

# Common Challenges in climate-adaptation and water management in Denmark and Schleswig-Holstein

Note on WP 4.2 “Strategies / formalized cooperations”

1<sup>st</sup> of March 2021

## About WP 4.2

The goal of NEPTUN is to trigger the innovation and growth potential of water technology companies including promoting supply, demand, supply visibility and knowledge in the value chain for water and climate-related solutions.

The goal of WP 4.2 was on both side of the boarder to identify common or shared challenges experienced by municipalities and water utilities with responsibility for climate adaption actions. From this, the goal was to identify 5 shared innovation challenges and select two specific challenges within the field of climate adaptation and water management in both Denmark and Schleswig-Holstein with the potential to be solved in a private-public procurement setup. The mapping of the shared challenges should happen via desk research on the municipal climate adaptation plans. It was assumed then, that these challenges would be mostly technical.

However, this research faced some challenges itself:

- The climate adaptation plans of Danish municipalities are heterogeneous and thus hardly comparable. At the same time, they rarely concern themselves with structural, technical, or other challenges, which could be a hindering for the implementation of solutions. The climate adaption plans are overall primarily focused on identifying threatened areas in the municipality and to some extent discuss a priority list. Furthermore, most of the climate adaption plans are 5-7 years old by now, which means that they only in rare cases address specific challenges, which at this point might have been dealt with.
- municipalities in Schleswig-Holstein hardly have any climate adaptation plan at all. The only exception is the district of Rendsburg-Eckernförder (around Rendsborg and Egernförde): Its climate adaption strategy has been published in December 2020. The district of Plön plans to develop a climate adaptation strategy as well.

Nevertheless, the study revealed that the municipalities are mostly facing jurisdictional and structural problems when it comes to climate adaptation. Consequently, the strategy was adapted:

The Danish thinktank CONCITO has identified 5 challenges Danish municipalities have to face when addressing water management and climate adaptation. Through conversations with employees working with climate adaption at the municipalities the findings of CONCITO have been validated while adding a further challenge to the list.

In a second step, it was discussed within the administration of Kreis Nordfriesland, to what extent these challenges also fit for Schleswig-Holstein.

## Structural and institutional challenges regarding climate adaptation

### Challenge 1: A coherent legal framework that enhances the legal status of climate adaptation

Denmark (taken from CONCITO’s report: Robustness in municipal climate adaptation plans, 2017; <https://concito.dk/udgivelser/robusthed-kommunale-klimatilpasningsplaner>)

*“The most recent revision of the Planning Act (2017) did not take the necessary step of raising climate adaptation as a theme in the local plan catalog, so that the municipal administrations could have an effective tool in balancing other themes. As it is now, the*

*effort is primarily based on volunteering, which in a busy everyday life with a very tight economy, does not have a promoting effect on updating and / or implementing the climate adaptation plans.*

*The municipalities try as far as possible, and are predominantly successful, in promoting holistic approaches to climate adaptation across at least the technical planning departments, but full integration is unlikely to be achieved without stronger legislative instruments.”*

*It should be noted though that 19 out of the 22 municipalities of The Region of Southern Denmark have joined the DK2020 project, which is aiming to help them formulate a binding Climate Action Plan that is in accordance with the C40 concept in regard to reach the targets set in the Paris Agreement. As part of the project, the municipalities not only pledge to revise their climate adaption plans – using the latest scenarios for future flooding risks – but also to prioritize measurements countering contemporary and future threats from flooding.*

Schleswig-Holstein:

The LEGAL framework is not the actual problem in Schleswig-Holstein. In Germany, the law demands that the municipalities follow technical regulations, when they plan a new sewage /drainage system. A private engineer’s association decides about these technical regulations, which are then valid for Germany as a whole. Thus, these regulations change only occasionally. Once these technical regulations are modified, though, they are binding for the municipalities.

On a state level, the general plans express the political decisions regarding flood protection.

