

Task 3.1a Asset Management: Template Questionnaire

WP3 Investment Planning and Asset Management

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Summary

FAIR (Flood infrastructure: Asset management and Investment in Resilience, adaptation and maintenance), is funded by the EU INTERREG North Sea Region (NSR) Programme and led by the Rijkswaterstaat, FAIR focuses on providing improved, more resilient, more multi-functional and adaptive approaches to providing flood infrastructure. Asset owners and academic colleagues from the Netherlands, Sweden, Germany, Belgium, UK and Denmark will be comparing approaches to asset management and investment planning to share good practice and support new developments.

This report is provided under Work Package 3 (WP3 Investment Planning and Asset Management) and sets out a questionnaire to be completed by the asset owners and science partners within the FAIR consortium. The aim of the template is to guide the Asset Owners in identifying the challenges, barriers and gaps they face in developing more adaptive Asset Management. The science team will then summarise the findings and incorporate elements in international practice and tools.

Glossary of terms

Asset	Item, thing or entity that has potential or actual value to an <i>organization</i> ¹ . In the context of flood management this is generally a physical asset (e.g. a gate), but it can also be the data that is used to manage the gate (i.e. if the data is gone, the performance will drop).
Asset function	Function related to an organizational objective that the asset fulfils, an asset can fulfil multiple functions. E.g. a sluice will contribute to shipping (a function), but also to flood risk reduction (a different function).
Asset management	Enables an organization to realize value from assets in the achievement of its organizational objectives ¹ . Asset management can be done on different levels, strategic, tactical and operational are the generally distinguished levels. An example of strategic asset management is that safety standards of flood defences are changed due to new societal developments (e.g. economic growth), an example of asset management on a tactical level is the planning of reinforcement of dikes over a longer period of time, an example of a decision on an operational level is how often a dike should be inspected in order to ensure its reliability meets the standard.
Asset performance	Measurable result ¹ Measure for the extent to which the asset performs, to be compared with the required performance. E.g. the reliability of a dike or the availability of a sluice.
Availability	Ability of a system to be kept in a functioning state ² . E.g. the percentage of time that a pump is functioning.
Consequence	Represents an impact such as economic, social or environmental damage or improvement, and may be expressed quantitatively (e.g. monetary value), by category (e.g. High, Medium, Low) or descriptively. ³ For instance the casualties and damage in a flood.
Cost	Capital: Initial investment required to provide a significant change to the performance of an asset or provide a new asset (e.g. reinforcement costs, cost of building a sluice) Revenue: On-going investment needed to maintain the performance of asset / asset system Operating: costs for keeping an asset (e.g. the sluice) operational (i.e. satisfying the performance criterion). For instance, cost for energy, maintenance, painting the doors. Whole life: see life-cycle cost
Life-cycle cost (LCC)	Or: Whole Life-cycle Cost or: Total Cost of Ownership (TCO). The total of all costs and revenues over the life cycle. Enables comparison of e.g. construction, maintenance and removal costs. Generally expressed as Present Value, where all future

¹ ISO55000

² http://www.ntnu.edu/c/document_library/get_file?uuid=ae1f2570-1191-4d7c-b4c3-9686aaeccc8&groupId=151572

