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Defend, Retreat and Attack: Urban Waters and Valuation Practices

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ABSTRACT: This paper explores the river landscapes and concomitant values resulting from tensions between flood management and visions of a River City. The aim is to contribute to an understanding of the management of urban waters as valuation practices. We regard valuation practices as co-constitutive of current and future river landscapes. Sweden's second-largest city, Gothenburg, is located next to the sea, and the Göta River, Sweden's largest water system, runs through it. Our empirical focus is on how this city approaches increasing risks of flooding. We explore three approaches that have been formulated in relation to flood management: defend, retreat and attack. We ask how these approaches are applied in the management of Göta River flooding and in the city's vision of a future Gothenburg that embraces the river as a genuinely positive aspect of urban life. We present the case as a journey that takes us upstream from the river's sea inlet port and through Gothenburg. During our kilometre by kilometre journey, the river's appearance shifts. The varied river landscape mirrors the diversity in how its waters are valued, both historically and in present times. The perception of urban waters is shaped by practices of valuation. These valuations are generative. They connect the value of water to other entities, actors, plans, activities and buildings, and they are thus key to the river landscapes that will eventually be realised. By way of conclusion, we identify a number of governance challenges that are particularly relevant to urban rivers.

KEYWORDS: Flood management, urban planning, visions, river landscapes, valuation practices, Sweden

INTRODUCTION

The Göta River is the largest water system in Sweden. It is 93 kilometres long and runs from Vänern, Europe's third-largest lake, to the sea area of Kattegat. At its river mouth in Kattegat is Gothenburg, Sweden's second-largest city. The Göta River runs through the city, dividing it into the southern mainland on one side and the almost 200 square kilometre (km²) island of Hisingen on the other. Located next to the sea and with rainy weather about every third day, Gothenburg has been identified as one of Sweden's highest flood-risk locations (MSB, 2018). In this paper, we are concerned with the various ways in which the city of Gothenburg is trying to address the risk of flooding. This endeavour includes efforts by its authorities, by hired experts, by city-owned companies, and by politicians. We will follow the Göta River from its sea inlet port through the city; in the process, we will make three stops that epitomise the city's adopted strategy yet harbour distinctly different ways of engaging with water. We will argue that examining these variations in the relationship with water is conducive to understanding how each type of engagement is inscribed with different values.

To understand the city's strategy around flooding, we need to know the character of the city and its recent history. In the last few decades, the area near the sea inlet has transformed quite radically. It was formerly defined by its shipbuilding activities which in the 1970s employed 6000 people, making it one of Gothenburg's biggest employers. Today large parts consist of exclusive, newly built houses with roof terraces and balconies and a view over the river and private docks. The river divides quite diverse parts

of the city and in this regard Gothenburg is often depicted as being highly segregated. On the mainland – what is known as the Gothenburg side – are the city centre and wealthier areas. On the Hisingen side of the river, close to the western seafront, one finds a combination of industrial areas and middle-class high income areas, while a few miles inland and to the east are 'satellite' suburbs. Many houses in the latter area were built in the 1960s and 1970s during Sweden's so-called Million Programme and are mainly prefabricated apartment blocks. Today they accommodate a high percentage of immigrants and a population with lower than average socio-economic status. The river is regarded as symbolically and physically upholding this separation between the two parts of the city; at the same time, it is seen as central to overcoming segregation through the implementation of planning initiatives that strive to make it connect, rather than separate, the two parts of Gothenburg (Gothenburg, 2012).

For city planners and decision-makers in Gothenburg, the river is central for several reasons. One vision for the city is based on the idea that its citizens should be able to interact more with the river; this vision is closely connected to the desirability – and thus high market value – of waterfront houses and company complexes. On the other hand, there is also a need to prevent water from damaging the city and harming its citizens. City planners and decision-makers must therefore confront both versions: a river that is both economically advantageous and highly threatening.

This paper aims to contribute to an understanding of the management of urban rivers as valuation practices. We argue that the values that are enacted or displaced in these practices are co-constitutive of the river landscapes that then emerge. Our empirical focus is on the Göta River and on the three approaches that have been formulated in relation to flood management: defend, retreat and attack. Gothenburg city, through its planning office, has chosen these three approaches as a framework for communicating planned urban developments near the river and for framing the city's approach to flood management (Stadsbyggnadskontoret, 2019b). As we shall see, this entails negotiating tensions between the need to keep water at arm's length using hard defences, and advocating softer approaches that allow water to occupy space within the city. The city of Gothenburg is thus pursuing the idea of building great closable barriers similar to the Thames Barrier in London and Venice's MOSE flood barrier, while simultaneously promoting the idiom of 'embracing water' (Gothenburg, 2012). It can therefore be presumed that the valuation of water in relation to flood management plans for the Göta River is qualitatively different than it is in relation to the city's grand vision of what is called the River City. The River City is a designated four km² area of Gothenburg; it spans both sides of the river and has an estimated economic worth of €25 billion (Stadsbyggnadskontoret, 2016a). Gothenburg's River City is frequently referred to as the largest development project in Scandinavia. It is expected to almost double the number of workplaces and inhabitants in the inner city; however, its closeness to the waterfront also makes it highly vulnerable to flooding. As we make our way upstream in the account below, we will discuss how the defend, retreat and attack approaches are manifested in the various plans and visions.

In the next section, we briefly present previous research on water and flood management, and we introduce our conceptual approach to urban rivers and valuation practices. We then sketch in a background to our selected case study and present our empirical data and methodological choices. In that section we also present a background to the approaches of defend, retreat and attack. This is followed by our empirical sections and our analysis of the shifting appearances of the Göta River as we travel upstream from its sea inlet. During our journey, we stop at the sea inlet port, at the creative and innovative hub of Lindholmen, and at the Free Port area that is currently undergoing several housing development projects. In the process, we encounter a range of initiatives in relation to the river, the city, and future plans. These initiatives often implicate a notion of urban waters that is wider than the river and includes rain, swimming pools, and increased sea levels. In the paper's final section we discuss the implications of these initiatives: what values are in the making? What future river landscapes are these values co-constitutive of? What governance challenges we are facing in relation to this?

