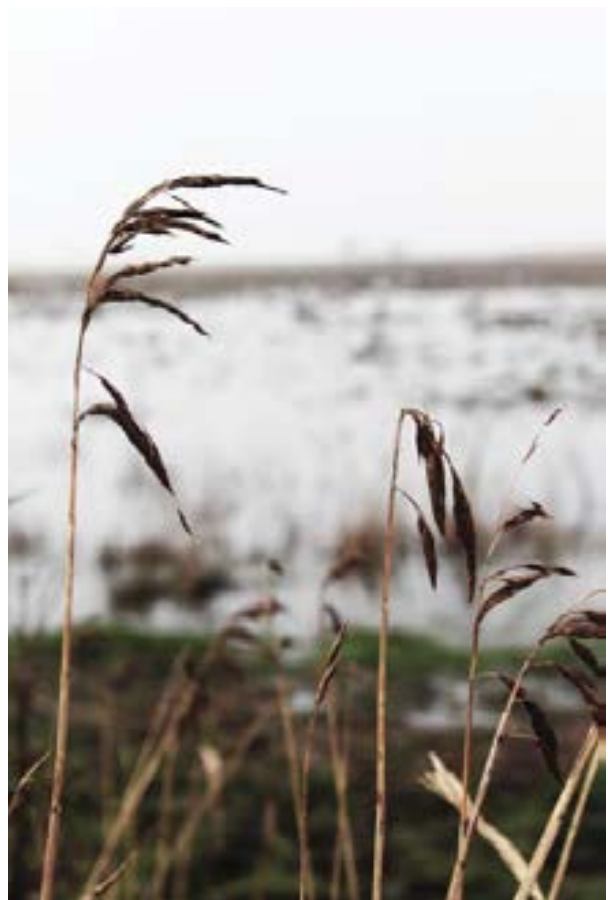


Illustration 19.1: Reeds in the wetland at Vejlerne.

Motivation for thesis

“In order to extend the possible, it is necessary to proclaim and desire the impossible. Action and strategy consists in making possible tomorrow what is impossible today” (Lefebvre & Bryant, 1976).

The contemporary public debate in Denmark is characterized by discussions related to climate challenges, demographic changes due to urbanization in urban and rural districts (Andersson, 2019; Realdania, 2017). The topics are likewise highly present in the spatial planning debate however it is urgent to implement new methods in the urban environment in search of a sensorial city that furthermore manages contemporary challenges (Andersson, 2019). How do we as the spatial planning praxis verbalize, manage and solve the challenges of tomorrow?

Urban design applies a holistic approach to contemporary and challenges in the field

within urban development and planning (Aalborg University, 2019). This applied in various scales across different disciplines combining engineering, architecture and sociological knowledge approaching unsolved challenges in society (Aalborg Universitet, 2019). As urban designers with a multi-disciplinary profession the motivation for writing this master thesis is to apply a holistic approach to the complex challenges of tomorrow.

As urban designers we seek to engage ourselves to the contemporary debate. This thesis aims to create visionary and innovative designs for contemporary and future challenges across scales to social tendencies and physical challenges.

Through demonstrated theoretical, analytic and practical knowledge this thesis aims to address and reflect upon the complex challenges in our contemporary society as demographic shifts, climate changes, biodiversity and livability. Hopefully new methods and designs will be show cased to improve a society of tomorrow.



Illustration 21.1: The Svinkløves Dune Plantation

A person in a dark coat and hat walks away from the camera on a snowy dune. The dune is covered in patches of dry grass. In the background, the ocean meets a cloudy, overcast sky.

Chapter 01

Introduction

This chapter introduces urbanization tendencies, political centralizing legislation and negative loaded articulation of rural areas influencing urban development. Furthermore sustainability and nature is introduced as response to contemporary challenges. The selected themes establish the foundation to understand theoretical discussions and analysis presented later in the thesis.



Illustration 23.1: Walking on Svinkløy Beach at first site visit

Double-urbanization

Urbanization is not as centralized as often thought or presented in the public debate, since it does not solely occur in the largest cities but across Denmark on every scale from national, municipal to local level.

Adressing parrallel patterns of urban growth and decline

The past 40 years the population in large cities (+3000) has grown. On the other hand, small villages inhabited by less than 1000 people and rural districts have experienced population decrease (Realdania, 2017).

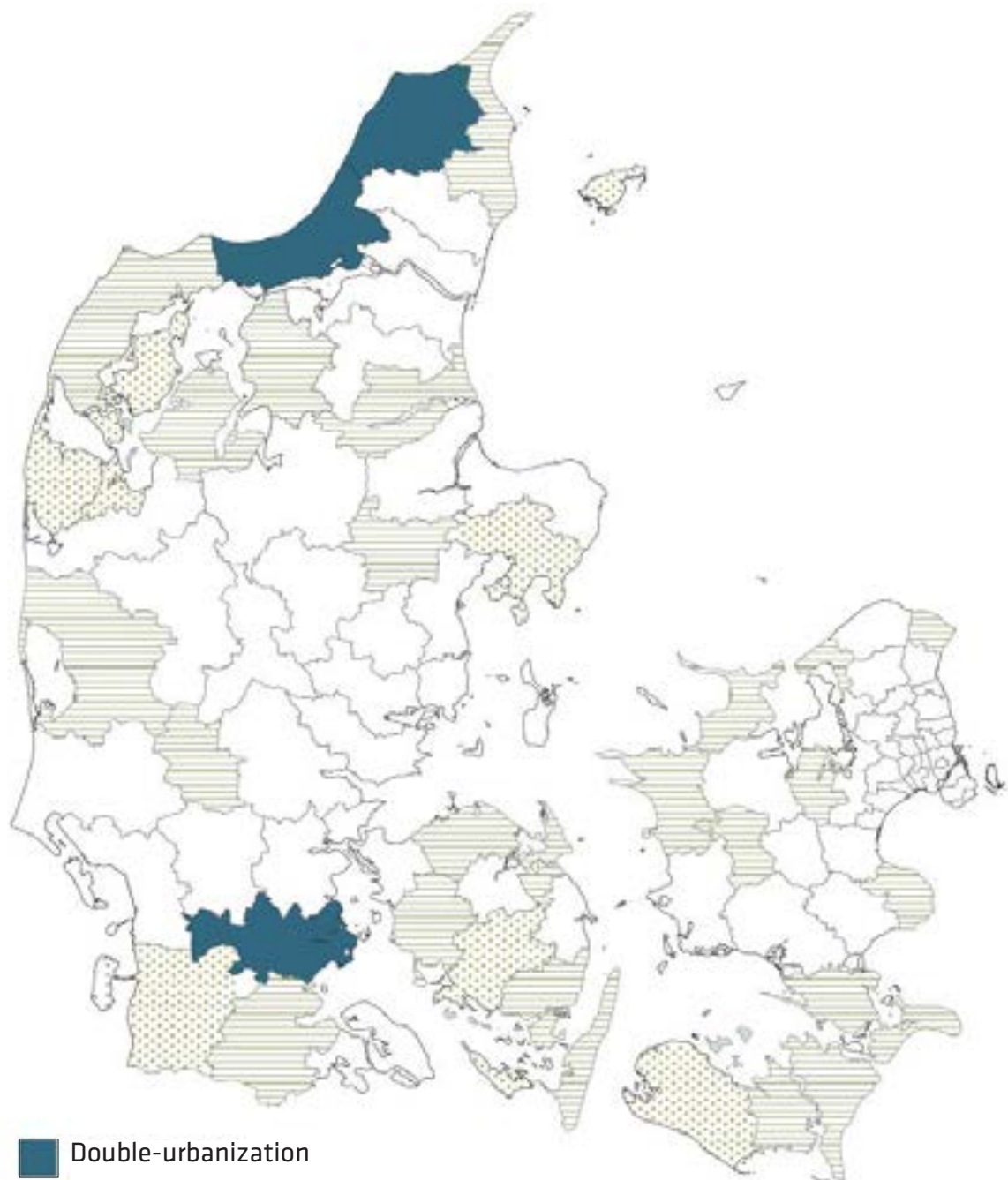
Now rural Danish municipalities' experience population shift internally towards local urban centers. Thereby an internal population increase in the local city centers while the municipality at the same time might experiences decrease in population when some move towards larger centers of growth. Thereby a condensation of people in the larger cities and in the local municipal city centers (Realdania, 2017). This defined as double-urbanization (Kommunernes Landsforening, 2017).

Thereby, a double-sided effect of urbanization verbalizing significant population growth and decline experienced on a

local scale. This articulates a more sensitive approach and narrative towards local development in especially rural districts (See illustration 25.1). The philanthropic association Realdania has initiated projects to develop areas outside large urban areas by campaign supporting projects economically. Realdania, the Danish Government and Local Government Denmark launched the campaign "Kommuner på forkant" or "Municipalities Cutting Edge" for a balanced development between rural and urban on national level (Realdania, 2017). The point of departure for the campaign was to encourage strategies for adaptation and development in municipalities outside the large urban regions. According to Realdania the rural municipalities must be "on the forefront" or "cutting edge" as the title suggests (Realdania, 2017). This entails rural municipalities to acknowledge and process

contemporary and future challenges.

This thesis zoom into the contemporary urbanization tendencies as double-urbanization to select place of intervention for this thesis.



Double-urbanization

Stagnation

Decline

Growth

Illustration 25.1: Map of double-urbanization in Denmark, based on statistics from Danmarks Statistik (Danmarks Statistik, 2019)

Political structural reforms

A new agenda for spatial planning practice

Recent decades countries across Europe have experienced structural reforms changing the orientation of planning organs (Lord and Tewdwr-Jones, 2014). These structural changes stated as “*municipal merger mania*” influences national, regional and local planning practice (Blom-Hansen et al, 2016). According to Kristian Olesen “*governance reforms were being implemented, which sought to reduce the scope of and in some cases abolish strategic spatial planning at regional and national scales.*” (Olesen, 2014). The structural reforms aim to facilitate municipal development and competitiveness in a global context. “*What many of these reforms have in common is the attempt to reorient planning towards facilitation of growth, and as a result, spatial planning today is largely conceived as a ‘vehicle to enable development’*” (Olesen & Carter, 2018). Thus, the spatial planning agenda priorities

economic growth objectives as generator for development.

Spatial planning structures in Denmark

Denmark is no exception, processing several reforms, latest in 2007. (Blom-Hansen et al, 2016). In early 2000s central government in Denmark articulated the demand to simplify administrative structures since the political administration was found inappropriate and inefficient due to overlapping responsibilities (Indenrigs- og Økonomiministeriet; Hansen, 2016). The objective was to improve efficiency and transparency in the planning system thus strengthen the ability to improve and innovate Denmark’s global competitiveness and position (Hansen, 2016).

Thus, a thorough structural reform was effectuated including a municipal reform to reshuffle functions in every municipality and further-

more small municipalities less than 20.000 citizens were amalgamated. The remaining municipalities retained their existing size (Blom-Hansen et al, 2016). The structural reform resulted in 271 Danish municipalities merged into 98 new municipalities and the counties were dismantled. Instead 5 new regions were established to operate and plan public health care as primary task.

The structural reform reorganized thereby created a new



Illustration 26.1: Territorial boundaries of Danish municipalities post-amalgamation in 2007.

Relocation of power; strengthen local responsibility

municipal and regional map. (Økonomi- & Indenrigsministeriet, 2013). Power was allocated from national towards more local governed systems thus de-centralized from government to governance (Laursen, 2009). Furthermore, a new division of labor between government, municipality and regions were implemented (Økonomi- & Indenrigsministeriet, 2013) thus *“rescaled planning powers to the local level, whilst maintaining (and in some areas increasing) regulative powers at the national level.”* (Olesen & Carter, 2018).

Land-use regulations became a municipal responsibility whereas the central government develops national guidelines. Spatial planning is no longer regulated on regional level (Hansen, 2016). Additionally, Olesen and Carter argues that the political structural turn towards urban *“entrepreneurialism”* on municipal level forced even smaller cities to engage in the

“inter-city” competition. Thus, a spatial planning practice *“increasingly ‘geared towards creating growth’ within urban localities across governance levels”* (Olesen and Carter, 2018).

Centralization; speeding up urbanization

The 2007 structural reform marks a political shift from welfare-oriented towards more neo-liberalistic politics with an inter-municipal competitiveness (Laursen, 2009; Olesen and Carter, 2018). According to Laursen *“neo liberalism speeds up globalization and globalization generate big changes in the structures of urban environments; it has major impacts on localities”* (Laursen, 2009). Thus strengthening urbanization towards centers of growth. Thereby, the centralizing processes prolong and reinforce one and another (Buch, 2017).

On a municipal level centralization of service adminis-

tration, demographic centralization together with centralization of employment is a strong self-perpetuating process without signs of a reverse development (Buch, 2017). According to Buch, municipal mergers are one of the reasons behind closure of public institutions as schools, day care and libraries (Buch, 2017).

However, another contributing factor might be the financial crisis following 1,5 years after.

The outer Denmark; A rotten banana?

Notable demographic shifts are experienced in the rural Danish outskirts where nearly 20% of the population has moved since 2000 (Buch, 2017). For the first time in Danish history, less than 700.000 are living in the rural outskirts (Buch, 2017).

According to Vestergaard *“the fact that public services [...] are centralized in the larger cities leaves the rural areas with depopulation, and more and more decoupled from economic growth and distanced from the power relations within the network societies”* (Vestergaard, 2016). Consequently, rural districts might be disconnected from development when public functions are centralized in local centers (See Political Structural Reforms, p. 26). Realdania on the other hand argues for centralized rural center to focus growth and development (See Case studies, Appendix).

A vicious circle, difficult to interrupt since the process seems self-perpetuating. Furthermore, this negative circle makes it difficult to keeping residencies, attracting new residents and companies in the peripheral Denmark (Svendsen, 2013; Vestergaard, 2016).

In the Danish spatial planning practice centralization has been the driving force for development including political, demographic and economic shifts from land towards the larger urban areas (See Political structural reform, p. 26). The centralization processes following the 2007 municipal amalgamation has created a new storyline for Denmark with the construction of *“Outer Denmark”* as Olesen and Carter states (Olesen & Carter, 2018). Thereby, a division of the country between an *“Inner Denmark”* and *“Outer Denmark”* was created .

The phenomenon *“Udkantsdanmark”* was introduced in 2010 to Danish planning debate due to political, demographic and economic shifts in rural areas (Vestergaard, 2016). *“Rural Outskirts of Denmark”* or *“Rural outskirts”* as the term is defined in English describes challenges regarding development in rural areas in Denmark and refers to the Danish term *“Udkantsdanmark”*.

The outer Denmark; a rotten banana

Overall, this development is often mentioned as *“the rotten banana”* in the Danish public debate describing the previously mentioned negative rural development especially in Jutland (See illustration 29.1, p. 29; Vestergaard, 2016). This is a rather place-stigmatizing word for the rural areas. According to Gunnar Lind Hasse Svendsen the negative rural

articulation or “*ruralization*” is linked to urbanization (of course) but likewise the lack of local identity (Svendsen, 2017).

This thesis aims to enhance the positive narrative of a rural municipality (See Analysis, p. 72).

Accordingly, the public debate regarding rural districts reveals more negative than positives notion which affects the future of the rural areas. What is the attraction of living in “*the rotten banana*”? Yet, few positive words as “*Cutting Edge Denmark*”, “*Coastal Denmark*” or “*the green cucumber*” has been articulated in the debate. In Danish “*Forkantsdanmark*”, “*Vandkantsdanmark*” and “*den grønne agurk*” (Svendsen, 2017).

Perhaps this reveals a new era for Danish rural districts in terms of a positive rural districts debate. A shift in focus might have a positive effect on the “*Coastal Denmark*”(- See Case Studies, Appendix).

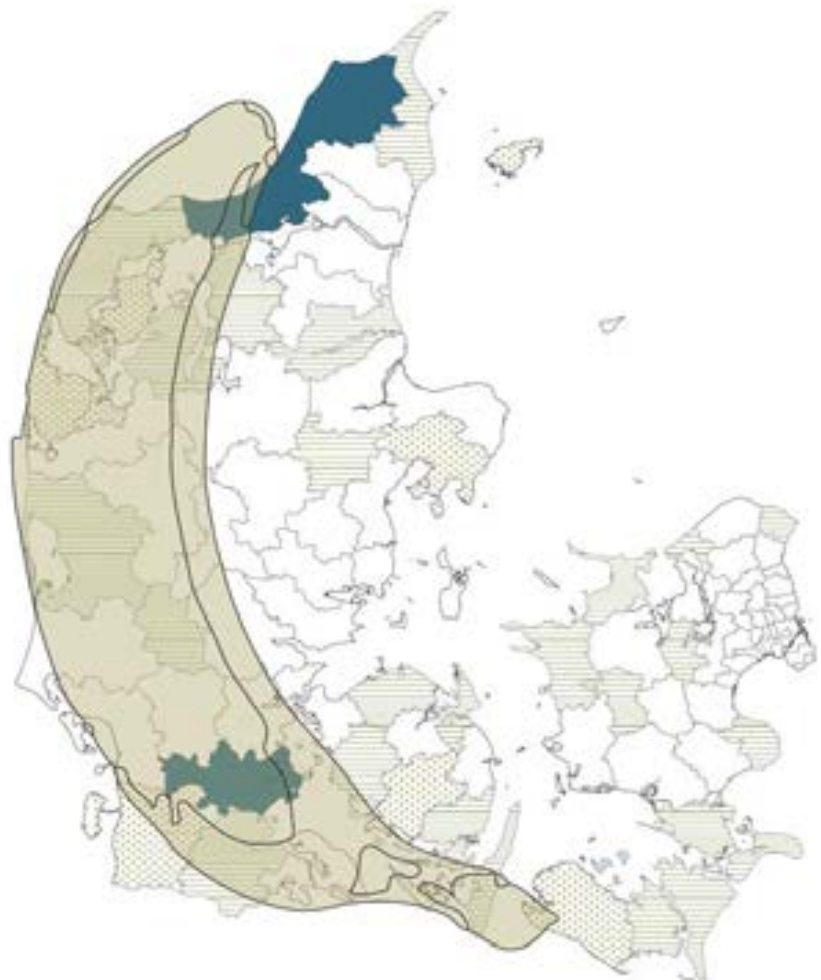


Illustration 29.1: Location of the “Rotten Banana” in Denmark. (Dr.dk, 2013; Liv & Land, 2013)

Sustainable development

An interrelated complex global challenge

The world experiences climate changes; glaciers melt, increased temperatures, sea water rise and extreme weather (NASA, 2019). According to scientists the changes are significant since human impact since the mid-20th century has caused these (NASA, 2019; European Commission, 2019).

In 2015 United Nations introduced the 2030 Agenda for Sustainable Development, a plan for people, planet and prosperity (UN, 2019). The core elements of the agenda are 17 sustainability goals as “an urgent call for action by all countries” (UN, 2019). According to UN the 17 goals “are integrated and indivisible and balance the three dimensions of sustainable development: the economic, social and environmental” (UN, 2019). Working with the goals is a complex organism of among others climate, environmental degradation, sustainable cities,

learning and partnerships.

All member states in the UN adopted the plan, the culmination of a process building a global partnership for sustainable development (UN, 2019). However, since UN is a non-legislative organization the goals are declaration of intent thus the member states responsibility to legislate (UN, 2019).

The transition to a sustainable future is complex and comprehensive which the European Nations found to their cost when the countries were inca-

pable agreeing being climate neutral in 2050 (Altinget, 2019).

Sustainable development
According to the Sustainable Development Goals Index Denmark is the second best performing member state of UN however the performances in terms of life below water and responsible consumption and production are lacking (SDSN Index, 2018). In the Danish 2013 municipal finance agreement municipalities were forced to formulate a climate adaptation plan. However, the municipalities were



Illustration 30.1: The 2019 Climate March Copenhagen (Folkets Klimatemarchkbh.dk, 2019)



SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD



not enforced to evaluate or review the developed plans. Some are extraordinary ambitious; Copenhagen aims to be the world's first carbon-neutral city in 2025 (Københavns Kommune, 2019).

Despite initiatives across scales the contemporary de-

bate and bottom-up actions reveals an urgent management of sustainable development. In March 2019 a globally supported climate strike took place fostering the debate (Guardian, 2019).

Denmark is a country with many ongoing sustainable

initiatives however capable being more ambitious securing a sustainable future. This thesis aims to examine and utilize the sustainability goals in a physical design proposal.

Illustration 31.1: United Nations Sustainability goals (UN, 2019)

The need for nature

6000 years ago, humans started cultivating the landscape with farming (Skov, 2014). Humans have influenced nature ever since; more than forces in nature itself (Skov, 2014). Recently the world has entered a new era due to human-influence on the planet, named the Anthropocene Era (Antropocene.com, 2019). However nature has a crucial importance for human existence (Miljø- og Fødevarerministeriet, 2019).

Humans need nature

There is an evident relation between the condition of human health and a green environment; green environments are considered as mental pauses in the everyday life. Humans need these pauses. According to Natur & Sundhed it reduces stress and increases the physical and mental health (Natur og sundhed, 2008). Research reveals that if a person has green spaces within 300 meters from work or home, daily use is more likely. Thus,

implementing green environments in planning increase the usage and thereby the condition of health (Grahm & Stigsdotter, 2003; Hansen & Nielsen, 2005). Furthermore, three types of nature improve human creativity; peaceful, spatial and wild nature since nature is not “designed” for a specific purpose behavior (Videnskab.dk, 2015). Being in nature human behavior changes towards a more relaxed condition or “soft fascination” opposite to the constant awareness in the urban environment (Videnskab.dk, 2015).

New development praxis is needed to reestablish connection between nature and humans to develop cities adaptable to and with nature since nature is the foundation for quality of life in the cities (Andersson, 2019). It is the politicians, institutions, schools and peoples responsibility to implement nature for knowledge and experiences. Thus it

is important for human well-being to integrate nature in everyday life (Friluftsrådet, 2018).

Based on above-mentioned research it is reasonable to re-establish synergies between the humans and the grown to strengthen the health of human beings. This will be theoretical elaborated (see Value of nature, p. 57; Nature as foundation, p. 60).

Between fjord and sea

”The scent of seawater, wind in
my hair and sand between my toes.
The North Sea whistles; the fresh
air is good to me.

Here, walking through Svinkloves
Dune plantation to the soft sound
of the Lyme grass, the dunes prick-
ly sand drift, screams from the
seagulls and the happy buzz of
guests at the sea side hotel Svin-
kløv. Walking towards the surging,
powerful yet soft North Sea.

In the horizon skies melt with the
blue waves. The sun softly warms
my wind-blown skin.

Here I am alive”.

(Subjective experience of the Svinkloves in Jammerbugt Municipality)

A photograph of a road with cars driving towards the viewer under a cloudy sky. The road is a two-lane asphalt road with white dashed lines. A dark grey car is in the foreground, and a red car is further ahead. The sky is overcast with grey clouds. There are trees and grass on the left side of the road.

Chapter 02

Jammerbugt

The following chapter introduces the site Jammerbugt Municipality. This municipality is selected since the place is experienced double-urbanization as mentioned previously. The chapter will introduce the location, historical development of Jammerbugt together with the contemporary situation.



Illustration 35.1: Driving on Highway 55 northern direction

Jammer

(In English: misery)

When storms raged locals went to the coastline with flashlights. For the passing ships, these lights appeared as other ships in the same stormy situation on the water. Consequently, the ships sailed towards the lights to help thus caught in the shallow water by locals looting the ships. This resulted in great “jammer” or misery hence the historical name

(Visit Jammerbugt, 2019).



Illustration 371: Location of Jammerbugt Municipality in Denmark

Jammerbugt Municipality

Between fjord and sea

The Municipality of Jammerbugt is located in the Northern part of Jutland, Denmark. Approximately 38.000 people live in the municipality making it the 61. largest municipality in Denmark. The municipal amalgamation in 2007 merged the former municipalities of Pandrup, Aabybro, Brovst and Fjerritslev municipalities to Jammerbugt. (Jammerbugt Kommune, 2019).

Jammerbugt Municipality has an unique location between the Limfjord in south and sea of Jammerbugt in north. Due to the long and narrow shape of the municipality the distance from sea or fjord is nowhere longer than 15 kilometers (Jammerbugt Kommune, 2019).

Characteristic nature qualities and complementing functions attract tourists and visitors to Jammerbugt Municipality.

As a visitor you find dune plantations, beaches, forests, ice agic moraine hills and wet land. These unique landscapes are supported by functions as nature playgrounds, shelters, beach hotels and mountain-bike paths as well as hiking trails (See Analysis, p. 72)

The municipality is currently challenged being a small municipality with an increasing elder generation and changes in private professions from large towards small companies (See interviews, Appendix).

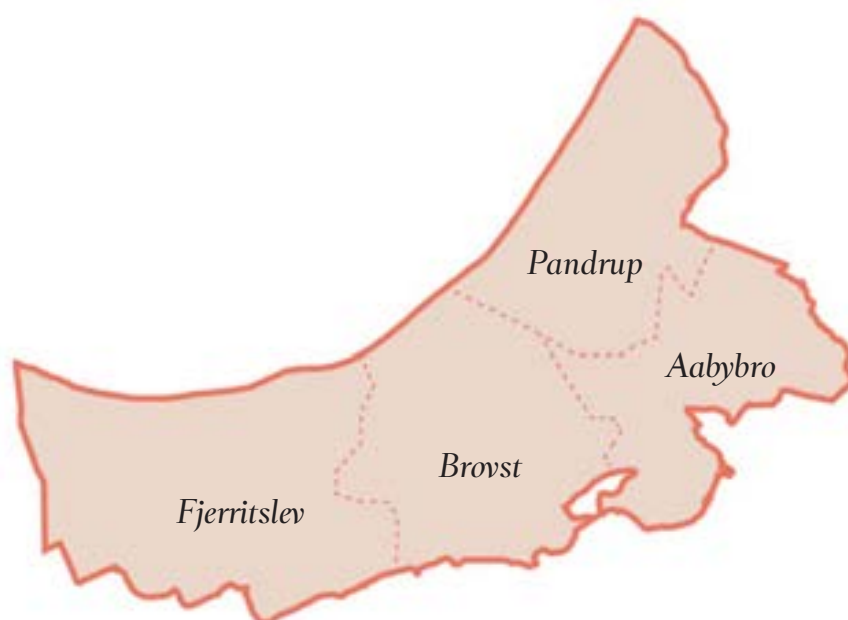


Illustration 38.1: Amalgamation in Jammerbugt Municipality where four municipalities merged into one.

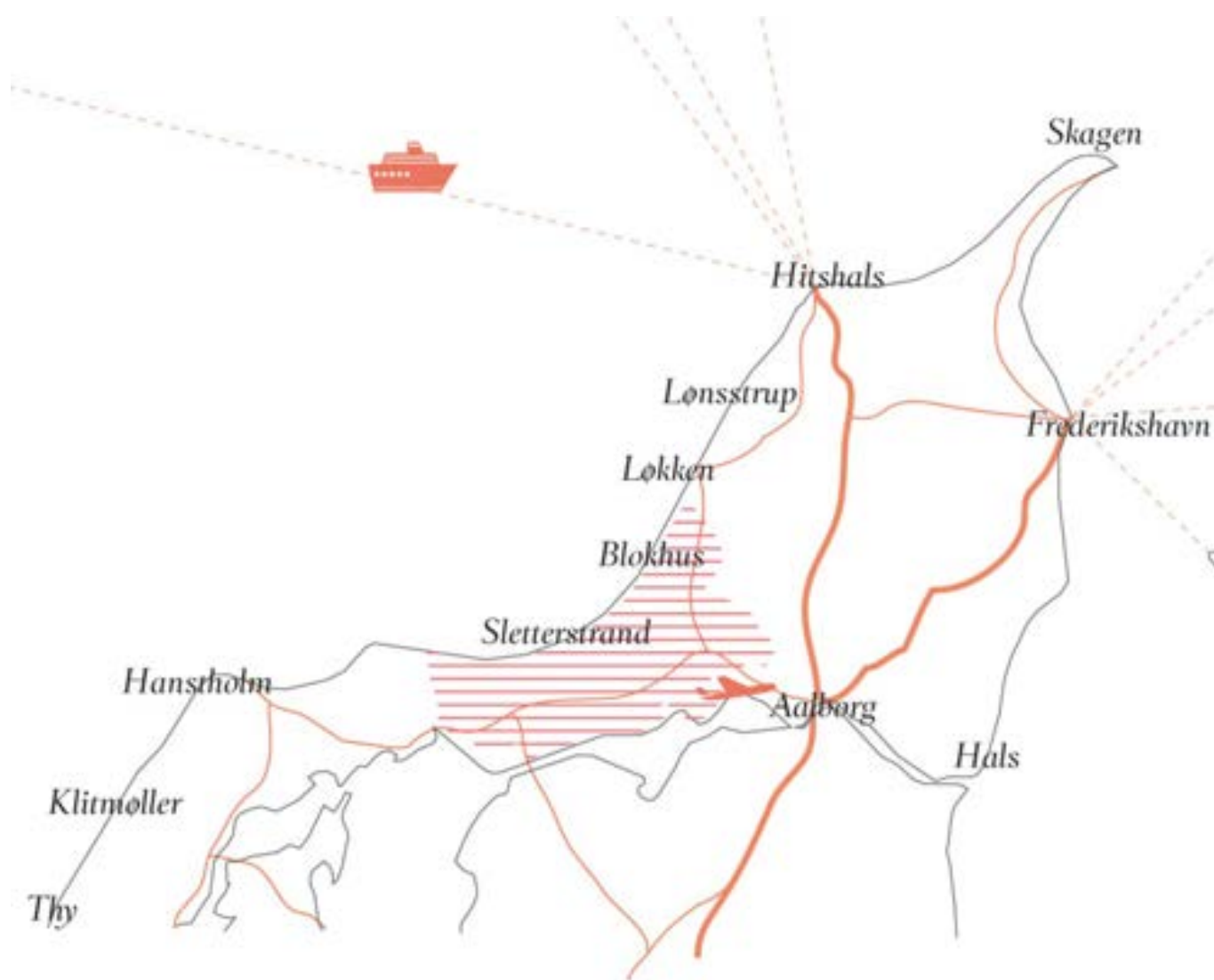


Illustration 39.1: Accessibility to Jammerbugt Municipality regionally, nationally and internationally.

Historical development

The following illustrations and text is based upon; Visit Jammerbugt, 2019; Den Store Danske, 2017; Visit Jammerbugt, 2019; Jammerbugt Historie, 2019)

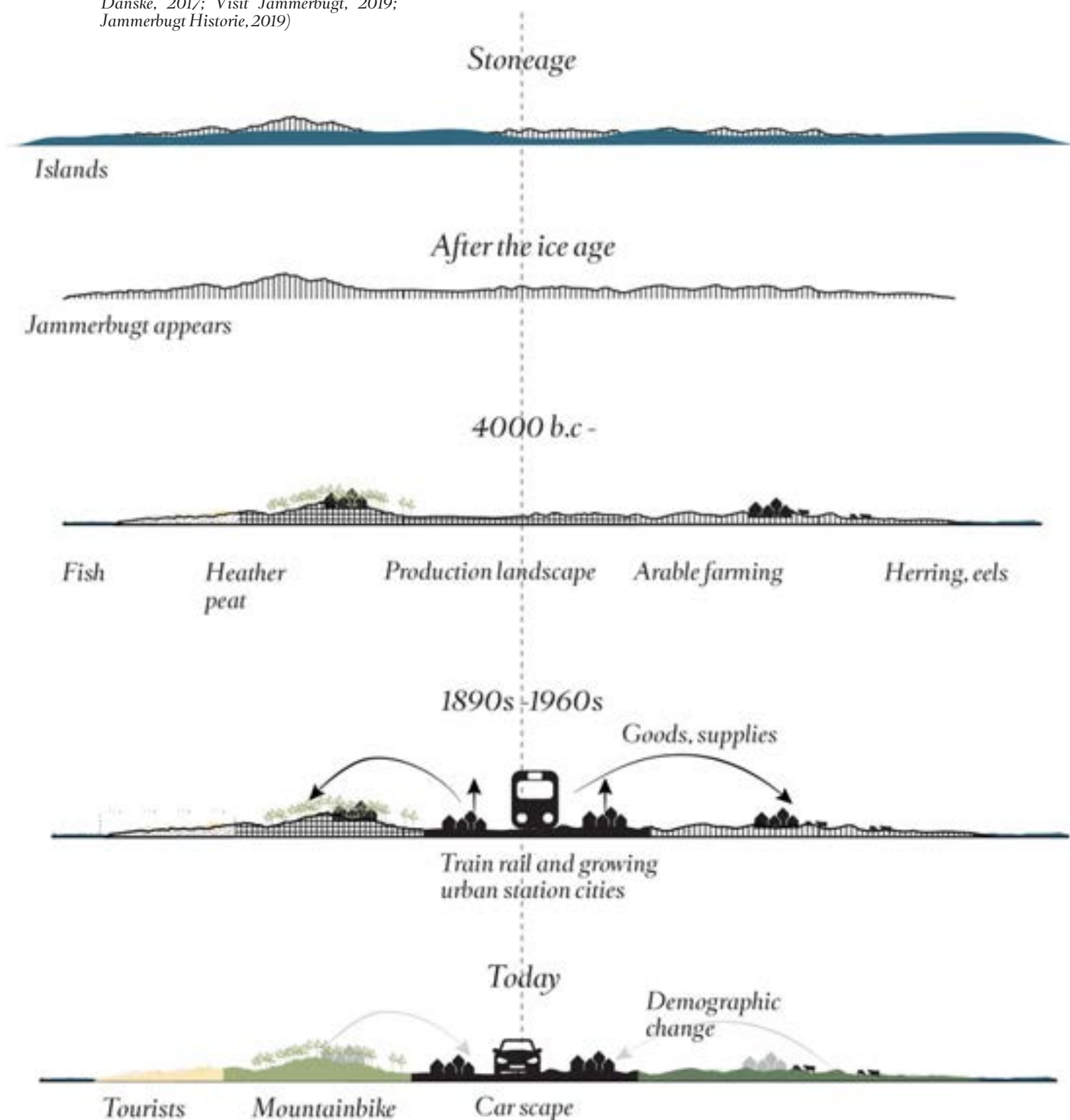
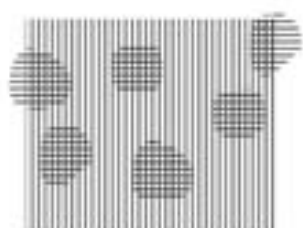


Illustration 40.1: Historical development of Jammerbugt Municipality



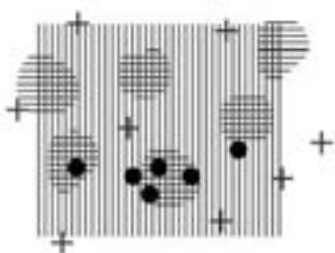
Stone Age:

During the Stone Age archipelagos appeared from the seabed in the area which today is known as Jammerbugt Municipality. The islands consisted of chalk and lime stone.



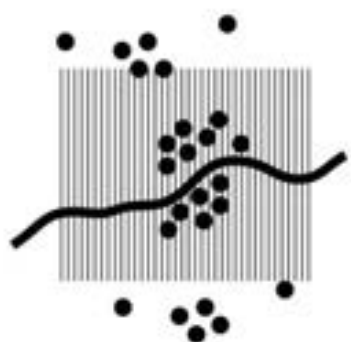
Post-Ice Age:

After the Ice Age the landscape raised, and the contemporary landscape was gradually created; the islands were connected by low meadows. The most notable historical landscape is Lien; a 65 meters hill elevating from Slettestrand to Tranum.



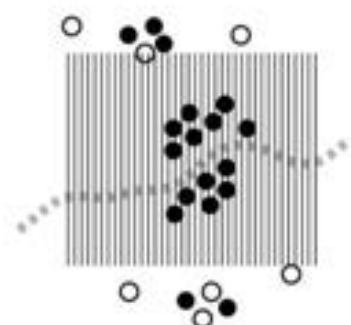
4000 b.c - :

The diversity of natural resources was an efficient foundation for farming and fishery. People were supplied with fish from the sea, peat from the heath and farming on the moraine in middle of the land. Between farmland large areas of wetland, pastures and marshland for peat cutting were found.



1890's constructing the rail way:

The rail way from Nørresundby to Fjerritslev opened in 1897 and in 1913 "The Fishery Express" from Aabybro to Hjørring opened. This generated growth and towns emerged with the rails as the pivot. Aabybro, Brovst and Fjerritslev operated as service centers. However, the rail ways closed in respectively 1969 and 1963.



Today:

The cities no longer serve as nodes for industry. Jammerbugt Municipality is influenced by demographic changes from rural to urban areas especially to the largest city Aabybro (See Political Structural Reforms, p. 26). Thus challenges the cities to maintain services and public functions. During the holiday seasons the area is an attractive destination due to nature qualities, Fårup Amusement Park and sea side hotels.

Illustration 41.1: Abstract interpretation of historical physical changes in Jammerbugt Municipality

The constructed landscape



The Ice Age influenced the soil layers in Jammerbugt creating moraine islands and a hilly landscape (Skov- og Naturstyrelsen, 2005; See Topography, p. 77 for further information). Gjøl and Øland were moraine islands surrounded by wetland and marsh (Skov- og Naturstyrelsen, 2005). However human cultivation later drastically changed the geog-

raphy of Jammerbugt (Skov- og Naturstyrelsen, 2005).

Before large damming projects were constructed the Limfjord almost reached the city of Brovst located in the middle of the municipality (See illustration 42.1). Until 1920 when the Øland-Attrup dam was constructed it was possible to sail cargo ship to Brovst serving

as a harbor city (See Analysis, Appendix; Hanherred, 2019). With the damming projects low-lying areas were transformed into land with drains, dykes and water pumps enabled usage and cultivation of the land. However, today this land is challenged by flooding and soil settlement (Jammerbugt Kommune, 2014).

Illustration 42.1: Map of Jammerbugt before damming projects

Current situation

The municipality is generally characterized by industry, farming and holiday “landscapes” for tourists in west while the eastern area occurs more urban with housing, retail and public function. The largest professions in the municipality are public institutions (2554 workplaces), retail (2406 workplaces), farming, forestry and fishery (1322 workplaces) and building industry (1257) (Jammerbugt Kommune, 2019)

Urban environments

When examining the four largest cities which likewise are the pre-amalgamation municipal centers; Fjerritslev, Brevst, Pandrup and Aabybro the three of the cities grow while Brevst is slightly shrinking. The eastern part of the municipality thrives being in the catchment area to Aalborg, the fourth largest city in Denmark. This area stretches from Aabybro to Blokhus named as the axis of growth (Interview-

ee 3, 2019) which mutually attracts private investors and citizens.

Demographic development

The movement of people to and from the municipality is currently in balance (Jammerbugt kommune, 2018). Thus, the experienced growth or decline in the specific town is affected by internal changes in the municipality. According to the Planning Department in Jammerbugt one reason can be found in new family structures contributing to an increase in humans living alone. Secondly it is caused by internal demographic changes denoted double urbanization in Jammerbugt this is especially in the axis of growth.

The municipality is currently planning building projects in Aabybro, Pandrup and Fjer-

ritlev and incorporate the knowledge of new family structures by constructing detached housing or apartments next to new housing areas. (See interviews, Appendix).