³ FLOODsite: The Language of Risk

	investments are expressed in current day value using discounting.
Probability	Measure of our strength of belief that an event will occur. ³ For more details on different interpretations and views on the concept of probability see ³ .
Reliability	Ability to perform a certain defined task, often expressed as probability of failure. E.g. the reliability of a flood defence is its ability to prevent a flood. Generally expressed in terms of probability
Resilience	Ability of a system to react and recover from a damaging hazard ³
Risk	Function of hazard, exposure and vulnerability ³ For a flood that would be: Hazard: the probability that a flood occurs (to given depth, velocity, duration) at a given location. Exposure: the people, businesses, infrastructure, habitats etc. that may experience harm if a given flood occurs. Vulnerability: the degree of harm (loss of well-being) suffered by those exposed to a given flood. Please note: This definition supports the more general definition of risk as a function of probability and consequences; where consequences are described by exposure and vulnerability.
Risk attribution	Decomposition of risk to individual assets/objects
Safety	The requirement not to harm people, the environment, or any other assets during a system's life cycle ⁴
Scenario	A plausible description of a situation, based on a coherent and internally consistent set of assumptions. ³ For instance a description of the development of climate or economic growth in the next decades.
Standard	Of protection: Performance Safety Ultimate limit state Serviceability limit state
(Investment) strategy	A strategy is a combination of long-term goals, aims, specific targets, technical measures, policy instruments, and process which are continuously aligned with the societal context. ³
Performance criteria	Required: Levels that performance indicators need to meet. E.g. safety standards defined by law. Desired: Levels of performance indicators that might be met, if benefits for organizational objectives (broadly) outweigh costs. E.g. if an organization has as objective to generate more economic activity on and around a dike, they can make it multifunctional, if it is not too expensive.

⁴ http://www.ntnu.edu/c/document_library/get_file?uuid=ae1f2570-1191-4d7c-b4c3-9686aaeccc8&groupId=151572

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1 Introduction

This template sets out the questions to be reviewed and completed by the Asset Owners. The responses will then form the basis of a comparison of methods across the North Sea Region and, importantly, common challenges identified and best practice shared. The results from the questionnaire will be taken forward in WP3 and WP5.

The questionnaire is structured in two main parts. This first part of the questionnaire explores the context within which asset management policy is made, strategies development and plans delivered. The aim is to provide a rich understanding of the approaches in each partner country that forms the background to the case studies. The second part of the questionnaire focuses on the specific challenges and approaches at the case study site. By including these two strands an in-depth understanding of the reasons why different approaches are used will be developed and, in doing so, enable best practice to be shared in the most meaningful way.

Note: The responses to the questionnaire should be provided as a standalone report and set out using the question headings given here.

2. Part A National context - Sweden

Question 2.1: Context within which asset management takes place

2.1a – Roles and responsibilities

We would like to understand the organizations with an interest in AM, their role and responsibilities for delivering AM (funding, programming and permitting etc.). This includes both private and public sector organizations, as well as the role of communities and NGOs. We would also like to explore how third party assets treated/managed.

Organization	Interest	Role	Responsibility
National government			
MSB – Swedish civil contingencies agency	<p>MSB works:</p> <ul style="list-style-type: none"> •via knowledge enhancement, support, training, exercises, regulation, supervision and their own operations •in close cooperation with the municipalities, county councils, other authorities, the private sector and various organisations •to achieve greater security and safety at all levels of society, from local too global 	<p>The MSB is responsible for issues concerning civil protection, public safety, emergency management and civil defence as long as no other authority has responsibility. Responsibility refers to measures taken before, during and after an emergency or crisis.</p>	<p>The Swedish Government steers the MSB via a body of instructions and an annual appropriation. The instructions specify the MSB's responsibilities and tasks. The appropriation specifies the objectives and reporting requirements, as well as the resources allocated for MSB administration and MSB activities.</p>
County administrative board of Skåne	Coordinate the local municipalities.	<p>The function of the County Administrative Boards is to be a representative of the state in their respective counties, and serve as a link between the inhabitants, the municipal authorities, the Central Government, the Swedish Parliament and the central state authorities.</p>	Provide good service with open accountability that is based on the rule of law.
Reginal government			
Region of Skåne	No responsibilities regarding flooding.	<p>Region Skåne has a permanent commission from the state to coordinate regional development issues and lead the work with creating a Regional</p>	No responsibilities regarding flooding.