APPROACHING URBAN RIVERS: THE PRACTICES OF VALUE-MAKING

In the following analysis, we use theoretical inspiration from valuation studies; this is an approach that focuses on exploring the institutional, historical, political and sociomaterial processes that shape the ways in which things are valued. Water is particularly suited to studies of value-making. It is fundamentally valuable to all of us and usually managed by only a few; also, the perceptions of its value diverge widely and are often significantly non-overlapping (Conca, 2015: 305). Recent social science studies have pointed to the sociomaterial aspects of urban rivers and the challenges that arise in new contexts of power and governance that favour market mechanisms (Beveridge, 2017; Bichsel, 2016; Conca, 2015; Obertreis et al., 2016).

Historically, particularly in the era of industrialisation with its demands for transportation and energy, urban rivers have been of vital economic importance. It is only during more recent decades that rivers have been economically valued for recreational purposes. Current waterfront housing developments are now tightly connected to ideas of the global city's economic prosperity. Urban rivers can be described as hybrid collectives. They are combinations of elements that in our modern society are often seen as opposites – nature/society, technology/politics, economy/ecology – but which in practice intermingle and constitute hybrid entities. Cordula Kropp captures this in her historical studies and her view of urban river collectives as "defined by water with multiple functions and symbolic meaning" (Kropp, 2015: 114). Since the upsurge of public interest in the recreational usage and protection of rivers, rivers and their concomitant values have become even more multidimensional. The urban river collectives of today are characterised by previously unseen heterogeneity; this will make it even more difficult to identify and control the created infrastructures of risk (Beck and Kropp, 2011; Petersson, 2020).

This paper's approach to studying valuation practices has its origin in science and technology studies (STS) and material semiotic approaches. We rely on assumptions that are fundamentally similar to those that underpin studies of the sociomaterial aspects of urban rivers (see, for example, Ranganathan, 2015; Budds, 2009; Linton, 2014; Linton and Budds, 2014). In this section, we will first briefly describe our approach to the sociomateriality of urban rivers, how our approach relates to that of previous studies, and what is specific to an approach that focuses on practices of valuation.

The predominant way of knowing water in industrialised parts of the world, "essentially abstracts all waters from the social, historical, and local conditions in which they are produced" (Linton, 2014: 111). It is in response to the dominance of this way of representing water that the emphasis on its sociomaterial dimensions has emerged. As Erik Swyngedouw (2004: 28) has put it, "water is a 'hybrid' thing that captures and embodies processes that are simultaneously material, discursive and symbolic". A reconceptualisation of water as hybrid enables us to explore the social relations in which water is embedded (Budds, 2009: 420). Social relations refer to a range of artefacts, institutions, communities and infrastructures that shape, and are shaped by, how water flows through the waterscape; this can include sewage systems and canals, legislation, political decisions, professional expertise, and local communities.

A paper by Ranganathan (2015) explains very effectively how we can understand flood risk as assemblages. Critical readings of this assemblage approach have accused it of being blind to power structures. In response, Ranganathan (ibid) suggests that approaching urban flood risk as assemblages is not opposed to a focus on structural political economy; rather, it is an alternative way of reading it. This alternative reading, the author contends, contributes with empirically detailed studies of how, for instance, the historic production of uneven urban flood risk connects to both flows and fixation of capital. The assemblage approach involves a tracing of the socio-ecological networks that underpin an uneven geography of flood risk. The data that thus emerges emanates from a range of actors and practices including residents of flood-prone neighbourhoods, local engineers, and archival expertise. In studies that take a longer view, this tracing will yield knowledge about how various sociomaterial dimensions are combined in new ways over time.

We argue that understanding rivers as part of assemblages of sociomaterial dimensions that can be recombined resonates well with an approach that understands water and values as co-constitutive. As stated by Greeson et al. (2020: 157), "Creating value is a process of joining together: classifying, grouping, combining, making, re-forming. Yet it is also a process where persons, things, parts of bodies, or landscapes are disentangled, abandoned, dismissed, or corrupted".

In this paper we focus on two sets of valuation practices, flood management and urban development. These are distinct practices, as they assemble different types of expertise and areas of responsibility; however, they also overlap and intermingle in intricate ways. We argue that the practices that surround flood management and urban development may interact in ways that create an assemblage of infrastructures, artefacts and meanings that is not always foreseen and is not necessarily related to explicit goals and measures. To unpack such assemblages is thus to analyse values in the making; these are often embedded in practices that are presented as 'pure' – in order to distinguish them from practices of valuation – such as climate change modelling and from those that are the product of engineering expertise. A focus on the practices of valuation thus makes explicit the active making of, and potential tensions between, values.

Approaching urban waters as part of valuation practices means that we understand both water and value as sociomaterially produced. The encounter between flood management and urban planning appears to be a clear division between two competing ways of understanding water: as connected to threatening flood-risk scenarios and as attractive and associated with a certain urban flair. However, 'threatening' and 'attractive' waters do not in themselves straightforwardly indicate a particular approach to urban rivers; on the contrary, they are the products of practices and meaning making and are the enactment of values. 'Enact' refers to the non-given status of values, in that values need to be maintained and reproduced if they are to hold across time and space (Metzger et al., 2017: 2521). Water's valuation is maintained both materially through built artefacts and infrastructures, and discursively through decisions, visions and plans. Values and water become entangled in the meeting of, for example, a specific river, a climate scenario constructed through particular modelling devices, decision-makers, the public, water users, city planners and their communication tools, architects, and physical buildings. The main advantage of a focus on valuation practices, therefore, is that it highlights how different "registers of value are enacted and ordered alongside any project of knowledge production" (Dussauge et al., 2015: 275). In addition, a valuation practice also has generative effects; it connects values to entities and it bundles values together. It has scaling and temporal effects in that it can determine the scope and scale of that which is valued and the temporality or pace that is activated; it can also provide legitimacy to, or delegitimise, decisions and it can generate certain actions or inaction.