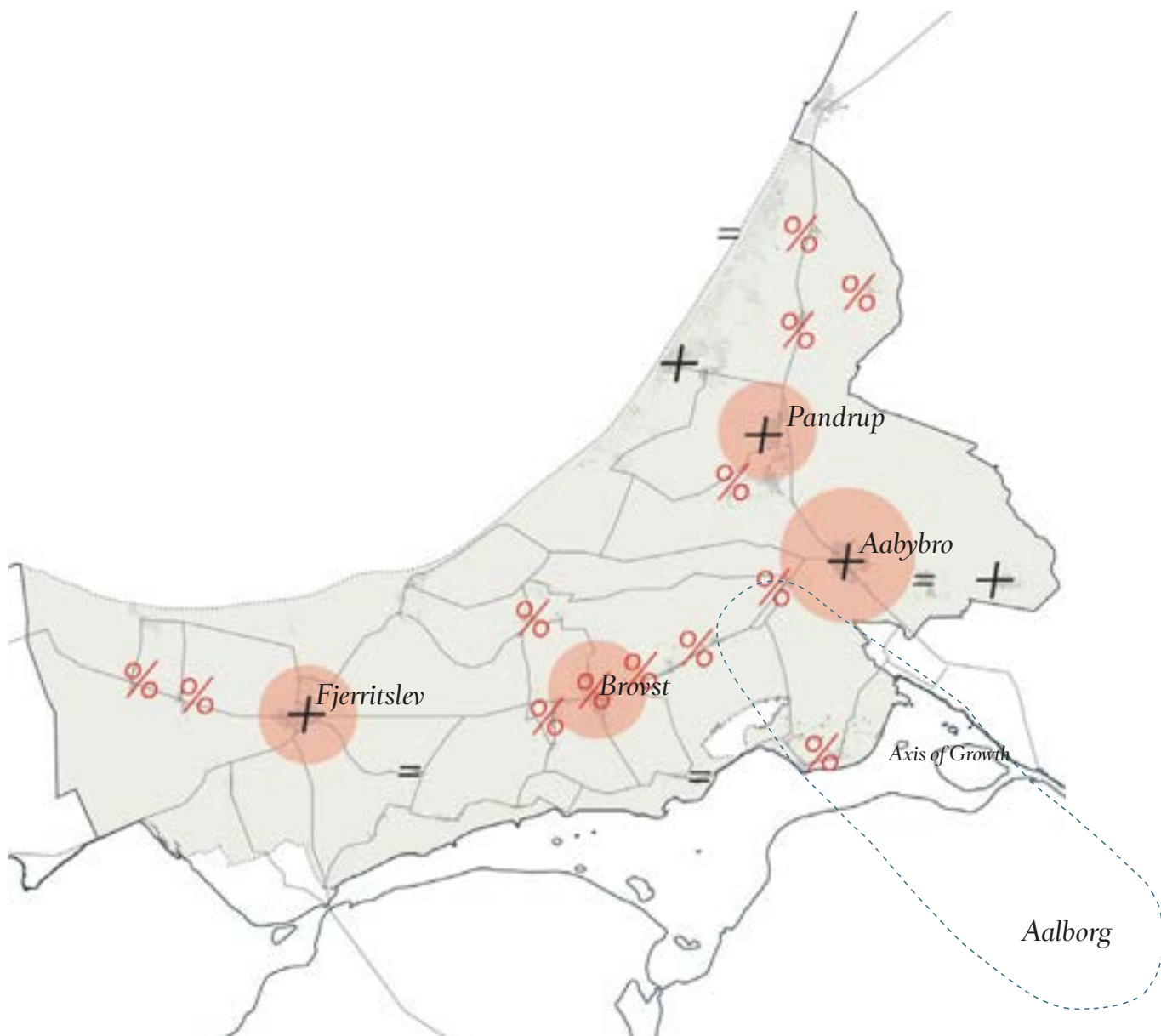


Illustration 44.1: Growing and shrinking cities in Jammerbugt

5 towns experience growth while 16 experience decline



Blokhus has the oldest population due to retirees moving to their holiday houses.



From 2010 to 2018 Aabybro has grown by 550 people and a certain amount of this caused by intern demographic changes



People age 24-29 and 60+ primarily settle in the municipality

Illustration 45.1: Growing and shrinking cities in Jammerbugt, based on empirical data (Danmarks Statistik, 2019)

Research question & objectives

*How can place-specific qualities
be utilized to develop Jammerbugt
Municipality adapting to
demographic shifts?*

We wish to critically review the theoretical relation between livability, urban transformation, the attractiveness of a place and value of nature.

Analyze the consequences of urbanization in the built environment and site-specific qualities in relation to nature, culture and activities.

Critically evaluate the perspectives of demographic shifts and climatic challenges within the municipality of Jammerbugt and the largest cities.

Synthesize the research findings to create a place-specific design to enhance a nature-based narrative in a municipality.



Illustration 47.1: Climbing the hilly moraine landscape of Klim for a night in nature



Chapter 03

Theoretical review

This chapter presents theoretical findings of growth and shrinkage in the urban environments, the attractiveness of a place and nature as the foundation to rethink design methods.



Illustration 49.1: Natural windbreak and snowy fields

Livability in the urban environment

In the following livability in public space investigated together with the experience of a place.

However what does livability actually mean? Partners For Livable Communities define livability as *“the sum of the factors that add up to a community’s quality of life - including the built and natural environments, economic prosperity, social stability and equity, educational opportunity, and cultural entertainment and recreation possibilities”* (Partners for Livable Communities, 2015). This understanding can be further elaborated by Appleyard adding human expectation to experiences and accessibility to urban spaces to the understanding of the term (Appleyard et al., 2014). Appleyard defines livability as; *“the accessibility people have to opportunities in and around the public realm (for commuting, work, education, rest, rejuvenation, etc.) to improve and/or maintain their desired*

quality of life” (Appleyard et al. 2014, p. 12). Appleyard argues that, the experience as the focus to improve quality of life. Furthermore the framework and conditions creating livability is an independent variable produced by planners, engineers and urban designers while quality of life is the output and a dependent variable (Appleyard et al. 2014).

Quality of urban spaces

Gehl’s observation of human behavior in urban space and the discovered patterns of behavior related to the surroundings and activities provided cannot be precluded (Gehl, 2010). According to Gehl well-functioning urban spaces invite to frequent and differentiated use such as travelling, stopping, resting and interacting as well as experiencing (Gehl, 2010). Urban space is the frame for people doing various activities in the same space. Gehl argues for the relation between the qual-

ity of urban space and activities in urban space; when the quality increases, the possibilities for spontaneous activities increases and thus social interactions (Gehl, 2010). In relation to this variety of overlapping activities are important for the safety of the urban spaces in the multi-functional city (Jacobs, 1961).

Atmosphere of urban spaces

To explore the experience of a place beyond physical and logic explanation the term atmosphere is introduced.

Atmosphere articulates perceived qualities of spaces and produced deliberately through characters of arrangements, but only defined through the eyes of the perceiving subject. The aesthetics of atmosphere mediates between objects and subject. (Böhme, 1993). It is an “in between”-phenomenon difficult to grasp; it fills spaces and emanate from things, constellations of things, and

persons leaving the subject with a certain emotional impression of a place (Böhme, 1993).

Atmospheric qualities as natural materials such as stone, brick and wood expresses age and accumulated history through the natural process of patina. Multi-sensorial qualities activate inherent senses of sight, smell, taste, touch and sense of movement (Pallasma, 1996). The relation between subject and object is necessary for the experience of atmosphere.

The notion draws parallels to Appleyard arguing that a positive impression of used urban space will improve life quality (Appleyard et al., 2014). Furthermore, urban spaces can invite humans to perform various activities, which creates a relation between the subject and object. In that relation, it is possible to inculcate a certain emotional impression of

the place.

The notion of livable urban spaces and atmosphere are crucial for quality of life. As urban designer it is our responsibility to learn from this and create the framework for

a sensorial experience of the place. The notion is applied to this thesis to design according for human experiences and sensorial apparatus to enhance quality of life.



Illustration 51.1: Impacting factors for quality of life in urban spaces

Shrinking cities

Articulating urban decline

Urban shrinkage occurs as a worldwide tendency related to demographic shifts in the society (Ganser and Piro, 2012). Shrinking cities is introduced as a notion to understand an urban phenomenon of decline.

The notion of “*shrinking cities*” originates from the German “*Shrumpfung Städte*” focusing on demographic or economic decline by various reasons. The phenomenon has been articulated since the late 1980’s in relation to urban growth, stagnation and decline. Shrinking cities thus emphasizes a polarization of urban development (Laursen, 2009).

The term “*shrinking cities*” simplifies the complex and dynamic process of urban development “*simultaneously a presupposition, a medium, and an outcome of continually changing social relationships*” in the urban environment (Haase, 2004). The phenom-

enon focuses on demographic decline however not the dynamic processes behind the phenomenon in the affected urban area (Ganser and Piro, 2012).

Urban decline occurs as an universal phenomenon though shrinking cities do not follow the same patterns of decline (Haase, 2004). Every shrinking environment can experience an exceptional example of decline. However can be argued that city shrinkage outlines a simplified understanding of demographic and economic development in the urban fabric.

non thus articulates a simplified negative perception of an urban condition. Thereby not addressing the nuances of urban development apart from demographic and economic challenges. The term must be processed when utilized in spatial planning for a holistic and nuanced development (Haase, 2004). Challenges related to shrinking cities are likewise a potential to rethink and optimize land-use in areas experiencing decline (Ganser & Piro, 2012). This will be further elaborated on the next page.

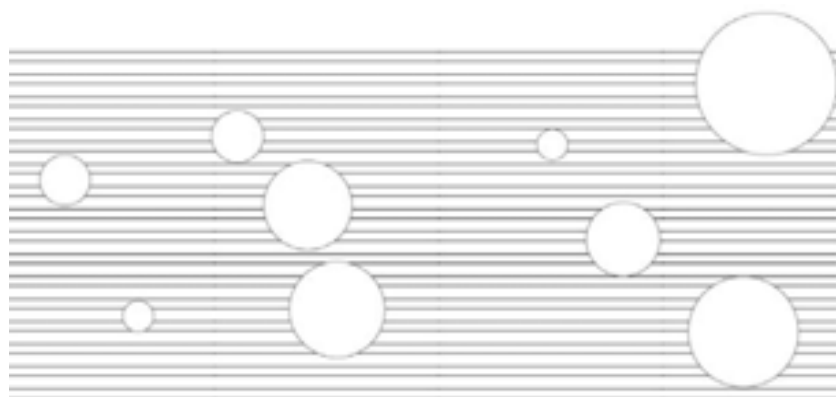


Illustration 52.1: Abstract interpretation of a shrinking city

Urban transformation

Addressing the parallel occurrences of urban growth and decline

Since the notion of shrinking cities is found too narrow capturing shifts in the built environment the following addresses parallel patterns of growth and decline. Laursen argues that *“shrinking cities lack considering the urban growth when describing an urban condition”* (Laursen, 2009). Shrinkage in an area occur as a dynamic growth and decline pattern and not as a coherent decline condition as *“shrinking cities”* simplifies it as described on the previous page (p. 41).

Accordingly the overall decline in the contemporary urban process occur in a highly differentiated manner on local, national and international scale where increase and decrease happens extremely close. A similar situation can be found in a generally growing area with decline within the analyzed area. Processes of growth and decline are thus a dynamic interconnected

phenomenon and the processes of development are difficult to separate (Ganser, Piro, 2012). Accordingly, Laursen introduces the term *“urban transformation”* to articulate simultaneously shrinkage and growth in urban areas utilizing a neutral terminology (Laursen, 2009, p. 101). The term *“urban transformation”* is applied to examine a differentiated and holistic focus on local development in rural districts.

Changes in the urban fabric are dynamic as an ever-changing and transforming organism. Urban transformation often refers to physical transformations in the urban territorial of either positive or negative character. However, the term can be used to describe demographic, social or perhaps economic transformations within an area (Laursen, 2009). Hence, nuancing the perception of transformation however the term does not specify the given factors effecting the

“Urban transformation is a term that includes both urbanization and de-urbanization that is urban growth as well as negative urban development” (Laursen, 2009).

change.

Furthermore, urban transformation cannot be regarded as an isolated phenomenon within one urban territory since the transformation might occur across spatial defined territories. *“the physical demarcation between specific areas is more fluid in this urban landscape where the boundaries between areas are blurred, both in relation to growth and decline and to urban and landscape”* (Laursen, 2009, p. 183). Hence, urban transformations take place across existing political and structural borders.

The transformations can be influenced by external economic, political and centralization forces strengthening the experienced transformation hence described in the municipal amalgamation paragraph (Political Structural Reforms, p. 26). Thereby, the term reflects the dynamic patchwork of transformations in the urban fabric across fixed territorial boundaries.

Since growth and decline happen dynamically on various scales from global to local the phenomenon reveals a potential to examine more holistic approaches to articulate urban development (Ganser, Piro, 2012). As mentioned in the introduction (Double-urbanization, p. 24) this thesis addresses “double-urbanization” referring to dynamic demographic shifts in the municipality (Realdania, 2017). Urban transformation states growth and decline tendencies in society, yet it can be

criticized being too broad addressing every transformation in the urban fabric. On the other hand it can be argued that “double-urbanization” is too narrow solely outlining local demographic changes. Despite these limitations, the term “urban transformation” is used to theoretically articulate and understand patterns of territorial growth and decline experienced in Jammerbugt Municipality. When combining the theoretical knowledge of various “urban transformations” and empirical data of demographic changes

learned from “double-urbanization” a nuanced picture of inter-linked transformations in the urban fabric in rural areas can be articulated. Urban transformation is thus a manner to address territorial changes leading to new transformations or mutations of the urban environment. (Realdania, 2017; Morales, 1996; Laursen, 2009)

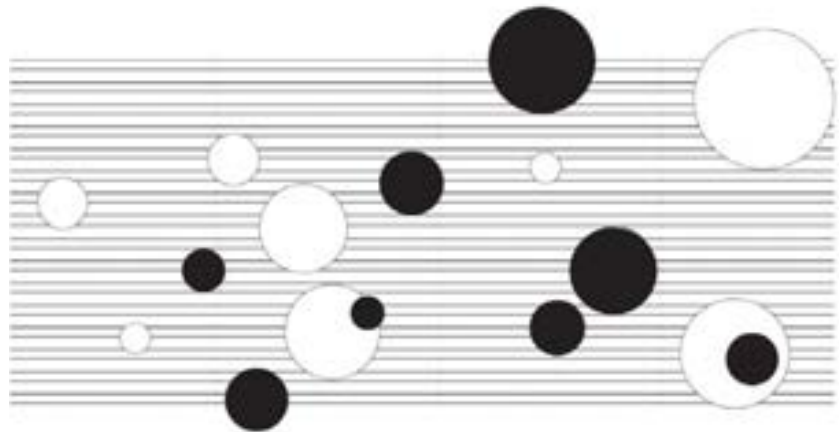


Illustration 54.1: Urban structural transforming. Growth and decline occur within the same district.

Sticky & slippery places

What is it that makes some places more interesting than others?

Urban transformation described simultaneous growth and decline. The following paragraph investigates theoretically what makes a place attractive. In order to articulate and distinguish between attractive and unattractive places the terms “sticky” and “slippery” places are introduced (Laursen, 2009). The terms do not articulate growth nor decline instead the value of the place and ability to attract and keep firms at the place (Marcusen, 1994).

When referring to places of value these are referred to as “sticky” since it is attractive for firms to stay or difficult to leave the places. “Sticki-

ness connotes both ability to attract as well as keep, like fly tape, and thus it applies to both new and established regions” (Markusen, 1996, p. 294). On the other hand, some places can be described as slippery. Here referring to places easy to move out of and into another place when any new candidate might appear. From an economic perspective Marcusen argues that places need to have or develop the glue that makes small firms stay, difficult to leave or encourage the firms to stay and expand in order to become a sticky place (Markusen, 1996). The same is arguably the case from a planning perspective when referring to the attractiveness of a place for new or existing citizens, visitors or tourist (Laursen, 2009, p. 94).

This thesis contests that “sticky” and “slippery” places likewise can describe places in the city with abilities to create the “glue” encouraging people

to stay or move to the place (See illustration 55.2, p. 55)

The transformation of rural areas towards a sticky place is interesting when examine the fragmentation following urbanization with growing centers and declining rural areas. Imagine a place capable of “filling the gaps” with attractions to the strengthened stickiness of the place. This can potentially prevent citizens in rural cities and districts from leaving the area. “An intriguing question is whether regions are capable of maintaining their stickiness by transforming themselves” (Markusen, 1996).

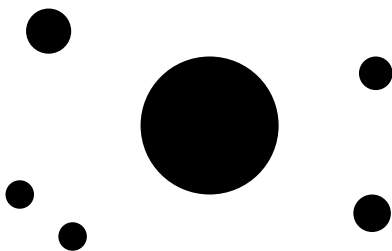


Illustration 55.1: A slippery place people are leaving

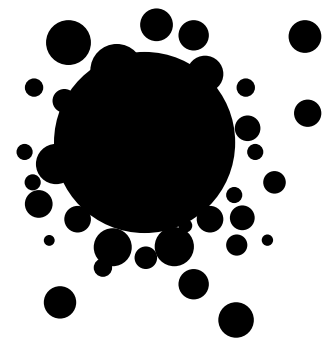


Illustration 55.2: A sticky place people are attracted by

A sticky place

People are moving to Cold Hawaii

In relation to sticky places it is interesting to examine Klitmøller, a small windy city located on the Jutlandic West Coast. This case serves as a best practice example of local transformations grounded in local resources, collaborations, impassioned stakeholders and a strong narrative.

Klitmøller has since 1970s experienced decline in fishery industry challenging the local community. Surfers introduced a new identity as the wind sport mecca “Cold Hawaii” which became the survival of the area. This transformation did not happen without contentions between the community and the surf enthusiasts. However, the local surfers initiated a masterplan to integrate the identity in the community. The plan consisted of three parts; an annual event with point of departure in surfing, an alternative settlement strategy including surf and establish an

educational opportunity with surf (Nordjyske, 2019).

Today approximately 10% of the 800 citizens have moved to the area because of the surf environment (Realdania, 2012). The population increases quite a lot in high season when the waves murmurs and allure visitors. This has a positive impact locally where the creative environment according to the citizens has transformed Klitmøller into a small metropolis (Nordjyske, 2019). Local stakeholders in the surf environment has created a community house (See illustration 56.1) and co-work spaces

for long-term surf tourist to retain potential citizens. (Realdania, 2012).

The bottom-up brand “Cold Hawaii” is crucial for Klitmøller and the surrounding area for a positive development. Stakeholders have created an attractive place for tourists, locals and potential citizens. The development of the area turned from being a declining “slippery place” based on fishery to a “sticky place” with education, cultural and urban feeling (See Sticky & slippery places, p. 55).



Illustration 56.1: The surf club “Lobster House” in Klitmøller, a sticky place (Archdaily, 2012).

Value of nature

The stickiness of Klitmøller takes point of departure in site-specific qualities in nature. The following reflect upon nature as an aesthetic and sensorial quality for humans to understand and process the attractiveness of a place.

2000 years ago the ancient philosopher Lucretius fabricated how nature awakens our senses; wind lashes the ocean and overwhelms vast ships and scatters clouds, and how humans smell manifold scents of things without descry coming to the nostrils, and feel warm and cold, but cannot grasp it. The same is experienced with sounds (Bailey, 1910). The existence of invisible particles in nature awakens senses and must consist for human to be touched

The aesthetic of nature

The term “*aesthetic*” originates in the late 18th century from

Greek and is a composition of the words; *aistheta* “*perceptible things*” and *aisthethai* “*perceive*”. The term relates to an object perceived by the senses of the subject. Being aesthetic means “*giving or designed to give pleasure through beauty*” (Oxford Dictionary, 2019).

Genius Loci

Nordberg-Schultz argues that creating aesthetic surroundings is the foundation for a meaningful world for humans; utilizing the unique qualities of a place; known as “*genius loci*” (Nordberg-Schultz, 1979). The natural landscape; the topography, vegetation and climate framed his work (Hvattum, 2010). Thereby aesthetic can be perceived as inherent in nature. Genius loci of the place can be manifested physically by translating the natural character of the place to a cultural condition architecture can contribute to create a meaningful world (Nord-

berg-Schultz, 1979).

Human disconnectedness

The above mentioned articulates how nature is a basic and fundamental element of human and through nature and from here design aesthetically and activate senses in humans.

Nature is a fundamental human need “*we are connected to it, and we constantly become more aware of the absence of it [...] the intuitive understanding of being part of a large organism*” (Thomsen, Flemming Rafn, 2019). Thereby, an urgent demand to reestablish connection between human and nature to enhance inherent qualities in nature for human livability.





Illustration 59.1: Fosdal forest plantation

Nature as the foundation

Cities, where most of the world's population lives, is centered around built structures thus "*disconnecting us from the natural environment which is our foundation*" (Andersson, 2017). The following examines "*Process Urbanism*" an approach and method to enhance sustainable development of natural and urban environments.

The world's limited resources and increasing urbanization require alternative design approaches to rethink the planning practice (See Sustainable Development, p. 30). The complexity of urban relations demands equivalent complex perspectives and answer to address contemporary conditions and future possibilities. Urbanism can be seen as contradicting to ecology but the urban can be more sustainable than today – a complementary relation between the grown and built (Andersson, 2014).

Developing the urban fabric demands a sensibility with capacity to incorporate and meet conflicting conditions between ecology and urbanism. This is the territory of nature-based methods including a relation and holistic approach to ecological challenges (SLA, 2010; Mostifavi, 2010). The method "*Process Urbanism*" is based on systems of nature where the process-related, changeable and unknown is central in the creation rather than the aesthetics - just as in nature (Andersson, 2012). Learned from these processes the process urbanist design nature and city as a unit to supplement one another as two elements that can and should co-exist (SLA, 2010; Andersson, 2012).

Learning from nature

Nature consists of invisible as well as visible dynamic processes existing in urban and rural environments. To learn from nature demands a holistic approach focusing on bio-

diversity with key features as changeability, development and precaution depending upon place-specific traditions of practical knowledge and flexibility to respond to a network of physical and non-physical variables (Mostifavi, 2010). Being flexible is the constant change from change from one state of instability to another where the ability improves through practice and repetition of habits and flexibility. The habits thereby allow conditions of instability and change creating new ideas as the process (Mostifavi, 2010).



Illustration 60.1: Complex and dynamic processes of nature

Rethink design methods

To develop a method to rethink urban environments in an ecological sustainable manner the existing planning practice can learn from the processes of nature – “*how it works not how it looks*” (SLA, 2010). The processes of the natural ecosystem are adjustable, balances and develop. The city can be regarded as one coherent eco-system integrating various structures (blue, green, infrastructure) working across the single structures (Andersson, 2012). Nature should thus not be protected from the city but cooperated with the city to create a new expression and aesthetics (SLA, 2010). Accordingly, that rethinking the urban potentially answers and transforms norms and affects the city such as geography, weather, smell, sound and pollution since “*the unit of survival is organism plus the environment*” (Mostifavi, 2010)

A matter of scale

An important aspect of ecological influence on the urban environment is the processed scale. The framework to develop a sustainable and holistic must work in every scale from small and large scale however how does this affect the city is designed? (Mostifavi, 2010). According to process urbanism interaction between vegetation, buildings, microclimate can be designed to manage water, increased biodiversity, cooling to replace air condition, sewers and maintenance on a small scale (SLA, 2012). In a large city scale reorganization of park for interaction between the built and grown can enhance performative urban nature and increase sustainability. Furthermore, the city can be regulated according to processes of nature creating process plans rather than a fixed masterplan. Thus, create flexible plans replacing rigid structures with an increasing “*ad hoc*” approach (SLA, 2010). This will ultimately en-

“The grown is first and foremost nature, which is the basis of our existence; but the grown is also the creative force, which nature inspires us humans to set free, when we allow ourselves to come into contact with natural resources.” (Andersson, 2016)

tail a greater impact than the designed physical boundaries.

Thereby process urbanism is a method to transform urban territories towards an ecological sustainable future. The method respectively state contemporary challenges to create a tangible method learned from nature and the processes of nature. However, the method might likewise be applicable in areas challenges by urban transformations to among other thing densify declining places, enhance livability and the perception of the place (See Urban Transformation, p. 53; Livability in the urban environment, 50).

Theoretical remarks

Findings and thoughts

Through literature studies the theory concerning urban territories attempts to simplify and polarize the state of the territory. It is not possible to address merely the growing urban territory or the shrinking territory without nuancing the picture of development in the urban fabric. Contrary it is necessary to investigate urban transformations as complex and dynamic depended upon innumerable parameters. Frequently growth and shrinkage happen side by side.

The city can be regarded as an eco-system constantly changing and developing. Thus, there is a requirement for a holistic and processual approach to think future urban realms to develop and create experiential and livable cities. To learn from nature and the processes of nature can be a methodologic tool to create and process this. Concurrently enhance biodiversity in the urban fabric and the coher-

ence between the built and the grown across scales. To humans this method can generate the foundation for community, sensorial experiences, safety and social affiliation.

The above-mentioned present a method to develop attractive environments to maintain and invite humans. Developing attractive cities revolves around the quality of the urban realm however likewise the aesthetic experience and place-specific atmosphere. Consequently, enhance the “glue” that compose the stickiness of the place thereby strengthen the individual experience of the place and generate the experience of life quality.

This literature study has given a theoretical understanding of the complex and dynamic development of the city while addressing crucial factors for human state of health in the urban environment. To proceed this knowledge regarding

processes of nature has given an understanding of tools and processual considerations when creating urban environments for humans, the grown and the built. This can create the previous mentioned stickiness making people stay. This thesis seeks to identify, enhance and strengthen this.

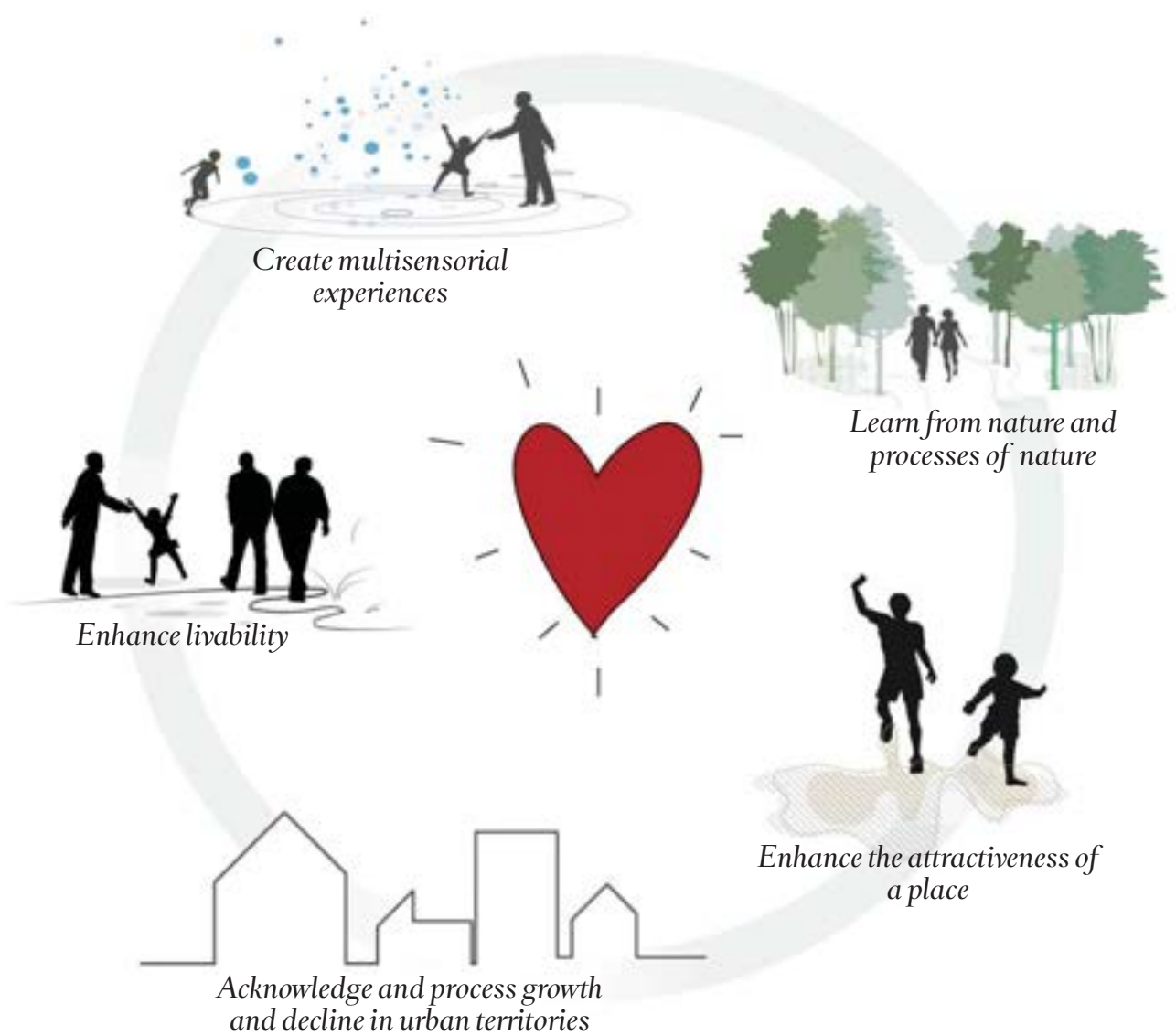


Illustration 63.1: The preliminary conclusion is to focus upon the grown, humans and the built.



Chapter 04

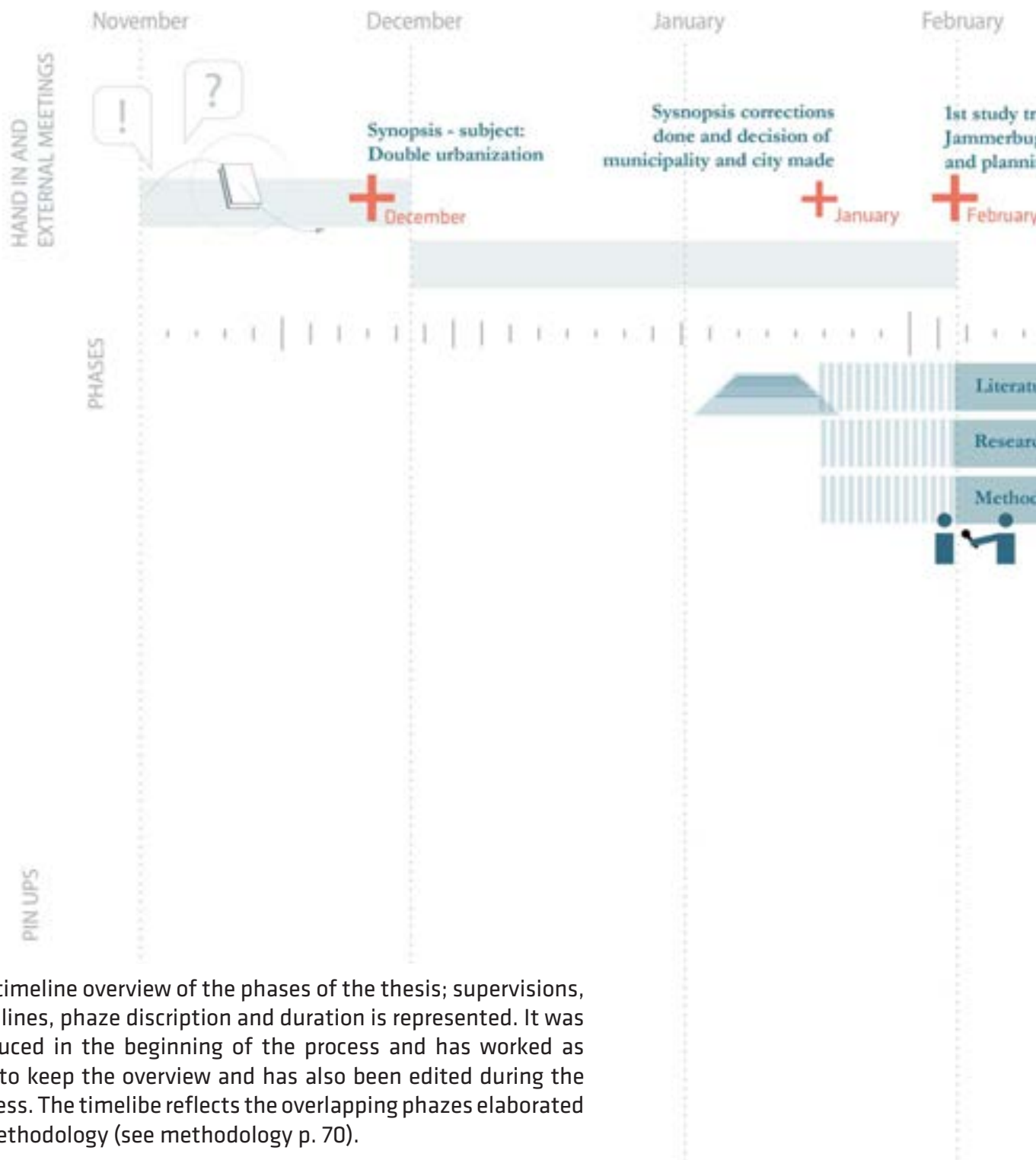
Methodology

In this chapter the process timeline for this thesis and the applied methods are presented. The chapter will introduce methods applied for the process for this thesis, during three site visits in Jammerbugt Municipality and methods applied to conducted interviews.



Illustration 65.1: The entrance to Hune Get Away a clearing with activities for everyone.

Process timeline



The timeline overview of the phases of the thesis; supervisions, deadlines, phase description and duration is represented. It was produced in the beginning of the process and has worked as tool to keep the overview and has also been edited during the process. The timeline reflects the overlapping phases elaborated in Methodology (see methodology p. 70).

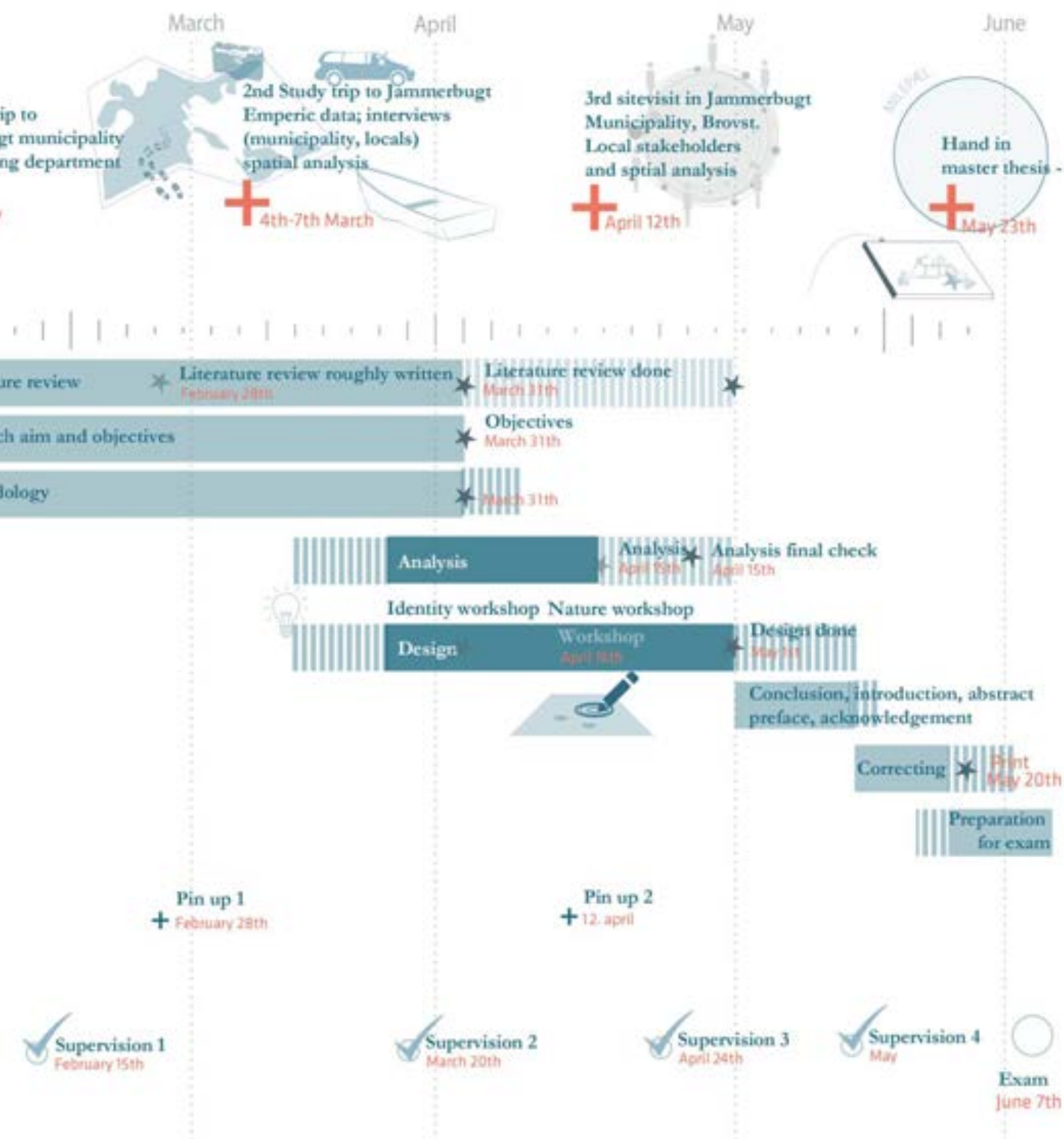


Illustration 671: Process timeline

Methodology

An inter-linked design process

The applied methods for the process of this thesis can be divided into six phases; initial phase, desk study, analyzing, sketching, synthesis and presentation. The Integrated Design Process (IDP) is used throughout the creation of this thesis (Knudstrup, 2004).

During the process as the project evolved and new information was gathered, reviewed, analyzed and synthesized new questions or topics of interest emerged thereby the need to revisit previous phases to refine conducted work and research question.

In the *initiate* phase the group searched for information, themes, topics and data of interest for the thesis. During this phase the group found the Danish philanthropic association Realdania campaign “*Hovedbyer på forkant*” encouraging rural municipalities to apply for funding for site-specific development of the municipal main city (Real-

dania, 2018). Here, the theme for this thesis occurred. The group focused on simultaneous the main cities experiencing population growth and anchoring the surrounding nature. Since the site is located in Denmark, the group went on three field trips with various foci; first impressions, comprehensive analysis and interviews and a finally collecting missing information.

In the phase of *desk study* the group was in a possession of an extensive amount of data from the initial site visit. With this information and through literature reviews the group was capable of defining the problem, establishing a research question and select methods for later field work.

The *analysis phase* was initiated by a field trip where spatial mappings, semi-structured elite interviews and narrative “people-on-the-street” interviews were conducted (Kvale, Steiner, 2007). The field work

gave the group new information and in-depth understanding of potentials and challenges. After the field trip the group analyzed collected information and interviews. More information regarding the theme was needed for the thesis to evolve, previous phases was revisited as a part of the cycle of continuous refinement for a new understanding.

Based on knowledge from previous phases the group started *sketching* the design proposal. Throughout this phase design workshops were held including brain storm, sketching and modelling. Ideas emerged continuously reflected, developed and previous phases revisited hence the integrated approach.

Following this desk studies, analysis and new information was *synthesized* and finally the proposal was *presented*.