		Development Strategy, RUS.	
Local government			
Municipalities	A safe community.	Municipalities in Sweden are responsible for providing a significant proportion of all public services. They have a considerable degree of autonomy and have independent powers of taxation. Local self-government and the right to levy taxes are stipulated in the Instrument of Government, one of the four pillars of the Swedish Constitution.	Responsible for spatial planning on a local scale.
Operating authorities			
Municipalities	See above	See above	See above
Private owners			
Land owners			
NGOs			

2.1b - Relevant policy, plans and codes

Discuss the policies, plans and codes that specifically influence the delivery of asset management. These should include both flood related and non-flood related (for example, broader development plans). This should be provided as a table as below with supporting text below.

Policy or plan	Level (international;/European/National)	Description	Influence on asset management
Policies and Plans			
Floods Directive	European		The requirement for a national understanding of areas at significant risk and develop Flood Risk Management Plans for those areas.
The municipalities spatial planning	Local	Local process for spatial planning.	Policy documents.
Plans			
Codes			
Guides			

2.1c Planning timescales of interest

Discuss the timescale over which asset management activities are assessed and planned and how each influences AM decisions. Consider the multiple timescales within which assessments takes place (national policy cycles, regional planning cycles, maintenance cycles, others).

Time scale	Associated time horizon (in years)	What AM decisions take place over this timescale?	Who leads these decisions?
Long term planning			
Comprehensive plan	Actualized every 4 th year. (if it is not up-to-date, changes must be made)	The Comprehensive Plan describes how the municipality want land, and water areas, to be used and provides guidance for decisions by the municipality and other public bodies.	The plan is adopted by the City Council. In Sweden each municipality is responsible for the use of their land
Medium term planning			
Changes in the comprehensive plan	Can be done continuously	A more detailed plan over smaller areas of land and water	City council
Short term plans			
Detailed comprehensive plan	Based on a five-year implementation	Detailed asset management planning	City council The detailed comprehensive plan is legally binding and the county administrative board review the plan and has the right to cancel it, or parts of it.

2.1d - Requirements of performance

Discuss what kind of performance requirements have to be met, who defines these and how these are determined.

- **Required criteria (i.e.** What criteria must be met regardless of cost)

Helsingborg, as well as all Swedish municipalities, follows the plan and building act. They have the responsibility to ensure safety and health for their inhabitants.

There has recently been a new addition to the plan and building act concerning risk of flooding, landslides and erosion.

- **Desired criteria?** What criteria might be met? If (broad) benefits outweigh (broad) costs
Each municipality can decide whether they would like to further extend the protection against e.g. flooding, more then what is stipulated in the plan and building act.

The municipality can decide to increase protection in different areas, even though this might actually be a property owner's responsibility.

The county administrative board examines the physical planning in the comprehensive detailed plan so that it avoids and minimizes the risk of flooding. The county administrative board can cancel the detailed comprehensive plan if there is a risk of people's lives.

2.1e Governance and other aspects

Funding

- Who pays, the asset management plan to be developed, for maintenance, capital investment and how secure is this funding stream into the future?

The different municipalities are responsible for funding development, maintenance and capital investment.

There is a growing discussion whether the municipalities will get governmental support for asset management in the future.

There is, in the current situation, no authority in Sweden who has the responsibility for asset management. Many municipalities wish for someone to take the lead.

Question 2.2: Challenges and barriers to be overcome

Questions 2.2a to 2.2d seek to tease out the issues in our understanding of asset performance over time and the availability of supporting data.

2.2a Barriers in the understanding of the current system

Physical understanding

Sources

- Extreme storms and river discharges (what are of return period storms do you consider; how do you include joint probability issues)

Helsingborg municipality have done an investigation about flooding from the sea and cloudbursts in a 100year perspective. The investigation has examined cloudbursts as well as rising of sea level. Helsingborg municipality have decided that new buildings should be able to withstand a sea level of +3,5m. However, there are no plan on how to secure existing buildings.

Helsingborg does not consider any specific return periods for storms or cloudburst, but based on statistics there is a probability that storms and cloudbursts will occur more often.

Helsingborg uses the “Malmö- and Copenhagen rains” as reference events. These scenarios are described in 2.2 b.