THE CASE OF THE GÖTA RIVER: BACKGROUND AND METHODOLOGY

Contemporary policy approaches to flooding claim to advance new measures for attending to floods. In contrast to historically common ways of protection by 'hard' defences that use concrete and steel and promise a fixed line of protection, contemporary programmes often advocate 'softer' solutions. Countries such as the UK and the Netherlands have adopted flood policies that do not aim to block overflows; instead they are labelled 'Making Space for Water' (Department for Environment, Food and Rural Affairs, 2005) and 'Room for the River' (Ministerie van Verkeer en Waterstaat, 2007). As the names of these policies indicate, they open up discursively to granting space to water instead of pushing it away through dams, dykes and levees. Such ideas have spread to the EU level and are an integral part of its directive for managing flood risks (Directive 2007/60/EC of the European Parliament and of the council of 23 October 2007 on the assessment and management of flood risks). This shift emerged from a calculation of the effects of climate change such as rising sea levels and increased precipitation. It also is the result of economic considerations including the high cost of carrying out promises to citizens regarding protection, an increased emphasis on the attractiveness of living by the water, and the negative

environmental effects of building hard defences (Petersson, 2020). Research has also emphasised, however, that discursive shifts are one thing and what actually happens in practice is another (Bergsma, 2016, 2018; Butler and Pidgeon, 2011; Wesselink et al., 2015).

In our case study, we explore how these contemporary shifts in flood management are translated into local practice. In the flood management strategies formulated around the Göta River, we encountered hard defences as well as the soft measures that make space for water. This variation is interesting since it allows us to examine the practices of valuation in relation to these different flood management strategies; we are also able to investigate how flood management strategies are enmeshed with practices of valuation in relation to urban development and visions of a River City. Our empirical material consists of texts produced primarily by Gothenburg city, its authorities, politicians, and commissioned experts. We use publicly available reports, policy documents, public communication, vision documents, and statements that have been produced by actors that have an authoritative and sanctioned voice for deciding on the river. We follow the Göta River from the sea inlet to the Free Port area and present our analysis as a journey with three stops; that is, we move through three distinct geographical areas which we present in the same order as they appear when you travel upstream on the river. The journey as it is presented is imaginary, although as researchers located in Gothenburg we have visited these places many times and have travelled the whole distance by foot, bicycle and ferry.

We will precede our analysis with a short background to our case study. As already indicated, the Göta River and its surroundings are historically and culturally important. Historically, the river has had many significant economic and social functions (Mulder and Kaijser, 2014). Gothenburg city was strategically built near the outlet of the Göta River in order to defend Sweden from foreign attacks. The city was initially built on marshy land with the help of Dutch immigrants, and the city's canals were inspired by those in the Netherlands. The river is important for transport of people and goods, and 1.5 TWh/year of electricity is generated by the river's power stations; the river is also the primary drinking water supply for 700,000 people. The waters of the river are threatening because of the risk of flooding and potentially lethal landslides; however, they are also valuable for their biodiversity since some parts of the river run through Natura 2000 designated sites. The parts of the river that run through industrial areas have historically suffered from contamination. Attractive aspects of the river include its use for recreation, fishing, tourism and waterfront housing development. The river has regional importance as it connects several municipalities. It is a barrier that divides the city of Gothenburg into two parts; at the same time, however, according to the vision for the city, it is expected to play an important role in reconnecting the segregated city by merging its shores into a common River City.

In other words, the river is many things and its waters have many meanings, functions and shifting appearances. Given the above, it should come as no surprise that the Göta River is of major importance for city planning in Gothenburg. Water is the primary element put forward in the planning initiatives connected to the 400th anniversary of Gothenburg that fell in 2021. (In 2020, a decision was made to postpone the celebration of the anniversary to 2023 due to the COVID-19 pandemic.) The planning for this anniversary relies on a vision that can be summarised with three broad aims: (1) to get closer to the city's water in all its forms including the sea, the archipelago, the harbour, the lakes, the canals, the river and even the rain; (2) to build bridges and close gaps between people (literally and figuratively); and (3) to develop an open and appealing atmosphere by providing creative meeting places near the waterfront (Gothenburg 2021).

The darker side of water and planning relates to climate change scenarios and flood management; these are areas where the river is also central. Inspired by an earlier British report (Peel, 2010) that expanded on a classification formulated by the Intergovernmental Panel on Climate Change (IPCC) (Nicholls et al., 2007), and building on research conducted in Gothenburg (Roth et al., 2012; Tahvilzadeh et al., 2017, 2015), the city has adopted terminology for different flooding scenarios, and urban planning that is based on three approaches: defend, retreat and attack. 'Defend' signals water as threatening and refers to an approach in which rising water is kept out of the city space by physical barriers. 'Retreat', on

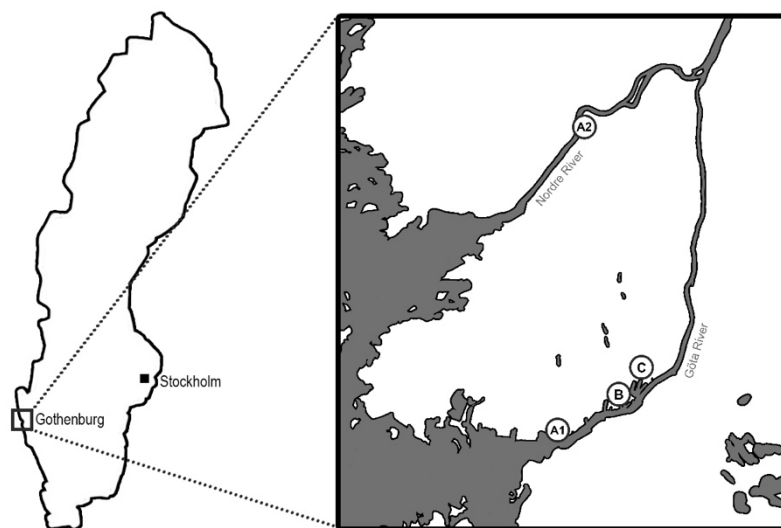
the other hand, means that the reality of flooding is accepted and it is the city that needs to withdraw and give space to the water. 'Attack' is the approach that takes water to be an opportunity rather than a threat; according to this approach, water is seen as exploitable and strategies such as floating houses are considered.