#### Other forms of financing (co-financing has suspensive effect)

Denmark:

*In the first instance, the co-financing rule should be subjected to a thorough inspection, and a more concrete examination should be carried out of the extent to which the co-financing requirement has a suspensive effect on the efforts. The division of labor between the municipalities and their respective water companies should be re-evaluated in order to simplify project administration, and to clarify definitions of which focus areas are covered by the co-financing scheme. There seems to be a fundamental need for more concrete guidance to the municipalities on possible sources of funding at home and abroad, and there is a need to help efforts on the way in the municipalities that are particularly vulnerable and capacity-challenged, including to a greater extent, to assist with, or facilitate technical assistance that can ensure a timely and robust decision basis and planning tools in the effort.*

Schleswig-Holstein

A lack of (co-)financing definitely also is a problem in Schleswig-Holstein. Until now, every climate adaptation project that has been granted and funded by the Federal Government of Schleswig-Holstein has been a single-case decision. A standardized co-financing system has not been implemented so far.

#### Uniform management of the entire water cycle (similar guidelines and procedures for flood protection by groundwater, river, sea, and rainwater)

Denmark:

*There is a need to take a step back, and as a starting point consider the entire hydraulic circuit as a single system that should be gathered in an actual water law, administered under a higher authority, and / or managed under a single and integrated set of rules. Prevention of flooding from seawater, rainwater and groundwater should be similarly managed and financed according to the same simplified guidelines.*

*Negotiations for a national water law, which aims to clarifying administrative responsibilities as well as a setting up a more streamlined financing system for actual*

*climate adaption initiatives, are under way between parties at the Danish national parliament. They have been dragging along for some time though and might not be done before early in 2022.*

Schleswig-Holstein:

This issue is true for Schleswig-Holstein as well. Many different legislations on water, natural resources come together in water management in Schleswig-Holstein as well as different authorities. This makes the situation rather complex, as well.

Sector thinking, better networking of various climate adaptation considerations to better identify synergies and conflicts

Denmark:

*There is a great need to ensure greater coherence between opposing considerations, including in particular in relation to diversion / storage of water in the open land, as well as in the pursuit of obvious synergies with adaptation efforts, including for example in relation to the extraction of organic soils, nature and biodiversity protection. A good place to start would be to carry out a thorough study of the conflicts and synergies to be dealt with in the open land, with a view to ensuring a well-balanced climate adaptation effort, which is otherwise based on socio-economic impact assessments of benefits. and disadvantages of storing water outside the cities. Furthermore, it will be crucial to find economic and land distribution models that can promote the role of agriculture in such efforts.*

Schleswig-Holstein:

In Schleswig-Holstein, the districts (like Kreis Nordfriesland or the city of Flensburg) have a great responsibility and control/ assist the municipalities with their plans. Thus, they have many similar tasks, as Danish municipalities (like e.g., Tønder Kommune).

Within the administration of Kreis Nordfriesland, the different sectors try to work together as pragmatically as possible, nevertheless this usually comes along with additional effort.

Furthermore, as municipalities in Schleswig-Holstein usually have to start from scratch when planning climate adaptation.

Lack of catchment-related climate adaptation

Denmark

*There is a great need to ensure closer coordination in the organization of climate adaptation in shared water catchments and along common coastlines. This is especially true for Denmark, where the municipalities to a very large extent share such common water catchments and coastal stretches. The management of the water is inappropriately organized according to municipal boundaries and is not based on, for example, Denmark's 23 water areas or common coastlines. Denmark is thus the only one of several countries surveyed in north-western Europe that does not have a regionalized or water area-based approach in climate adaptation planning. Other countries, e.g., Sweden, Norway, the Netherlands, and the United Kingdom attach great importance to climate adaptation across government boundaries (CONCITO 2016).*

*The Region of Southern Denmark harbors a substantial of these water areas. Among them seven of the 14 nationally recognized high-risk areas. A multitude of the cross administrative borders, but there is no formal template for how these challenges should be dealt with in unison.*

Schleswig-Holstein

The municipalities can only plan within their own jurisdiction.