The statistics used do not account for an event when a maximum cloudburst and highest sea level occur simultaneously, this is not likely to occur at the same time.

Pathways

- Accuracy of the floodplain topography data (what level of accuracy is typical and is this good enough?)

There has been made an investigation, “skyfallskarteringen”, where there is an accuracy on 4 x 4 meter (in order to be able to run the model within a reasonable amount of time). This gives us approximate statistics on how the rain falls and moves on the surface, once pipes and drainage systems are running full. But not on a paving stone-level which we will need to in detail plan the asset management.

- Accuracy of information on asset location, geometry and construction (what is known and where are the key gaps in knowledge)

To be able to do a detailed asset management plan we need more detailed information, data and even 3D maps. Higher resolutions maps, showing geometry will be needed.

Socio-economic understanding

Receptors

- Accuracy of information on floodplain usage (residential properties, people, businesses etc.)

We have general information on floodplain usage. We have fairly good knowledge on how many buildings (essential services, permit requirements, etc.) within each catchment area would be flooded, or at risk of flooding, in each scenario (sea-level, rainfall and river flow) modelled in our study.

2.2b Future change

We would like to understand how future change is accounted for. In particular:

In climate

What guidance is provided on climate change, including: (change to a table)
Sea level rise allowances – what estimates of SLR are used.

River flows – what estimate of change in peak flows are assumed for. If not peak flows how is climate change accounted?

Rainfall – what change in the estimate of rainfall (30 and 100 year return period hourly, daily, monthly) are assumed for? If not quantified how is rainfall change accounted for?

Our sea level scenarios focus on the years 2065 and 2100, assuming a mean sea level rise of + 0,5 m in 2065 and + 1,0 m in 2100. A sea-level corresponding to a 100 year return period is assumed to be +2 m above the mean sea level, an extreme level +2,4 m, as seen in table below. The 2065 scenarios are intended to be used when constructing protection measures, whereas 2100 scenarios are to be used for long term planning.

	2065	2100
Mean Sea level (height system RH2000)	+ 0,5 m	+ 1,0 m
Tidal level	+ 0,1 m	+ 0,1 m
“100-yr sea level”	+ 2,0 m	+ 2,0 m
Still water level during 100-yr high water event	+ 2,6 m	+ 3,1 m
“Extreme sea level” (highest on record)	+ 2,4 m	+ 2,4 m
Still water level during extreme high water event	+ 3,1 m	+ 3,5 m

Waves are not accounted for here. Waves will be taken into account when protection measures are designed.

Our rain burst scenarios are a 100-yr event: A cloudburst with a 100-year return period, plus a 10 % increment, i.e. 93 mm in 6 hours

An extreme event: 171 mm in 3 hours (this occurred in Copenhagen in 2011). The return period of this event is said to be 1500 years.

Surface runoff was then simulated using MIKE 21 (surface runoff) and MIKE URBAN (sub surface pipes etc.).

River flows: Flooding along the river Råån and its tributary Lussebäcken have been modelled according to two scenarios; a 100-yr flow and a 200-yr flow.

Is any consideration given to the influence of the following climate change related issues on asset management decisions?

- Temperature – Yes/no – if yes how? But we use IPCC survey as knowledge base.
- Storm sequencing – Yes/no – if yes how? We use statistics on previous storms, however, there is a likelihood that storms will occur more often.
- Spatial coherence – Yes/no – if yes how?

In socio-economics

- Population growth – Helsingborg has an increase of population prognosis of 40 000 persons until 2035 (today's population approx. 135 000)
- Economic development – this type of information is not used today

In land levels

Localised settlement of the levees – If yes, what assumptions are made

None right now. Helsingborg is at the moment investigating how potential levees will look like in existing environment, and where levees can be located.

Regional soil subsidence (i.e. groundwater management related consolidation) – If yes, what assumptions are made

Still in the investigation phase.

Isostatic rebound – If yes, what assumptions are made

Still in the investigation phase.