There is no assured climate scenario that points to a simple or straightforward choice among the three strategies; rather, the three approaches are a response to the river's different meanings and functions. The approaches will be valued differently depending on how water is perceived and what threats and values are associated with the river. Each of these approaches is open to interpretation and, as we shall see, they are coproduced in relation to the River City vision.

THE GÖTA RIVER: FROM THE SEA INLET AND UPSTREAM

In the following sections, we will follow the Göta River from the sea inlet upstream. On the map below, we have marked the stops we will make on our journey with the letters A to C. At each stop, we will provide examples of each of the three flood management approaches: defend (A), retreat (B), and attack (C).

Figure 1. Map of Sweden, with an enlarged section showing the four study locations on the Göta River.



Source: Illustration by Loui Schiller.

Note: A = Planned barriers; A1 is at the sea inlet port and A2 is on the Nordre River; B = Lindholmen; C = Free Port.

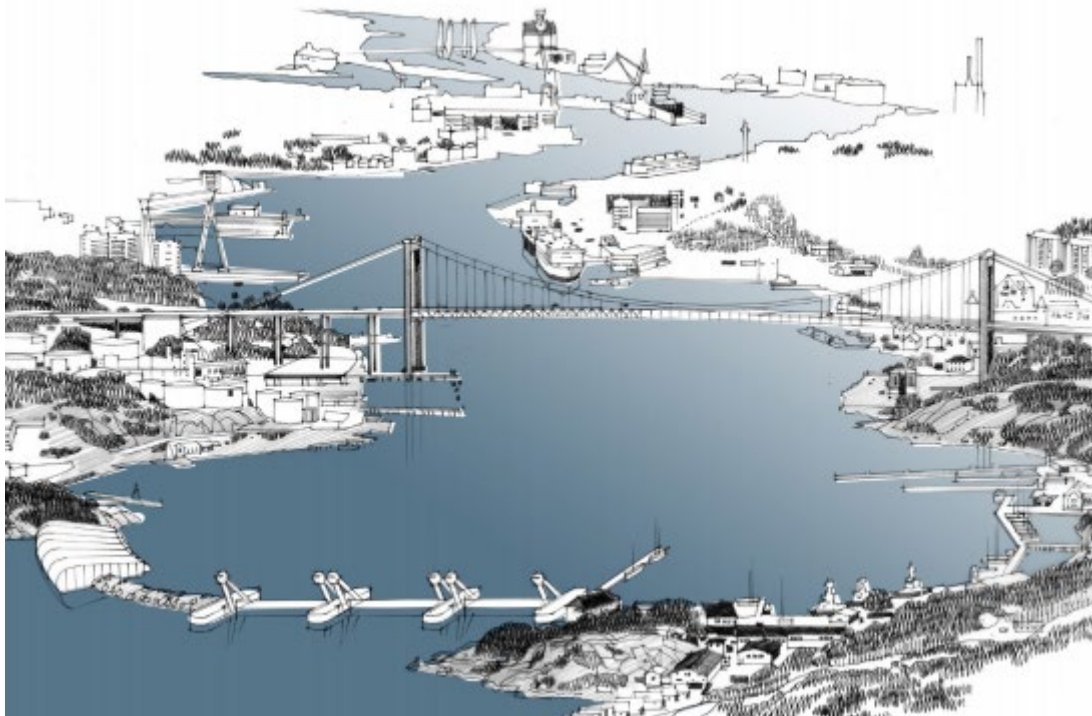
A: Defend

The first stop on our journey along the river is at the sea inlet port, near one of Gothenburg's most iconic landmarks, the 900-metre-long and over 100-metre-high Älvsborg Bridge. Starting from the sea, it is the first of five bridges spanning Gothenburg's Göta River. The bridge connects the large island of Hisingen with the south mainland. The north bank on the Hisingen side is the site of Gothenburg's Energy Port for bulk liquids, while the south bank is a sparsely populated recreation area. Älvsborg Bridge is close to the officially appointed boundary between the sea and the river (FIFS, 2004: 36); this is where the waterway begins to narrow down and the city of Gothenburg becomes visible to those arriving by sea.

Proximity to the sea means that rising sea levels due to climate change are a real threat to the city's existence and to its River City plans. Translating worst case scenario figures from the IPCC into local conditions, the Swedish Meteorological and Hydrological Institute anticipates the rise in sea levels around

Gothenburg to be 0.7 metres by 2100 (SMHI, 2014). Confronting these figures and comparing them to the existing height of riverbanks and quays and to the metres above sea level of the surrounding area, key actors in the city have contended that the city faces a serious threat from flooding, especially in the case of storms and heavy rains. Several initiatives were launched in response to this realisation, and the solution that was finally proposed resulted in the inlet port becoming a very important site for city planners, local politicians, and expert consultants who were called in. The idea was to quite literally attempt to separate the sea from the river and neutralise the effect of the rising sea by building a large barrier across the river at a narrow stretch near the inlet port. The city would eventually decide that its main strategy of defence for handling climate change would be a closable outer barrier that was accompanied by a similar barrier in Nordre Älv; the latter would prevent the entry of sea water from through Nordre Älv, which would flood the city from upstream (Figure 1) (Stadsbyggnadskontoret, 2019a).

Figure 2. Early draft of the outer barrier.



Source: Sweco (2015) (by commission from Gothenburg's city planning office); illustration by Per Göran Hillinge.