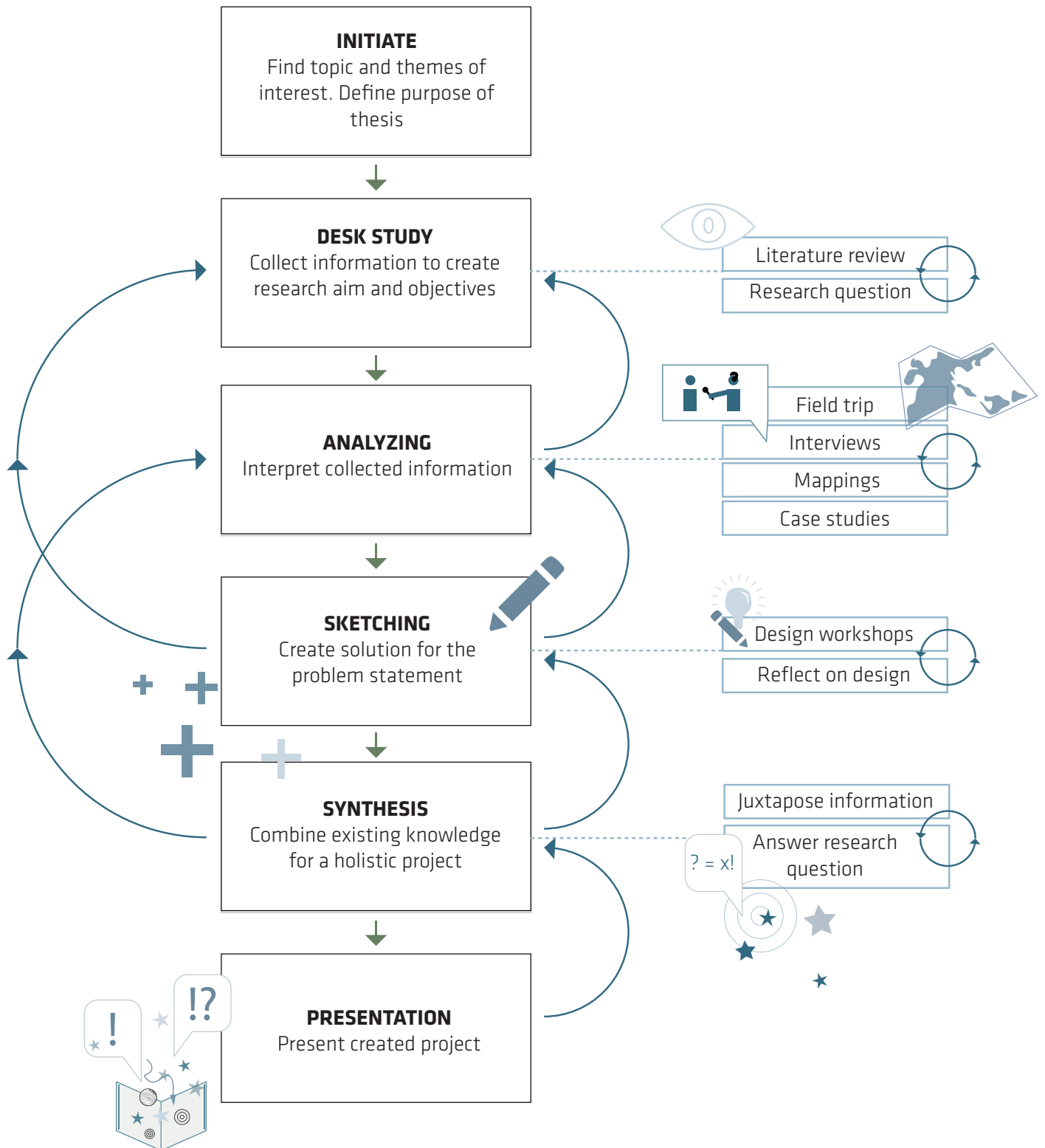


Illustration 69.1: The applied methodology to this thesis (based on the Integrated Design Process, Knudstrup, 2004)

Method for fieldwork

Spatial mappings

The qualitative empirical method identifies significant distinctions, aspects and terms regarding the actual characteristic. The method is applied as phenomenological mappings of subjective observations. The phenomenological mapping has three fundamental strategies; the description, interpretation and deconstruction (Keller, 2006)

The quantitative cartographic method is used to map and evaluate the form and the visual qualities of the city. This method enables the collection of data and the systemization of it. (Lynch, 1960)

For site visits experiencing a place in motion reveals aesthetics of the roads; appearance and what it implies for their design. Thus address the meaning of visual sequences for the observer in motion (Lynch, 1965). Motion, space and views are organized

creating a specific experience. The frequency by which the user drives on the road effects of the experience. Experiencing a landscape from the car dilutes smell, sound, sensation solely framing the vision. This is an inactive way of perceiving the place however also a way of focus (Lynch, 1965).

Applied methods

The mentioned three methods approach the environment differently therefore complement each other in the process of achieving a sufficient understanding of Jammerbugt. Mappings were conducted during site visit in Jammerbugt Municipality to examine inherent characters such as the experience and the feelings of the cities, the landscapes, the roads and the contrasts. The subject's body provided as senses apparatus and the experiences were captured in photography's and sketches.

During the fieldtrips, the group were inspired by Kevin Lynch's method separating the layers of the landscapes to examine the place and collected unique characteristics (Lynch, 1965; See Analysis, p. 72). Layers of components were reconstructed in analysis to systemize conducted empirical data in graspable thus useable layers for further exploration.

During the three site visits the group drove through various landscapes however this experience only simulated the eye having a different speed than the moving body. Characteristics of the landscape was framed focusing on physical formations. Contrasts and scenic views awakened the senses while others are experienced dull and monotonous. Each experience where different; seasonal changes, specific theme occurred and knowledge obtained (Lynch, 1965).

Method for interviews

Elite and narrative conversations

Interviews are effective instruments to achieve a detailed understand of an opinion, experience or notion. An interview can be conducted utilizing various procedures however some guidelines can ease the process (Kvale, 2011). This thesis conducted interviews utilizing three different methods; semi-structured elite interviews, semi-structured narrative interviews and informal interviews.

Semi-structures interview is a method having a given amount of questions for the interviewee to be answered however the order can vary and follow up questions might occur. Thus, an opportunity to control and maintain liberty during the interview for changes (Kvale, 2011). Both the narrative and elite interview where conducted as semi-structured interviews.

The narrative interviews focus on the subject's story. One

question leads to another thus achieve a thorough and personal interview (Kvale, 2011). The elite-interview is an interview with a profession who is an expert in a given subject thus having a powerful position. To improve the conversation the interviewer must communicate on a professional level and ask professionally relevant questions to gain knowledge and insight into the given subject (Kvale, 2011).

The applied method

Focus for the interview was to ask understandable and open questions and listen to the interviewee. Thus, the interviews were informal and developed spontaneous.

The interviews provided authentic information to identify and broaden the horizon of the field of investigation. The aim was qualitative interviews with a limited amount of persons with various backgrounds not considered representative for the population.

The conversations varied between elite-interviews with professionals and narrative interviews with citizens. To ask relevant questions it was essential to examine the contemporary situation in Jammerbugt Municipality before the interviews. The narrative interviews focused upon their personal experience.

The interviews were compiled and summaries can be found in appendix and local narratives in the report (See Perspective on Jammerbugt Municipality, appendix; Perspective on Jammerbugt, p. 102). The summaries are thematized to create an overview .



Chapter 05

Analysis

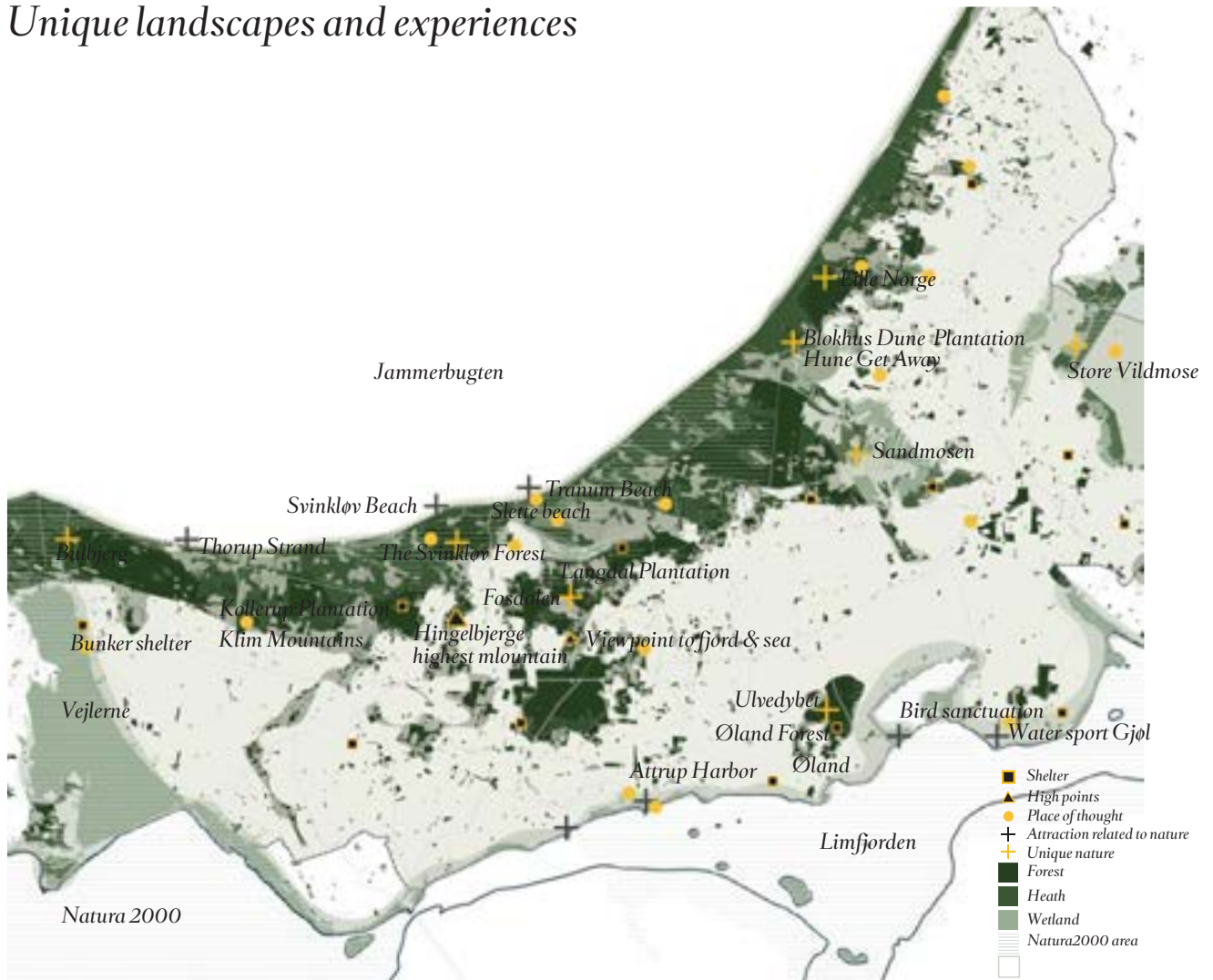
The following chapter analyzes and processes potentials and challenges found in Jammerbugt Municipality conducted in cartographical and phenomenological analysis. Results and findings will be discussed in the chapter remarks.



Illustration 73.1: The Cinema in Pandrup

Green structures

Unique landscapes and experiences



Landscapes and supporting functions are mapped to examine the quality extension of nature. Public accessible green structures are located along the edges of the municipality most present along the bay (Jammerbugten). In nature visitors can experience Ice age terrains, white beaches, cultivated dune plantations, a bird sanctuary and forests. A range of activities including hiking and mountain biking routes, shelters for a stay, viewpoints and natural playgrounds can be found in the landscape. The usability and activation

of the nature is a continuous process by the municipality and citizens which culminated in 18 “places for thought” selected by citizens marked with yellow circles (See illustration 74.1). The map reveals the diversity of nature and a range of functions which is a valuable quality for Jammerbugt however large areas inland are non-accessible production landscapes. The green structures reveals a potential to strengthen the identity of nature in the municipality.

Illustration 74.1: Green structures and characteristic places accessible for the public



Ice age mountains at Grønnestrand



Dunes at The Svinkloves



Langdal Plantation



Slettestrand



Bird Viewpoint near Øland



Hune Gateway



Forest in Fosdalen

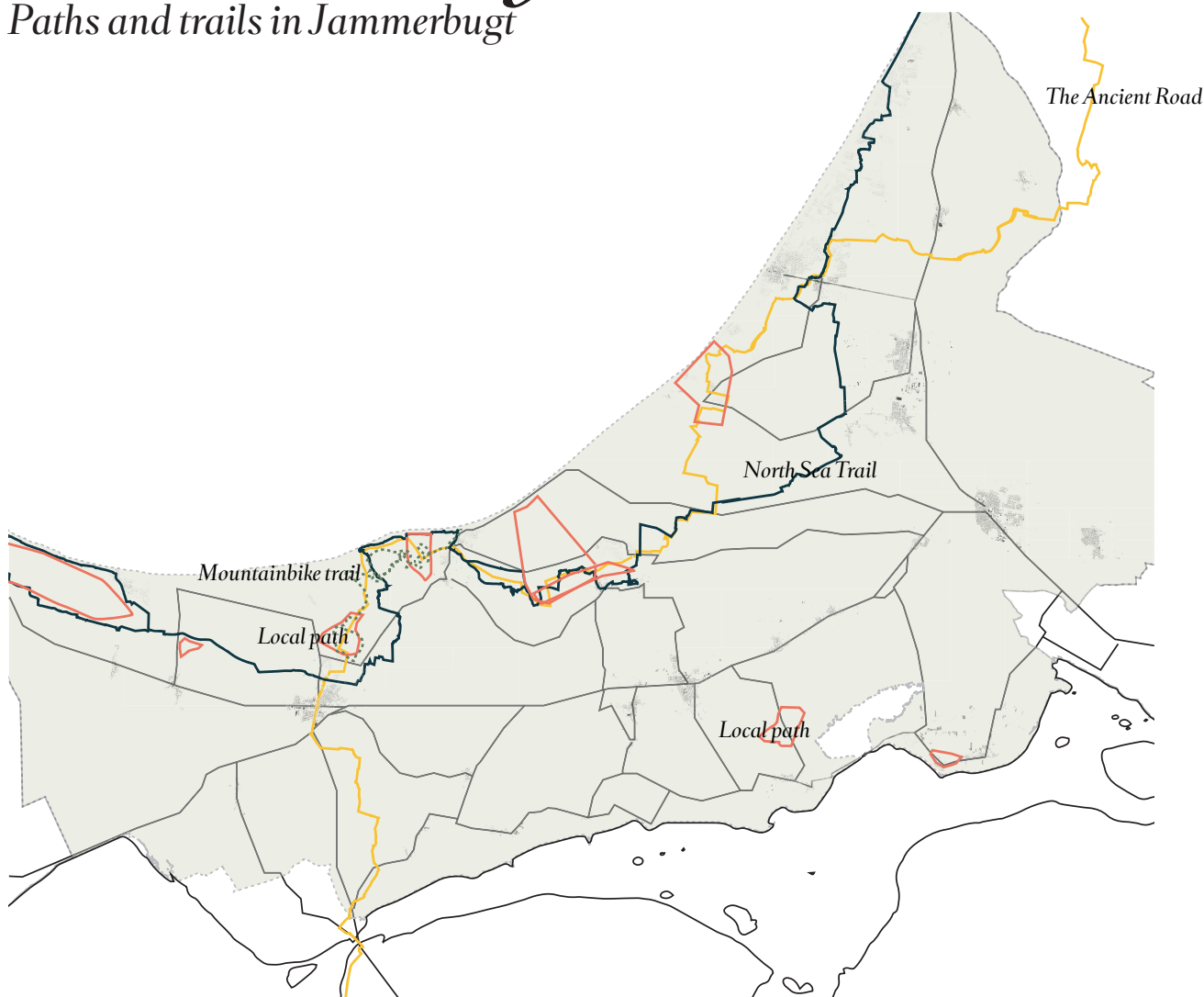


Wetland in Vejlerne

Illustration 75.1: Unique nature-related experiences in Jammerbugt

Accessibility

Paths and trails in Jammerbugt



Public pathways are mapped to examine accessibility to nature. International, national and local routes are found in Jammerbugt connecting internal and across municipal borders. The North Sea Trail runs along the Jutlandic West Coast to Grenaa, Djursland passing several characteristic plantations such as Klim, Fosdalen and Kollerup. The Ancient Road likewise runs through the municipality inviting users to hike in the area. In addition to these, local loops invite visitors to visit the nature in e.g Klim, Fosdalen, and Kollerup.

Jammerbugt municipality is known for mountain biking especially in Fosdalen and near Blokhus with marked trails. The map reveals that these paths are disconnected from the towns besides Fjerritslev where The Ancient Road runs. The gap distances citizens in everyday life. Thereby, a potential to strengthen the connection between the urban and nature.

Illustration 76.1: Walking and bike paths in Jammerbugt Municipality

Blue structures



The municipality is surrounded by water thus relevant to examine potential challenges related to water. Illustration 77.1 shows one meter water rise; the expected sea rise towards year 2100. The water rise will influence the landscape of Jammerbugt municipality dramatically. The landscape of Gjør is expected to be flooded transforming Gjør and Øland into islands due to water rise in the fjord. The nature sanctuary Vejlerne will likewise be flooded. The water rise reveals respectively large challenge and potentials; water might damage houses and cover landscapes, however water

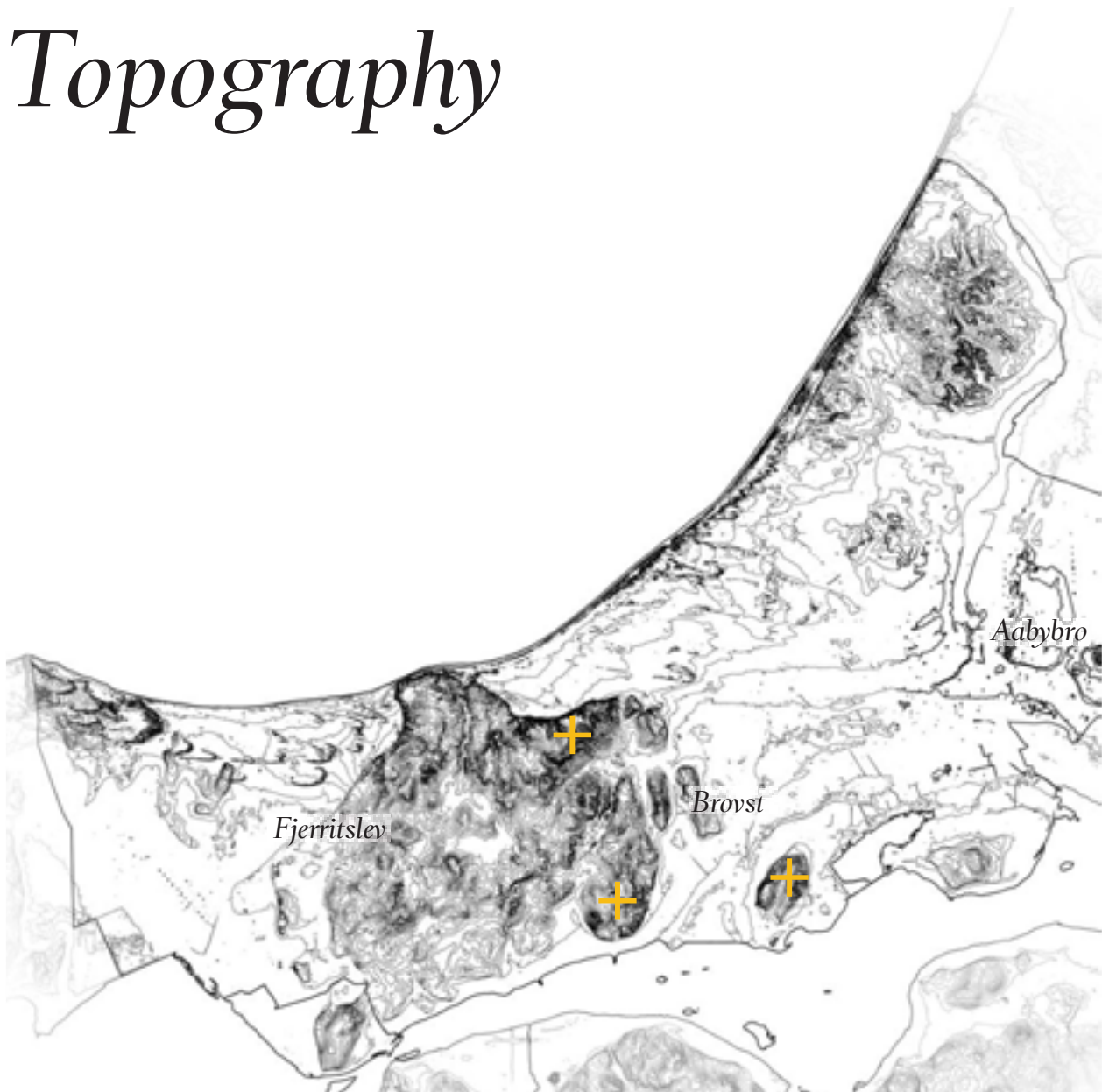
is the foundation for life. Water has aesthetic and functional qualities as mentioned (See Nature as foundation, p. 60). In the contemporary layout of the urban fabric the qualities and aesthetics of water is not utilized though it surrounds the municipality on two sides. The presence of water characterizes Jammerbugt on a national level however not an identity in the everyday life. The map reveals a potential to utilize the cities transformed to coastal cities when the sea level rises if the existing dykes are not elevated.

Illustration 77.1: 1 meter rise in water level (predicted water level rise)



Illustration 78.1: The deep gorge in Fossdal Plantation

Topography



The topography in Jammerbugt is dramatic and hilly. During the Ice Age hills, gorges and hollows which today create the foundation for an experiential nature. It is possible to see both sea and fjord at certain places in the middle of the municipality. Thereby, the hilly topography is the frame for experiences and physical movement in nature.

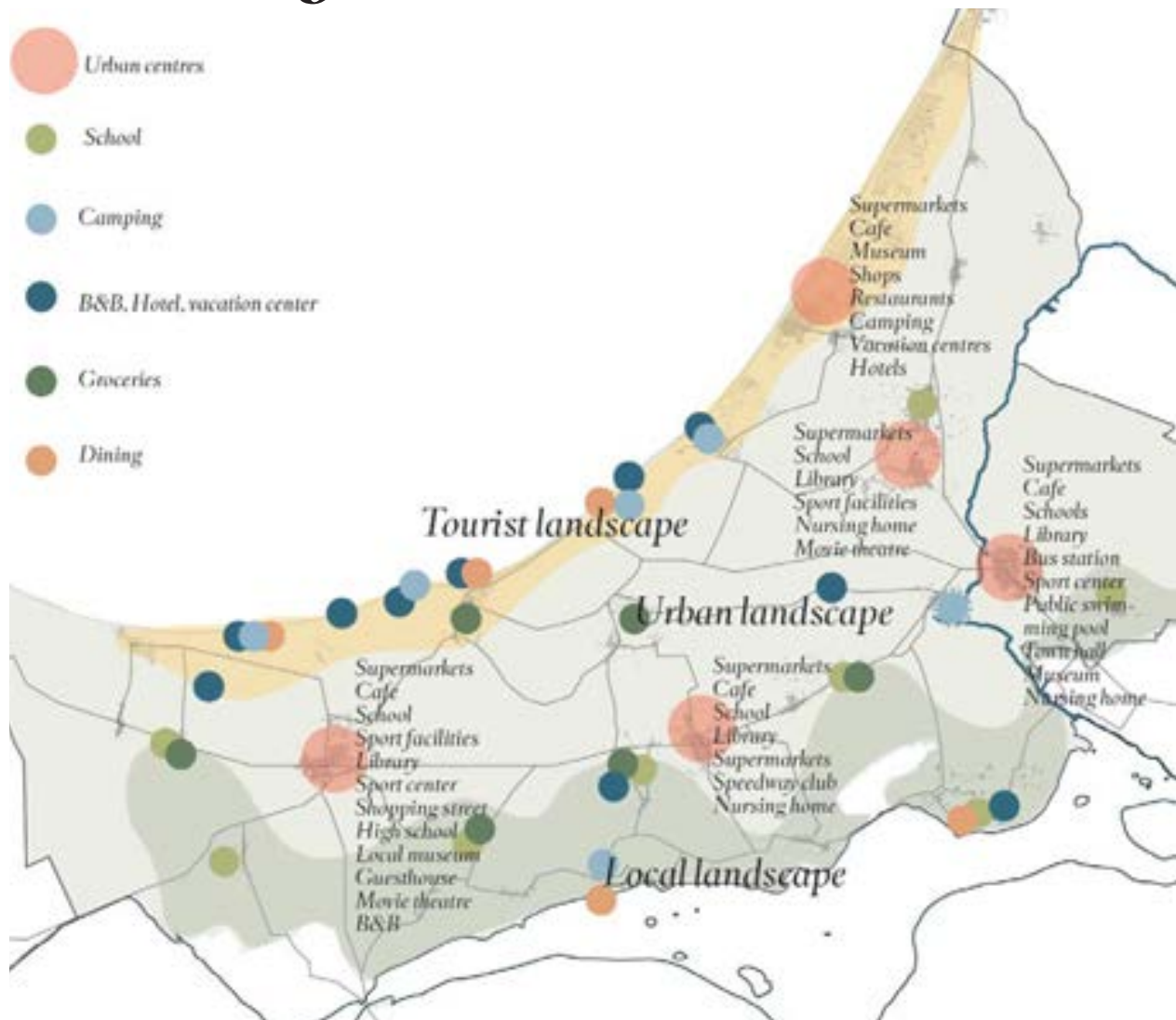
Due to the last Ice Age 15-20.000 years ago ice pushed large parts of Denmark down creating an isostatic movement causing land

raise today. In Northern part of Jutland the land is annually raising 2mm (Søterritoret, 2011). However, since large areas are cultivated and drained the raise is not experienced here (Aktuel Naturvidenskab, 2011).

The topography has the possibility to protect urban areas elevated above sea level from predicted sea water rise and flooding which is a present challenge in Jammerbugt Municipality.

Illustration 79.1: The topography of Jammerbugt

Urban functions



Location and clusters of functions are examined to understand the identity and patterns of use. Towards the West Coast functions such as hotels, campsites and museums reveals the coast as a holiday destination. In the south local schools and local grocery shops and local harbors set the frames for local community. (See images p. 81).

The municipality contains a diversity of attractions in the characteristic amusement, holiday and local landscapes (See Analysis,

appendix). In between these strips of amusements, holiday and community landscapes the cities are placed. Fjerritslev and Aabybro contain the greatest diversity of functions.

The map and photographs reveal a potential to strengthen the character of the certain place by strategically selected functions to enhance livability.

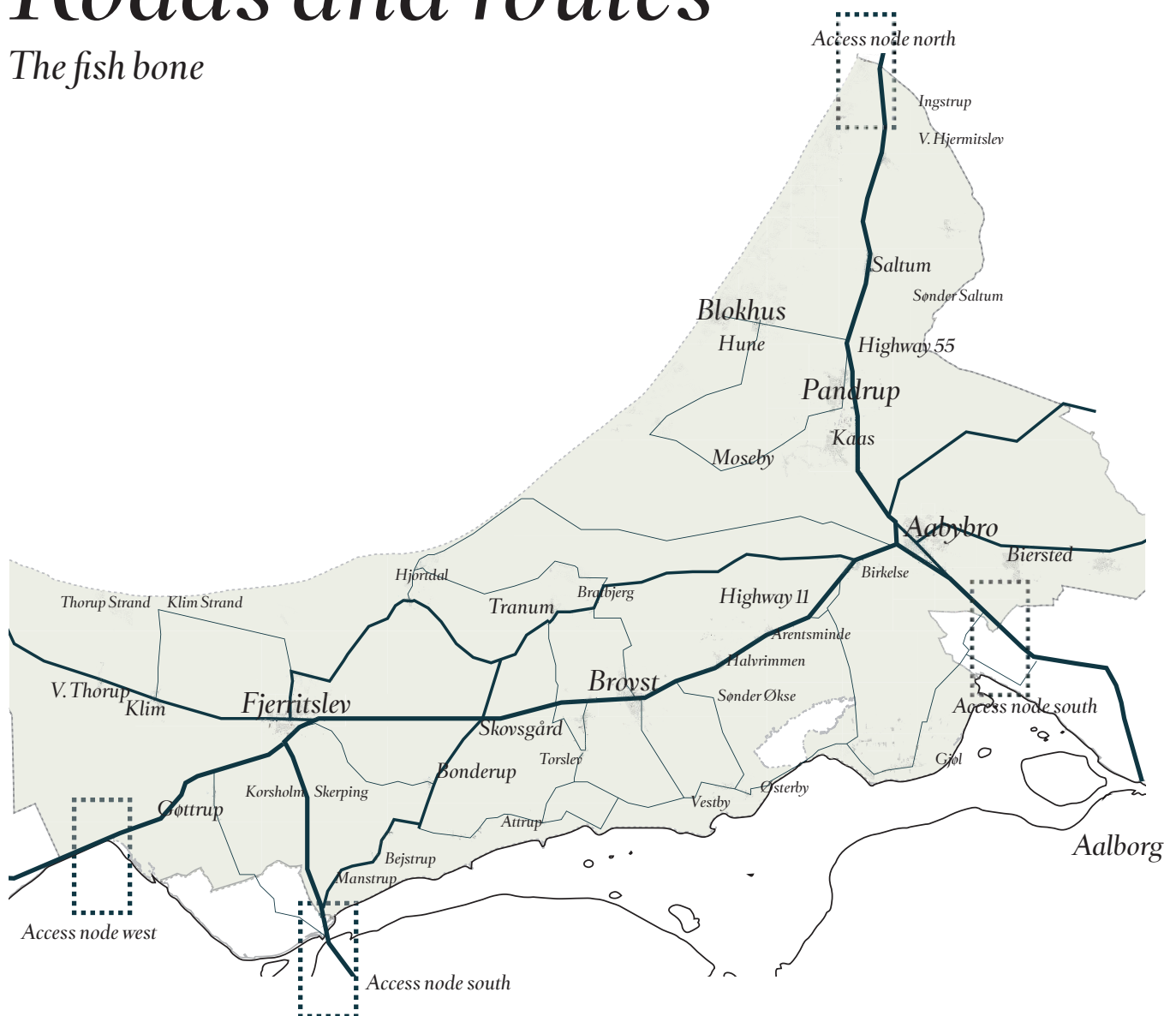
Illustration 80.1: Urban functions in Jammerbugt Municipality



Illustration 81.1: Local cultural and historical attractions

Roads and routes

The fish bone



The infrastructure in Jammerbugt reveals accessibility in and to the municipality. The infrastructure is concentrated around highway 11 running from Aalborg towards west and highway 55 from Aalborg towards north. It can be interpreted as a fish bone since most roads are accessed from “the spine” with local roads towards the fjord in south and the coast in north. This is simultaneously an infrastructural challenge and potential for the municipality causing increasing distances between the communities but likewise a differ-

ent experience of speed exiting the highway to a minor road. The map revealed that the largest cities in the municipality are located along highway 11. Thereby, the cities serve as infrastructural nodes for other towns and villages in the municipality.

Illustration 82.1: Infrastructure in Jammerbugt Municipality

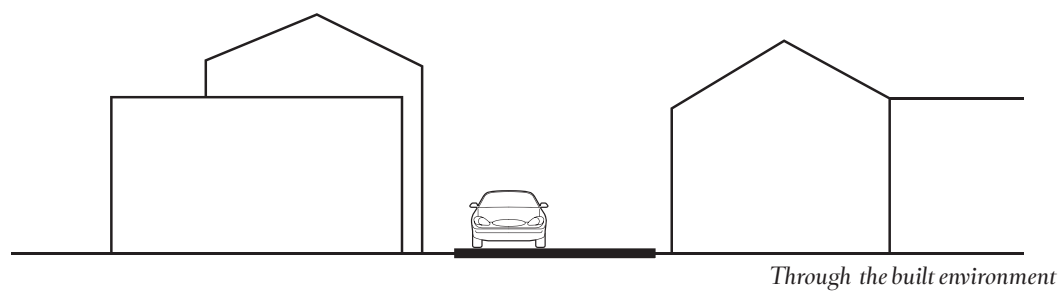
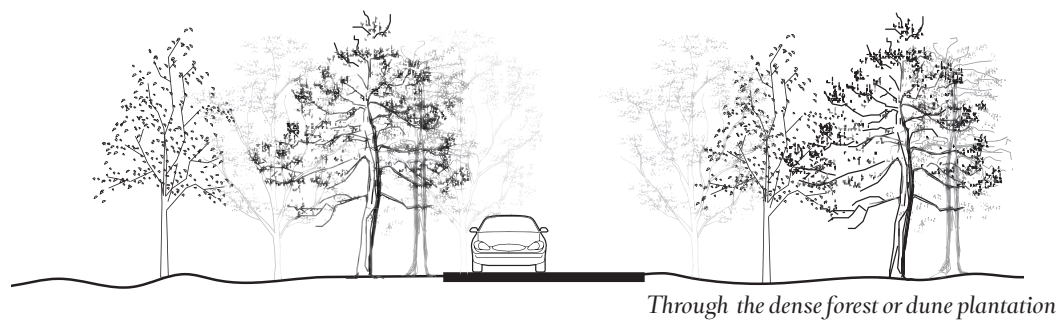
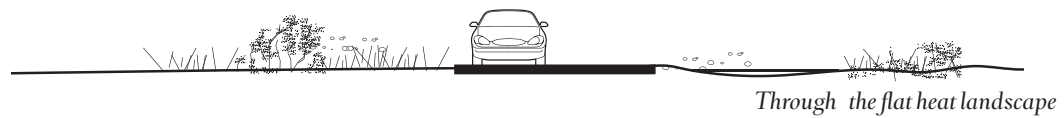
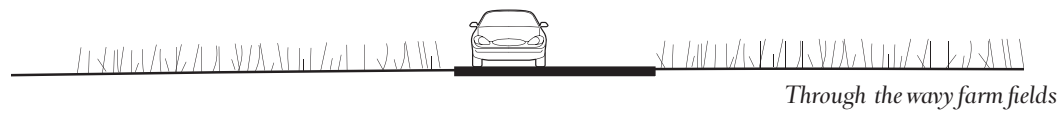
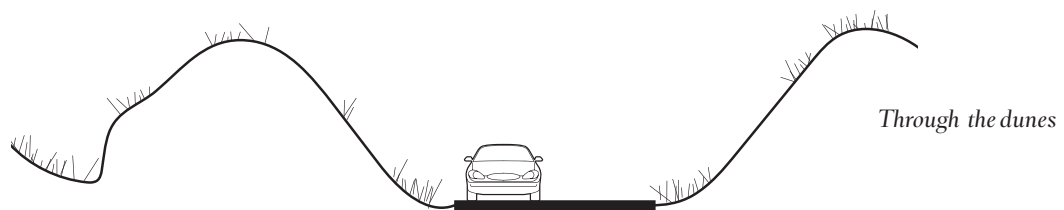


Illustration 83.1: The experienced landscape typologies driving through Jammerbugt Municipality from Aalborg to Blokhus

Public transportation



The public transportation is mapped to understand accessibility in the municipality. Jammerbugt is connected via regional routes between the larger cities to the surrounding municipalities and local routes from the cities to the villages in the catchment area (illustration 84.1). Local routes are running in the morning and afternoon to accommodate primary school students (Jammerbugt Kommune, 2019). Aabybro serves as an infrastructural node for transport in the municipality and regional. According to our interviewee

Nissen public transportation from Brovst e.g. is so limited when commuting and living in Jammerbugt (Nissen, 2019). The mapping together with interviews reveals that many of the local routes are minor loops making the journey across the municipality is limited and time-consuming.

Illustration 84.1: Public transportation in Jammerbugt Municipality (Nordjyllands Trafik-selskab, 2019)

20 %



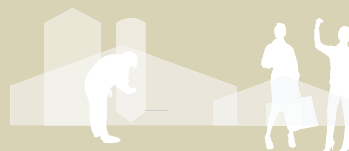
7.700 Commute out of the municipality
(4600 people commuting to Aalborg)



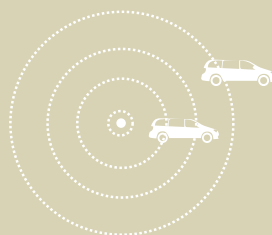
10.090 people work and live in the municipality



80.600 full-time jobs can be found with 30 min
drive from Aabybro



160.000 full-time jobs can be found with 1 hour
drive from Aabybro



The average commuter distance is 29km
(age 18-64)

*Illustration 85.1: Occupation, distances and commuting in Jammerbugt, based on
empirical data (Danmarks Statistik, 2019)*

Catchment areas



The municipality consists of three overall catchment areas; the cities Fjerritslev and Brevst attract citizens from the surrounding villages whereas the axis of growth (Aalborg towards Blokhus) attracts people from the municipality and new citizens. Aalborg and a 20km zone around is a centrifugal force of growth across municipal borders (Perspective on Jammerbugt, Appendix). Aabybro has an acceptable commuting distance to Aalborg thus attractive; while Pandrup located 10min by car further north is perceived too far away (illustration 86.1). A large catchment area of

villages and tourist along the West Coast are attracted by commercial and public functions in Fjerritslev or Aabybro as cities with the most vivid centers. On the other hand Brevst is struggling in the middle of the municipality too far from Aalborg for daily commuting and offering similar but less functions as Fjerritslev.

The mapping revealed a potential utilizing the existing Aalborg-Blokhus axis and Fjerritslev as self-sustained by a large catchment area.

Illustration 86.1: Commuting distances and catchments areas in Jammerbugt Municipality



Illustration 871: Centers in 6 of the cities in Jammerbugt

Identity of towns



Brovst



Pandrup



Fjerritslev



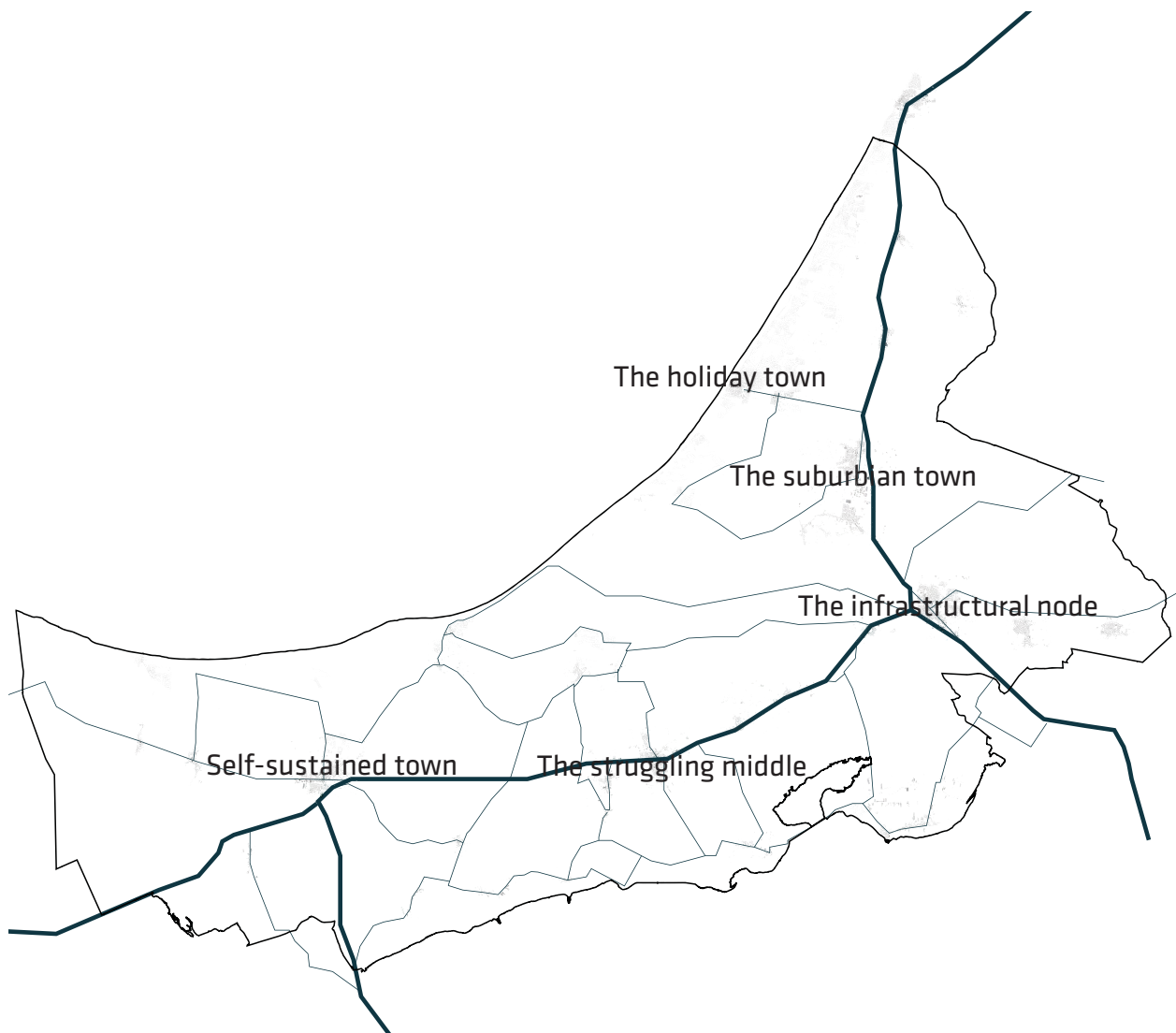
Aabybro

The geographical expanse and experience of the respective city centers are marked orange (See illustration .1). In Fjerritslev, Brovst and Blokhus, the city centers are experienced as dense centralized pedestrianized zone. The center in Pandrup is experienced as a small indication on the long main street. In Aabybro three circles bear witness of a fragmented center oriented around a bus station thereby manifests the towns as the infrastructural node in Jammerbugt (Illustration 82.1, p. 82). Brovst struggling maintaining critical mass

and urban functions due to location between Fjerritslev and Aabybro with large catchment areas (See Catchment area, p 86)

The Ancient Road runs through Fjerritslev, but the spatial presence of it only exists in invisible signs (See Accessibility, p. 76). The city center of Fjerritslev is dense creating an experiential walk through the pedestrianized street. In Aabybro former rail way tracks serves as a pedestrian and bike path but unresolved in the center.