2.2c Funding barriers

Everyone has a finite pot of money – but is the structure of funding or payment a barrier to optimal / best asset management (compensation for example).

The different municipalities are responsible for funding. However, there is a growing discussion whether the municipalities will get governmental support for asset management in the future. This would be desirable for the municipalities.

2.2d How successful is asset management

Is it known whether the asset management is being delivered successfully?

Regarding new settlements asset management is delivered successfully. E.g. in conversion of an old harbour area protective measures are done before new constructions are made.

Helsingborg works with developing new methods to prevent erosion; some measures have been done. Nevertheless, asset management have to be done in existing surroundings as well.

Question 2.3: Overview of tools and data used (where this is known)

2.3a Reliability

Overview

- What approaches do you typically use to support policy analysis and design?

We take into account probability and consequences. We have no ability to ensure lifelong protection. When establishing new protection measures, we take into account a higher protective level than needed, according to today's data.

- Do you have data to support these methods? If so, who collects it, who collates it and can access it and is it openly available, if so where? Is uncertainty in the data considered?

We use SMHIs database. (Swedish Meteorological and Hydrological Institute)

Specific challenges and gaps in understanding

What are you particularly grappling with

We have a delimited space to work with. We would like to densify the city but have to take space for protection into account. We are struggling with limited space but also distribution of responsibilities within the municipality organisation, and in regards to private owners.

We also have an inconvenience regarding the responsibility to keep inhabitants safe on the one hand, and the sea as one of our city trademarks on the other.

2.3b Deterioration

With and without management....

The quays are built with a long term perspective and isn't in need of general maintenance.

The protection against erosion and our surface water units is in need of extensive maintenance.

Question 2.4: Decision process

The following question explore the aspects that shape the choices made.

2.4a Investment planning and prioritisation

Expenditure type

- Total expenditure (whole life cycle costs) – or just capital or revenue?

The investment planning is decided by the city council.

Prioritisations

- First in the queue – early bird gets the worm – constraints on permitting for example

The prioritisations are made by officials.

- Given the nature of expenditure, do you seek to identify least cost or max BCR, or other

Not applicable. We are still in the investigation phase.

- Individual asset versus asset portfolio planning: How is investment optimised across the portfolio of assets that exist?

Not applicable. We are still in the investigation phase.

Opportunities for enhancing the return on investment

- Payment for non-FM benefits/functions? i.e. broader benefits – is this possible and do they change the investment ranking?

Not applicable. We are still in the investigation phase.

- Private contributions – does this change the ranking?

It is not likely that we get private contributions.

- Opportunities of material reuse and other infrastructure investment synergies – i.e. tunnelling programme has generated potential source of materials?

Not applicable. We are still in the investigation phase. This will get investigated further.

2.4b Social justice

How are the three principles of justice considered:

- Equality – Are all citizens treated equally in the FRM process? If no, why not? If so, how is this ensured?

The city council and officials make decisions regarding investments and prioritisations. The inhabitants have the possibility to discuss and provide feedback to the detailed development plan.

- Are the most vulnerable members of society prioritized? If no, why not? If so, how is this ensured? When writing the detailed comprehensive plan there is no consideration who lives in prioritised areas. However, we know that the people living close to the sea are high-income earners and they are often more keen on influencing decisions.

- Utility – Is it required to ensure the best return for each euro spent? If no, why not? If so, how is this ensured?

3. Part B Case study – Helsingborg

The following questions focus on the specific approaches taken at the case study sites. The responses here follow on from those in Part A and will help provide an understanding of how the approaches nationally influence and are taken up locally.