A Special case is the drainage of the low-lying marsh areas: As the drainage systems have evolved through time, each drainage system is more or less like a single river catchment, which makes planning easier, at least in Nordfriesland.

## A lack of sufficiently up-to-date data or model results

### Denmark

The Region of Southern Denmark experiences a lack of detailed, up to date data as another major issue hampering climate adaptation, because thus it stays unclear what municipalities should adapt to and what the consequences are. As an example, data on flooding risks haven't been updated for roughly 10 years meaning that municipalities are still mapping risk areas on the basis of now outdated scenarios for future developments in temperature and what consequences that will bring. There's also a fully lack of knowledge about ground water levels and how that might affect areas regarding flooding.

### Schleswig-Holstein

Although regional climate scenarios have been developed and published, there exist no "official" models or scenarios, which should be used for planning. This links back to lack of adapted technical regulations (see above). Another reason, though, is the European Directive for Flood Risk Management (Directive 2007/60/EC) which does not ask for the incorporation of future scenarios, but only for statistics of the past.

## Summary: List of common structural challenges

Thus, the following challenges both municipalities in Denmark and Schleswig-Holstein are facing:

1. A coherent legal framework that enhances the legal status of climate adaptation
2. A Lack of funding
3. A lack of uniform management of the entire water cycle
4. Sector thinking, better networking of various climate adaptation considerations in order to better identify synergies and conflicts
5. (Lack of catchment-related climate adaptation)
6. a lack of sufficiently up-to-date data or model results

### **Comparing with the problem owner challenges within climate adaptation mapped in wp 4.1.**

#### **Denmark**

##### **Structural challenges**

- Water utilities and municipalities are limited by economical frames, not update legal framework, and demands for efficiency and is therefore less motivated to enter development projects
- A need for more collaboration and knowledge transfer within the water and climate adaption sector.

##### **Technical challenges**

1. Lack of climate management strategies and digital tools, that combine life cycle costing, risk management, sustainability assessment for climate adaptation systems using weather data, radar data and online sensors.
2. Lack of models and technologies for handling rising groundwater / drought.
3. Lack of robust sensors and drones for monitoring water quality and water level in connection with. cloudbursts and floods from seas, streams, and rising groundwater

#### **Schleswig-Holstein**

## **Structural challenges**

Lack of sufficiently trained employees

Lack of holistic thinking and procedures in dialog with municipalities and other actors.

Tendering procedures do not promote joint and innovative solutions

## **Technical challenges**

1. Lack of hydraulic data and better models for how different cloudburst scenarios will affect the water level in streams, the upper aquifer, fjords, and sea.
2. Lack of models for how different technologies can protect cities, buildings, and landscape.

## **Conclusion: Similarities**

### **Shared structural challenges**

The findings of structural challenges in wp4.1 substantiates the finding of shared challenges between Denmark and Germany in wp4.2. Moreover, Germany also seems to have a lack of sufficiently trained employees probably also to an structure of many small municipalities and a not innovative promoting tendering procedure.

### **Shared technical challenges:**

About point 6. “a lack of sufficiently up-to-date data or model results” Denmark seems to be quite much ahead compared with Germany with the latest launched hydraulic data in HIP, in a 100 m grid, the scenario model KAMP for municipal climate workers and the SCALGO models with models watering the landscape before and after adding climate adaptation elements. Moreover, a Danish company, CBMC group have developed a tool for municipalities about the economic consequences of cloudburst and damages on buildings, rivers, coast, and open land in different climate scenarios, so the municipalities got a tool to prioritize.

Nevertheless, different state of hydraulic and reliable data and models available in both countries see a need for more and better digital tools **to predict climate changes effect on water level and models that can predict effect of different methods to protect cities, buildings, and landscape.** Germany seems in the future to have more focus and need for more reliable water data and Denmark seems to in the future to have more focus of more efficient and digital methods to measure changes such as a bigger use of sensors and drones.