Illustration 88.1: 1:5.000 Structures of the four main cities in Jammerbugt



Despite the various unique characteristics of the cities a common denominator is the inadequacy of green structures in the urban fabric. Green structures are omnipresent in Jammerbugt; however, the presence and quality of the green is limited as experienced in the city images (See *Green Structures*, p. 84).

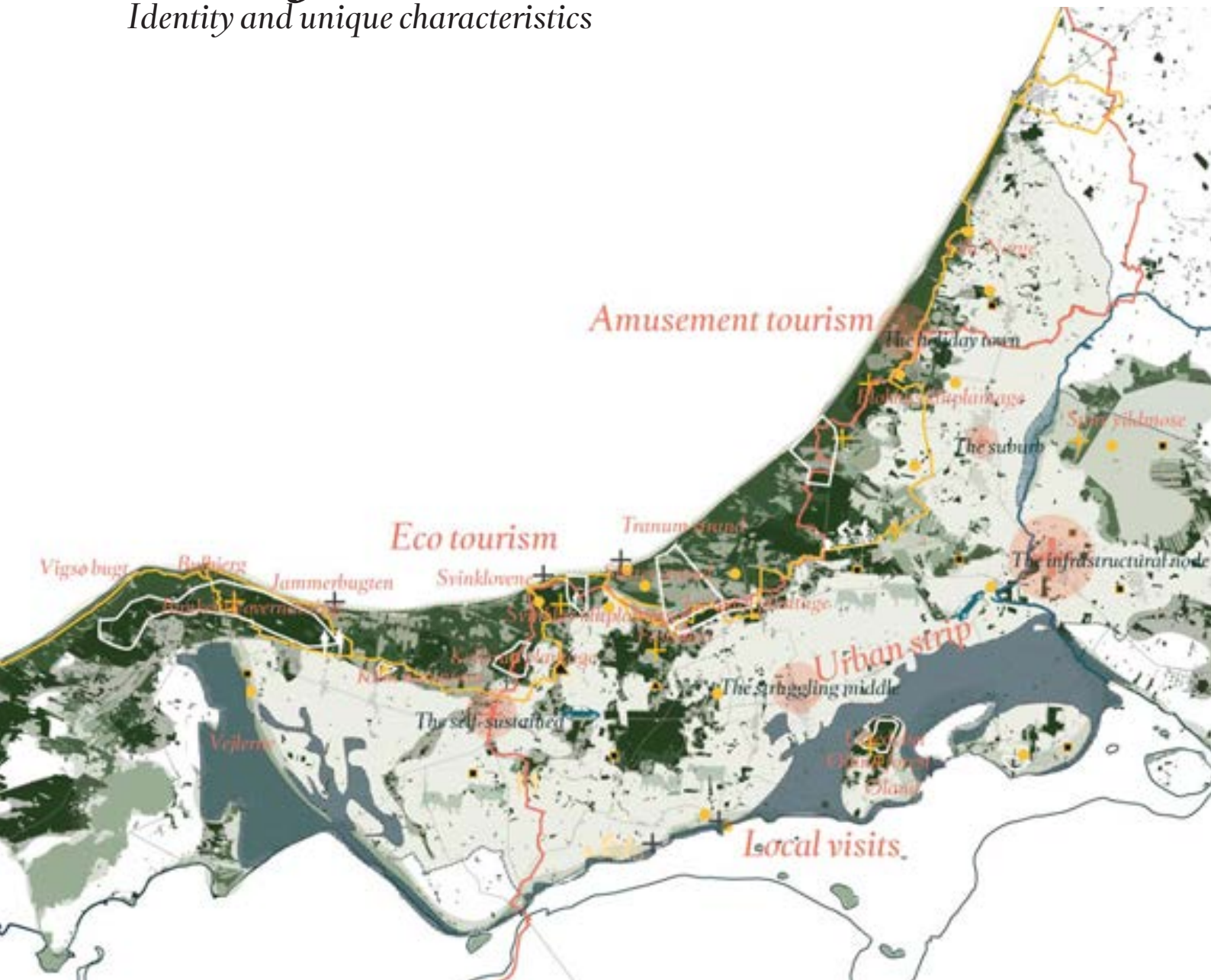
From the analysis and experiences from site visits to each of the cities in Jammerbugt Mu-

nicipality can be characterized with a unique identity (See *Study Trips*, appendix). These identities reveal respectively potentials and challenges for the specific cities. Illustration 89.1 describes the identity of cities as a pattern of towns perceived as convenient in terms of infrastructure and housing, whereas others are more vivid with dense and experiential city centers. However, Brøvst is struggling to survive, trying to attract the same visitors as Fjerritslev.

Illustration 89.1: Identities of towns in Jammerbugt Municipality

Analysis remarks

Identity and unique characteristics



The conducted analysis have revealed a unique identity of Jammerbugt as a nature municipality. However the nature and accessibility here-to is limited within the urban environments. Based on the analysis a map of potentials and identities summarizes and conclude upon the most significant findings (See illustration 90.1). Especially future challenges related to water and demographic changes challenging

the cities reveals a unique possibility to utilize water and nature as a quality acknowledge that water will transform the grown and built landscape dramatically. The framed possibilities are later used to develop scenarios and a strategy for the future of Jammerbugt Municipality and potentials meeting demographic shifts.

Illustration 90.1: Collection of most significant elements in Jammerbugt defining the unique identity of the municipality



West Coast landscape



Forest landscape



Urban landscape



Infrastructural landscape



Fjord landscape



Illustration 91.1: Images of landscape identities in Jammerbugt Municipality



Chapter 06

Local narratives

The following chapter investigates local voices, situations and components conducted and deconstructed to isolate unique tactilities, sensorial experiences and atmospheres related to an object. The components are reassemble into pictures revealing potential juxtapositions for new experiences.

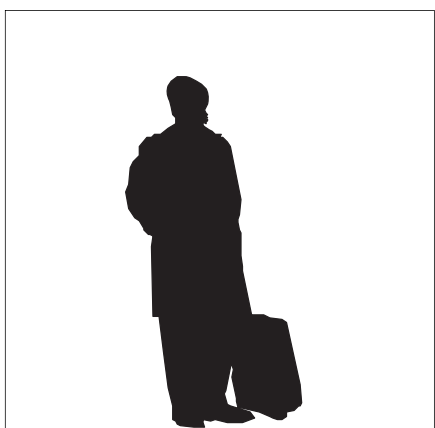


Illustration 93.1: Images of bird sanctuary, Gjol

Local voices

Three interviews have been conducted with the planning department in Jammerbugt Municipality to understand their perspectives upon the planning, the foci in municipal development and place-specific challenges.

Planner, rural district department



Jammerbugt municipality consists of 25 rural village districts and some of these areas have development plans and some not. The rural districts are less planned by the municipality instead driven by local initiatives. It has become an unstructured strategy; it meets the local needs but does not include a coherent structural strategic development. On the other hand, this strategy meets every village and does not exclude any local communities. Furthermore, the “*Life, village, school*” strategy aims to prevent closure of schools if citizens engage themselves in local development. (See Perspectives on Jammerbugt Municipality in appendix).

Planner, strategic development department



The municipality experience an activity in every community disregarding size of the communities however the activity varies due to individual stakeholders in the community. There is life apart from demographic statistics – it demands the ability to find the life behind the statistics. The stakeholder-driven rural development is mutual a strength and a weakness for the community. It depends on the individual engagement to local development, on generation replacements and delegation of local power for future developments. Sometimes one village is growing, sometimes another one; but they do not become extinct (See Perspectives on Jammerbugt Municipality in appendix).

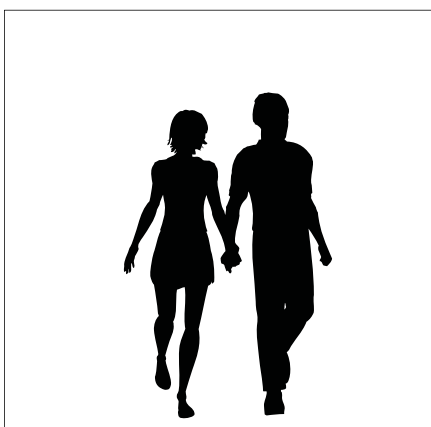


Planners, spatial planning department

Apart from the coast with tourist, development occur in the cities Fjerritslev, Brovst, Aabybro and Pandrup where municipal urban investments are made. Aabybro is characterized as the “*leading*” city (*førerbyen*); most of the external investments occur here thus time and resources from the municipality. The municipality is aware of intern demographic changes and new family structures and plan for this. Urban development and centralized growth are seen as a possibility to increased resources beneficial for the entire municipality (See Perspectives on Jammerbugt Municipality in appendix).

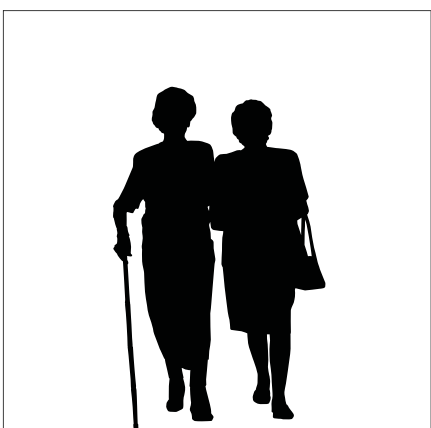
The professional interviews reveal two levels of planning. A bottom-up level with municipal planning of the rural villages surviving due to local engagement, economic support from the municipality and the close to a larger city. The other level is top-down planning of the largest cities where the municipality mainly focus in Aabybro and the axis of growth thinking that centralized growth influence the entire municipality. (See Perspectives on Jammerbugt, Appendix)

During the process and three site visits several interviews have been conducted. Four local narratives are presented as a supplement to understand the individual experience of living in Jammerbugt municipality.



The young couple, Brovst

The couples life in Brovst is resourceful because the expenses are lower than in a large city and it possible for her to be a stay-at-home mom. Recent years Brovst have experienced closure of grocery stores and shops; it has a negative impact on the city center and urban life. There is a square in the city with potentials but right now it is not used. Both like using the local environment and participate in the community activities; dining out, knowing the owners and participate in local arrangements and citizen meetings.



The senior couple, Brovst

Recently the couple moved to Brovst from a village located in the catchment area. They moved there to stay in familiar surroundings and get closer to more public services. Their children likewise live nearby. The couple like Brovst but also experience the public services change and closes for example the local pub and the grocery store. Frequently they drive to use the local nature plantation and beaches such as Fosdalen, Sletterbeach etc.



Local stakeholders, Brovst

Two years ago he opened the shop which offers exclusive products such as wine, local alcohol and chocolate. Recently Super Brugsen closed and followed by that people do not use the pedestrian passage anymore. The city no longer offers high quality meet therefor tourists drive to Fjerritslev or Aabybro to shop groceries. It is difficult to run local shops but he does what he can and gather people to engage one another.



The employee, Aabybro

The employee works in the multi activity center in Aabybro. She lives in Aabybro and like it there. Recent years many families have moved here and the municipality subdivides land and sell it. In her spare time she walks her dog but local nature paths are limited and the nature seems far away from the city.

Each interviewee represent a characteristic citizen in Jammerbugt. The young couple representing the good family life in Jammerbugt because of economic independency, more quality time and local acquaintances. The senior couple represents the intern demographic changes towards the larger city as described (See Double-urbanization, p. 24). The local stakeholder represents the personally experience running a local buisnesses. The employee highlights the limited accesability for pedestrians in the city to the landscape. The assemblage of the voices create an understanding of potentials and challenges related to experience of living in Jammerbugt municipality.

Illustration 97.1: Local narratives

Local situations



The experiences of local situations are attached to the inherent atmosphere affected by the tactility and materiality of the object (Livability in the urban environment, p. 50). The experience of the gnarled tree is related to the touch of scabrous bark, the smell

of damp forest floor, the sound of twittering bird and the sense of movement (See image, p. 98.1). Furthermore the experience is subjective thereby a presentation of the perceivers subjective experience.

Illustration 98.1: Found situations and elements

Imprisoned nature



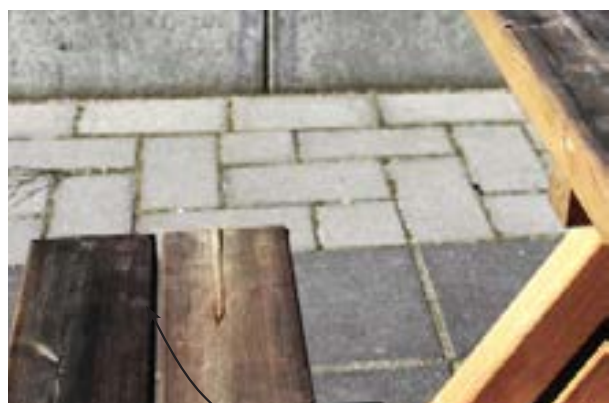
Embracing structure



Spatial border



Historical heritage



Contrasting tactilities

Local components

Deconstruct the situation

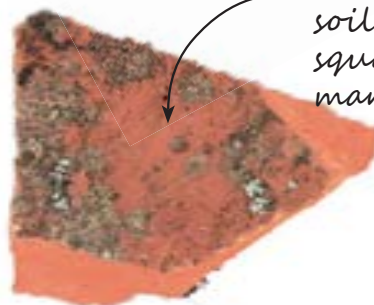
The French philosopher Jacques Derrida developed the strategy “*deconstructivism*” in the 1960’s to expose and subdivide existing opposition in metaphysic pieces (Encyclopedia of Philosophy, 2019). Deconstructivism was a critique of the Western world’s systemization thus reducing and disregard opposites of the system. The notion was later adapted by architects (Dansk Architektur Center, 2019). Bernard Tschumi was one of the first architects working with deconstructivism for a more flexible and processual architecture where the character of architecture changes when someone enter a space. Furthermore, the aim was to explore hidden potentials in architecture (Dansk Architektur Center, 2019).

Deconstruct dichotomies

When disrupting and deconstructing existing dichotomies between built and grown new notions can be reconstruct (Dansk Arkitektur Center). By mapping the deconstructed contradiction it is possible to enhance awareness and experience of various expressions and contraries (See Pieces of nature and urban, p. 101-103). Thus, there is never one side of the dichotomy or the other (Danmarks Radio, 1994). This deconstruction of elements from existing environment and atmosphere create the possibility to juxtapose opposite pieces. Deconstructivism is thereby not a destruction of something but instead a reconstruction of something new (Encyclopedia of Philosophy, 2019).



I origin from
soil but was
squared by hu-
mans



This is so
nice biking
on!



Pieces of urban

The urban materiality is resistant to human and weather influence. The materialities are processed and shaped by humans to construct shelter and being in motion. The components vary in density, harshness, color and visual

appearance and origin in nature however processed according to the human demands.

Illustration 101.1: Images of unique components found in the urban environment on site visits in Jammerbugt.

Can you
see my new
buds?



I hide so
many insects



The moss works
as natural
insulation..



Soo spongy



I feel so skinny



AW! I have a
bad hair day..



Pieces of nature

Each of the components bears witness of a diversity, complexity, functionality and aesthetic in simplicity of nature. The elements are isolated from existing context and juxtaposition to examine sensorial

experience, tactility, color and density. The components and related experiences learned from nature are inspiration the later design (See Spatial Design, p. 138).

Illustration 102.1: Images of unique components found in the nature during site visits in Jammerbugt.

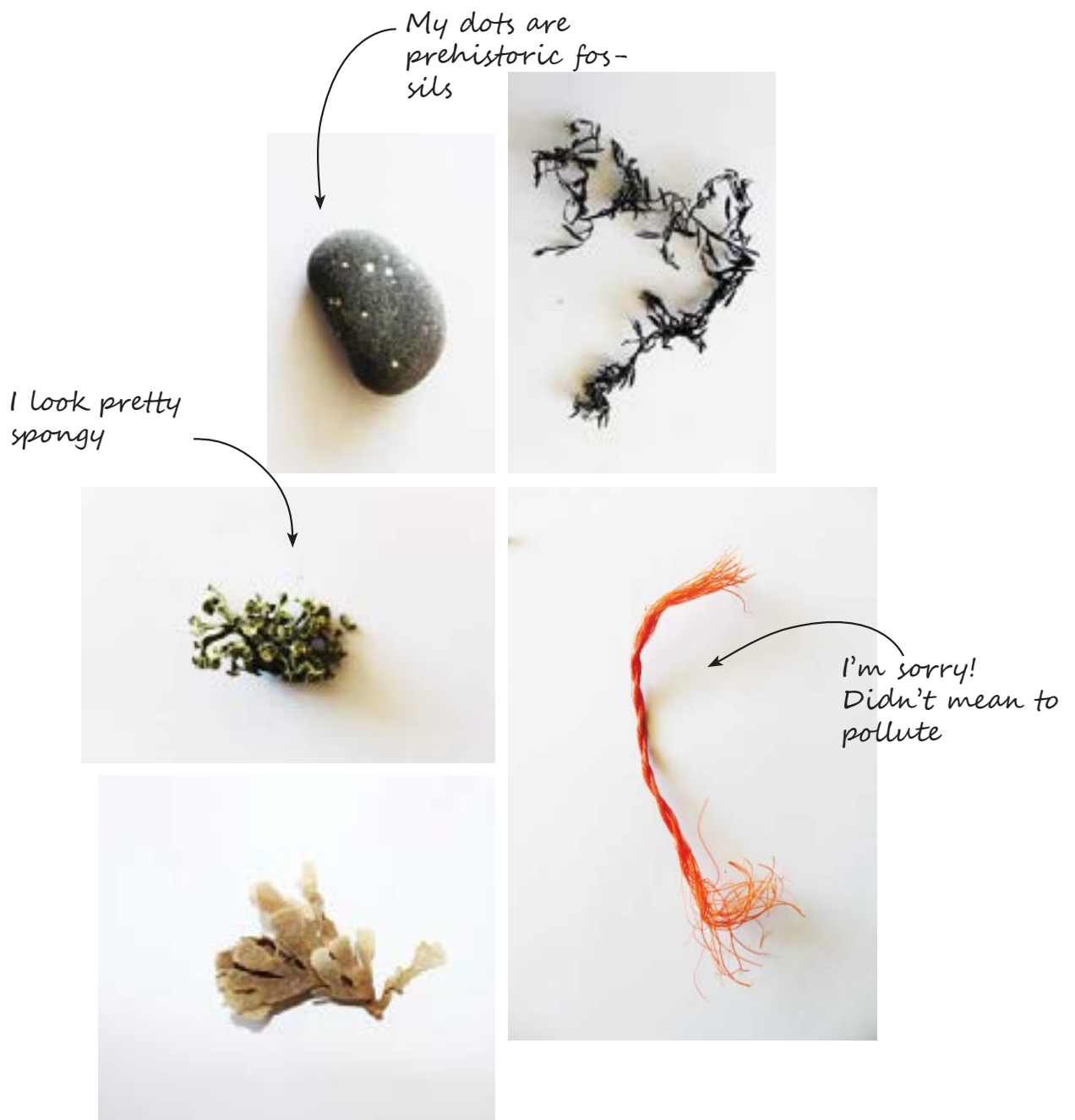


Illustration 103.1: Images of unique components found near the water on site visits in Jammerbugt.

Reassemble the components

Imagine taking
a walk here!

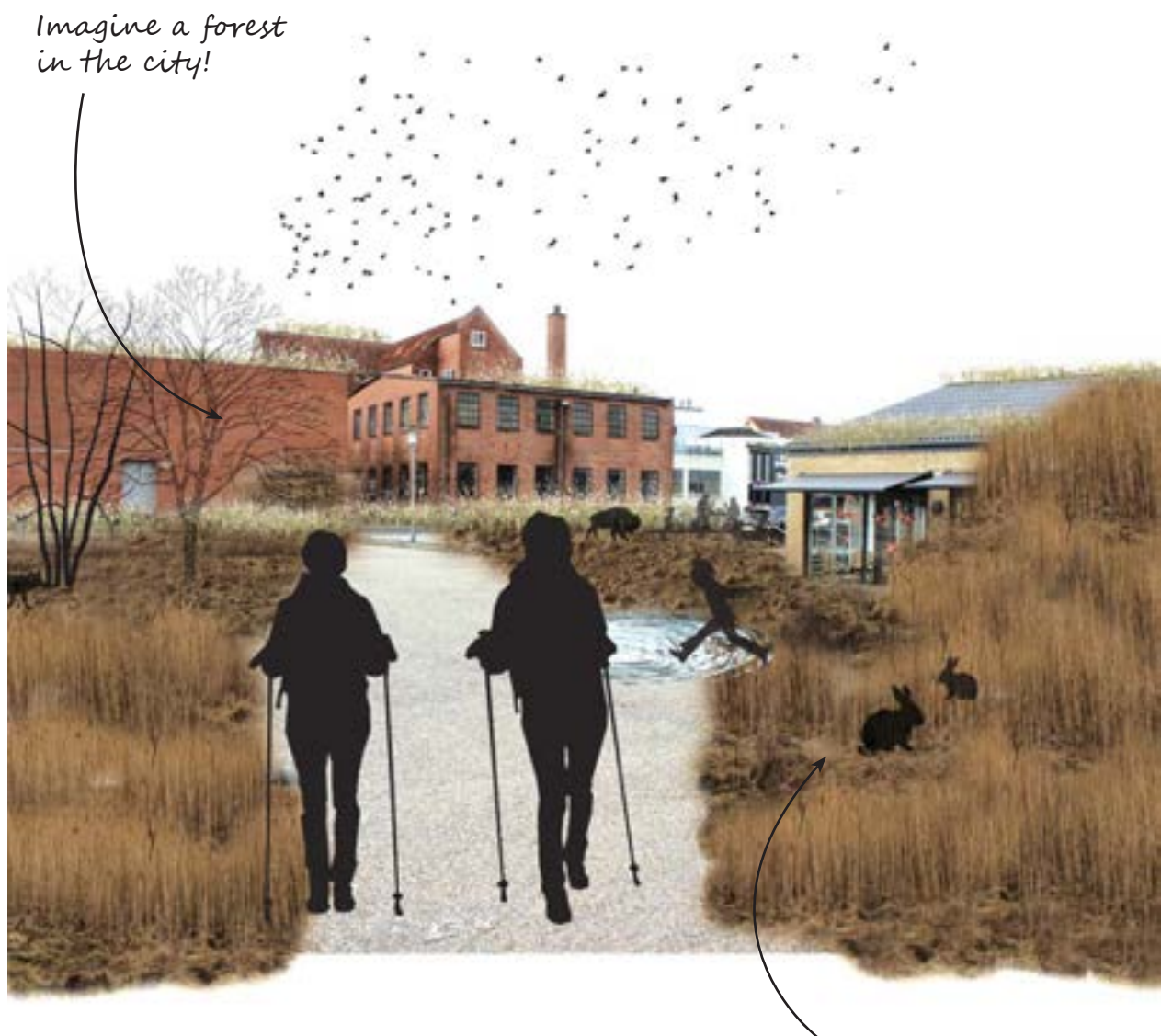


The deconstructed elements and narratives are reconstructed into new images of Jamberbugt Municipality aiming to fabulate and image new constellations of experiences. This is thus an interpretation of potential compositions of the tactility, materiality, atmosphere and perceptions.

Illustration 104.1: Collage of built structure in existing wetland



Illustration 105.1: Collage of built structure in between land and water



Now we have wildlife where we live

Illustration 106.1: Collage of grown environments implemented in built environment

The reconstructed situation

The theoretical perspectives and conducted analysis has created a foundation to focus on human, built and nature. In the attempt to imagine new constellations of existing elements this chapter has examined natural and urban components as well as local voices. Together these elements characterize the municipality and the desire is to juxtapose these.

The chapter has deconstructed components to regard them solitary and thus understand them. Here the phenomenological approach where the subjective body and sensorial apparatus are utilized to understand the object – the phenomenon.

This to examine different tactility's, colors, scents and softness can be understood differently according to the origin in respectively the urban or natural environment. The materiality of the city is perceived as rough and hard in comparison with soft and vulnerable elements in nature. The objects are isolated from existing physical associations to imagine new juxtapositions and combination among the objects.

The local voices present individual experiences by citizens and municipal planners these perceptions are crucial as non-physical however site-specific evidence. Together the narratives reveal a comprehensive story about Jammerbugt experienced respectively bottom-up and top-down. To initiate a project demands insight into the complexity of local wishes, demands and municipal willingness. Development revolves around the ability to imagine potentials and situations in the future.

The collages imagine the conducted elements from the grown and built environment in a new situation to create different experiences for people. Thus regard the grown and built as a dynamic and inter-related process instead of opposites. The images explore new possibilities to juxtapose nature and city. The collages are used as mediators between conducted analysis and design proposals and inspire the constellation between human, built and grown.



Chapter 2

Future Scenarios

In the following chapter three scenarios is presented addressing climatic, infrastructural and demographic changes. The scenarios are created to examine potential futures of Jammerbugt Municipality. The scenarios will be evaluated and juxtaposed in one concluding scenario the group found most probable.



Illustration 109.1: Image of Slettestrand

Why imagine the future

Why think about the future?

For some it might seem frightening to think or consider the future. The future is defined as “*a period of time following the moment of speaking or writing; time regarded as still to come*” (Oxford Dictionary, 2019). The contemporary society is constantly changing making hitherto impossible elements possible.

According to John Urry thinking about futures is essential for all societies (Urry, 2016). Learned from existing elements in society and extrapolate from elements of the present it is possible to generate future scenarios. There is no single future as such but many futures relating to different time frames (Urry, 2016).

Urry argues that “*futures are unpredictable, uncertain and often unknowable, the outcome of many known and especially “unknown unknowns”*” (Urry, 2016). In order to think about

the future and potential outcomes one has to consider the unknown and consequences of the unknown. One approach to regard the known and unknown in the future is according to Urry to consider “*the probable, the possible and the preferable*” (Urry, 2016). This will enable one to imagine simultaneously futures likely to happen, futures undesirable for one or society and inevitable desirable futures.

“A scenario is a description of how things might happen in the future”

(Oxford Dictionary, 2019)

Urry is a protagonist of creating scenarios to image in the future. According to Urry it is important to democratize the social futures for the benefit of future generations. To do

this future scenarios can establish a picture of possible futures. The future is common thus it must be considered to imagine a common future for everyone (Urry, 2016).

Building the scenarios

Based on previous theoretical and empirical data three scenarios will be established to imagine a possible future happening within the particular time frame. The scenarios will present a future of Jammerbugt Municipality in 2100 since the place might experience dramatically changes related to urbanization, climate changes and infrastructural extensions.

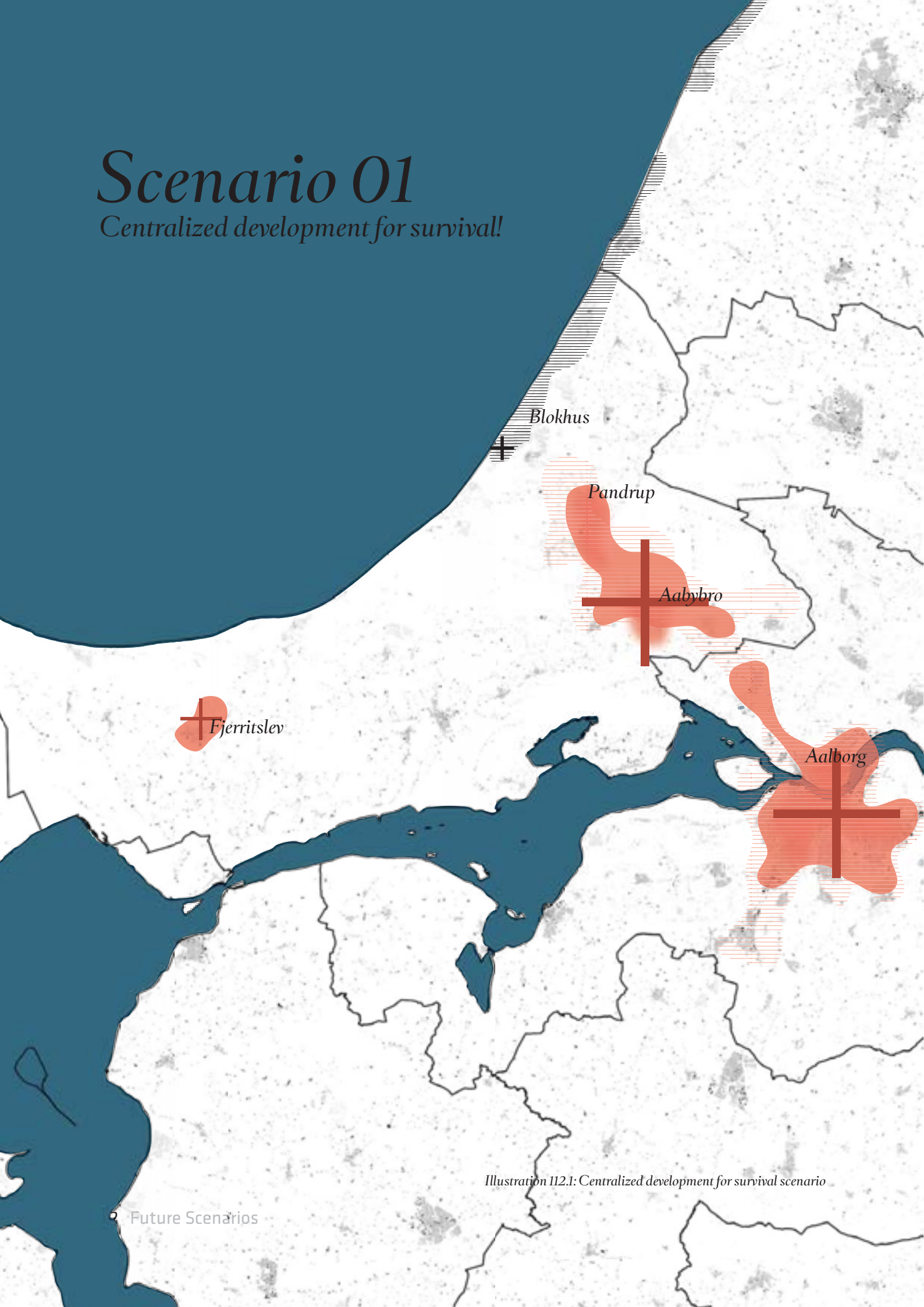
The following chapter will present scenarios of respectively the year 2100 scenario of a third connection across the Limfjord, one meter sea level rise and an urbanization scenario.



Illustration III.1: Mother Earth

Scenario 01

Centralized development for survival!



Blokhuis

Pandrup

Aabybro

Ejerritslev

Aalborg

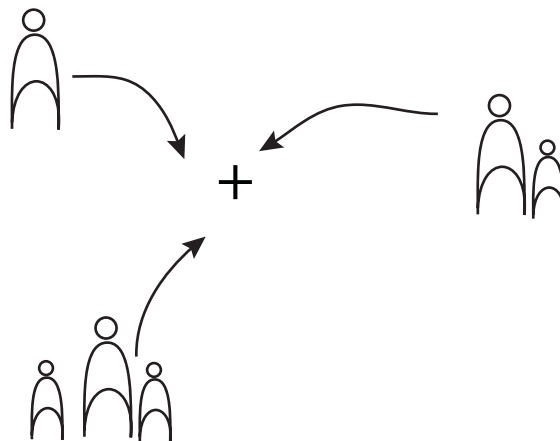
Illustration 112.1: Centralized development for survival scenario

In scenario 01 regarding growing cities the urbanization tendency is expected to remain powerful from Aalborg towards Pandrup. The cities of Aabybro and Pandrup will be experienced as one coherent urban area due to growth tendencies from Aalborg. Blokhus is on one hand a part of this narrative however having a strong force of attraction of visitors and tourists.

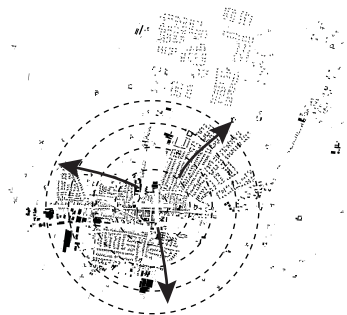
If the existing internal demographic shifts continue Brovst is predicted to experience a notable negative movement of people. This strengthens the towns of Fjerritslev and Aabybro competing with Brovst today. In this scenario Brovst will thereby no longer function as a town.

It is thus relevant to focus resources in Fjerritslev as the entry to nature and as the only larger city between Thisted and Aabybro.

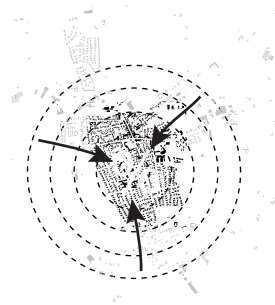
Develop growing cities



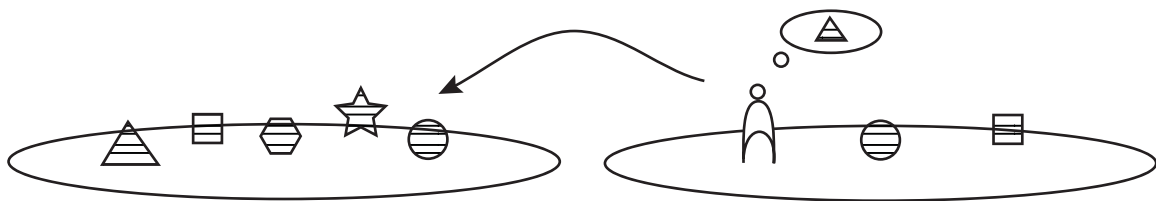
The global population tendency reveals demographic shifts towards larger cities and urban areas likewise in Jammerbugt (See Double-urbanization, p. 24).



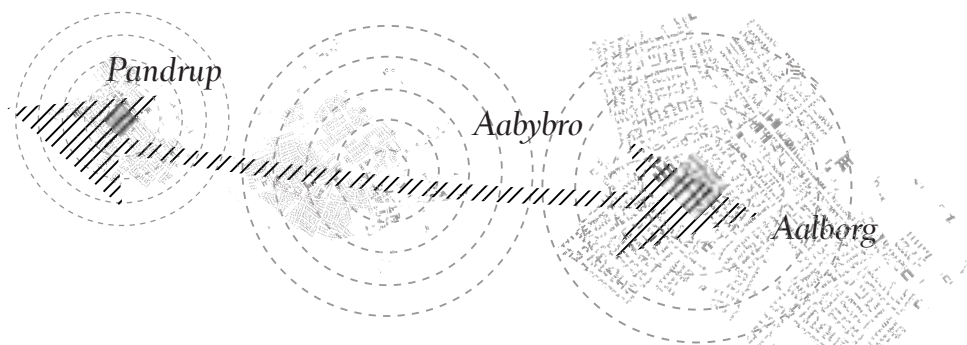
This scenario revolves around growth in the three main towns; Pandrup, Aabybro and Fjerritslev. Municipal planning and external investments are likewise focused in these towns.



The remaining towns and villages experiences negative or stagnated development. This development is however not a focus for this scenario.



Brovst incapable to serve citizens and the catchment area with demanded functions are outmatched by other towns thereby depopulated.



The metropolis Aalborg is a crucial factor for growth in catchment cities; Aabybro and Pandrup.

Illustration 115.1: Developing growing cities.

Scenario 02

The third Limfjord connection



Blokhus

Pandrup

Aabybro

Aalborg

Illustration 116.1: Infrastructure as game changer scenario

Future Scenarios

The third Limfjord connection

The connection will improve the connection from Jammerbugt to especially the southern Aalborg where many workplaces are found. However driverless vehicles must be considered for new infrastructural project to prioritize capacity and layout correct.

Utilizing driverless vehicles time and place in no longer of importance thus make commuting distances insignificant. The Limfjord connection and future mobilities has the potential increase the attractiveness of Jammerbugt to live.

The potential in this scenario is to focus growth along infrastructure leading to the new motorway thus has the greatest effect on Aabybro as the infrastructural node and distributor (See Roads and routes, p. 82). A possibility is that businesses settle in the catchment area of the connection settle due to connectedness and economic benefits thus enhancing Jammerbugt as an attractive municipality.

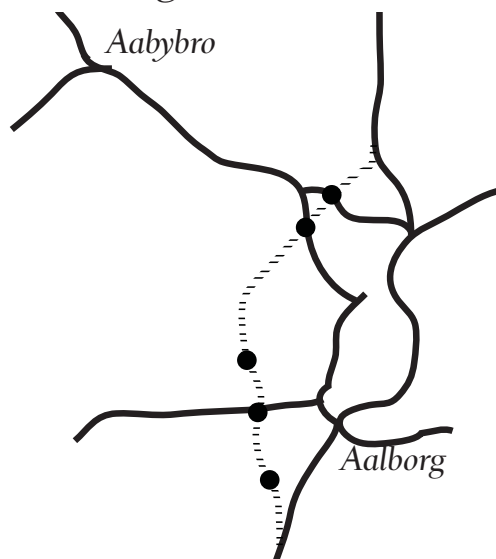
The third Limfjord connection will denote faster regional public transport enhancing Jammerbugt as a destination and attractive for citizen and professions. Jammerbugt will enhance the role as catchments area or perhaps suburb to Aalborg as a large inter-municipal urban area.

Requisite for the scenario

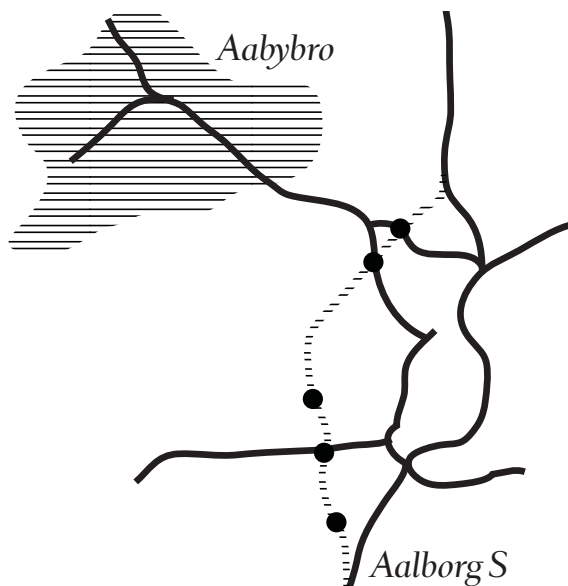
During the coming decades driverless vehicles are predicted to displace human-driven vehicles depended upon economy, taxes and customers interest and legislation among other things. The automation of vehicles are measured on five levels from non-automation to self-driven vehicles (Vejdirektoratet, 2018). Vehicles driving on the road today are level 2 where the driver can control the car. The self-driving vehicles are expected implemented at motorway and large road at first since maneuvers on these distances are rather predictable (Vejdirektoratet, 2018). Today driverless vehicles are solely tested by the Danish Road Agency (Vejdirektoratet, 2018).