Question 3.1: Setting the scene of the case study

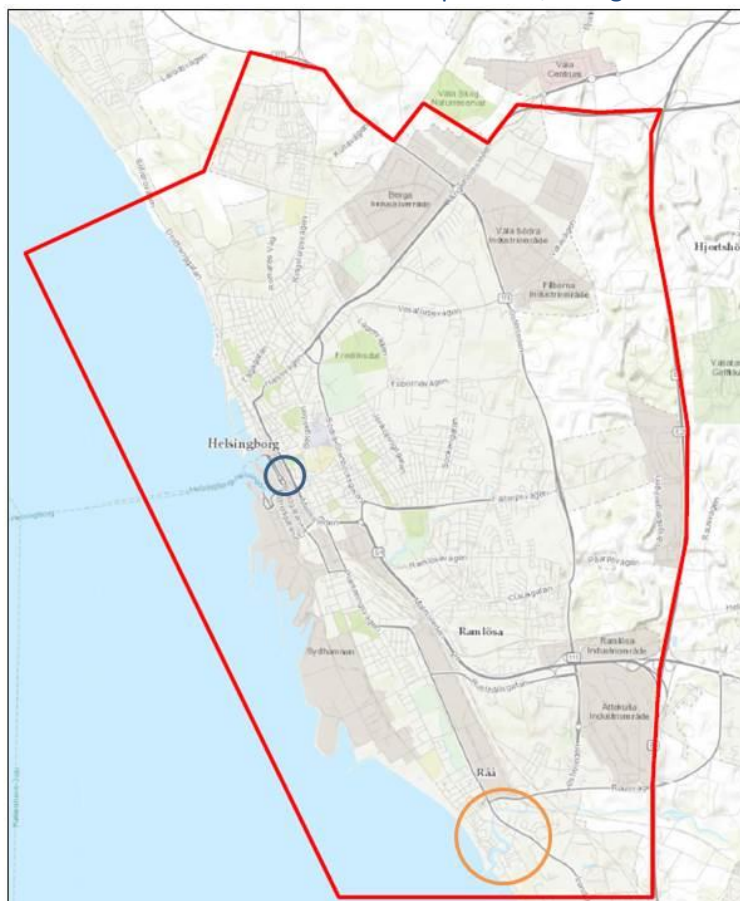
There is an investigation made in Helsingborg “Skyfallsmodelleringen”.

We would, within the frames of project FAIR, like to have the possibility to exchange experiences with the other participants. We would also like to take the next step in our organisation on how to incorporate assessment management in our day to day operation, not only to discuss these questions when specific measures, or point operations, are required.

Please describe (in no more the two pages including figures) the context of your case study. This should include:

Name of the case study and a map

Map of central Helsingborg. The red line shows the area for which flooding investigation has been carried out. Blue circle shows the location of Knutpunkten, orange circle shows Råå.



Focus/objective of the case

Decision focus:

Knutpunkten - to secure against sea level raises.

Råå – to secure against high sea level as well as high levels in the river Råån. Measures protecting in case of cloudbursts. Protection against flooding from the sea whilst letting river flow and rain water out.

Objective:

The objective is to, within the frames of this project, investigate asset management in the specified areas. To get guidance, and suggestions, on protection measures.

The physical setting

Nature and topography:

Both case studies are located close to the seaside. Råå is located in the lowlands.

Sources of flooding:

Knutpunkten is situated on the quayside.

Råå is a village situated close to the seaside and the river Råån, and its tributary Lussebäcken, flows close to private houses.

Existing flood defence infrastructure:

There is no existing flood defence system at Knutpunkten.

In Råå there is a natural levee but non constructed. (i.e. sand dunes)

The socio-economic setting

State if rural, semi-urban, dense urban

What is the nature of the communities to be protected, residential and non-residential activities, important infrastructure services (hospitals, transport hubs etc.) that may be in the floodplain and how these might be impacted by a flood?

Have there been past floods in the area? If so, how was it caused and what impact did it have?

Knutpunkten is urban and have no prior history regarding floods. Knutpunkten is an important infrastructure hub with both national and regional railways. At Knutpunkten you can access both trains and buses as well as take the ferry across Öresund to Denmark.

Råå is semi-urban with many private owned buildings. Råå have had prior difficulties regarding flooding.