Note: The draft shows a pumping station to the left; this is needed for expelling water that has accumulated behind the barrier from the outflow of the Göta River and other connecting rivers, and from precipitation. The Älvsborg Bridge is seen the foreground and the soon-to-be-completed Hisingen Bridge is in the background.

The outer barrier located at the sea inlet was not the first alternative investigated. Initially, the city of Gothenburg asked experts to look into building several minor inner barriers along the river. Their purpose would be to prevent the influx of sea water that would reverse the water flow from the city's drainage canals and watercourses. After visiting the area, however, the contracted experts responsible for writing up the report felt compelled to put together a list of necessary points of attention (Sweco, 2014: 85). Their first point was that the defence strategy of building inner barriers seemed "spatially extremely complicated"¹ given that these parts of the city were heavily populated and that the city planned to

¹ In some cases, quotes have been translated from Swedish to English by the authors of the paper.

further increase their density by developing many of the wharf and harbour areas into housing with the construction of the River City. Second, they called attention to the fact that the inner barriers would be higher than the current riverbanks and quays; they thus concluded that it would be necessary to build very costly defence walls along the riversides. Having taken these points into consideration, the experts' task of looking into the question of inner barriers was extended by the city to include drawing up a general overview of building an outer barrier; this would later become the city's main option.

Considering the expert group's first point of attention on the city's plan to build the River City, it may be advisable to consider the need for defending against flooding at all. Two of the first EU directives to recognise the effects of floods are the Birds and Habitats Directives (Directive 79/409/EEC of the council of 2 April 1979 on the conservation of wild birds; Directive 92/43/EEC of the council of 21 May 1992 on the conservation of natural habitats and of wild life fauna and flora). These directives concern the preservation of wetlands where regular flooding is actually deemed essential for preserving the specific conditions of wetlands. To defend such areas from flooding by building barriers would be counterproductive as it would mean destroying these ecosystems. On the other end of the spectrum, one finds island nations that are threatened with inundation from rising sea levels caused by climate change; in such cases, coastal protection is an existential decision. In between these two opposites, one finds a much more common perception of whether flood is a threat or not: economic exploitation of waterfronts – ergo the River City. The city planning office (Stadsbyggnadskontoret, 2019a) estimates that the exploitation of the seafront area is worth around €25 billion, whereas it calculates the cost for securing the area against flooding to be €1.2 to 2.0 billion; this includes the cost of building the barriers as well as the additional protection that will allow the River City to be secured. As such, the city is well aware that building the River City will bring problems and costs; however, as the planning office explains, the exploitation of this central area is of such great importance to the development of the city and the larger region that the city council has made it clear that the city will not retreat from the area (ibid). The way forward, from their point of view, is exploitation.

The city has thus decided that large barriers are its preferred solution. This decision implies that defence walls are still considered necessary for long stretches of the riverbank in the city area. The city planning office (Stadsbyggnadskontoret, 2017) has put forward a twofold explanation for this. First, the city anticipates that the effects of climate change will be felt sooner than the barriers can be built. Building the barriers is dependent on a multitude of actors, many of whom are not located in the immediate waterfront area; they include neighbouring municipalities, the environmental court, and the relevant authorities. According to the planning office, defence walls within the city will therefore be needed as interim protection before the barrier is built; in case the barriers are not built at all, the defence walls will be needed permanently. Second, even if the barriers are built, defence walls will still be needed on some stretches, allowing the frequency of barrier closure to be minimised. From this, it would be easy to make the conclusion that whether the barriers are built or not, the outcome for the city centre would be quite the same, meaning that inner defence walls have to be erected. However, there are some vital differences between the two options of building an outer barrier or only relying on inner ones, which take into consideration other values than mere protection from water as associated with the defence mode. Accordingly, the city's planning office has declared that the development of River City will depend heavily on which barrier solutions are chosen. From their point of view, relying only on inner walls would require them to be considerably higher; this would severely impact the cityscape, creating unwanted barriers within the city and occupying a significant amount of urban space (ibid). The outer barrier solution, on the other hand, would minimise these effects due to its outer placement and the fact that they would not be visible from the city.

The vision of the River City has lent support to the defence approach. Building barriers to close the city off from the sea would simultaneously help ensure the survival of the River City in the case of threatening floods; the barrier plan and the plan for the River City thus appear to be mutually reinforcing. The outer barrier's function of stopping threatening water at the mouth of the inlet will also allow the

city to fulfil its goal of creating an attractive city by bringing the water closer to its citizens. Not building the outer barrier, on the other hand, would mean that the city's inner defence walls would not only be a barrier to rising water; they would also block citizens' access to 'attractive water'. There is thus no clear-cut tension between water as threat and water as attractive. In the meeting of flood management plans with visions of a River City, these valuations of water as dangerous or alluring also co-constitute each other (Dussauge et al., 2015). The value of the various barrier solutions is related to what is considered to be worth protecting, in this case the estimated value of the River City area. As we observed from the approach of the city planning office, these evaluations are stabilised in the form of calculations and are translated into monetary value.

As we travel to our next location, we pass Gothenburg's first transformative seafront housing project. Eriksberg is located by the river on the Hisingen side. It is an area that was initially exploited at the end of the previous century and is still expanding. The 84-metre-high Eriksberg Crane is preserved as a tribute to the city's legacy of shipbuilding.

B: Retreat

Our next stop is Lindholmen. It is located next to Eriksberg, by the waterfront on the Hisingen side. For lack of a bridge across the river in this area, many citizens commute to Lindholmen by one of the ferries that connects the island to the city's mainland. Lindholmen is one of the district's prime sites for the River City. The River City webpage describes how the space has transformed from a place for shipbuilding into a creative knowledge hub, connecting academia, technology companies, media and the arts (River City Lindholmen, n.d.). It is the location for one of Gothenburg's planned new landmarks, the 245-metre-high skyscraper called the Karlatornet, though this project is currently at a standstill due to financial difficulties. This has also recently been the site of one of several failed attempts to improve connections across the river; in this case, the project involved the building of a cable railway over the water to celebrate the city's 400th anniversary. The Lindholmen area is one of the locations that is highly sensitive to the anticipated rise in water levels.