Places unattractive today due to distances might experience prosperity in the future since driverless vehicles can increase human mobility. If driverless vehicles are not taken into account in future mobility projects authorities risk prioritizing undesirable. Road typologies for driverless vehicles demands different layouts of road marking, signals and equipment (Vejdirektoratet, 2018)

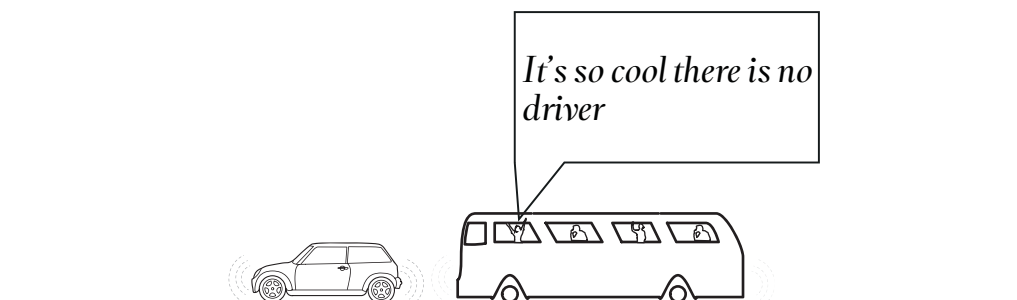
Infratructure as game changer!



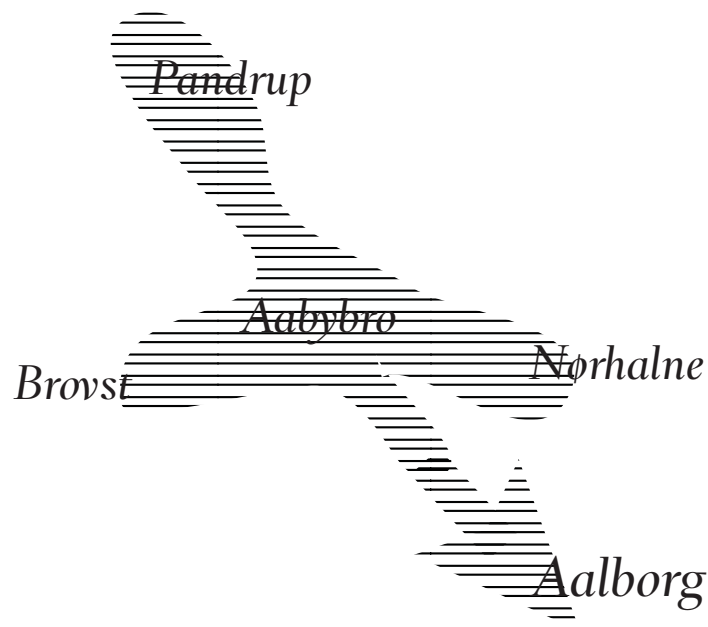
The scenario revolves around the future third Limfjord connection which will relieve existing motorway traffic, shorten travel time and enhance accessibility around Aalborg towards north.



According to predictions by the Danish Government Jammerbugt will experience a positive effect by the enhanced connection to Aalborg. Thus, make Jammerbugt Municipality attractive for new companies and citizens.



Driverless vehicles are implemented making Jammerbugt more attractive for commuters



Cities in Jammerbugt Municipality located along infrastructure leading to the motorway are expected to grow.

Illustration 119.1: The third Limfjord connection

Scenario 03

Nature as the lifeguard!



Vejlerne
The Wetland Sanctuary

Brovst
The city by the water

Extreme rain event

1m sea water rise

Aabybro
Between green & blue

Øland & Gjøl
The nature Islands

Illustration 120.1: Nature as the lifeguard scenario

Scenarios

The predicted sea level rise will dramatically change the geography of Jammerbugt thus crucial to plan for future flooding scenarios.

This scenario revolves around the potential to regard future water rise as quality for the biodiversity in the fjord landscape and unique identity being a “nature-municipality”. Adapting to predicted changes can create positive conditions for wildlife and nature.

Several cities along highway 11 will be affected by the sea level rise however this is likewise a potential to utilize the cities future location near the fjord. This is a potential to make water accessible for changeable experiences.

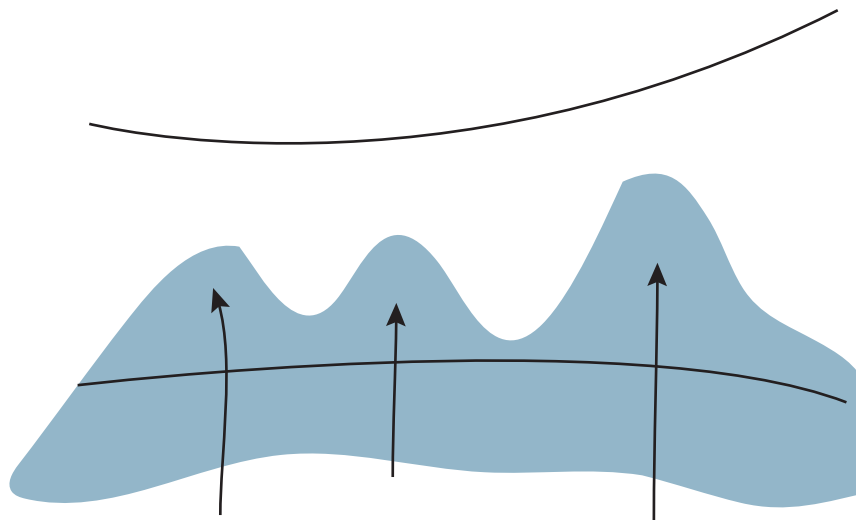
Brovst is the largest city affected by sea level rise. The city is located on a hill but the municipality no longer subdivides industry due to the flooding risk (Jammerbugt Municipality, 2019). Therefor this scenario imagines the city as depopulated since it might be flooded in extreme events.

In the future Gjøl and Øland will transform into islands if dams and dykes are not enlarged this situation thus reveal a possibility to transform the place into nature islands.

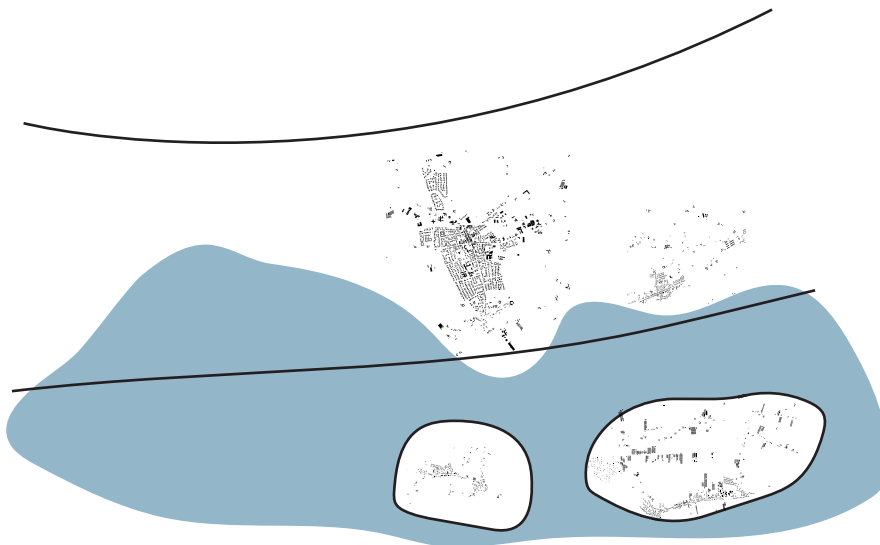
The consequences allowing floodings will affect accessibility, flood urban environments which must be relocated and limit production land since a great amount of the flooded area is farming. However new production methods as sea weed farms and mussels produced can be applied to compensate.

Furthermore, in the event of a 50 years flooding in 2100 several urban areas along the fjord and low-lying areas in Brovst will be flooded. Thereby, this scenario likewise entails a depopulation strategy of the affected towns and villages.

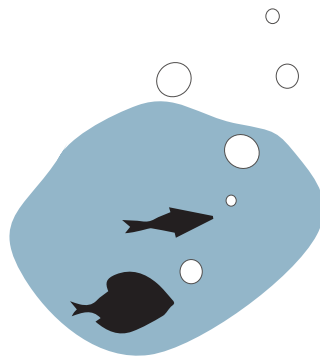
The water is coming!



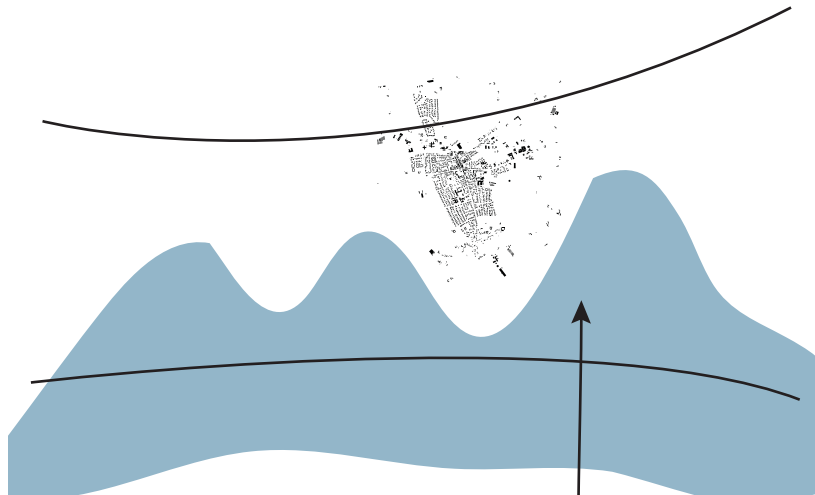
This scenario revolves around sea water predicted to rise with 1m towards 2100 which will change the geographical map of Jammerbugt Municipality dramatically.



The water rise creates new islands and endangers several existing urban areas.



The water will influence the wildlife and fauna enhancing biodiversity along the fjord landscape. New species might be found in the area when production landscape is flooded thus transformed into wetland (Landbrugsavisen, 2019).



In the extreme event of a 50 year flooding in 2100 the sea water might damage several urban areas. One solution is to depopulate or move affected urban areas.

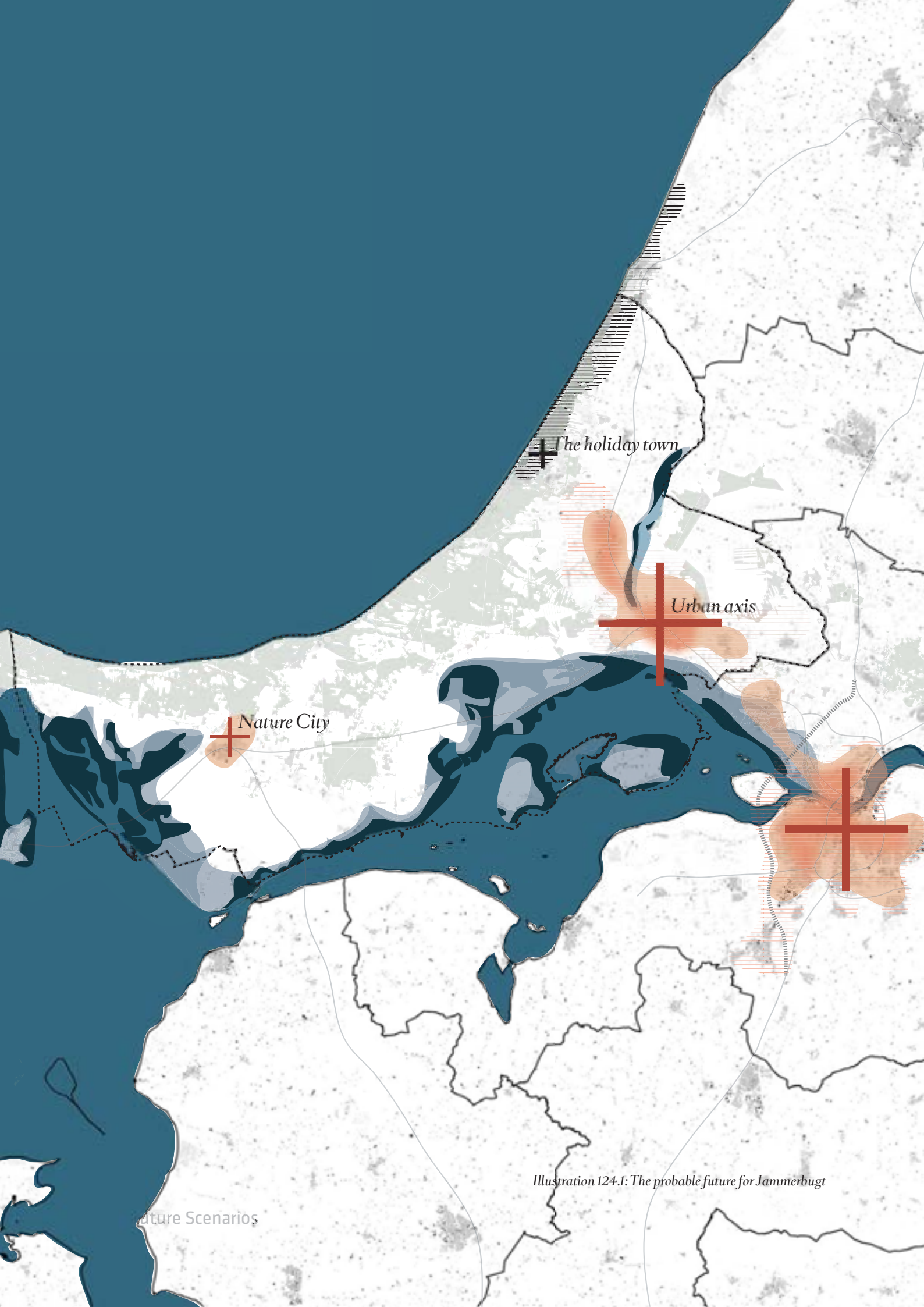


Illustration 124.1: The probable future for Jammerbugt

... *So what is the future?*

Jammerbugt Municipality in 2100

In 2100 Jammerbugt Municipality is incessant in transformation. The geography of the place has experienced dramatically changes due to sea water rise however imparted a unique identity and experience being near water and nature regardless location in Jammerbugt. The flooding threat is changed to a certainty that the water floods large adaptable nature areas along the fjord. Here bird sanctuaries, wetlands and nature islands can be found while the built is concentrated and located elevated in Fjerritslev and along the urban axis. The predicted water rise and the existing demographic tendencies contradictory further development of Brovst thus the future of Jammerbugt is to focus to centralize growth in Fjerritslev and the axis of growth (See Analysis, p. 72).

The built environment in Jammerbugt is changing centralizing functions and built structures. Brovst is no longer characterized as a city on contrary a nature territory with water on sides of the former urban hill (see Blue Structures, p.

77). Fjerritslev has enhanced the city's genius loci with nature as the center of rotation. Outdoor institutions, nature attractions and accessibility to nature transformed the city into a sticky place (See Sticky Places, 55). Aabybro and towns in the catchments area have slowly grown together now experienced as one coherent urban area fostered by Aalborg's growth.

The third Limfjord connection will have a positive impact upon growth and development in Jammerbugt Municipality. The connected especially combination with future mobilities enhancing accessibility to the municipality and internally between towns and villages.

This thesis has examined three scenarios however several known and unknown factors will likewise affect the future of Jammerbugt (Urry, 2016). However further scenarios will not be elaborated in this thesis.

Vision



The conducted analysis revealed unique qualities in nature and place-specific identities (See Analysis, p. 72). The reassemble of local narratives revealed a differentiated approach to regard correlations (See Local Narratives, 92). The future scenarios revealed places of focus (See Future Scenarios, p. 108). Based on these analyses a vision is formulated to specify the aim for the following strategy and physical design.

Illustration 126.1: Integrate the built, grown and humans

The aim of this thesis is to engage and utilize place-specific qualities in search of an unique narrative for Jammerbugt Municipality.

The vision is to integrate the built and grown for a livable municipality with increased quality of life for citizens. The aim is to regard increased water level as a quality in the endeavor creating a sustainable nature municipality. In the intersection between water and land the vision is to communicate this narrative to citizens, visitors and tourists.

The ambition is to juxtapose humans, nature and city to protect and recreate connection. This happens through understanding, strengthening and protection of the unique nature in Jammerbugt Municipality. Nature is not a place out there but where humans are and live. The aim is to enhance nature brought to effect through human focus upon processes of nature as an integrated aspect of our consciousness, society and planning for a future in symbiosis.

A photograph of a gravel road stretching into the distance. The road is flanked by dry, yellowish-brown grass and a dense line of bare, dark trees on the left. The sky is overcast with grey clouds. The overall mood is quiet and contemplative.

Chapter 08

Strategy

The following chapter presents the strategy for future development in Jammerbugt Municipality. Based on theoretical and analytic knowledge the scope of the strategy is three parameters; the built, the grown and human.



Illustration 129.1: Characteristic of minor roads in Jammerbugt

How to develop?

Strategy for Jammerbugt

Based upon theoretical and analytical acknowledgement and profounded scenarios it is found important to strategically process the future of Jammerbugt regarding respectively demographic changes and climatic challenges of significant influence (See Future Scenarios, p. 108).

According to rural development planner in Jammerbugt the municipality lacks a coherent strategy for the existing and future projects and plans (Interviewee 1, 1h34min26sec, 2019). This thesis has found qualities in Jammerbugt which future planning and strategies can further process and enhance. Externally this has a branding value reflecting the place as a nature-based municipality. Furthermore, the strategy can strengthen the local understand of Jammerbugt's unique characteristics and qualities (See Analysis Chapter, p. 72; Local Narratives, p. 92). The strategy thus makes these qualities accessible through awareness and in physical projects.

Therefore, this thesis examines what a strategy must accommodated for various projects to generate a coherent development. Furthermore the thesis specifically courts to create a strategy transferable to physical projects and enhances quality of life for citizens for the future of Jammerbugt Municipality. The following chapter will unfold the developed strategy.

A unique constellation of humans, nature and built environments

The strategy aims to embrace and preserve the atmosphere and identity of Jammerbugt municipality. The principles intend to provide a framework and guidelines for the focus of future development of the municipality. It aims to integrate nature, human and the built environment to recreate a strong relation in between.

The strategy consists of three principles; humans, the grown and the built environment. The elements are interrelated and together create a holistic approach for future focus. Therefor it is not possible to focus on one of the principles solely. The principles include the following;

Humans in focus

Many local initiatives already flourish within the municipality and bring human together in a shared activity. The aim is to embrace the already existing networks of people and activity and strengthen the synergy. The focus is to embrace the activities related to nature, communities and local qualities.

Enhance nature

The municipality is framed by varied nature characteristics. The strategy aims to enhance these qualities especially in the main cities where the nature is scarcely present. Furthermore, enhance biodiversity in the landscape and built environment.

Livable urban areas

Since most of the population in Jammerbugt municipality lives in the main cities consequently, it is important to maintain and increase the livability here. The strategy aims to introduce the processes of nature to densify and activate the built environment in order to create aesthetic and sensorial experiences in the built environment.



Increase quality of life

The following part of the strategy focuses on the human to increase the individual experienced quality of life.

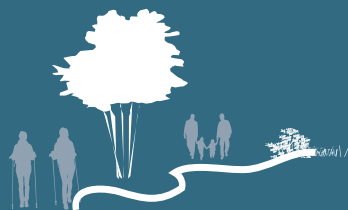
Nature can activate the sensorial apparatus of the human body creating this experience (Appleyard et al. 2014). Furthermore social interactions and activities impact human livability positively.

If humans learn from nature and the processes in nature it enables humans and future generations to live and act more sustainable. Furthermore, knowledge regarding natural processes across legislative and political authority can enhance a sustainable development of the built environment.

Many initiatives exist in Jammerbugt municipality this strategy aims to embrace the existing, strengthen the frames experiences and create new experiences for humans in relation to nature.



*Strengthen communities
and activities*



*Enhance accesability to
grown environments*



*Learn from nature and nat-
ural processes*



Enhance nature

The following part of the strategy aims to strengthen nature qualities perceived as the most characteristic identity of the municipality (See Analysis, p. 72). Thus human must adapt to nature and the current changes in sea water level and climate changes causing among other rains bursts.

The focus is to enhance biodiversity for the future generations. Jammerbugt has large protected nature sanctuaries however the predicted flooding's reveals the potential to rethink nature in the grown and built environment.

The nature can reveal solutions to solve future challenges in society especially in the built environment. Nature-based design solutions can furthermore manage Anthropocene climatic challenges as air pollution, contamination and flooding's (NASA, 2019).



Adapt to future water rise



Enhance biodiversity



*Nature-based solutions to
urban challenges*



Create livable urban areas

The following part of the strategy enhances the quality of urban environments to create livable cities. The analysis revealed the differentiated characteristics of the main cities thus experience and identities of the cities are different.

The strategy aims to strengthen the unique characteristics of the respective cities. However focusing on the growing and most characteristic main cities thereby the strategy densify these cities through fill in.

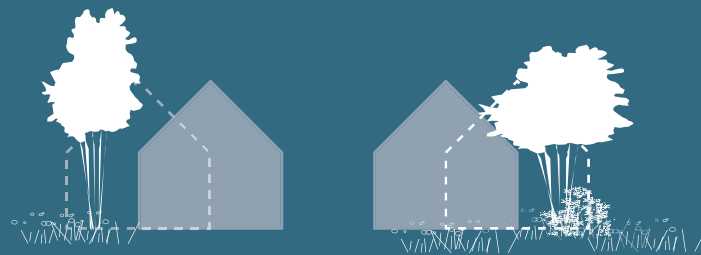
Cities experiencing continuing decline will be depopulated and public and commercial functions are relocated. Here nature serves as in-fill to densify cities being depopulated and thus enhance biodiversity.



Strengthen characteristic identities of main cities



Focus on growing main cities and densify with in-fill built and grown structures



Depopulate where necessary and use nature as infill in urban areas

Concluding remarks

The presented strategy focuses on livability, the grown and the built in search of developing a strategy applicable to the following design (See Spatial Design 140). The strategy focuses on simultaneously potentials and challenges in Jammerbugt. Furthermore the aim is to create a strategy to embrace existing and future projects within Jammerbugt Municipality.

Thereby point of departure is the genius loci of the place and existing qualities in Jammerbugt to develop a strategy enhancing the narrative of the place.

The transparent and graspable principles in the strategy are created to enhance the direction by which the development in Jammerbugt is planned and developed. The municipality has realized several strategies and approved projects with various characters and despite the aim for development and growth the projects seem to be without a common plan (See Local Narratives, p. 94). Therefore, this strategy represents a common strategy and narrative for Jammerbugt Municipality.



A person in a dark jacket stands on a concrete pier, looking out at a calm body of water under a cloudy sky. A red and white lifebuoy is mounted on a vertical post next to them. The scene is serene and contemplative.

Chapter 09

Spatial design

The theoretical chapter revealed a general understanding of contemporary tendencies, the analysis a site-specific understanding of characteristics. Local narratives examined new understandings in reconstructed situations. Scenarios revealed futures of Hammerbugt thereby potential places of interventions and the strategy established guidelines. The following chapter translate the previous mentioned into a site-specific design.



Hovedspring
forbudt

Vanddybde
kun 90 cm



Badning sker på eget
ansvar.

Pas på kæder og
betonklodser ved
badebroen!

Bathing at your own risk.
Beware of chains and concrete
blocks by the bathing jetty.

Baden auf eigene Gefahr.
Beachten Sie die Ketten und
Betonklötze bei der Badebrücke.



Illustration 141.1: Visit at Gjøl looking towards Øland

From strategy to design

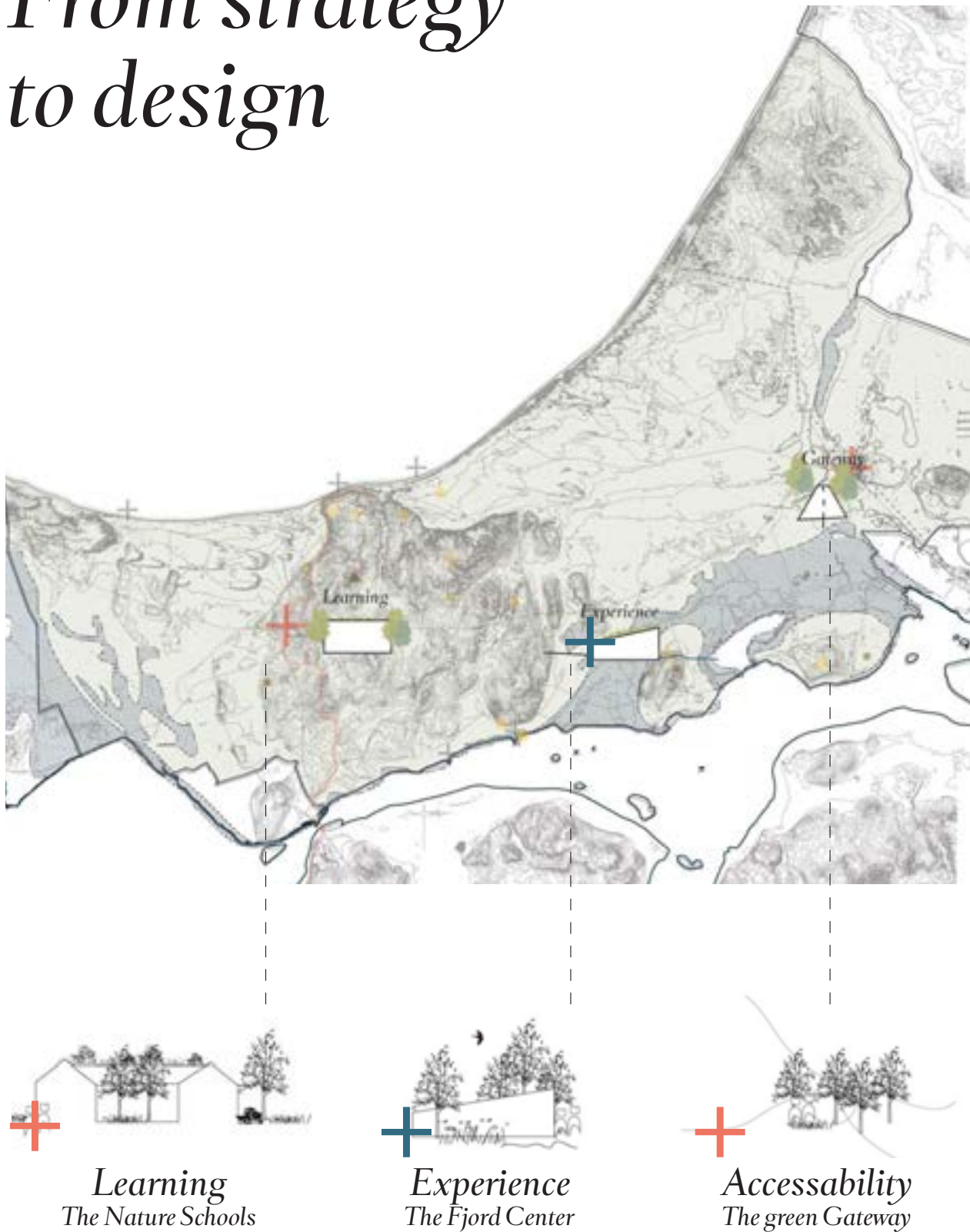


Illustration 142.1: Three important points of intervention

The accessibility from the cities of Jammerbugt and surrounding nature must be strengthened to enhance quality of life for citizens and communicate the identity as a Nature Municipality.

Three strategic points of interventions are found based on theoretical and analytical findings and scenarios regarding demographic and climatic changes in Jammerbugt. Today three main cities contend for citizens and visitors however this thesis has found that existing critical mass can solely feed two cities (See City Identities, p. 88).

The following describe the three strategic points followed by a zoom into the intervention marking the juxtaposition between fjord and land near the depopulated Brovst.

The green Gateway

Aabybro is the infrastructural node of Jammerbugt however public accessible nature is inadequate in the urban fabric. When arriving to Jammerbugt Municipality visitors encounter the infrastructural landscape surrounding Aabybro. The arrival must be processed to communicate the narrative of the municipality. Imagine arriving to the green gateway of Jammerbugt!

Initiatives:

- Create a distinct recognition arriving to Jammerbugt with a physical initiative. Indicate nature-based experiences and narrative of Jammerbugt a municipality with unique nature qualities.
- Process the relation between the built and grown
- Strengthen accessibility to nature and strengthen biodiversity in and around the city. (See Design Catalogue, appendix).

The Nature Schools

Fjerritslev has a vivid city center but the synergy between nature, city and humans is inadequate (See City Identities, p. 88). Next generations thus have to learn about nature to create synergy.

Initiatives:

- The schools and institutions in Fjerritslev are converted teaching into nature-based and common physical outdoor frames are established.
- Every day-nature is made accessible in the city for human health and to strengthen biodiversity in the built environment.
- Strengthen citizens attachment to the city through communities and collaboration enhancing quality of life.

(See Design Catalogue, appendix).

The Fjord Center

The sea water level rises flooding low-laying areas along the Limfjord (See Blue Structures, p.77). On the edge between water and land a Fjord Centre is located to make forces of nature visible and reveal the unique fjord landscape of Jammerbugt.

Initiatives:

- Exhibit nature and wild life in Jammerbugt to enhance experiences in and about nature.
- Establish a learning environment framing the fjord landscape, climate and biodiversity in Jammerbugt in relation with The Nature Schools.
- Conduct research biotopes above and under the fjord to examine changes in the fjord landscape.
- Brand existing nature-based destinations in Jammerbugt.

(See Design it, p. 144).

Design it

Design principles

The thesis will elaborate further on the design of the Fjord Center. Based on previous chapters the notion working with a narrative of the complementary relations between the grown, built and humans was developed. Furthermore analysis of the cities potentials for development and climate challenges indicated that Brovst is and will be challenges (See Cities Identities, p. 88; Blue Structures, p. 77). This design assumes that the city has to be depopulated and nature is utilized as in-fill to densify. The spatial design focuses on the narrative between the fjord and land thereby not the built environment of Brovst.

The spatial design communicates the narrative in a building; The Fjord Center designed to enhance Jammerbugt Municipality as a sticky place for citizens, visitors and tourists by implementing nature-based design methods (See Theoretical Discussion, p. 48).

It is important to regard the Fjord Center as more than just an attraction. The building is a workplace for researches, knowledge and experiences. The functions related hereto are gathered to create a synergetic effect for the researchers, students, visitors and tourists (See plan, p. 148). Furthermore, the center is a place offering nature-based knowledge and experiences for citizens.

The Fjord center aims to create an experiential

frame for everyone of interest. A common aim for every visitor is the activation of senses through sensorial experiences. Thus the concept of the building is to invite various users to interact with nature; feel the water, hear the wind or touch the fish in the fjord biotope. Hereby the aim is to increase the awareness of the relation between the built, the grown and humans to inspire and gain knowledge about sustainable everyday solutions.

The idea is for the users to understand the nature as quality humans must protect. The house is integrated into the existing landscape inviting users to exploit and learn from nature in the area.

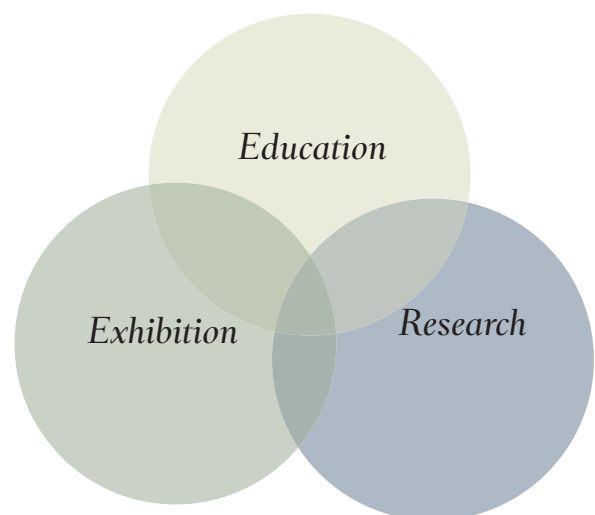


Illustration 144.1: Three themes for the center

Concept

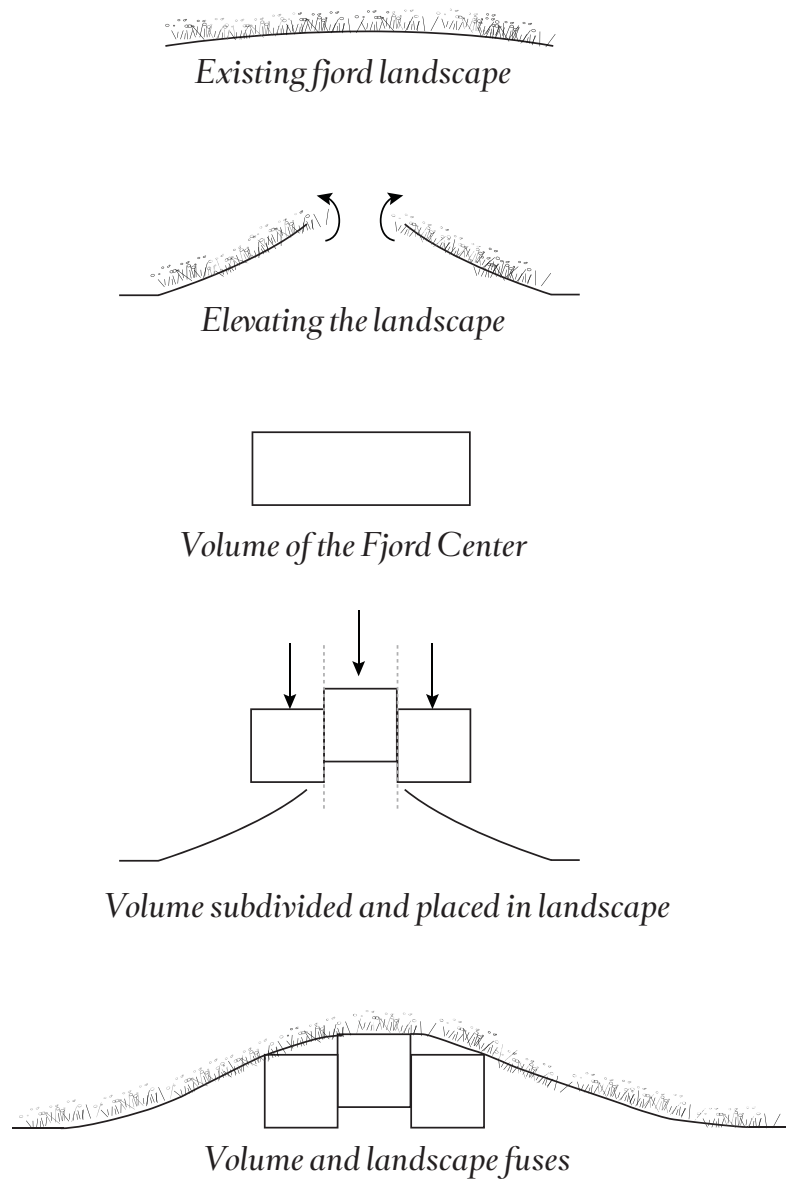


Illustration 145.1: Designing the Fjord Center integrated in the landscape





Illustration 1471: Visualization of the foyer in The Fjord Center

The Fjord Center

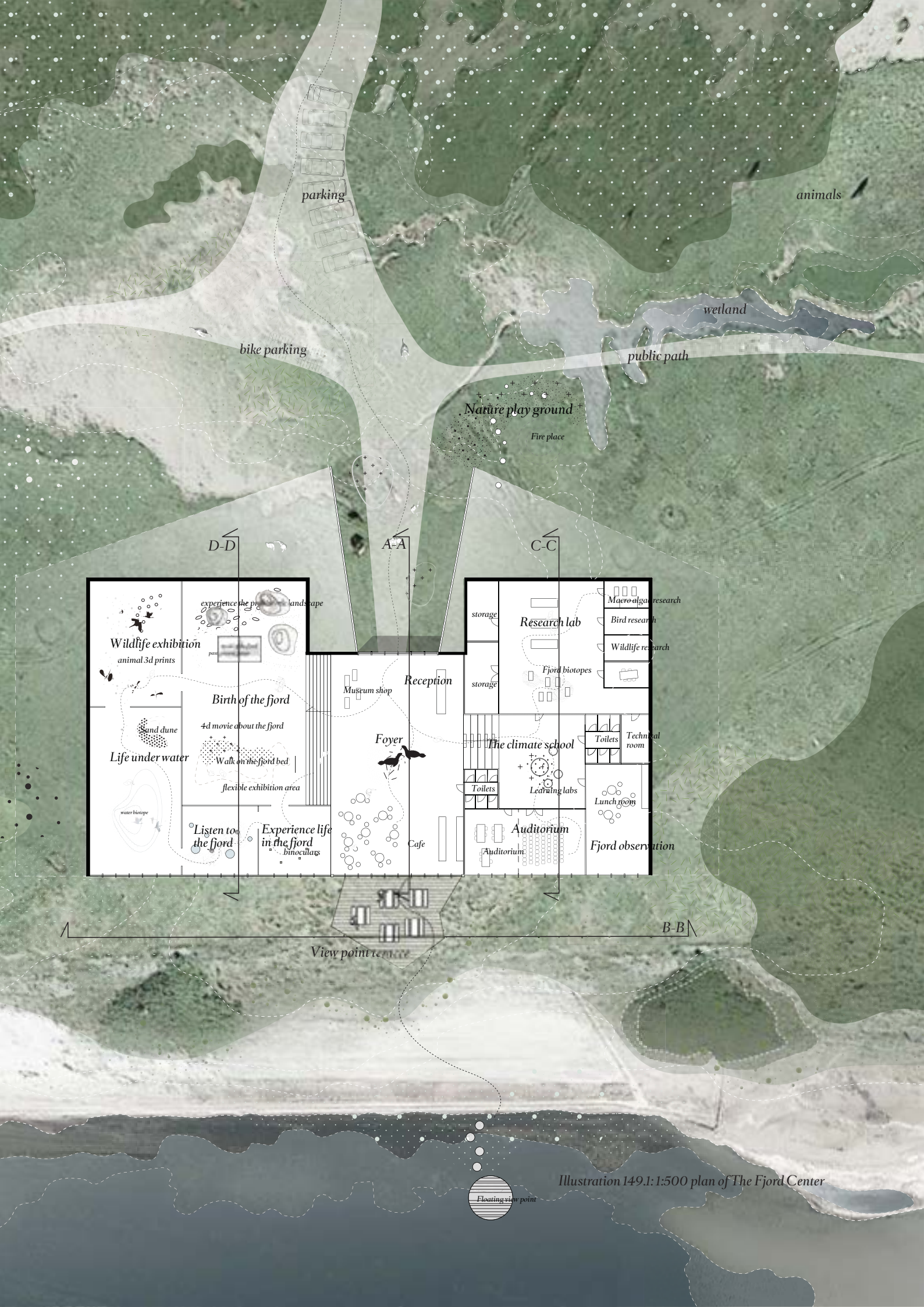
In the center of the building; the foyer and museum shop invite guests to enter. When entering the building a window in front of you frames the fjord landscape. Here a café is placed to enjoy the view of the fjord and changes in weather. On the one side the foyer educational and research spaces are found. The other side of the foyer is exhibition spaces inviting visitors on a journey through the birth of the fjord to wildlife and life under water towards the sensorial experiences of the fjord. The research unit and exhibition spaces separated but maintain connected visual.

Canal

heath

New Coastline





parking

animals

wetland

bike parking

public path

Nature play ground

Fire place

D-D

A-A

C-C

Wildlife exhibition
animal 3d prints

experience the pro landscape

Birth of the fjord

Life under water

4d movie about the fjord

Walk on the fjord bed

flexible exhibition area

Listen to the fjord

Experience life in the fjord
binoculars

Museum shop

Reception

Foyer

Cafe

Research lab

Macro-algae research

Bird research

Wildlife research

Fjord biotopes

The climate school

Learning labs

Auditorium

Auditorium

Toilets

Technical room

Lunch room

Fjord observation

View point terrace

B-B



Floating view point

Illustration 149.1: 1:500 plan of The Fjord Center

Rooms & programs

The interior program reveals an interesting environment of research, education and exhibitions. The building gathers functions to narrate a common story of the municipalities nature initiatives.