Question 3.2: Specific challenges and barriers to be overcome

3.2a What is the asset management challenge

What is the driver for the case study and what makes AM difficult?

Subsidence? Flood plain development? Funding/political momentum/support? Are there any constraints on the solutions? {environmental, technical feasibility}

Helsingborg is grappling with lack of knowledge on building levees, and how to work with protection barriers. In Råå there is a subsoil water problem.

We are also grappling with the responsibility issue, the division between municipal and private owner responsibilities.

Knutpunkten houses services for both governmental, regional and local authorities, as well as private owners. A significant part of the investigation will handle the distribution of responsibilities among the involved parties.

There will be discussions concerning who “owns” the asset management plans and solutions. Whether it is the municipalities, private house owners or other authorities.

We are too early on in the process to be able to identify constraints on the solutions.

Though, there is today no organisational solution to whom should lead the process, or coordinate asset management issues, within the municipal organisation. The asset management topic is new in the municipality and an organisation handling these issues have not yet been established.

3.2b Understanding of the current system

Helsingborg is in the process of building a database and therefore has no current system.

A basic typology of the flood and coastal erosion risk management infrastructure is provided in the table below (Sayers et al, 2015). Which asset types exist in the pilot study area and what role do they play?

Asset types to be considered in the pilot (asset typology after Sayers et al, 2015)
In Råå the investigations mainly affect private house owners. The local street system and accessibility is the municipality’s responsibility.

The case study regarding Knutpunkten and suggested protection measures will affect government, regional and local authorities as well as private property owners.

We will not know who is affected by the measures until the investigations are made, probably not until after the end of the FAIR project.

Type of asset	Example activities	Considered in pilot (yes/no)	Why?
Local scale infrastructure			
Private homes and businesses	Avoidance		
	Resistance		
	Recovery		
Critical service nodes	Avoidance		

	Resistance	property scale ing dykes The use of flood products and construction detailing to prevent water entering a property.		
	Recovery	The use of function specific building designs and network redundancy to avoid loss of function if flooded (i.e. continued power or communication distribution).		
System scale infrastructure				
Hard path infrastructure & Planning, design and management of built infrastructure				
Linear and network assets	Active	Barriers that can be deployed as temporary and demountable defences.		
	Passive - Above ground	Raised defences and shore parallel structures (i.e. embankments, levee or dyke, breakwaters) through to storm water storage ponds.		
	Passive - Below ground	Individual pipes, CSOs and the drainage network they compose.		
Point assets	Active	Pumps, floodgates and sluices.		
	Passive	Fixed trash screen, groynes as well as interface assets (that link above and below ground linear systems) such as manholes and gullies.		
Soft path infrastructure & Utilizing natural infrastructure systems				
Watercourse	Channel	The management of vegetation (e.g. weed cutting) and sediment (e.g. shoal removal and dredging).		
	Floodplain	The management of floodplain roughness and debris recruitment.		
Coast	Foreshore and backshore	The management of dunes and beaches through active (e.g. recycling and profiling) and passive (e.g. sand fencing, marram grass planting) management as well as natural wetlands and soft cliffs.		
Urban landscape	Urban land use	The engineering of urban green space, managing		

		surface permeability (e.g. through SuDs) and debris recruitment.		
Rural catchment	Rural land use	The management of rural run-off, sediment yields as and debris recruitment.		

Note: FCERMi includes any feature that is actively managed to reduce the chance of flooding or erosion (Sayers et al., 2010). Dams and associated ancillary structures are excluded from this paper

Accuracy and source of information on asset geometry and their performance

Our case study includes collecting information and data which makes the following questions hard to answer.

Socio-economic understanding

- Accuracy and source of information on floodplain usage (receptor etc.)

Existing plans and policies

How do existing plans and policy influence the approach to asset management in the case study site
The plans influencing the case study, and which will most likely will have to be updated, are the comprehensive plan, the detailed comprehensive plan and changes in these. See question 2.1.c for more information.