Figure 3. Picture of Lindholmen showing the planned skyscraper, Karlatornet, and the planned (but now abandoned) cable railway.



Source: Illustration by UNStudio.

The risk of flooding at Lindholmen has not stopped the city from making plans for building houses and expanding the business area. Instead, the closeness of Lindholmen to the river has become part of the River City vision of dissolving the boundary between water and land, with the view that closeness to water is a compelling feature of urban life.

The city believes that things can be done to handle potential flood situations at Lindholmen. This takes us to the strategy of retreat. We argue that, for the city of Gothenburg, retreat can be two things. A 'strong' version of retreat is proclaimed to be very negative for the city, preventing exploitation of certain areas, while a 'weaker' version, according to the city, offers the possibility of a more harmonic co-existence between flood and exploitation.

We find the strong version in one of the interpretations the city has made of the retreat strategy, that in the long-term, retreat means abandoning land. This would eventually, according to the city planners, make Gothenburg an unattractive city to both its current inhabitants as well to outside interests, such as foreign capital (Stadsbyggnadskontoret, 2018a). A version of this type of strong retreat has been suggested in one of the city's recent comprehensive plans; it stipulates, among other things, that new construction is to be avoided in flood-prone areas (Gothenburg City, 2018a); however, the city has provided a way to sidestep this rule if construction can be justified on the grounds that it would improve the urban environment (Stadsbyggnadskontoret, 2018b: 13). This has meant that the measures against the threat of flooding have been open to re-evaluation; in reinterpreting the threat and the possible ways of managing it, a weaker version of retreat has been explored.

The weaker version of retreat involves leaving some areas exposed to flooding (Gothenburg City, 2018b: 85). In case of rising water, the city would simply back away from protecting the area; it would refrain from holding the line, which is the defining feature of a defence strategy. The weaker version of retreat, however, does not imply abandoning land; instead, it is about allowing temporary inundation during episodes of rising water levels. Thus, in the case of Lindholmen, two proposals for handling flooding in the area have emerged. They both involve defence walls, but their routing suggests different strategies. The first construction of walls is by the quay; it builds on the defence strategy by constructing a fixed line between exploited land and river water. The second suggested line of walls would leave part of the area deliberately exposed to flooding (ibid). Here the idea of safeguarding individual buildings surfaces in the city's proposal. It mentions, for example, internationally inspiring architectural solutions such as buildings with closable watertight metal gates and elevated evacuation routes; these would make it possible to create an urban environment in flood-prone areas (Gothenburg City, 2018b: 83-85). A report commissioned by the city mentions so-called multifunctional spaces, such as underground parking garages that during flood would function as water containers, and football fields that are able to soak up and contain water (Stadsbyggnadskontoret, 2016b: 76-78). The River City vision similarly aligns to this weaker version of retreat; it even refers to areas purposefully designed to tolerate flooding as transforming Gothenburg into a favourable version of Venice (Gothenburg, 2012: 27).

In 2019, the city officially rejected the stronger version of retreat when passing a flood supplement to its Comprehensive Plan on the future vision for the city. This supplement stated that, "Gothenburg has taken the political decision to exploit areas close to the river in the expansion and development of the city. This means that the city will focus on defence and attack for these areas" (Stadsbyggnadskontoret, 2019a: 34). The supplement also pushed the idea of strong retreat at least 200 years into the future, arguing that to fulfil the UN requirements of being a sustainable city, Gothenburg had to be more densely populated, and that this justified exploitation of the city centre (Stadsbyggnadskontoret 2019a, 2019b).

From this, it becomes clear that abandonment is not an option: the city should grow in density and the designated area for this is the one by the riverfront, end of story. In this context, giving away land permanently to the river would be almost absurd. It would seriously threaten the very existence of River City and would devalue the attractiveness of Gothenburg to international capital; it would also reveal a lack of confidence to its citizens. The three approaches – defend, retreat and attack – and what their

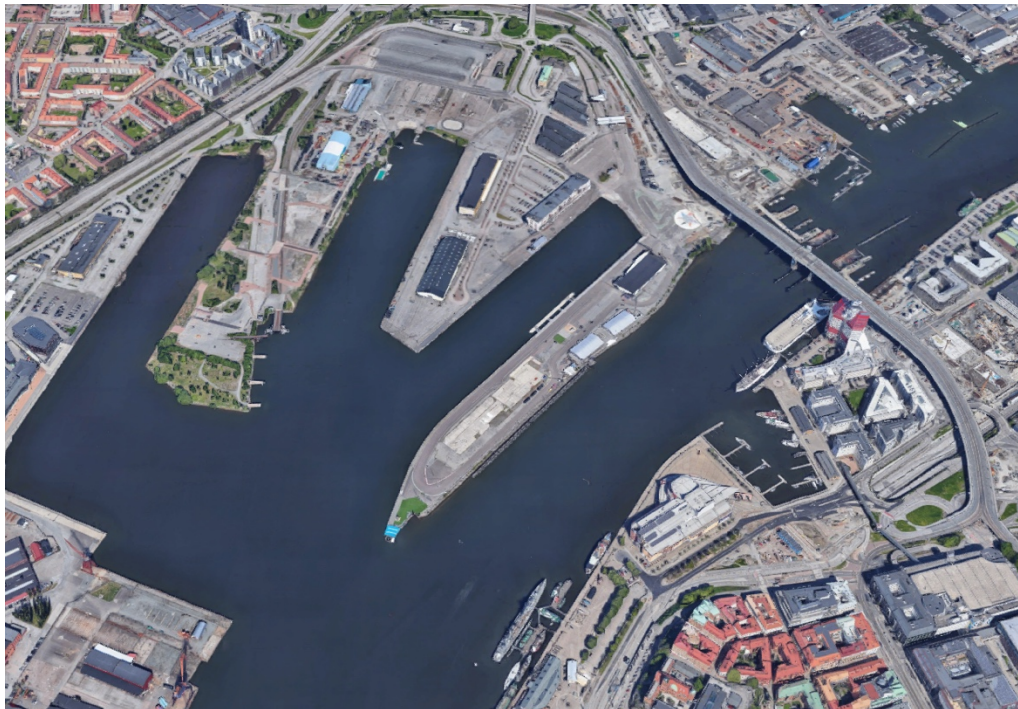
manifestations mean in relation to specific areas and flood management measures, are simultaneously enacting and displacing values; the above manifestation of a weak retreat, for example, reinstantiates the value of a globally competitive city.