The house provides indoor facilities needed functioning as a research and exhibition hub. Conference rooms, exhibition rooms and labs for educational purposes of institutions.

The exhibition spaces of the Fjord Center have a diversity of sizes and shapes to enhance experiences and enable different functions and activities. Large and open spaces are flexible when creating exhibitions, stage lectures or workshops. The simple floor plan makes it easy to understand and navigate for all users.

Room	Area
Exhibition space	828 m ²
Foyer (cafe, shop & reception)	376 m ²
Education space	128 m ²
Research labs	177 m ²
Research office spaces	74 m ²
Auditorium	100 m ²
Lunch room & fjord observation	90 m ²
Technical room	17 m ²
Toilets	38 m ²
Storage	54 m ²
Total	1.882 m²

Illustration 151.1: Room program

The experience

In this room wildlife under the fjord can be experienced. A 3D movie is played over the walls and ceiling so time and place for a moment is forgotten almost engrossed by the magical world of the fjord. On the floor among reeds and sandy soil you can be fortunate to find birds and mussel bars, revealing one of many biotopes in the area. Follow the footprints of the birds and find the next room where you can hear sounds from the fjord landscape.

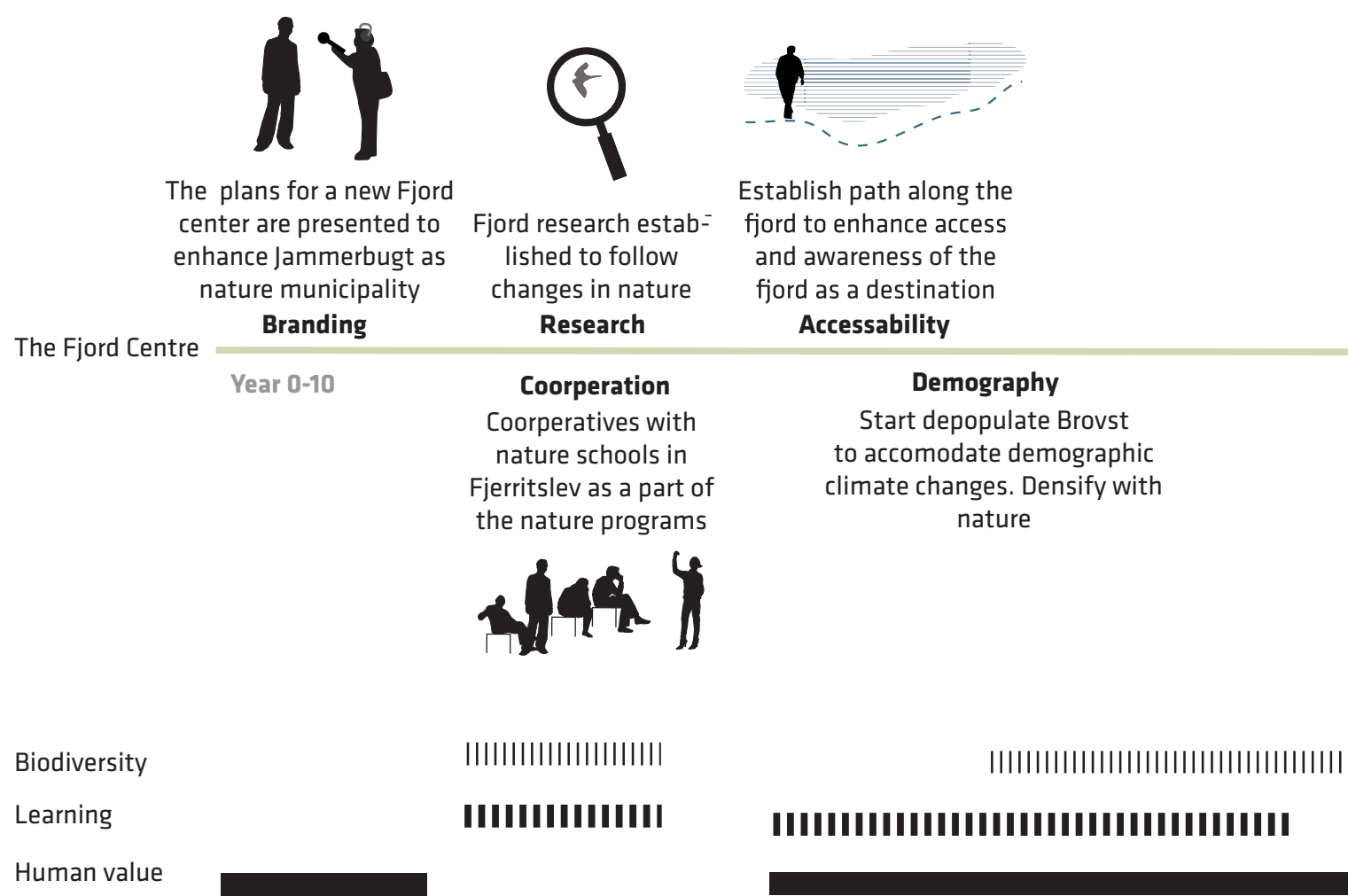




Illustration 153.1: Visualization of exhibition space about wildlife under water in the Limfjord

Design timeline

The timeline illustrates the phases of the design in a period of 80 years. This period is chosen since the water is predicted to rise with one meter and future mobilities can likewise be expected implemented in society.



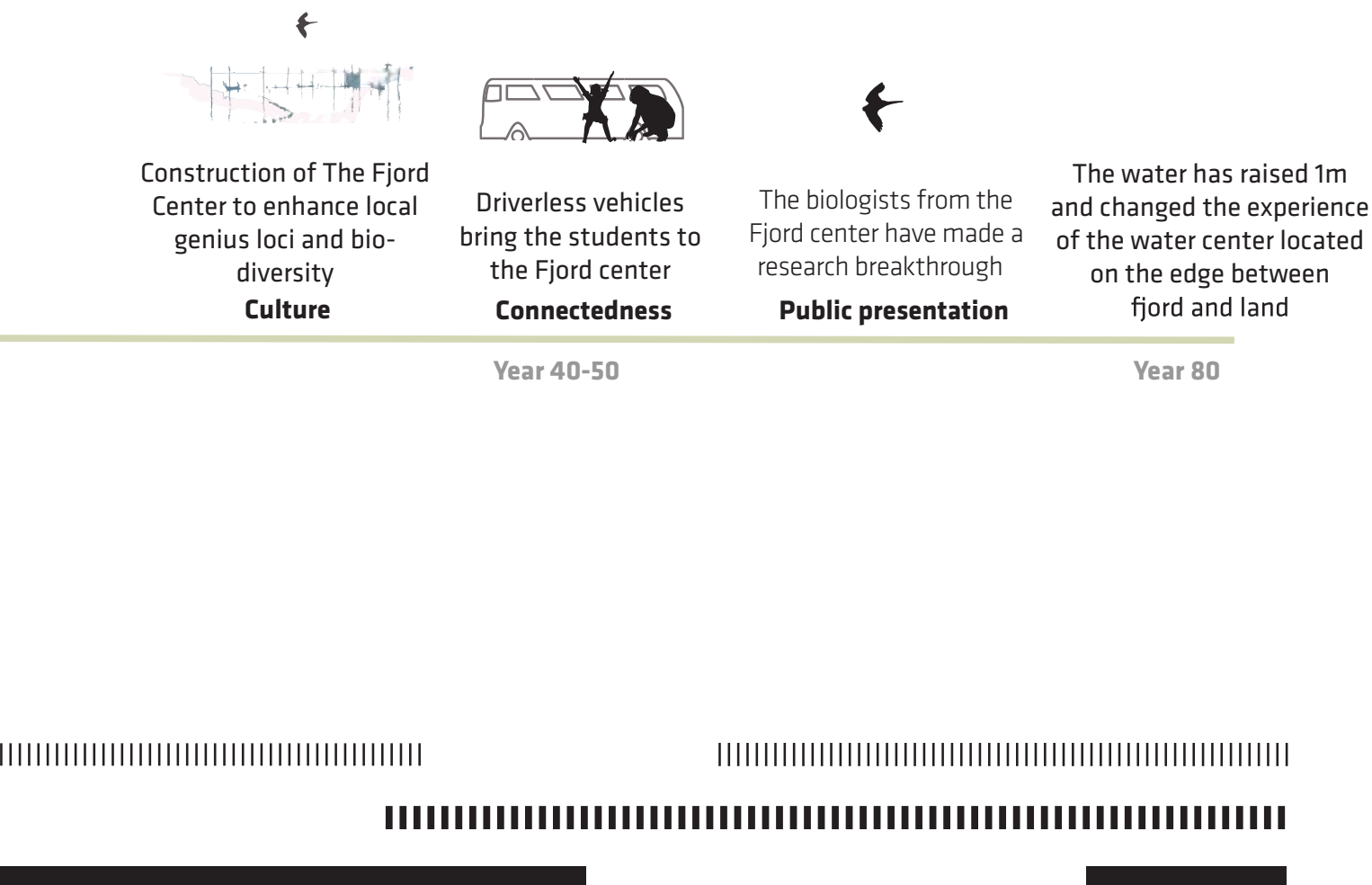
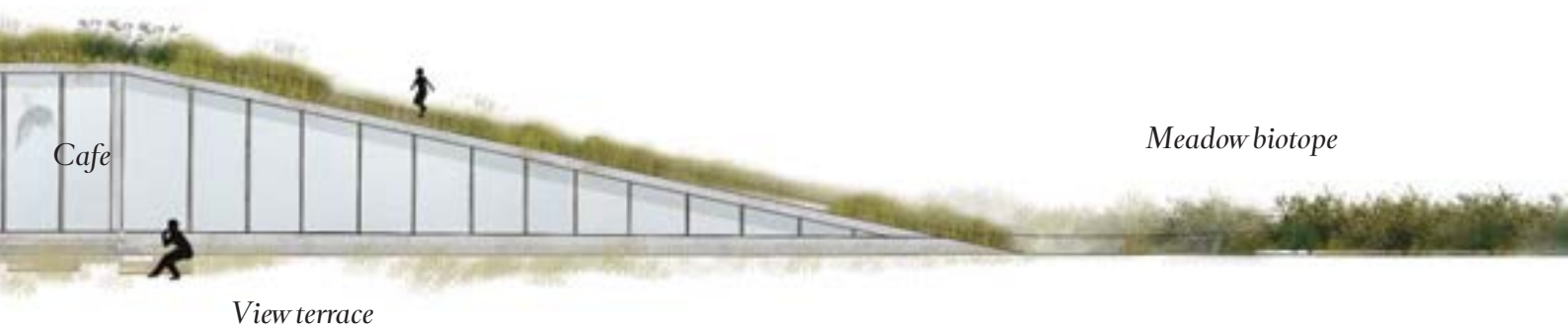


Illustration 155.1: Timeline for The Fjord Center





*Illustration 157.1: Section A-A
Scale 1:200*

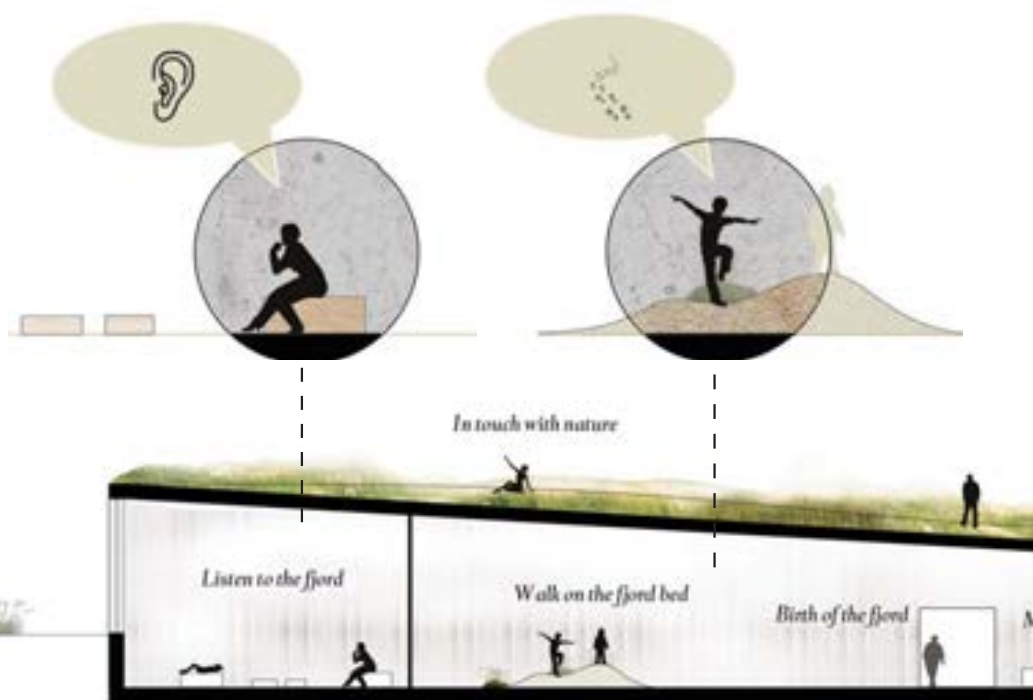
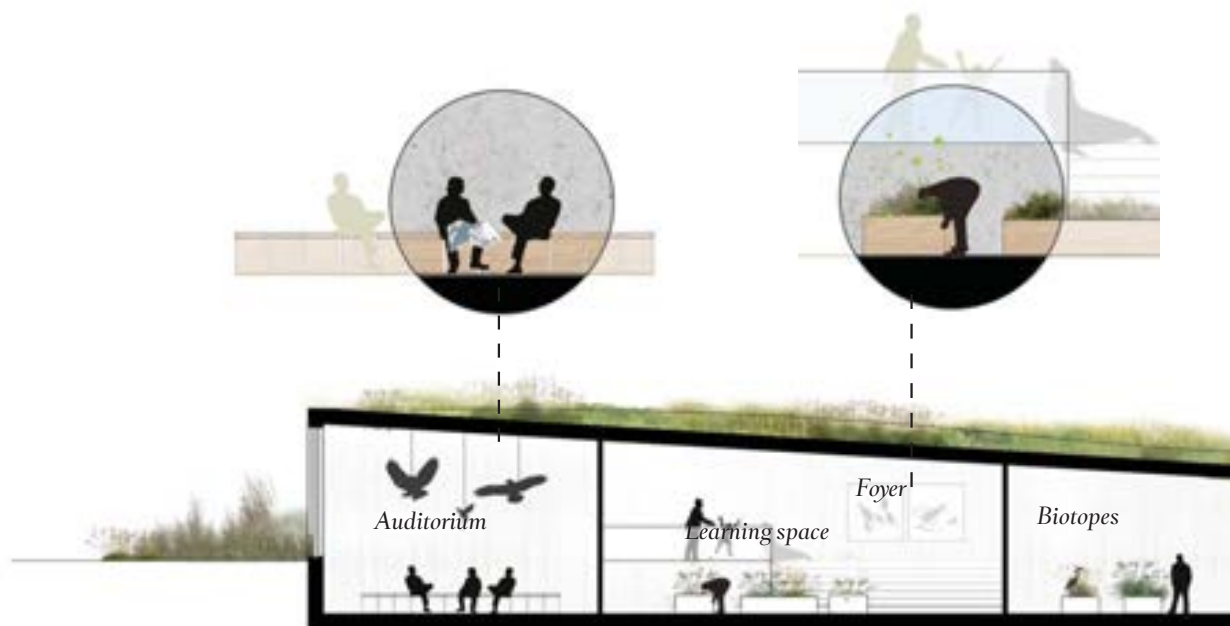


*Illustration 157.2: 1:200 Elevation B-B
Scale 1:200*





Illustration 159.1: Visualization of the arrival and entrance to the Fjord Center



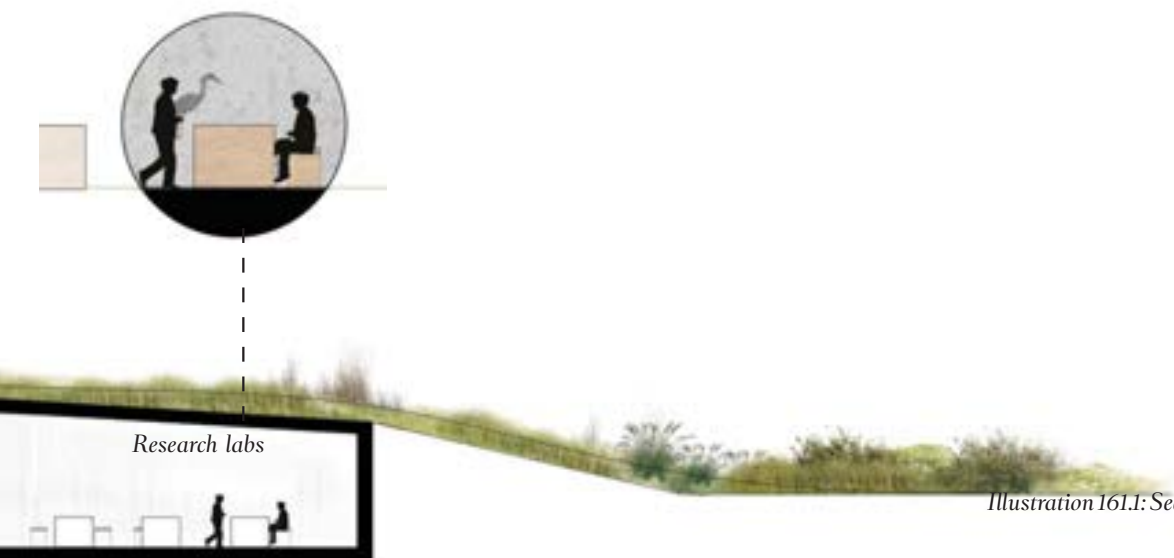


Illustration 161.1: Section C-C research spaces
Scale 1:200

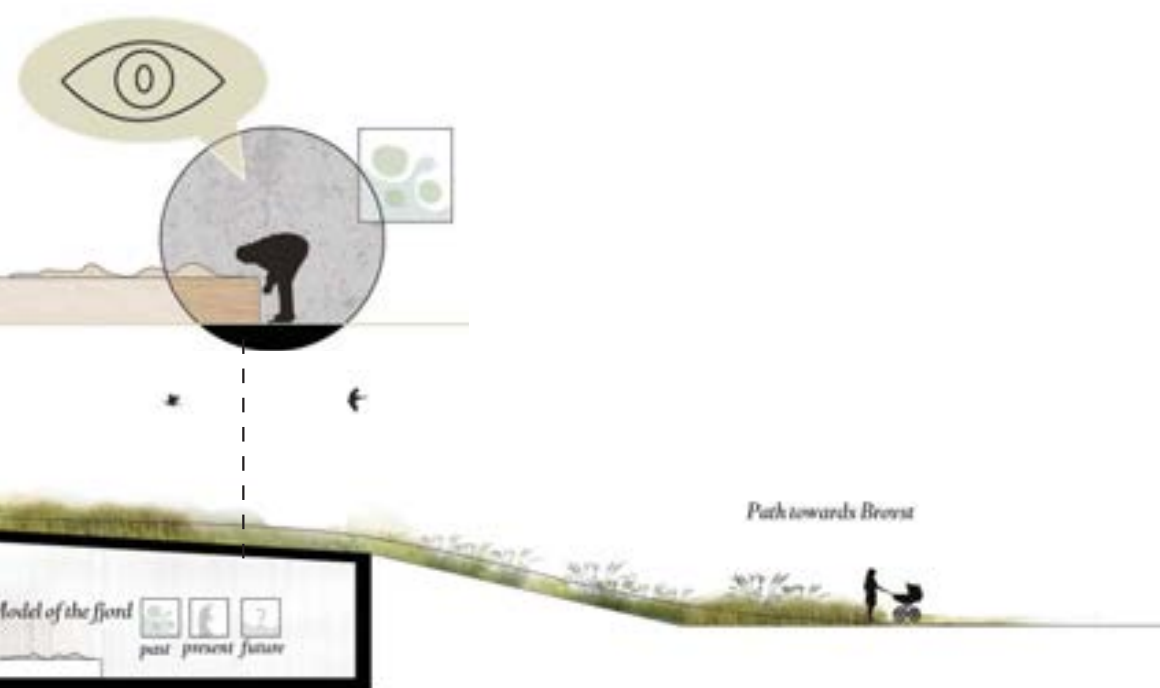


Illustration 161.2: Section D-D exhibition space
Scale 1:200

The users



The researcher

The employee uses the center for work related purposes. The employee work as a guide and researcher to increase knowledge about nature; biodiversity, the life in the Fjord and sustainable futures. Knowledge found by the researcher is beneficial for the center and occasionally the researcher hosts guided tours or public seminars of new findings.



The students

The students visit the center in institutional and school relations. The institutions increases the nature-based learning already being taught at the schools (See Design Catalogue, Appendix). For the students the center frame education in biodiversity, natural systems and sustainability. The students are curious and open for new experiences including listening, touching, watching, smelling; activities that activate the senses; elements the center aim to enhance.



The local

The citizen live in Jammerbugt. He or she visit the center for natural recreational purposes in the spare time. The center creates a frame to enjoy the natural surroundings and lunch here. The locals become familiar with natural qualities and how to protect it through knowledge obtained in the center.

The tourist

The tourist visit the center in relation to a visit in Jammerbugt either in Blokhus, Sletterstrand or with the center as the destination. The tourist choose this destination due to unique nature qualities and with the desire for enlarging their horizon and learn about local environment and nature relations.

Illustration 163.1: The users

User intensity

During a week

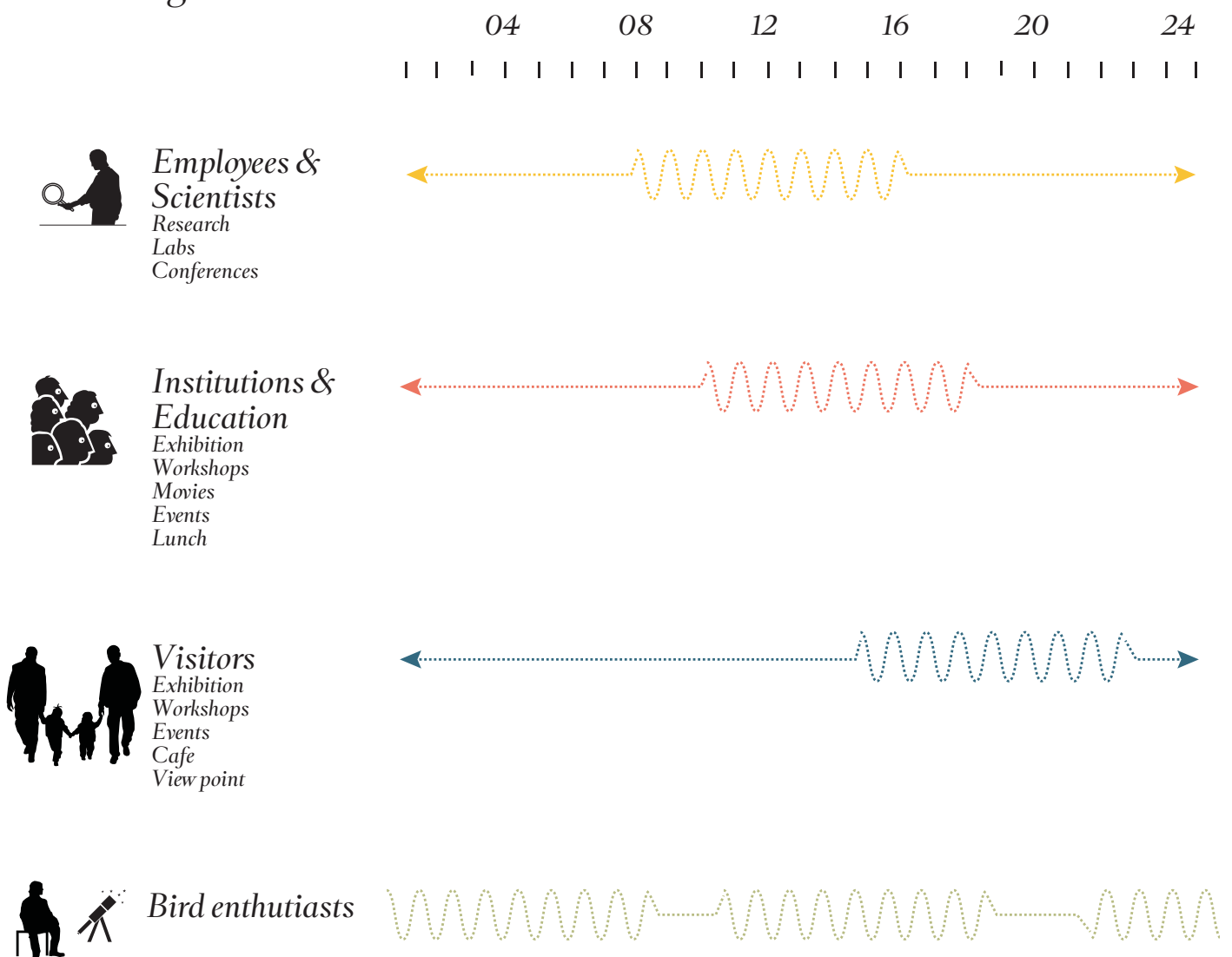
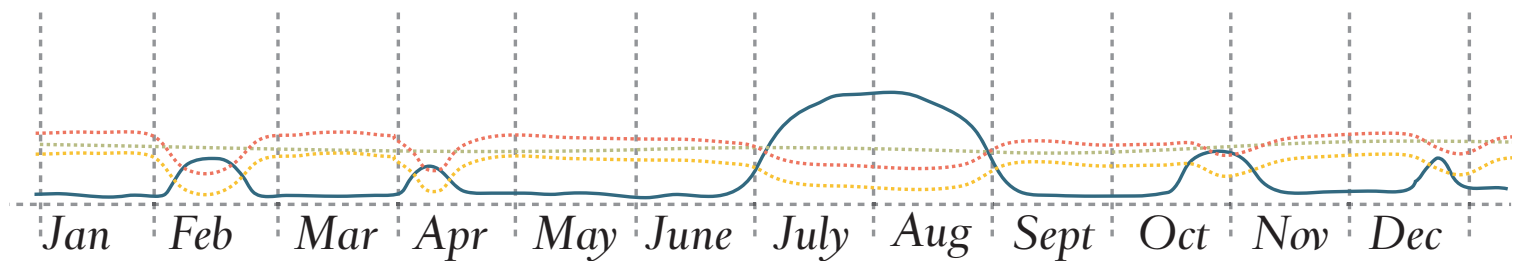


Illustration 164.1: User intensity during a week

During a year



Learning, exhibition and research is assembled in one building accordingly the everyday life of the center is changing defined by the users at the given time. The building aims to accommodate this variability by creating flexible spaces for a diversity of activities.

The weekly activity diagram (See illustration 162.1, p. 162) and the annual activity diagram (See illustration 163.1, p. 163) can be regarded as images of dynamic and variability the Center can experience.

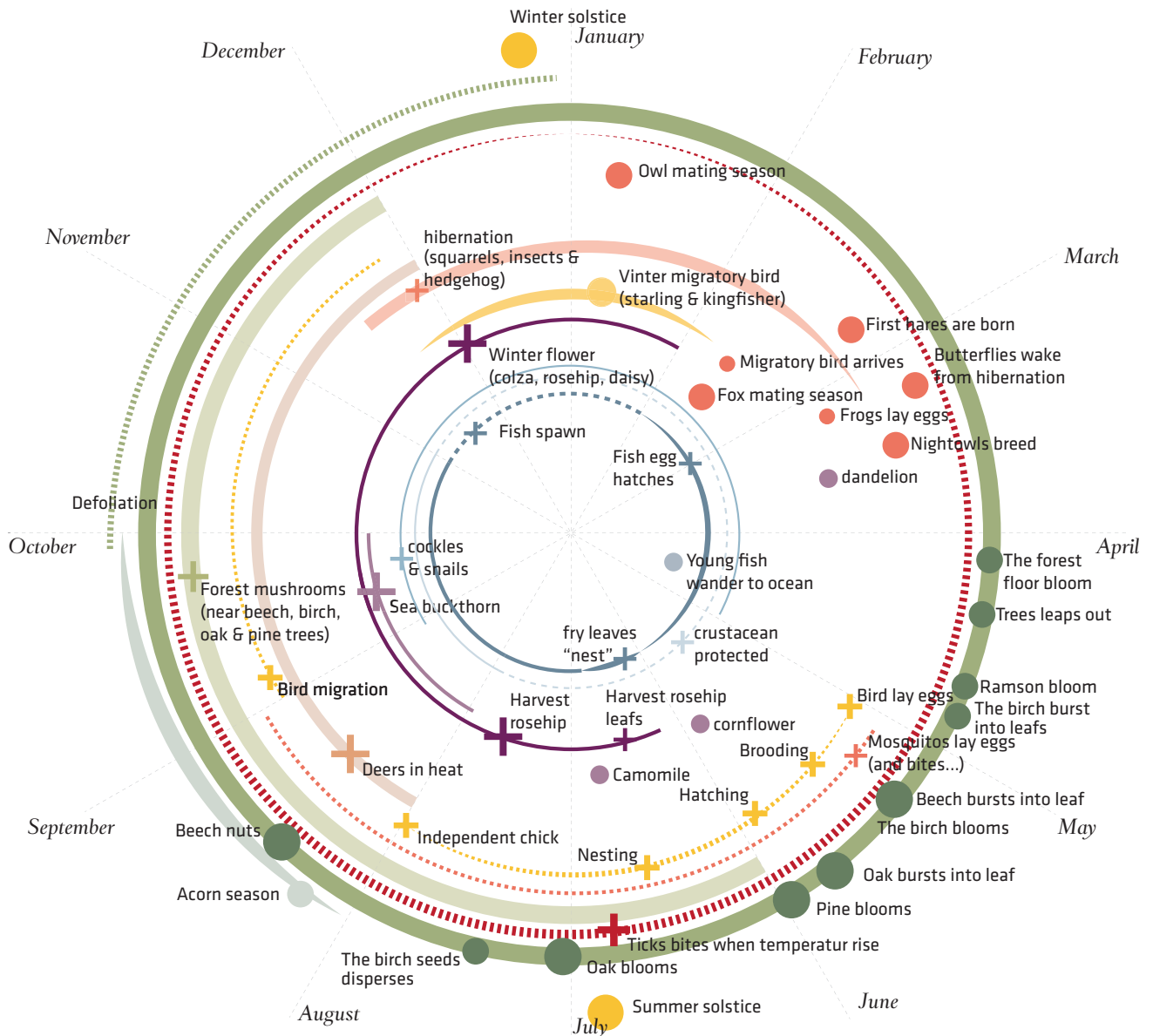
Due to various user groups the center will be used most of the day and year. During the day the center is place of employment for researchers concurrently students and institutions from the surrounding cities learn about

nature and wild life in the fjord. In the afternoon and weekends the Center is expected to attract visitors and tourists.

Furthermore, the intensity of the user groups is expected to vary during the year. During the summer months the center is expected to accommodate a high intensity of tourist while schools and institutions use the center during the academic year from August to June.

Illustration 165.1: User intensity during a year

Annual nature wheel



The nature is changeable during a year. The seasons change, seeds sprout, new leaves begin to expand and baby animal are born. For humans these changes might happen without human consciousness or appreciation. If examining the nature and processes of nature one is likely to find and experience an abundance of processes happening simultaneously. This is a complex eco-system of among

other things animals, plants and insects mutually depended upon each other. Some plants adapt to natural or human-impacted changes as climate changes while other animals and plant do not have that ability. Knowledge about the eco-system can contribute to comprehension of biodiversity simultaneously understand how it can be strengthened.

Illustration 166.1: The annual variability in nature



Biotopes and biodiversity in Jammerbugt are examined to understand the complexity of nature. According to United Nation biodiversity is defined as *“the variety of life on Earth, it includes all organisms, species, and populations; the genetic variation among these; and their complex assemblages of communities and ecosystems”* (UN, 2010). Biotope is a habitat defined by the specific environment among other an oak tree is the habitat of more than

800 insect species (Skoven I Skolen, 2019) Commonly three different levels of biodiversity are described; genetic, species and ecosystem diversity. Ecosystem diversity describes the various biotopes, ecological processes and animals (UN, 2010). Knowledge of biotopes and biodiversity is crucial to understand and communicate processes of nature in the Fjord Center.

Illustration 167.1: Images of various biotopes found in Jammerbugt

Connections in the landscape

View point to fjord and sea

Skovsgård hotel

Kolkedal castle

Attrup camping

Attrup new harbor

The floating harbor cafe





New coast line

Site of Fjord center

Oxholm forest

Shelter

Oxholm Mill

New coast line

Former Dyke

Protected wildlife

The Fjord Path

Shelter

Walk in the water surface

The Limfjord

*Illustration 169.I: 1:25,000 Plan
Location of The Fjord Center*

A sensorial journey

The Fjord center is located approximately two kilometers from the highway driving through Jammerbugt and a few hundred meters from the village Brovst.

Passing through the village of Brovst, the open landscape meets the eyes of the visitor. A meadow landscape in front of you and you can dimply see the new coastline in the horizon. On the edge of water and land, the Fjord center is carefully placed thus naturally inscribe in the landscape.

An outdoor path leads visitors to the center and allows visitors to experience the surrounding landscape with birds, meadow flowers and changing water levels.

The low meadow landscape invites the visitor to experience great views and unimpeded movement. The nature qualities create a sensitive atmosphere. The area consists of unique landscape qualities and the concentration and variation of bird and wildlife is extraordinary.

Thereby the building is a place for human experiences in nature and invites everyone the engage with nature.



Illustration 1711: Visualization of path leading to the center



Illustration 172.1: The narrative of the Fjord Center enrolls into the regional narrative of nature-based identities.

The West Coast identity

To place the Fjord Center according to the narrative on the edge between water and land the future coastline in 2100 was found. Water already defines Jammerbugt Municipality and the new coast line communicates the forces of nature. Today the meadow and wetland landscape predicted to experienced future floodings is protected nature appointed by the European Union as Natura2000 (European Commision, 2008; See Green structures, p. 74). Over time water rise will expand the meadows and wetland landscape towards the Fjord Center since these low-lying areas no longer will be attractive as traditional production landscape or housing. Thereby the unique landscape and bird life surround the Fjord Center enhancing the experience.

On a regional scale water has throughout time defined the identity of the region and been an important for fishery, as employer and as a tourist destination. A genesis of a national park has placed Thy on the map while creating awareness of the place-specific nature (Nationalpark Thy, 2019). Klitmøller is now a world-famous surf-destination and the water here serves as an activity and a recreational life style (See A sticky place, p. 56). At Rubjerg Knude high Ice Age cliffs and natural erosions drastically changing the landscape and the built environment has for years attracted visitors (Rubjerg Knude, 2019; See Analysis, Appendix)

The proposed design of a Fjord Center inserts into the identity of the West Coast as a water and nature-based region. The Fjord Center inserts into this narrative by creating the frame to communicate, educate and experience the forces, life and beauty of water.

Placement in landscape

The design of the Fjord Center enhances existing potentials to develop a peripheral node in Jammerbugt municipality. The Fjordcenter does not dominate the landscape but is carefully placed and designed to implement naturally in the environment. It creates environments for experiences, education and exhibitions and enhance the connection between nature and human and set the frames for interactions between different users as students, locals, families, tourists etc.





Illustration 175.1: View towards the center from the Limfjord

Materials

The Fjord Center communicating respectively the natural environment with the green roof as well as the built structure functioning as a mediator between the built and the grown.

The materials for the Fjord Center are selected to occur naturally and complement the surrounding environment. As well as creating a contrast between the built and the grown. Experiencing the center from a distance, it naturally enrolls to the surrounding nature and the green meadow roof harmonically melts together with the existing landscape.

Inside a contrasted expression is achieved between rough tactility and feeling of concrete and the color, tactility and perception of wood. Wooden window frame the view to the fjord and is inspired by the natural surroundings. Furthermore, wood is applied to surfaces inside the center and to terraces in the landscape.

The building is constructed from reused concrete where the concrete blend is substituted with concrete from demolished buildings to reduce the CO2 imprint (Lendager, 2019).

A green roof make the roof has an insulating effect and contributes to the biodiversity. The roof is a construction system optimized for vegetation, water balance and protection of the roof construction. (Videnbladet park og landskab, 2013).

Building materials are often debated and new methods are continuously investigated. Several pilot projects examine and demonstrate circular building methods of recycling and up-cycling thus reduce the imprint of CO2 by reducing the amount of waste, transportation of materials and virgin materials in a building process (Miljøministeriet, 2018; Lendager, 2019).

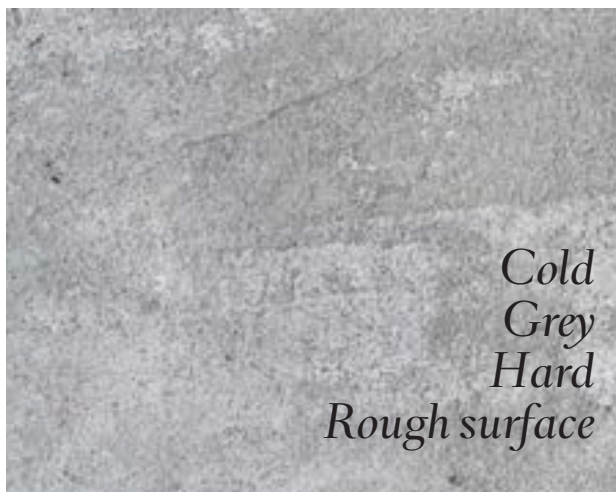


Illustration 177.1: Applied materials

Make it sustainable



The following will present the sustainability goals by United Nations processed in this design proposal.

Nature is a prerequisite for life on earth however actions of throughout time have caused unbalance in among other things nature (See A need for nature, p. 32). Humans have a common responsibility to create a sustainable future for everyone. United Nations sustainable goals seek to meet the complex situation through 17 themes. These goals have

inspired the sustainable approach of the strategy and design in this thesis.

The sustainability goals are introduced as one approach to examine and use in search of a sustainable future.

It is acknowledged that the 17 sustainability goals are interrelated however this thesis directly addresses the sustainability goals number 4,11, 12, 13, 14, 15 and 17 (See Sustainable Development, p. 30). These are related to education

and knowledge, the built environment and green structures. The following page present quotes from subsidiary goals of the goals applied to the physical design.

Illustration 178.1: Applied Sustainability Goals (Based on UN, 2019)



4.7 By 2030, ensure that all learners acquire the **knowledge** and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development



11.7 By 2030, provide universal access to **safe, inclusive and accessible, green and public spaces**, in particular for women and children, older persons and persons with disabilities



11.a Support positive economic, social and environmental **links between urban, per-urban and rural areas** by strengthening national and regional development planning



12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and **lifestyles in harmony with nature**



13.3 Improve education, **awareness-raising** and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning



14.a Increase scientific knowledge, develop **research capacity** and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries



15.9 By 2020, integrate **ecosystem and biodiversity values** into national and local planning, development processes, poverty reduction strategies and accounts



17.17 Encourage and promote effective public, public-private and civil society **partnerships**, building on the experience and resourcing strategies of partnerships.



The focus on selected sustainability goals simplified the complexity dealing with questions of sustainability within this type of projects.

The diagram above illustrates the inter-related goals and the goals this design project directly addresses.

Illustration 180.1: The complex and inter-related Sustainability Goals applied.

A common future

Several sustainable initiatives have been introduced in this thesis; United Nation has develop 17 goals for a sustainable future, the Danish Municipalities developed Climate Plans as a part of the 2013 Economic Agreement and The Danish Society for Nature Conservation has appointed Jammerbugt as a climate municipality however the performance in terms of sustainability is dynamic thus continuously processed (See Sustainable Development, p. 30; Sustainable Planning, Appendix).

This project presents a physical design aiming to increase awareness and act upon predicted climate challenges facing Jammerbugt Municipality. This project aims to learn from nature and the processes of nature in search of a more sustainable future (See Nature as the foundation, p. 60).