3.2b Future change

We would like to understand how future change is accounted for. In particular:

In climate – repeat by the Part A questions here but answer for the specifics of the case study

What guidance is provided on climate change, including: sea level rise allowances, river flows, temperature, storm sequencing, spatial coherence?

In socio-economics

The climate investigation that has been made (existing at the start of the project) will be used as knowledge base for the case studies. The objective is to, in the final phase, be able to get down to a level of details concerning asset management.

3.2b Governance and other aspects - move to be consistent with Part A

Funding

- Who pays, the asset management plan to be developed, for maintenance, capital investment and how secure is this funding stream into the future?

There is no political decision taken regarding asset management. There is, however, an anticipation that the investigation will provide answers on who has the responsibility to fund development and maintenance.

- Are there other funding or payment barriers (compensation for example)

Non known at the moment.

How successful is asset management – review Part A question

- Is it known whether the asset management is being delivered successfully? If so, how is it measured? (e.g. required and desired performance requirement (if present) is met?)

We can't answer this question now.

Question 3.3: Overview of tools and data to be used (where this is known)

3.3a Reliability

The investigators will examine the built constructions in comparison to the vulnerability of the buildings.

Overview

- What approaches are you planning to apply?

In Råå we will investigate typography, soil and formation options (formation of barriers, groundwater conditions etc.)

- What are minimum data requirements for this approach(-es)?

Data will be collected during the case study.

- Will the analysis be undertaken by a specialist engineer? If yes, is this in-house or external?

Yes, external specialist engineers will be used, probably both regarding Råå and Knutpunkten.

Specific challenges and gaps in understanding

What are you particularly issues are you grappling with

- Gaps in physical process knowledge, gaps in analysis capability:

We are grappling with the delimitations of which areas to be investigated. To be able to answer this we first have to frame the questions to be answered.

2.3b Deterioration

Why is deterioration of assets important at the pilot? Are the deterioration rates known, if so, what is the evidence that is used? Is deterioration managed, and how is value for money of the associated expenditure evaluated?

Specific challenges and gaps in understanding

What are you particularly grappling with – transitions, piping, on-demand M+E, peat, exceedance?

There are no asset management that can be deteriorated today.

Question 3.4: Decision process

3.4a Social justice

How are the three principles of justice considered:

- Equality, the most vulnerable are prioritized, utility (best return)

City council decides on the comprehensive plan and officials assist in prioritising actions.

The inhabitants are able to provide input and feedback on the detailed comprehensive plan but have no saying in regards to investment and funding.

E.g. if there is a need of a levee to be built in Råå, the inhabitants will have the possibility to influence, but regarding technical solutions at Knutpunkten, they will not.

3.4b Robustness under conditions of future change

What are the specific values of future change that have been considered in the pilot site?

- How is climate change factored in?

There is data collected that answers to a 100year period, which we relate to.

- How is development in the floodplain factored in?

- How is uncertainty over future funding factored in?

Funding of asset management is one of the critical questions which also leads to big insecurity. We believe that funding will be one of the key factors to be solved, to be able to secure successful asset management in the future.

3.4c Investment planning

What funding constraints exist at the pilot site?

Will be investigated in the case study.

How is long term funding secured?

Helsingborg municipality adopt a budget every year. The budget shows a 7-year period which can be adjusted at the yearly approval.

We will investigate long term funding more thorough in the case study.

Is additional funding for multi-benefits being sought - if so, where from and is this likely to be successful?

Will be investigated in the case study.

Question 3.5: The relationship of AM to board planning issues

Within the pilot location, do flood defence activities and funding link with broader planning policies and plans, if so how?

Since we don't know what conclusions will be made in the case studies we can't answer these questions right now.

What we do know is that there are no large projects planned, or operational, concerning asset management in the municipality at the moment.

As a minimum consider the relationship of the flood defence approach to:

- Spatial planning
- Environmental regulation (such as the Water Framework Directive)
- Promotion of redevelopment or tourism
- Evacuation planning?