C: Attack

Our third stop, the Free Port area, neighbours Lindholmen on the north side of the river. The Free Port was inaugurated by the King in 1922 and is the innermost of Gothenburg's harbours; it is located in front of Gothenburg's opera house on the mainland side and adjoins the most central of the city's bridges, the Göta River Bridge, which is soon to be replaced by the new Hisingen Bridge. The Hisingen Bridge is being built with lower clearance than its predecessor in order to free land for exploitation at the expense of maritime traffic, thus inscribing the city's contemporary shift in self image. Over the course of the 20th century, more and more handling of cargo was moved to the outer harbours and today the Free Port area is an almost abandoned brownfield. Plans for this central area of the inner city are however grand; it is estimated that it will contain 9000 apartments and 15,000 workplaces by 2050. This development is considered to be a vital part of tying together Hisingen with mainland Gothenburg. Lately, activities and facilities such as urban gardening, a public sauna, and roller skating have started to change the area, often on the initiative of citizens (Metzger et al., 2017).

In the plans for the Free Port area, the city has pursued the River City vision of 'embracing water' by attempts to 'attack' water. The attack approach is explained in the River City vision document: "Attack means that buildings meet the water – in the form of floating constructions for example" (Gothenburg, 2012: 6). Accordingly, and in line with the city's 400th anniversary goal of getting closer to the water, as well as building bridges between people, closing gaps, and providing creative spaces by the water, the city has sought to build floating housing in the Free Port area that is reserved for newly arrived immigrants, students, and business guests.

Figure 4. The Free Port and its three piers; recent plans involve reclaiming land by removing water from the basin at the far left.



Source: Image from Google maps.

Valuation practices are often implicit and their results are sometimes not noticed until something that is valued has disappeared or is threatened with disappearance; this can include a species threatened with extinction or a disappearing way of life. Sometimes, however, practices of value-making are more explicit; they can take the form of written protocols and formal decisions in response to a particular action or inaction.

The Free Port area was the object of explicit valuation practices which occurred in the form of a workshop that engaged experts. The workshop was conducted in the context of a city research project that assembled academics, representatives from industry, developers, and staff from the city planning office. The research was inspired by the aforementioned British report (Peel, 2010) that introduced the approaches of defend, retreat and attack. The workshop aimed to elicit the invited experts' valuations of the three approaches in terms of their ecological, economic and social impact. Through this exercise, the Free Port area turned into an example of how to apply the attack approach. Newly built floating housing on the river was envisioned; this would be anchored at the Hisingen side and would literally bridge the distance to the mainland. The project summary report goes on to describe how the choice of an attack approach could make Gothenburg into a model of innovative solutions for tackling climate change (Roth et al., 2012: 59). This is echoed in the River City vision wherein the effects of climate change are turned into an 'opportunity' for the city to become an international testing ground for climate adaptation; this would, at the same time, reinforce Gothenburg's brand and attract business and research (Gothenburg, 2012: 27).

The River City vision is an adventure of "embracing water" to "create a living, attractive riverside space" and simultaneously "deal with the effects of climate change" (Gothenburg, 2012: 11); however, the polluted soil that is a legacy of the site's industrial heritage means that the project cannot go forward as planned, as the contamination will prevent the anchoring of houses (Älvstranden Utveckling AB, 2018). The dilemma of polluted soil was highlighted in the city research project; its summary report was very clear that if environmental sustainability was the most valued factor, then retreat should be the prime option and any large-scale exploitation of the area should be avoided. In turn, this would mean that the economic return would be low and the few houses actually built would be very expensive. This would threaten any idea of bridging socio-economic gaps, as it would prevent construction of the affordable housing that would allow citizens from diverse groups to reside in the area. It would thus not live up to any standards of social sustainability. The report also put forward the argument that although retreat would be favoured from an ecological point of view, an unexploited brownfield in the city centre would hardly be attractive to the business sector; it went as far as arguing that it could even have a negative effect on citizens' will to work and run businesses in the whole of Gothenburg (Roth et al., 2012: 59).

The city failed in its plan to 'embrace' water through constructing floating houses on the river; this was to have simultaneously advanced an image of the city as being in the forefront of climate adaptation. In the process, it was nevertheless made clear that refraining from exploiting the area was not an option. In this context, one might wonder what Gothenburg should do with the site? The plan investigated embarks us into another, much more common practice of attacking water, also labelled as a part of the attack mode in the British report (Peel, 2010) inspiring the city's research project: land reclamation. In an effort to kill two birds with one stone, the idea is now to bury the polluted soil by covering it with even more landfill. Accordingly, instead of building a few floating houses on the river, the intention is to transform this river area into land (Figure 4), thus increasing the available land area that can be exploited for large apartment complexes (Norra Älvstranden Utveckling AB, 2020). This mode of attack is also favoured by Masthuggskajen, a part of the River City that is located on the mainland side. Here the idea is that the city takes a leap out into the river by building an 18,000 m² artificial peninsula in order to increase exploitable land area. This is expected to result in a "creative, sustainable life all day and night" and, importantly, to "connect the new area to the waters" (Älvstranden Utveckling AB, 2020).