As Urry argues the future is democratic thus a sustainable future is the responsibility across scales and authority; a responsibility for stakeholders, for local planning, national planning and international (See Why imagine the future, p. 110).

As humans we have a common responsibility for the future. Thereby, a common understanding and agreement upon the common responsibility is crucial. Disregarding background and opinion this can enable humans to develop towards a common sustainable future.

“The grown is first and foremost nature, which is the basis of our existence; but the grown is also the creative force, which nature inspires us humans to set free, when we allow ourselves to come into contact with natural resources.”

(Andersson, 2016)

Spatial design remarks

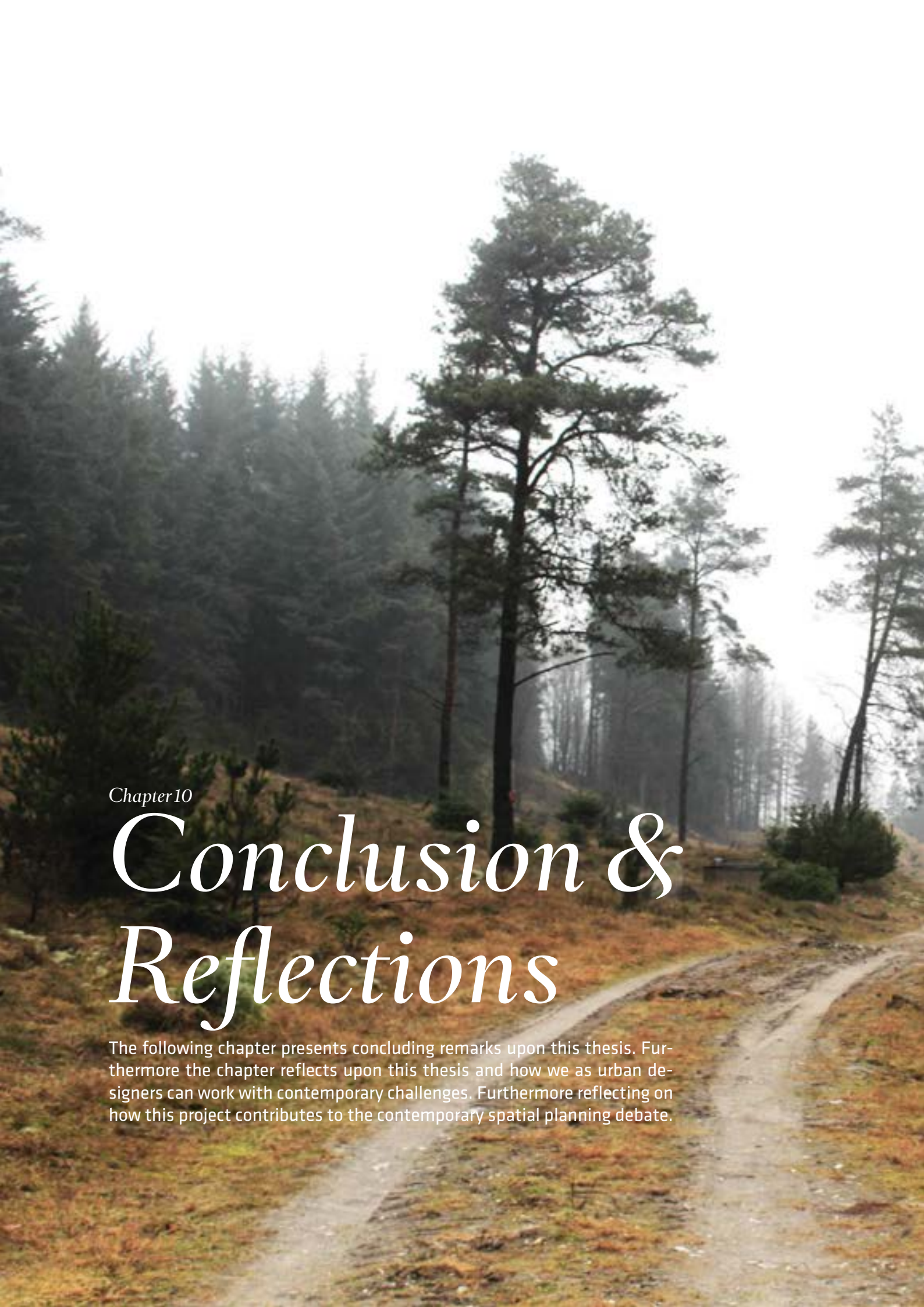
The chapter show cases how a vision to create a strong identity anchored in local potentials can be realized in a physical design. The Fjord Center is created to link education, experiences and research within one building. The building is the frame for students to exploit nature and enhance curiosity. For researchers the building enables new discoveries to be made thus contributing with knowledge to the local, national and international debate. For visitors unique experiences awaken the senses and knowledge about the nature. Hopefully, every user of the building will experience increased awareness of nature and perhaps reflect upon the relationship between nature and humans.

On a local perspective the Fjord Center creates increased value. On the regional level, it creates yet another reason to visit the municipality in search of an experiential destination.

The Fjord Center reveals the willingness to embrace, manage and communicate future challenges. The branding value of the center can potentially increase attention and attract visitors.

The design is a physical manifestation of Jammerbugt as a Nature Municipality communicating existing initiatives and the unique nature experiences in the municipality. The Fjord Center is recognized as a part of the narrative for the municipality, as mental awareness having an icon in a larger context and as a everyday institution for citizens.

The chapter introduced a physical design of a Fjord Center which was one of three potential sites for intervention as introduced in the beginning of this chapter (See From Strategy to Design). Conceptual proposals for the two remaining sites can be found in Appendix (See Design Catalogue, Appendix)

A photograph of a misty forest landscape. A dirt path leads through tall pine trees, with a dense forest in the background. The scene is hazy and atmospheric.

Chapter 10

Conclusion & Reflections

The following chapter presents concluding remarks upon this thesis. Furthermore the chapter reflects upon this thesis and how we as urban designers can work with contemporary challenges. Furthermore reflecting on how this project contributes to the contemporary spatial planning debate.



Illustration 185.1: Klim forest plantation.

The Nature-Municipality Jammerbugt

Concluding remarks

The point of departure for this thesis was to focus on national and international demographic and structural changes to understand how this impact the formation of rural outskirts experienced today.

Contemporary tendencies revealed internal demographic changes in Jammerbugt however likewise revealing local growth in an area otherwise considered as “the outskirts of Denmark”.



Illustration 186.1: A dandelion growing through the built

Based on theoretical knowledge and conducted analysis the thesis verbalized probable future scenarios for Jammerbugt. This established the basis for a strategy with focus on humans, nature and cities translated into a design creating a building to communicate nature as a quality to learn, understand and experience. The design and strategy enroll in the international debate of sustainability and the complexity formulating and process visions into a physical project on a local scale in search of a resilient and sustainable future.

The design communicates Jammerbugt's narrative connected to water as a quality for life in the past; present and future thus make Jammerbugt a forerunner revealing the story of the climate changes and qualities in nature.

At the same time, the design communicates the urgent de-

mand for action and answers to the challenges of tomorrow.

The Fjord Center is located on the edge between water and land mediating the relation between the built and the grown. Thereby, Jammerbugt manifests the identity and positive narrative being a Nature Municipality. Thus the design of the Fjord Center strengthens the brand of the municipality.

The Fjord Center activates users, creates experiences and stimulates curiosity allowing the user to reflect upon nature and the reciprocal impact. Thereby, the aim is to inspire people to understand nature and the processes of nature. The center aims to compile existing nature-related destinations, activities and attractions in order to generate synergies and enhance awareness hereof. Furthermore the design is regarded as part of the common identity of the

Jutlandic West Coast related to nature.

The thesis creates a new understanding of Jammerbugt being a Nature Municipality containing attractions, destinations and now an icon re-

lated to nature. The intervention is one attempt to creating awareness of a sustainable future thus change the existing dichotomy separating built and grown. This is effectuated through distinct inherent potentials as the foundation

to create initiatives accommodating simultaneously the grown and the built. The thesis centralizes and focuses growth for the places to function as engine. Thereby create places working as anchors for the catchment area.



Illustration 187.1: A blossoming future for Jammerbugt

Mother Earth's second youth

As time passed a new story was written.
Society changed, life styles changed and nature
was reborn. Mother Earth found herself in her
second youth with new energy to care for her
grand-children.

Her previous unsettled temper with great unpre-
dictable changes is now replaced by stability.

Looking back Mother Earth think about this
previous unsettled period as the Anthropocene
Era. Luckily this is changed with help from
her children. The hair of Mother Earth is now
blooming again.

She astonishes everyone with her colorful cor-
als and flowers blooming in all the colors of the
rainbow. Her skin now is lush and green again.
The children of Mother Earth was so terrified by
her potential dead thus realized they could nev-
er protect or care too much about her. Mother
Earth now found herself as a part of her chil-
dren's life and every day for the delight of ev-
eryone.

This learning was likewise acknowledged by the
grand-children of Mother Earth and they lived
all lived together
happily ever after.

A new story for Jammerbugt

When working with urbanization brutal disadvantages must be acknowledged. Every town or city cannot attract new citizens and grow. The cities and thereby the municipality of Jammerbugt are experiencing the effects hereof.

This thesis is a statement; a call for action! A proclamation to rediscover the beauty in nature and the changeability experienced there. Humans and nature reconnect once again for the wellbeing and survival of respectively humans and nature. Climate changes and water rise are crucial contemporary debates which this thesis seeks to contribute to.

It is urgent to rethink the traditional planning ideologies. The visionary nature-based approach established a theoretical background and has been the focal point throughout the thesis. The nature-based visions were translated to the presented strategy and ideas for the design however difficult to transform into visionary and innovative solutions for a physical design. This is of course a matter of scale yet we found that existing sustainable solutions are limited. Examining processes of nature present one way to rediscover

or innovate existing manners of building, living and being. Some solutions exist, some must be discovered and some invented.

The thesis acknowledges that the presented design itself cannot change the traditional planning praxis rationale and logic by which we act today. This demands action and from municipalities, governments, stakeholders and common man.

To realize a project as the Fjord Center municipal willingness and economic support must be acknowledged. However being visionary and create an “icon” for Jammerbugt Municipality entails exactly this awareness regarding the identity of Jammerbugt thus potential economic support from founding.

In accordance with the timeline the process for the Fjord Center is long and will contin-



Illustration 189.1: Urban Designer mapping the city

ue after construction. If sea water level continues to rise further than the predicted 1m a new reality might occur for Jammerbugt and how this will affects the place.

The title of the thesis refers to the unique characteristic of the place. Where else can you experience fjord and sea as well as great variety in nature experiences within short distances? These qualities must be utilized and communicated!

Urban Designers are committed to trace hidden potentials and narratives of a place to create specific visions and concepts for the future. The field of action for urban designers is in between architecture, planning and design causing limitations. However knowledge regarding the place and the various collaborative professions with in planning field reveals a potential for the urban designer to mediate. It can be our role as urban



Illustration 190.1: Urban Designer examining local environments

designers to mediate and innovate the existing planning professions to solve challenges of tomorrow.

The process of the thesis was rather managed however the focus changed from urbanization in the built environment towards a holistic understanding of the complexity of urbanization including the attractiveness of a place. Thus acknowledge the future of places as Jammerbugt revolves

around the qualities of the place rather than solely develop the built environment. Citizens are attracted by unique characteristics as nature, water and communities in the case of Jammerbugt. Thus these characteristics must be enhanced. In our opinion Jammerbugt is unique thereby it is our aim to communicate it.



Illustration 191.1: Urban Designer ready to go



Illustration 192.1: Urban Designer reflecting upon nature

A brief talk about nature

Line: *"I believe nature is everything"*

Anne-Sofie: *"You mean, because everything comes from the same"*

Line: *"Yes"*

Anne-Sofie: *"I see what you mean, but what about concrete, I don't think of that as very naturally?"*

Line: *"It still comes from nature and is nature"*

Anne-Sofie: *"I think that everything people have impacted, isn't nature anymore"*

Line: *"Every Danish forest is touched by humans, So, you mean all Danish forests are not nature?"*

Anne-Sofie: *"No, maybe not."*

Line: *"Hmm"*

Anne-Sofie: *"Maybe it is about the feeling and experience"*

Line: *"So, if it feels like nature, it is nature?"*

Anne-Sofie: *"I mean, I think Danish forests feel like nature and I think certain urban areas can make me feel the same way"*

Line: *"So, nature is not the untouched, but how it feels?"*

Anne-Sofie: *"Yes, You know, listen to the birds, feel the grass and follow the process of seasons, that is nature to me"*

Line: *"It makes sense. It is sad; It seems like nature and it's biodiversity is decreasing and that the natural process are changing"*

Anne-Sofie: *"I know"*

Line: *"I would love making a change for nature. Maybe also for people and cities"*

Anne-Sofie: *"Maybe, a situation where cities and nature are considered equal and not seen as opposities"*

Line: *"So nature can have more space in the city so human live side by side with it?"*

Anne-Sofie: *"Yes, exactly"*

A photograph of a person sitting inside a simple wooden shelter in a forest. The shelter is built with logs and has a low, sloping roof. The person is wearing a plaid shirt and is holding a red object. The background is a dense forest of tall, thin trees. The ground is covered in grass and fallen leaves.

Chapter 11

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Chapter 12

Appendix





Image of work station during this thesis with most important instruments

Study trips

Physical site visits in Jammerbugt have been an important tool in order to experience the identity of the built, the grown and the humans in towns and villages in the municipality. Furthermore, the spatial experience and perception of places and spaces has been important to understand scales, atmospheres and activities of the places.

First study trip

First impressions of Jammerbugt

Before starting this academic thesis the group when on a study trip to Jammerbugt Municipality in order to explore the area without any prejudices or perceptions of the place. The aim of the trip was to explore the “entrance” to the municipality and how the cities in the municipalities are experiences disregarding challenges these might experience. First stop at the trip was Aabybro, the largest city in the municipality. The local stakeholders at the primary school and especially the sport center “DGI Huset” was highly helpful verbalizing the contemporary status of the city in terms of public life in the city center, development of a new housing south of the city and local collaborations between public institutions, locals and the sport center.

In Aabybro we likewise met with a local strategic planner from the municipality who contributed to this thesis with unique insight to the munic-

ipality. The meeting revealed a significant challenge for the municipality - there is only one main road through the entire municipality. Therefore we decided to follow the main road through the municipality however with detours to some of the current projects.

The continuous mapping through the main road reveals the significant difference among the cities - from big-box landscape in Aabybro to livable shopping strip in Fjerritslev and co-created production in Bonderup. Despite this, the area contains various nature experiences from fjord in the south, forest and wet meadow central and plantation, dunes and the ocean in north.

As many other coastal cities in the western part of Jutland, Jammerbugt municipality experiences a great difference in population from winter to summer where the coast is inhabited by tourist and sum-

mer residents.

This study trip contributed with a local insight into a positive experience of local communities constantly developing to meet contemporary desires for functions and events in cities.





Second study trip

Mapping the identity

Second study trip took place in the beginning of March and included three sleep overs in Jammerbugt municipality. We divided the municipality into three parts and each part represented a research area of one day. The first day included the area from Aabybro to Blokhus and two interviews with the local planning department. (see interview). The second day included another interview in the planning department followed up by visiting Brovst and Øland and the area central in the municipality. In the evening, we

were invited to dine and do an interview with a local couple. The third day included a spontaneous trip with the same couple showing us Brovst and the catchment area (see photos). The day ended with a visit in Fjerritslev and afterwards finding shelter for the night on Klim Mountain sleeping together with the animals of the forest. The study trip included a variation of methods and included both phenomenologically and cartographic ways of perceiving the environment

(see methodology). Photos, filming, sketching, interviewing and mappings were substantial methods used during the field trip. Qualities and challenges of the urban, the nature, the culture and the planning approach were gathered for later reflection and development of the project. The analytical foundation of the thesis constitutes mainly by this study trip. We found various nature qualities and diversity in the urban layout and atmosphere in the cities.

	Growth axis	Summer cities	Nature attractions		Methods
Week 10	Mandag 4th of March	Tirsdag 5th of March	Onsdag 6th of March	Torsdag 7th of March	
8.30	10 - Meeting with Lars, rural department, Pandrup	10 - Ida, planning department, Aabybro (lokale 112)	On a trip with Kathrine and Mads	Thorup beach	Sketching
	Experience Pandrup			Vejlerne nature area	Fotos
				Towards Aalborg	Filming
12	12 - meeting with Kelt, Head of planning department, Pandrup and Jesper Runge.	12: Lunch	Altrup harbor	Kl 15.30 - Towards CPH	Phenomenological - senses
	13: Lunch	Hanherred Havbåde	Kokkedal castle		Serial visions
	Nørhøne	Svindelev badehotel	Fosdalen plantagen		Sticky vs slippery places
	Pandrup + Blokhus	Vissehøj	12: Lunch, Søndermarken		Mappings
15		Oxholm Mølle			Potentials
		Gjøl			Interviews, professional and narrative.
	17: Questionary in front of the local super market		Fjerritslev		
		Tirsdag kl 19: Kathrine og Mads, Brovst			
	Rbnb in Pandrup	Rbnb in Brovst	Shelter at Klim mountain		



The diagram shows the planned route for the second study trip in Jammerbugt Municipality. First day visits along the axis of growth. Second day explore the struggling middle part of Jammerbugt and the last day examine "the bumble bee" the vivid self-sustained part of the municipality.



Situations during the second study trip ; Maps and sketches, the driving office leaving a local stay, sleeping in a shelter and the feeling exploring Jammerbugt.

Third study trip

Analysis of specific site

The third study trip in mid-April and in opposition to the other two study trips this trip were by bus to explore public transportation to Brovst. This way of travelling challenged our flexibility making visits apart from the largest cities difficult.

Beforehand we decided to visit Brovst due to observed challenges from conducted analyzes. 40 minutes after departure in Aalborg we arrived in Brovst. We went to the central pedestrianized street and observed few people and several cars. The street was affected by closed shops for rent. Several shops have limited opening hours. However a new wine and delicacy shop was open. We entered the shop selling spirits and rewarded local produced products.

In a semi-structured narrative interview we talked with the owner of the shop and a local gin delicacy (See Local Narra-

tives, 96).

To capture the everyday life of Brovst we went to the local library. Magazines and brochures about site-specific experiences and events was found revealing plenty attractions in the surroundings.

The experience walking around town was by characterized by large grey surfaces of parking and walls to obtain differences in high. Places for sitting, playing or recreation were not found in the city center. A new square has been constructed along the pedestrianized street however appearing as an uninviting lowered passage with grey surfaces as walls and flooring.

Afterwards we visited the local castle and went home by public transport with new impressions as foundation for the further work with the thesis and site of intervention.



Situations during the second study trip ; Mapping local attractions, testing and finding unique experiences, the shoppingstreet in Brovst and local conversations.

Interview persons

Interview person	Interview form (all semi-structured)	Interviewee background
Interviewee 1	Elite	Rural Planning department
Interviewee 2	Elite	Planning department
Interviewee 3	Elite	Planning department
Interviewee	Elite	Planning department
* Man	Spontaneous narrative	Local, Brovst
* Senior couple	Spontaneous narrative	Local, Fjerritslev
* Young family	Spontaneous narrative	Local, moved to Pandrup
Employee	Narrative	Local, Aabybro
Elderly woman on the street	Narrative	Local, Aabybro
* Stakeholder 1	Spontaneous narrative	Local, Brovst
* Stakeholder 2	Spontaneous narrative	Local, Brovst
* Shop Owner	Spontaneous narrative	Local, Brovst
Young couple	Narrative	Local, Brovst



A spontaneous interview without any structure is called an informal interview. This way of interviewing demands writing notes down shortly afterwards. This interview form fit for creating a fundamental understanding of a situation. After semi-structured interviews conducted with the planning department and with other locals, we had an idea of what to ask and what the focus should be, when spontaneous conversations started.

Perspectives on Jammerbugt Municipality

Conducted semi-structured elite interviews

During the site visit in Jammerbugt municipality, several interviews were conducted with local planning authorities. The department of rural district development and department of urban development are represented in three interviews with duration of one hour to two hours. The following text presents the main points for further exploration and reflection. Both the method and approach of spatial planning practice are evaluated as well as specific physical initiatives in the municipality.

Recent years the municipality has named themselves “leisure” municipality (fritidskommune) to unfold the perception of a municipality offering activities and a recreational lifestyle for the citizens. Though the strategy is published, the word spare time is corrected to outdoor during the interviews since the interviewees are unsure whether the strategy is “leisure” or

“outdoor” municipality.

Rural planning perspectives
The perspectives of rural development in Jammerbugt municipality is mainly based on two interviews; one with interview person 1 working with rural planning and in contact with local stakeholder and Interview person 2 with a strategic perspective of projects and development in the municipality.

Jammerbugt municipality consists of 25 rural village districts; “in some of these areas you see development plans and some you do not; the rural districts are less planned and more driven by local initiatives” (Interviewee 1, 1h3min15sek). Interview person 1 mentions the strategy “municipality 3.0” which is a cooperative strategy between the municipality and the locals; as this morning where he received an email from local stakeholders requesting economic resources

to restore the shelter. The strategy “Life, village, school” aims to prevent closure of local schools if the citizens take responsibility and engage themselves. “It becomes an unstructured strategy; it meets the local needs but does not include a coherent structural strategic development” (Interviewee 1 4min) On the other hand, this strategy meets every village and does not filter out any local community. (Interviewee 1, 45min50sec). Despite the size of the local communities, “we experience an activity in every community” though it also varies due to the individual settled in the community (Interviewee 2, 38min40sec). Hence a person driven rural development thereby mutual a strength and a weakness for the community. It comes down to the individual engagement of local development and the strategy

depends on generation replacements and delegation of local power for future developments. *“There is life though you do not see it in the statistics – it is the ability to see life behind the statistics”* (Interviewee 2, 18min27sec). Buildings in very bad condition can be demolished since much of the (rural) housing stock need renovation or must be demolished to ensure some kind of aesthetic level. (Interviewee 2, 1h35min). In rural districts a structural in-fill strategy is implemented to fill the void for coherent development when buildings are demolished.

In relation to the characteristic location of the municipality in-between sea and fjord we wonder if it is possible to create accessibility to nature on daily basis from your home. Today the accessibility is limited, and it is a problem *“you rarely experiences a path taking you into the nature from the communities”* (Interviewee 1, 1h56min34sec).

Urban development

The perspectives on urban development in Jammerbugt municipality is mainly based on an interview with the planning department; Interview person 3 and spatial planner interviewee .

“If you don’t consider the coast and the tourist landscape, the development happens in the four cities Fjerritslev, Brevst, Aabybro and Blokhus and millions are invested for urban renewals”. (Interviewee 3, 7min). Aabybro is characterized as the leading city (førebyen); most of the investments happen here and therefor also time and resources from the municipality. (Interviewee 4, 51min). It is a change that has appeared the past 10 years; that the focus has increased in the axis from Aabybro to Blokhus, also mentioned as the growth axis and an extension of growth from Aalborg. (Interviewee 3t35min). There is an awareness of the internal demographic changes that

flourish these years and cities, especially Aabybro is planned to handle movements from rural districts to the more urban areas as well as Fjerritslev, Brevst, Pandrup, Nørhøne and Blokhus. (Interviewees 3 and 4h25min). Urban development and centralized growth are seen as a possibility to increased resources beneficial for the entire municipality, though they experience complaints from areas that are not placed in the growth axis (Interviewees 3 and 4, 1h30min).

Reflections

Strategic plans have been developed by the municipality these plans are advises and guiding tool for local authorities utilize however not legally regulating. The plans map initiatives by local stakeholders with various identities. The local stakeholder in the rural areas take responsibility for the rural communities but the development happens fragmented with non-relational

individual local project. It raises the question of coherence in the municipality and the need for a tool for municipal authorities to meet the local development but at the same time create and strengthening a large-scale coherent strategy. The uncertainty regarding the politically defined strategy as either a leisure municipality or an outdoor municipality outlines the challenge of not having one coherent narrative; the identity is not agreed internally in the political apparatus thus vague externally. The urban development in the largest cities in Jammerbugt and especially Aabybro appears differentiated; people want to live, and companies invest in especially the largest cities and the axis of growth. The past 10 years, this development has been experienced and it rises the reflections upon whether this centralized growth is linked to amalgamation; it seems possible. Yet, the spatial planners in Jammer-

bugt are in doubt. The positive development is most visible in the axis of growth thus natural to invest and develop here. However, is it possible while sustaining rural district development and the local energy that flourish here easily hidden beneath statistics?

Perhaps, it is time for a narrative for the municipality implemented internally by the authorities to utilize internally and externally. This narrative can include and benefit from development mutual in urban

areas and rural areas – in other words the experiences double-urbanization. The strategy thereby implements existing demographic changes and the unique identity between fiord and sea in the strategy. Thus, communicate an understandable and distinctive identity for a future coherent development of the municipality.

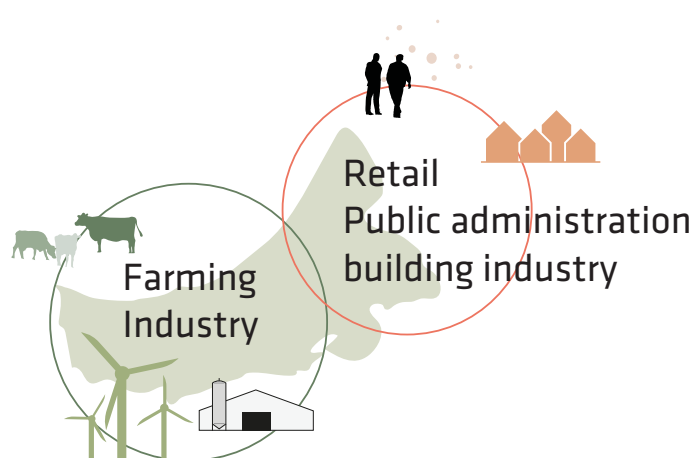


Illustration of existing location of industries in Jammerbugt Municipality learned from interviews.

On tour with locals



The map reveals the route and stops at local characteristics on a journey around Jammerbugt with a local couple from Brøst. With pride, the couple showed us hidden routes with viewpoints, Kokkedal castle, Attrup harbor and café, their newly bought farm and the forest landscape of Fosdalen. After the tour, we visited the local socio-economic restaurant at Slettestrand for lunch. We experienced qualities through the eyes of locals. The landscape with all the potentials revealed through local voices and eyes.



Kokkedal castle



Kokkedal castle



Kokkedal castle



From village



Road along Fjord



Attrup Harbor and cafe



Attrup Harbor



Road along Fjord



Attrup



Fosdalen



Slæterstrand

Analysis

Sustainable planning

Adressing climate adaptation

In 2009 Jammerbugt became the first “Climate Municipality” in Northern Jutland an agreement that obligate the municipality to reduce the CO₂-emission by 2% annually towards 2025 (Jammerbugt Kommune, 2019). The title is granted by The Danish Society for Nature Conservation (Danmarks Naturfredningsforening, 2019).

Followed by an agreement between the Danish government and Local Government Denmark every municipality in Denmark was forced to elaborate a climate adaptation plan in 2013 (Jammerbugt Kommune, 2019). In Jammerbugt Municipality this resulted in an “Agenda 21 and Climate plan” which is a statement thus not acting on identified challenged. However several of the stated challenged in the climate plan was processed in the 2017 Municipal Plan aiming to develop a plan for the sea, support development of wind mills and solar

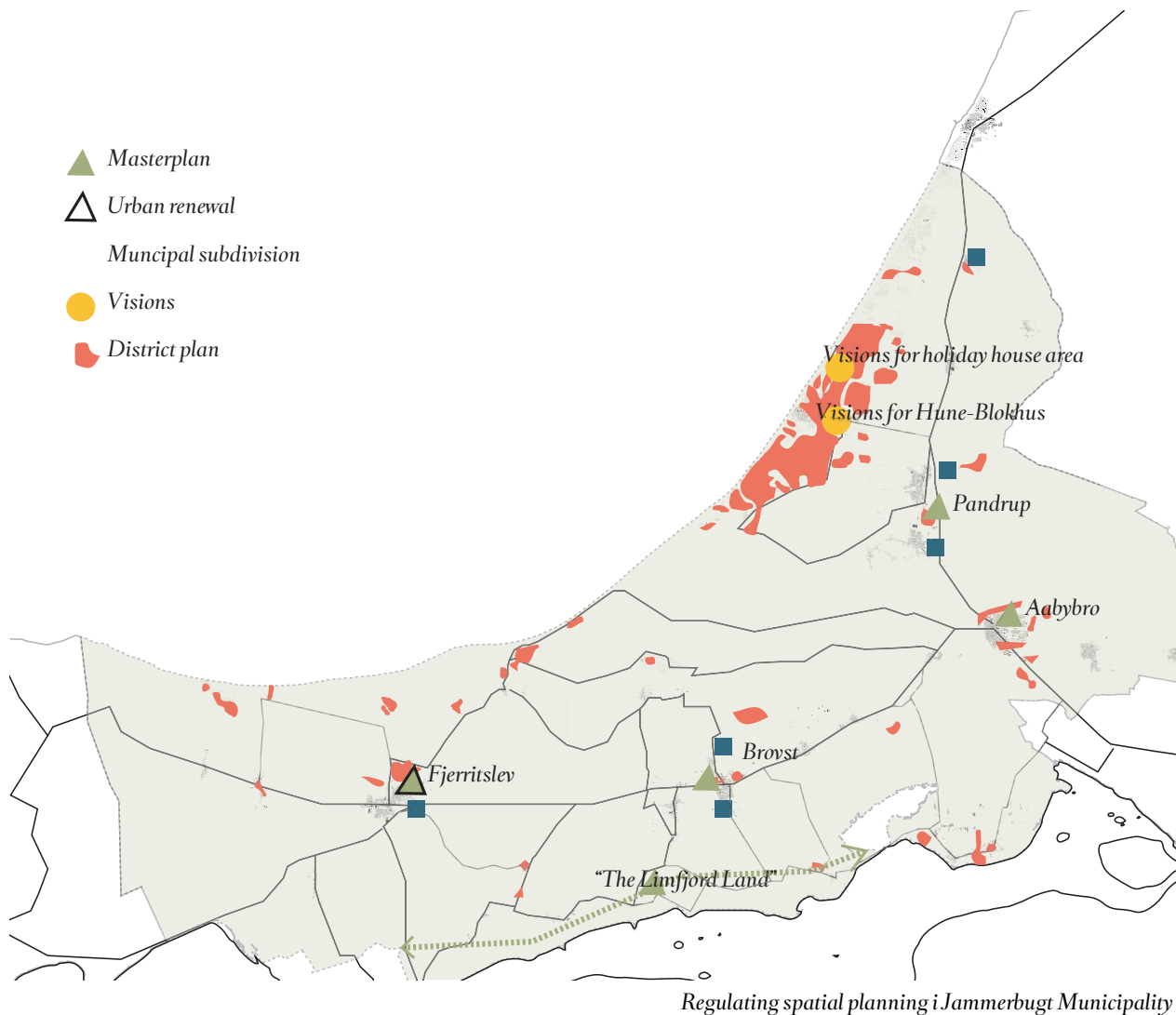
cells, work with climate investments in low-lying areas thereby not subdivide land in Brovst e.g. Furthermore, the aim is to strengthen social sustainability through organizations, inter-generational social communities and activities in nature (Jammerbugt Kommune, 2019). However, developed physical projects are initiated by stakeholders thus a fragmented development created where resourceful citizens operate or live.

The Climate Adaptation Plan for Jammerbugt further describes the expected sea level

rise and scenarios for extreme flooding events based on UN’s climate scenario A1B (Jammerbugt Kommune, 2014). This reveals an urgent demand for water management in low-lying areas along the fjord. Despite existing dykes and dams along the fjord large areas around Vejlerne and Gjør will be flooded with the predicted 1m water rise towards 2100 (Jammerbugt Kommune, 2014). On page xx the expected sea level rise is shown.



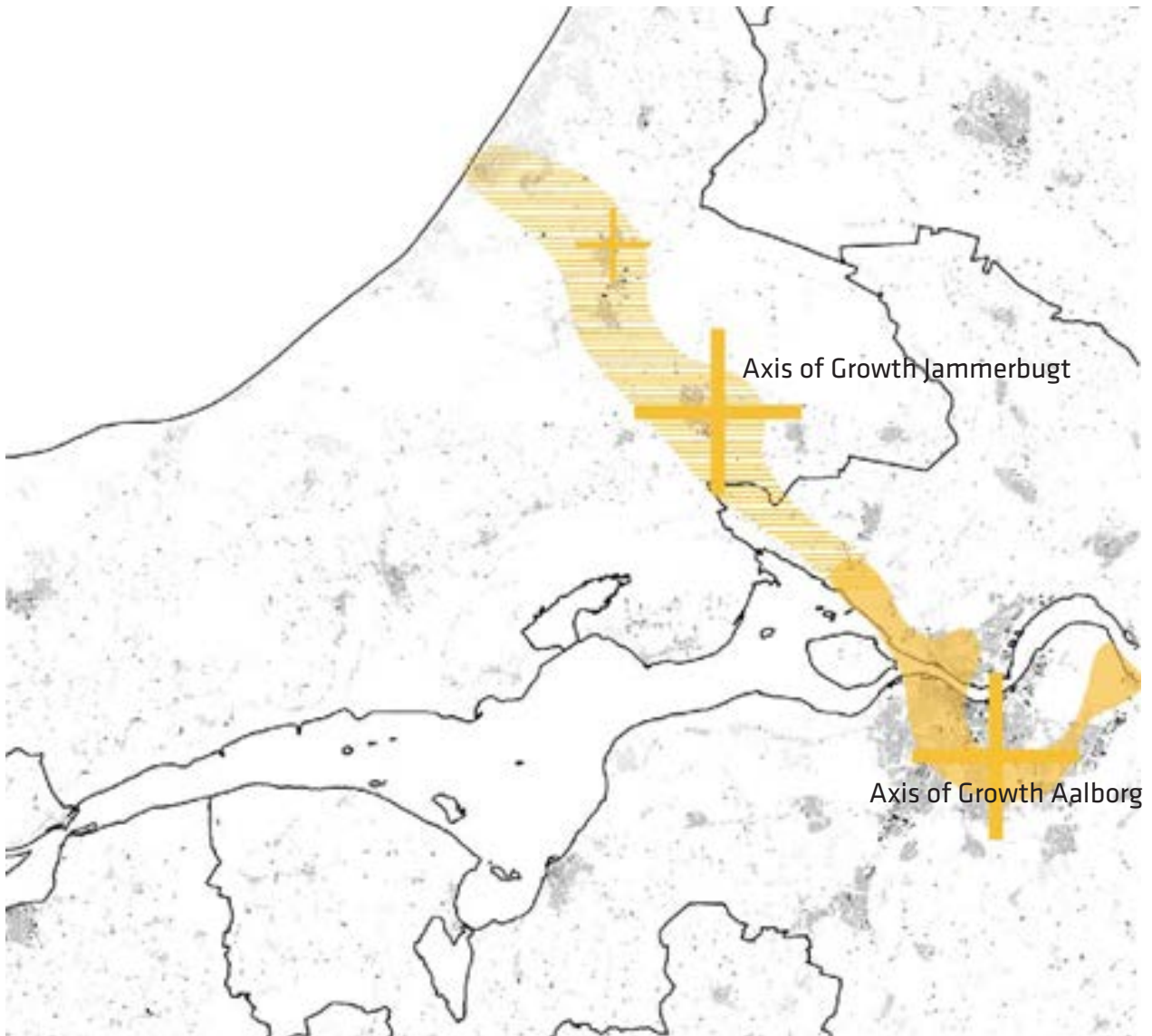
Spatial planning



Spatial planning in Jammerbugt Municipality is centered around the four pre-amalgamation municipal centers and the bay to regulate holiday house areas. However this year the local government has ordered and accepted a strategy to enhance accessibility and supporting attractions along the fjord. This is an attempt to strengthen the accessibility across the fjord landscape which is highly disconnected today.

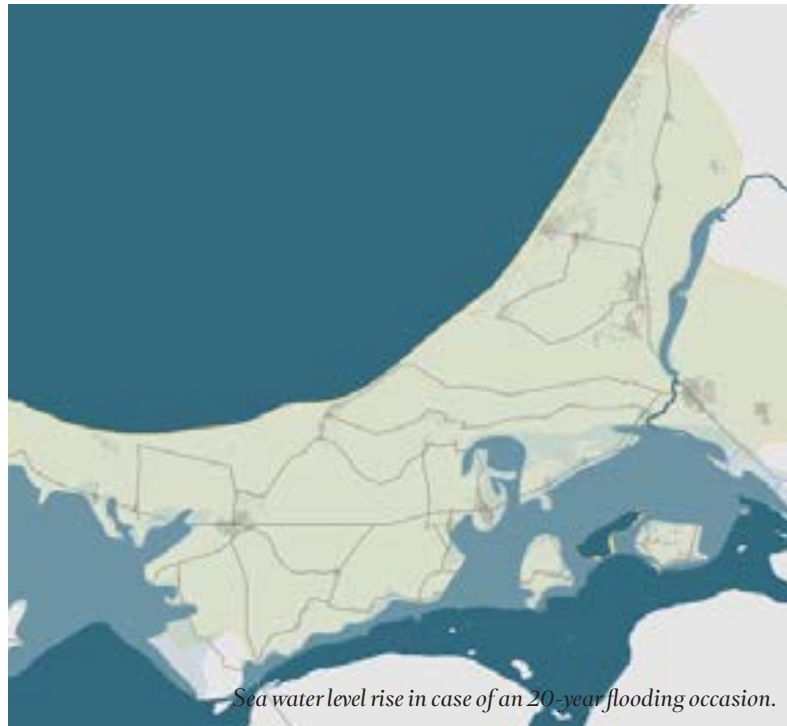
In order to qualify future city planning and district plan the municipality has developed masterplans for each city (Jammerbugt Municipality, 2013). The masterplans represent visions for each town likewise in towns without need for district plans due to limited growth tendencies. The masterplans can be seen as an attempt to create a more flexible planning practice to incorporate changes in the urban fabric.

Municipal axis' of growth



Aalborg and Jammerbugt both describe their own axis of growth however none of the municipalities merge or indicate the two axes as being a continuance of the same tendency. According to the planning department in Jammerbugt the growth axis in Jammerbugt is a direct consequence of growth in Aalborg (Aalborg Kommune, 2013; Perspectives on Jammerbugt, Appendix).

Flooding scenario



Resistant dykes



Jammerbugt has several dykes constructed around the 1920's to protect land however many are constructed to embank wetland. Along the Limfjord several dykes embanked land to cultivate soil inland. The tractor was introduced in the same period easing the construction (Naturcafeen, 2019)

In the 1950 the natural dykes along the sea; the sand dunes where broken through and new concrete road made the coast accessible as an employment project. The excavation and constructions where executed by hand (Grundejerforeningen Tranum Ejstrup Strand, 2010).

Dykes in Jammerbugt protecting areas along the fjord landscape

Attractions & culture

1. Fårup Amusement Park
2. Blokhus Rescue Station
Blokhus Cannon
3. Nordic Paper Cutting Centre
4. The Garden in Hune
5. Rødhuse Church
6. Han Herred Boats
7. Svinkløv Seaside Hotel
8. Grønnestrand Lyme Mill
9. Thorup Beach Fishermen Boats
10. Bratskov Manor House
11. Gjølv Havn
12. Oxholm Mill
13. Kokkedal Castle
14. Hvijseshøj Passage grave
15. Attrup Harbor
16. Haverslev Harbor
17. Fjerritslev Brewery- & Local Museum
18. Klim Chalk Oven
19. Vejlebo

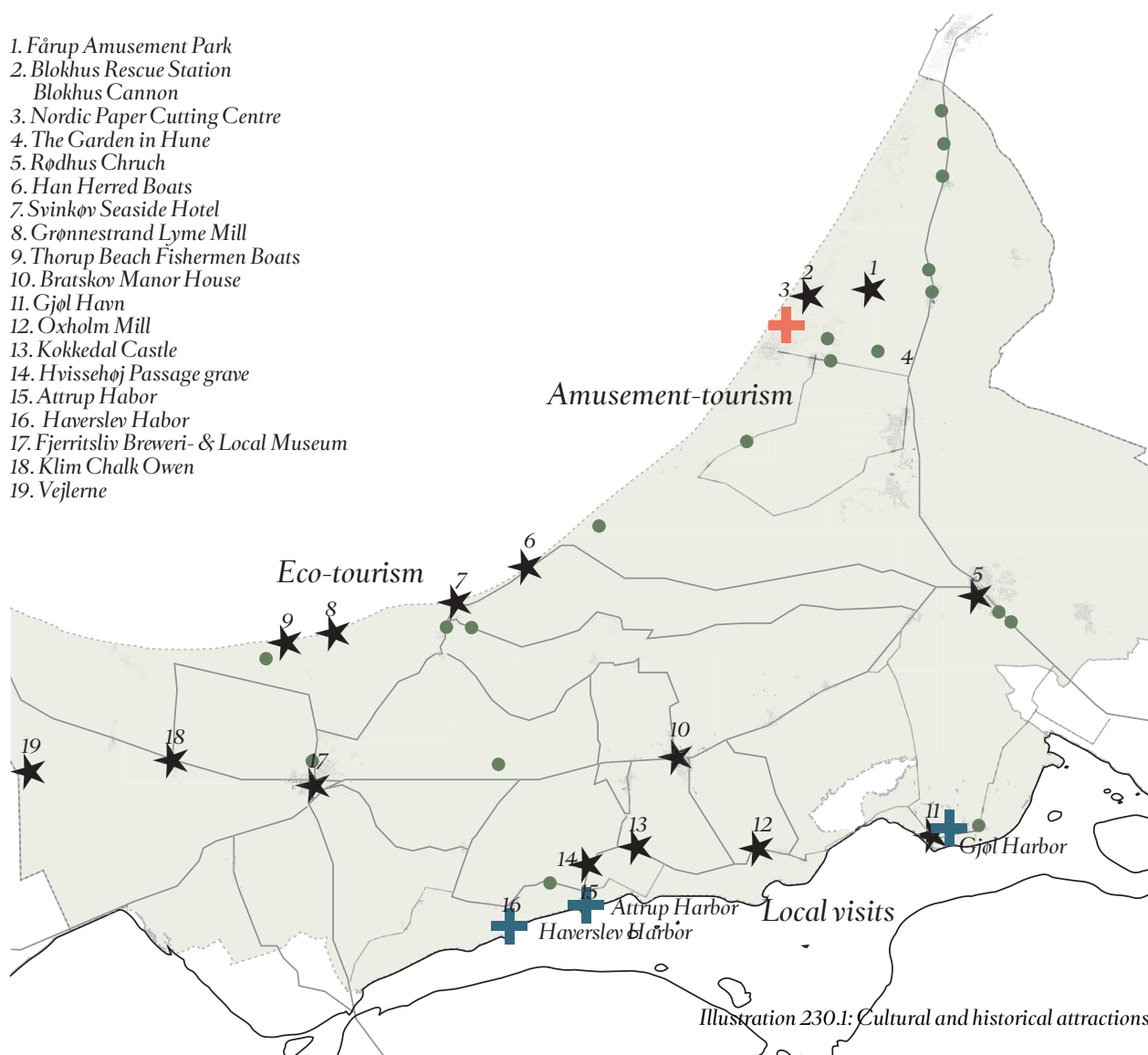
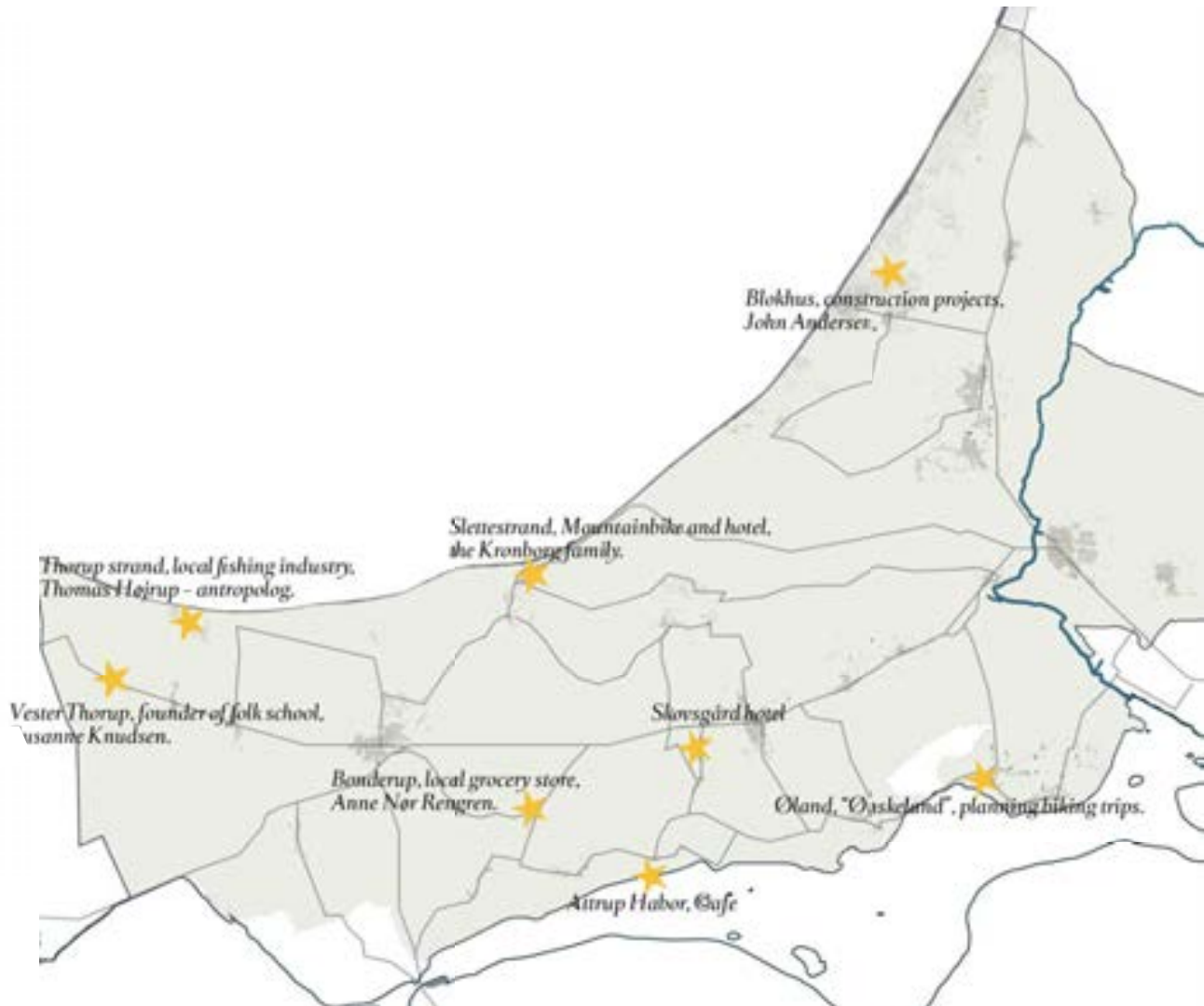


Illustration 230.1: Cultural and historical attractions.

Cultural and historical attractions are mapped to examine the character of site-specific experiences. Jammerbugt offers a diverse range of experiences addressed to different segments of visitors such as stays at a castle or manor house, cultural institutions, natural historical sights and historical attractions. The West Coast can be separated in two recreational characteristics; the eastern part is entertainment-oriented attractions with Fårup Amusement Park, urban life and shopping in Blokhus whereas the western part is more

nature-oriented tourism and local production. This is reflected in Svinkløv Seaside Hotel, Klim Chalk Oven and the fishermen boats at Thorup Strand part of 18 selected cultural environment by Jammerbugt Municipality (illustration 230.1; Visit Jammerbugt, 2019). The mapping revealed many niches attractions addressing a minor audience however offering a diversity of unique experiences across the municipality.

Stakeholders



Local stakeholders and socio-economic companies are mapped to examine bottom-up initiatives and develop the local communities. Innovative and successful stakeholders are found in the villages utilizing local resources based on personal interests. For instance in Slettestrand a local mountain bike enthusiast has constructed mountain bike paths in the surrounding forest and following this now runs a active holiday center.

The map reveals a local willingness to initiate and develop the local communities to maintain activities in the villages. There is a potential to utilize resourceful stakeholders to continue the development and strengthen collaborations across stakeholders and villages in Jammerbugt.



Perception of Jammerbugt based on the three study trips

Movement through the landscape



On the edge between city and land



Through the forest



Along the town



Through the heath

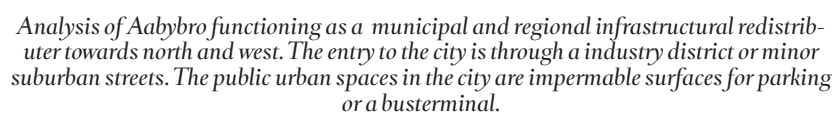


In the town



Across the fjord

Aabybro





Analysis of Aabybro city center interpreted as a fragmented city with limited urban life due to many introvert functions and a mall area withdrawing functions from the city center. The perceived centre is the bus terminal with surrounding "big box" landscape (sports centre, school and parking).

Fjerritslev



Analysis of Fjerritslev interpreted as the bumble bee; the city is far away from larger cities and with limited public transport yet the city is vivid with many urban functional and a well-defined built structure creating an experience of the dense city centre.

Brovst



Analysis of Brovst a city with a large industrial district, a municipal function district and single-family houses however the city also have a small city center with shopping and a park. The highway 11 drives right through the city from Aabybro towards Fjerritslev making Brovst a "drive-through" city.

"There's 8 minutes drive to the fjord and 8 minutes drive to the sea" (Nissen, 8min20sec)



The small shopping strip is the fulcrum of the public realm in Brovst with several extrovert functions however the street is interrupted in each end by large infrastructure; a round-about in north and highway 11 in south. In the city centre a school, sport- and cultural centre and a after class school are located. A city park is located close to the shopping strip but disconnected by highway 11.

Blokhuis

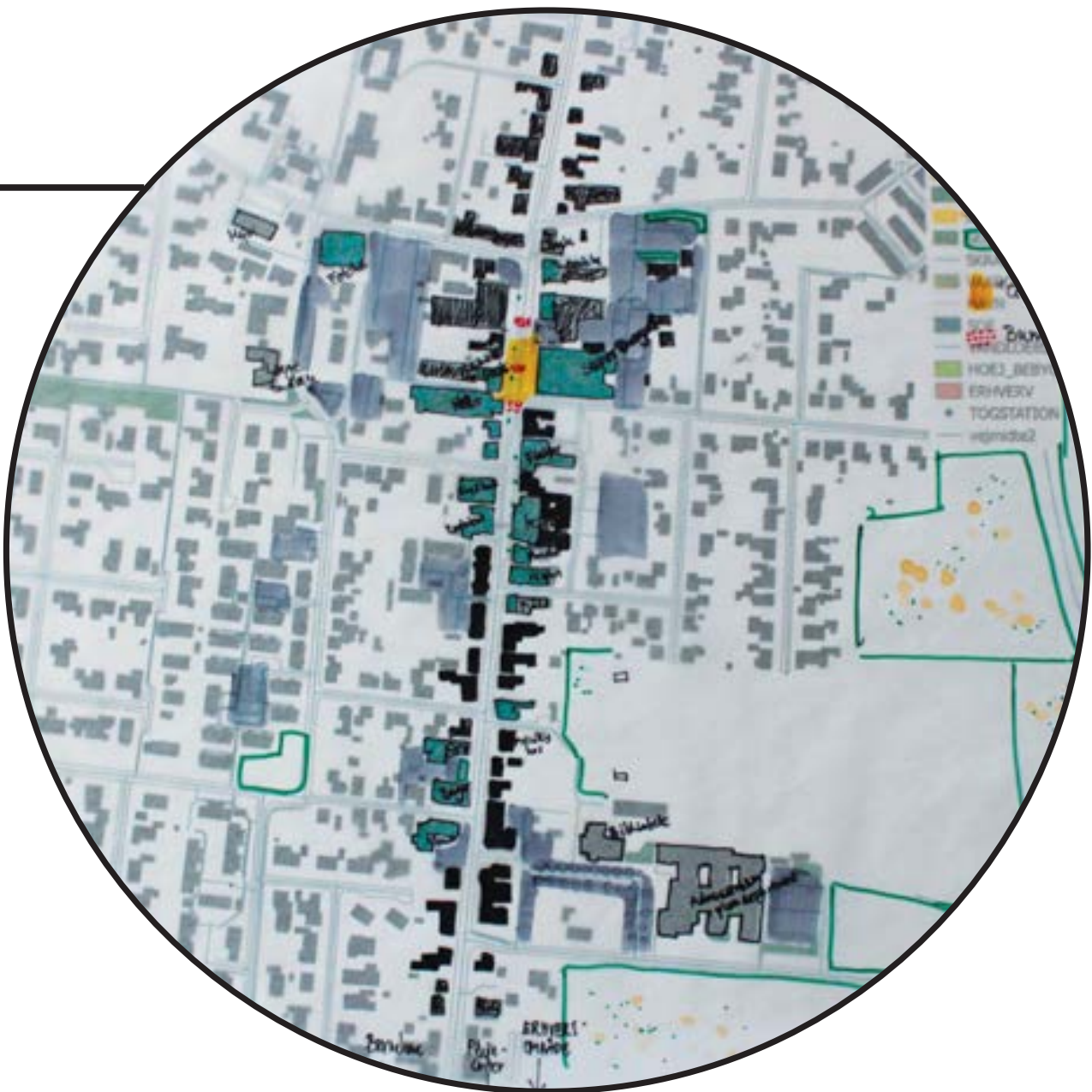


Analysis of Blokhuis with a city structure centered around holiday houses and sea side hotels but also with many restaurants and shops in the city center. The entrance to the city is like sequences of city and dune plantation or heath making the drive experiential. Due to the city size the nature is ubiquitous.

Pandrup



The illustration is an analysis of Pandrup a very long and narrow suburban town with a small city center, a school and a large industrial district. The town almost seems as a suburban however disconnected from the city of Aabybro. Pandrup is mostly single-family houses almost as a grid-structure surrounding the city center. The highway 55 runs outside the town connecting Pandrup to Aabybro within 10min drive.



The city center of Pandrup is rather long and located on the edge of the city. Extrovert functions and residences are scattered along the main road creating an incoherent city center. However the city has several public functions as a school, elderly home, library and the municipal planning department strengthening the quality of everyday life. In the town a park can be found as the only public space in the city.

Case studies

Municipalities at the forefront

Realdania campaign

The project “Municipalities at the forefront” started in 2014 by the philatropic association Realdania and continued for three years; it supports 25 strategy plans made for the rural municipalities of Denmark. During the elaboration of the plans former knowledge as well as sharing experiences has been a method for creating a foundation and frames of developing strategies inspired in a broader perspective.

Common for the strategy plans is they are oriented towards strengthen long-term adaption, conversion and development, expressed by differentiated solutions reflecting the site-specific potentials and resources. Areas with characteristic qualities; functional or geographic become drivers. Drivers such as nature, local citizens or local food production become important in the goal of releasing unresolved potentials.

Partnerships between citizens, stakeholders, municipal invigilators and business communities based the foundations to enable a common vision everybody supports as a way to express a common direction for handling contemporary and future challenges. Being on forefront comes down to creating a frame for strengthen existing resources and qualities. (KL, BARK and Realdania, Kommuner på For-kant). Three strategy plans are chosen as inspiration and reflection upon the strategy plan as a tool.

Gribskov municipality

The municipality offers qualities such as shoreline, green structure, active local communities in the catchment area of Copenhagen. In the making of the strategy plan, perspectives and qualities within the municipality were clarified. Unfolding these qualities became the main focus and were specified into

four points; narratives, physical connections and anchor points, strengthening nature qualities and co-creation processes. Relations between the coastline and hinterland will be strengthen in clarifying the natural landscapes and communicating the characteristics. The realization process incorporate cooperation between stakeholders, municipality and local communities. (Landskabsstrøgene kobler kysten og landskabet, Gribskov commune, 2016)

Mariager fjord municipality focusses on developing the four main cities in the municipality to condense growth and making the municipality a place to settle, live and work in. The frames for development are different therefor the strategies for each cities need different approaches; considering the cities separately and in a context of the municipality. Human resources, local narratives and iden-

tities of Arden, Hadsund, Mariager and Hobro create the frame for developing the cities as attractive in itself and as a part of the municipality. It has been a cooperative process between municipality and local citizens and has created a common understanding of differentiated treatment to fulfill potentials. The realization process will need cooperation between citizens, volunteers, stakeholders, the municipality, forenigner and business communities. (Med byerne forrest, Mariager fjord Kommune, 2016).

Ringkøbing Skjern municipality

The demographic and structural changes of Ringkøbing Skjern are less problematic compared with many similar outskirts municipalities. Challenges related to working active groups is though representative and the municipality participated in the campaign as a pilot project. Addressing

challenges before the extreme case of it, incorporate the vision of being on forehead. The strategy aims to create a new core narrative of the municipality with the richness of nature in focus. This to clarify the priorities of future development and ground the narrative within the locals. The foundation of the strategy is based on five points; active citizenship, a great place to live, worklife 4.0, nature and cultural heritage and good connections. The plan inspires local politics and action plans.

The strategies create a framework for focussing the development in the municipalities. The cooperation between locals and municipality creates a common ground for understanding the qualities and local resources. It creates the ground for a common vision and mission; a focus for development facilitated by more levels of engagement. Gribskov mentions their strat-

egy plan as a "tool for dialogue". (Gribskov municipality, 2016). The plans are not legally binding and only serves as inspiration for local politics and decisions. One consider if the strategy plans, as a tool is a reaction of the structural reform and the change of power; since 2007 the planning power and responsibility belongs to the municipalities. (Structural reform, p.).

In Jammerbugt municipality not only one plan representate the development but several plans. (Jess). It represents one of the disadvantages when it is not binding.

The West Coast leads the way



Realdania has initiated the campaign "The West Coast leads the way" running from 2018-2020 to economical support a development plan for the Jutlandic West Coast to turn the place into the most attractive coastal destination in Northern Europe. The campaign is a follow-up on a

development plan initiated in 2018 by 11 municipalities and 3 regions along the West Coast (Realdania, 2019). The starting point of the campaign is site-specific potential beneficial for visitors as well as people living along the coast (Realdania, 2019). The campaign thereby focuses on rural municipalities

and development here as seen in previous campaigns as "municipalities on the forefront" however this campaign solely revolves around important coastal cities and analyses of site for potential visitor centers or non-commercial attractions.

Illustration 2471: Municipalities along the West Coast who can apply Realdania for founding via the campaign "Vestkysten viser vej". In English, "The West coast is leading the way". (Realdania, 2019)

Naoshima art island

Enhance the local identity

In the southern part of Japan a private investor and a local municipality has in collaboration transformed several rural islands into world famous art islands revealing the relation between nature and art.

In 1985 Naoshima Municipality was contacted by the private Benesse foundation wishing to transform the island into an international recognized art hub. The first art piece was placed in 1989 together with a hybrid hotel by the foundation including an art museum. A key person in the process is the famous architect Tadao Ando who has designed many buildings at site and supervised location for the art pieces. Now visitors can find art pieces by world famous Japanese and International artists (Navitime, 2017).

Recent year the project has increased now including several islands in the area including Inujima, a small island

with around inhabitants. Here, abandoned houses and a copper refinery have been revitalized and transformed into art houses. The reuse of existing structures creates a unique experience for the visitor of the present and the past communicated by world famous architects and artist (Artspace, 2013). Furthermore, the islands host the Setouchi Triennale art festival (Japan-guide, 2018).

Now several cafes, art museums, hotels and restaurant can now be found at the islands. Many of these are

owned by the Benesse foundation thereby profiting from increasing activity in the area. However this special identity of the place attracts young Japanese people moving to the islands in search of a slower life style (Navitime, 2017). Thereby embed the transformation in positive population development among young people.



Art installation by Yayoi Kusama, Sørensen, Anne-Sofie, 2016

The Viking Museum

Resilient buildings

The Viking Museum, Roskilde has been flooded several times thereby demands modifications to resist future flooding. Institute of Technology has suggested peeling the façade into the wire reinforcement and replaced by concrete to reinforce the construction. Furthermore to make the preserved brutalist building resilient to flooding windows and shores must be replaced with (ingeniøren, 2017). Ministry of culture has cancelled the preservation to construct a new museum instead of transforming the existing (Vikingskibsmuseet, 2018).

However the mentioned solutions to construct a resilient building has inspired the structure and constructive notions regarding the Fjord Center



Design catalogue

Design principles

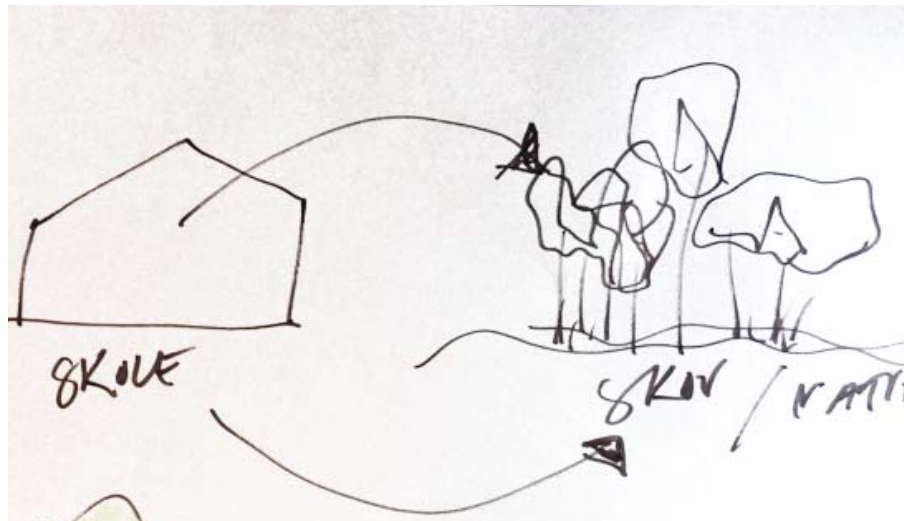
Nature-based



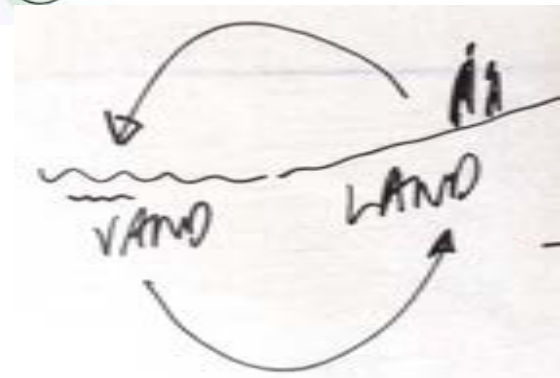
The situations were drawn to inspire designing with nature. The principles examine complementary relations between elements of built, grown and the human experience thereof. Thereby sketching situations to examine various manners to interact

with or be in nature. Furthermore natural instruments to enhance sensorial experiences are implemented as steam, water, various colors and the sound of bird.

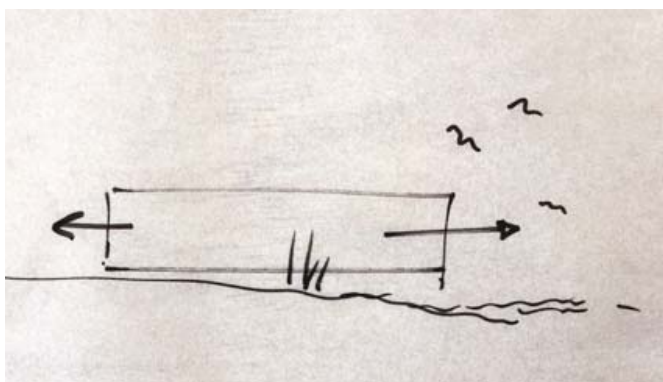
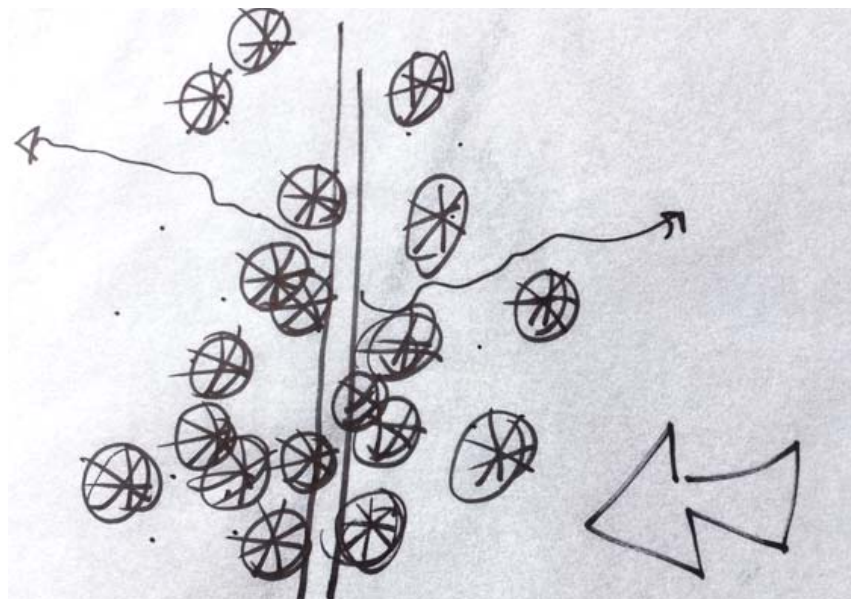
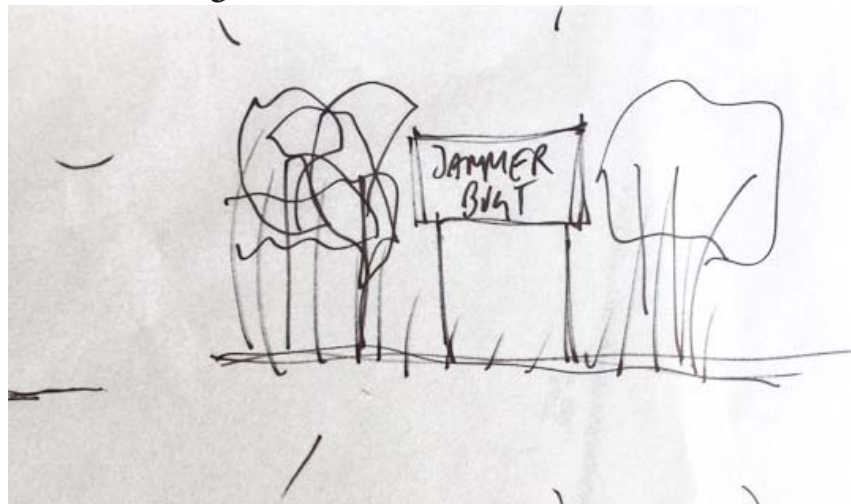
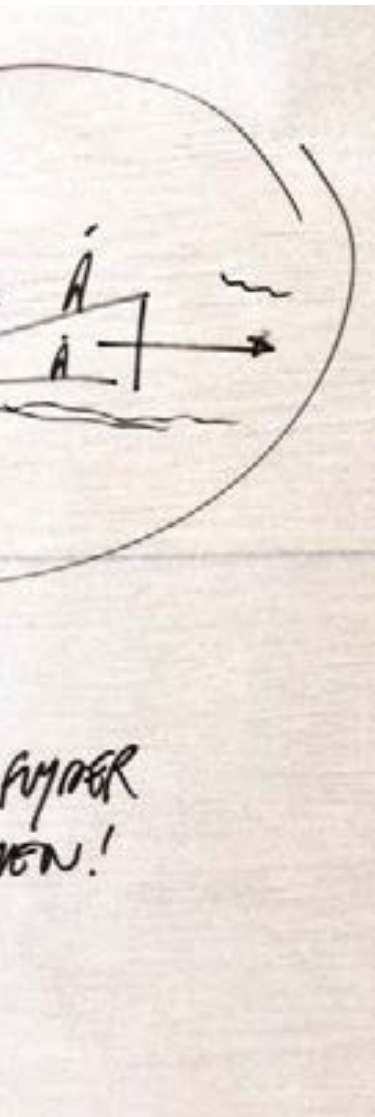
The Climate Schools



The Fjord Center



The green Gateway





Aabybro

The green Gateway

The vision is to create an experience while being in motion thus prevent the perception of “non-place”. The proposal could implement an element enhancing curiosity, surprising experiences and place Jammerbugt as a destination.



Ryå

Highway 55



Driverless vehicles

The biodiversity park

Green city

Driving through a forest

Soft historical path

Highway 11

The green passage

Conceptual plan for the green gateway

Aabybro



Densification of the city
with infills and subdivi-
sion of land towards
suburbs

Densification



Green environment and
path in the city center of
Aabybro

Biodiversity



Green environment
along the arrival into
Jammerbugt municipali-
ty

Biodiversity

T|The Green Gateway

0-10

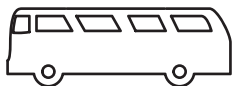
Biodiversity



Learning

Public value





Central infrastructural
node serves as hub for
driverless vehicles
Connectivity

Year 40-50



Large green urban area
with Aabybro as the
central urban point and
infrastructural node
Urban area

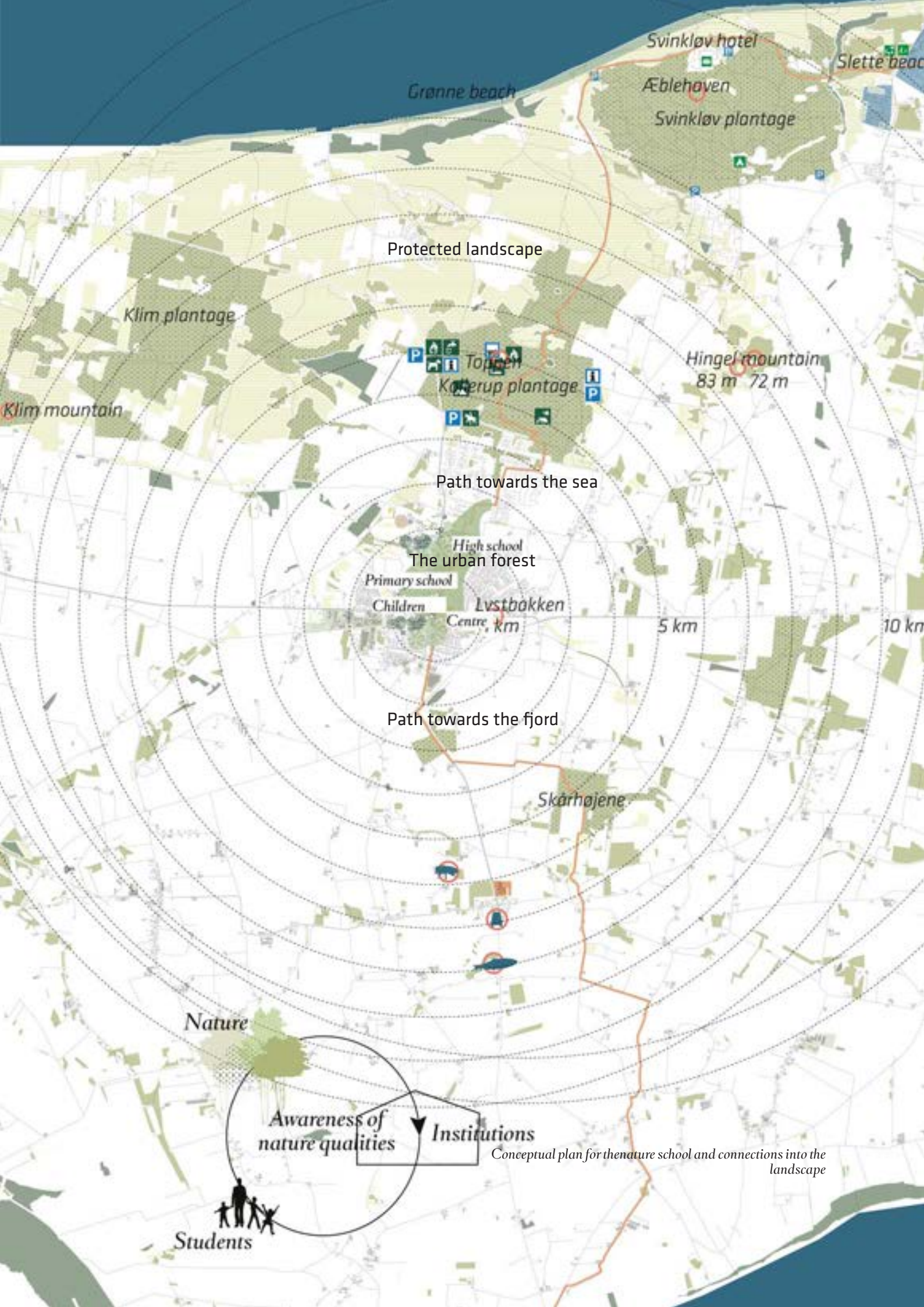
Year 20-50



Fjerritslev

The Nature School

The vision is to develop the existing learning environment from the outdoor-highschool in Fjerritslev including public schools and institutions. Thereby create a place for experiences, curiosity and learning for respectively students and citizens in Fjerritslev. The images present the relation between the grown and built as well as experiences in nature.

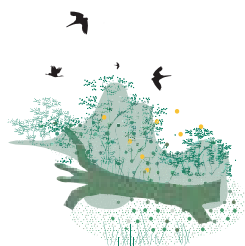


Conceptual plan for the nature school and connections into the landscape

Fjerritslev



Existing schools are transformed to nature programs
Learning



Biotopes established in the new common school yard
Biodiversity



Establish paths through the area for public access
Accessibility

The Climate Schools

Year 0-10

Biodiversity



Learning

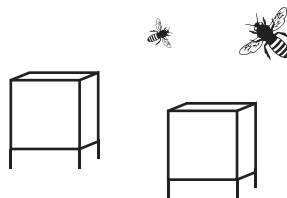


Public value

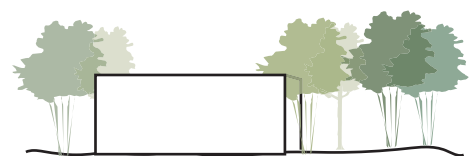




High school, school and
day care students share
same nature learning
environment
Community



Make outdoor eatable
environments
(berries, permaculture,
bees and insect hotels)
Grow



A new school is needed
to continue the possi-
tive development in
Fjerritslev
Develop

Year 10-20

Year 20-50



Timeline for The Climate Schools



The Fjord Center

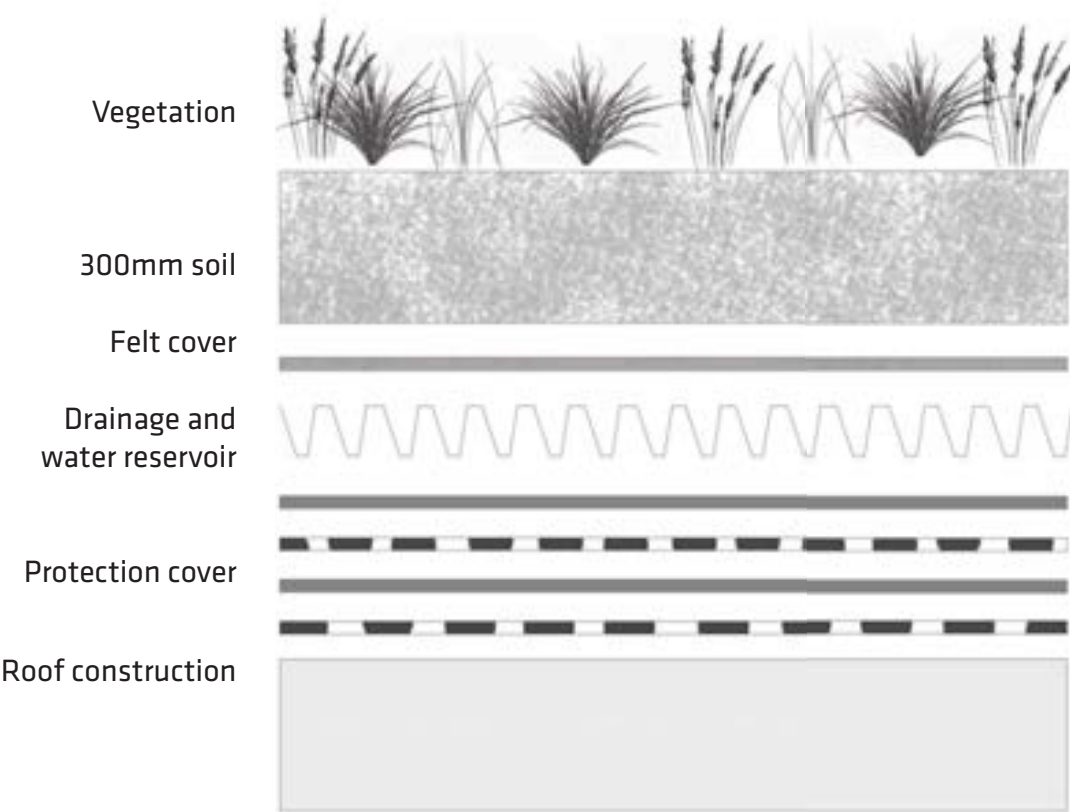
The vision is to create a building integrated in the landscape thereby adapting the materiality and appearance of the context. The aim is to create a beacon for experiences, research and learning.



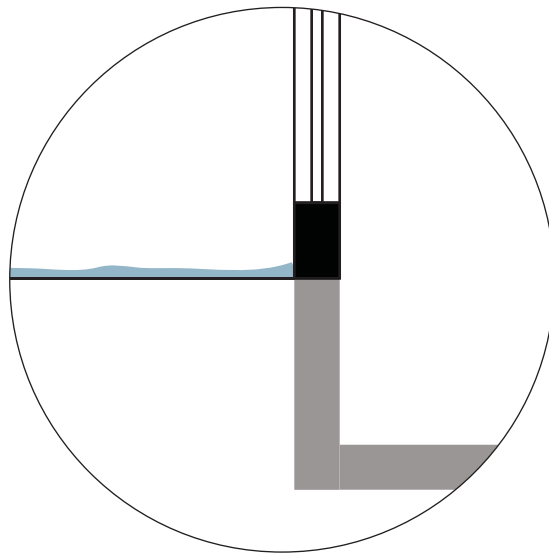
Movement through the landscape surrounding the Fjord Center

Green roof solutions

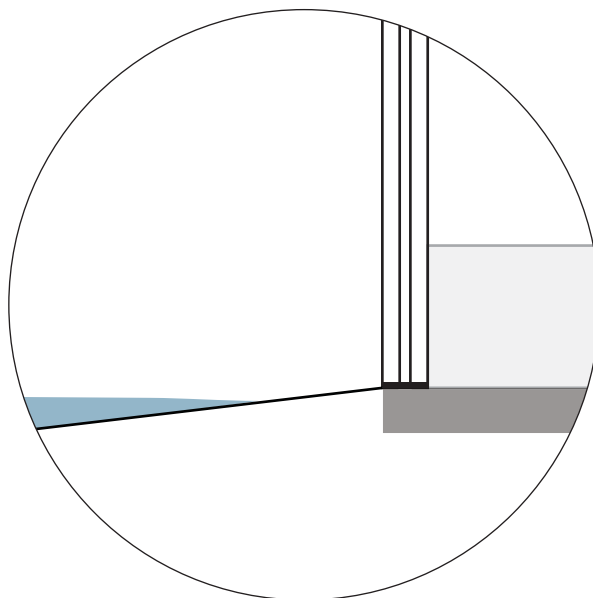
Principle for a green roof



Green roof construction inspired by HFB (HFB, 2019)



The concrete foundation continue above ground to stop water



The center is slightly elevated compared to surroundings and the path to the center slopes to avoid flooding of the center. The doors to the center open outside to resist water pressure in case of flooding.

Technical principles adapting in case of flooding of the Fjord Center