To celebrate the 400th anniversary of Gothenburg city, the plan was that the Free Port's first 1000 apartments and as many workplaces were to have been built by 2021. In 2019, however, all plans were

stopped when the city-owned development and exploitation company that was working with the River City developments determined that the Free Port project would entail severe economic risks. Commissioning a reappraisal of the area, the resulting report (Norra Älvstranden Utveckling AB, 2020) recommends "chop[ping] up the elephant into pieces". In what can best be describe as a retreat for monetary (not ecological) reasons, this means that only the most central parts of the Free Port area are currently planned for construction. Due to the high economic risks of building out onto the water, the most spectacular river monuments and new constructions (as presented in the visionary drawings, would be put aside, "saving the best for later"; this included the postponement of a fixed connection across the river). The proposal to fill in the river to make new land has been given a go-ahead; however, due to soil subsidence, it will not be ready for construction until after 2035. In a further attempt to get the economic figures to add up, it was suggested in the report that the political promise that half of the apartments should be rental housing to allow for more socio-economic diversity should be cut down to 25%. There was also a postponement of a long-standing promise to the city's inhabitants of building a public outdoor bath out into the river at Free Port so they would finally be able to bathe in the river. This postponement was due to the slow rate of exploitation of the land and hence the dearth of real estate for the city to sell, however the project has recently been granted additional financing by the city (Frihamnen, 2020). Because of the river's pollution, however, the bath is only possible if salty seawater is pumped into the bathing area.

It is thus not only ecological values that are being displaced here; it is also social values and the initial ambition to realise citizen-initiated ideas that could be integrated into plans for the Free Port area at certain points in the planning phase (Metzger et al., 2017; Soneryd and Lindh, 2019). In the attack mode, water is still seen as an opportunity for exploitation.

CONCLUDING DISCUSSION

We have suggested that urban waters are caught up in practices of valuation that shape future river landscapes. Our analysis has focused on the intermingling of two sets of valuation practices: flood management and urban development. Our empirical focus has been restricted to key documents produced by the city of Gothenburg and its authorities, decision-makers, and commissioned experts; however, our analysis does not account for other actors' involvement in, and perspectives on, ongoing struggles around the future of the city. What our analysis shows is the struggle of the city's decision-makers, officials and experts to make sense of, and assign value to, particular plans and visions. These practices of assigning value to entities such as particular buildings or barrier solutions provide legitimacy to decisions and generate certain actions or inaction (Dussauge et al., 2015). Values are stabilised in decisions and in investments that are made in these plans, but they continue to be in flux and can also be destabilised when plans are continually revised and sometimes abandoned.

Our analysis finds strong affinities to the approach by, for instance, Ranganathan (2015). Ranganathan has shown how the historic production of uneven urban flood risk connects to both flows and fixation of capital. In our case study, the produced inequalities are not related to flood risk, but rather to the overall question of who is expected to live in the city, and hence the importance of overcoming segregation vis-à-vis the exploitative value of the area in question.

The strategies of flood management that we discussed in our analysis relate to water – and value it – in different ways when they are enmeshed with urban development and the vision of a River City. 'Defend' is based on a relatively clear definition of what we are to protect ourselves from, that is to say, threatening waters. Even so, it is subject to reinterpretation and re-evaluation, meaning that values are made rather than given. In the case of Gothenburg, the defence strategy clearly intermingles with the city's ongoing work of exploiting the waterfront and making it attractive and accessible to its citizens and to companies. Even if the commitment to the construction of barriers is straightforward, it is not necessarily an easy option since it also requires serious cooperation between multiple actors. 'Attack'

and 'retreat' strategies are more ambiguous; we find several versions and meanings of these in the plans and visions, often finding them in tension with one another.

We could see that retreat, which in a strong sense means abandoning land, was reinterpreted and translated into a weaker form. Abandonment was thus never considered an option. The weakened version of retreat meant that some areas could be designated as being allowed to flood. This option was easy to align with the River City vision, especially when it could be integrated into imaginaries of Gothenburg as a favourable version of Venice. This translation of retreat thus re-instantiated the value of a globally competitive city.

The attack strategy means that water is embraced. There is no need for defence from the water or for retreat from it; rather, it is necessary to find ways to live with, and by, the water, for example through the construction of floating houses. When observing how Gothenburg city communicates the attack strategy in the form of concrete activities in the different areas, it is clearly an 'attractive' version of waters that emerges; however, what emerges is rather narrow and exclusive in terms of what is valued and to whom it is valuable. Water is embraced for its value in the form of waterfront housing, and those who are valuing this aspect of the water are presumably the owners and residents of these houses; the city's citizens as a whole can appreciate the value of waterfront housing to only a limited extent and other species not at all. In discussions of the risks of flooding versus urban development, ecology as a value is downplayed. Discussions around managing floods and the continuation of urban development in the form of new constructions are characterised by the aim to continue with the latter while not being hindered by the former.

There are recent discursive shifts in addressing the question of flooding that grant more space to water; that is, they are softer and more flexible measures than the traditional hard defences that promise a fixed line of protection. When looking at our case study and at the translation of these contemporary shifts in flood management into local practice, we can see that traditional hard measures still dominate and that the softer versions are only allowed insofar as they can be considered 'innovative' in the context of local and international economic competitiveness.

Visions around both urban development and risk management relate to the future. The images that are used in Gothenburg's plans and visions include frightening pictures of a flooded city with iconic city buildings under water; these are juxtaposed with pictures of the very same area filled with happy people having pillow fights in their floating bedrooms out on the river. These contrasting images reveal very different imaginaries of the future. Our study contributes with an exposé of the values that are expressed explicitly and implicitly in relation to these future-oriented practices and how such values are attached to the river and its various waters. Such values may have an impact on what future river landscapes we can imagine and may eventually create. This future orientation can activate a sense of urgency and a need for action or it can lead to a sense of uncertainty that sometimes can explain inaction. Plans for development in the River City area are frequently referred to as being implemented too slowly. Politicians are pushing the completion of the barrier's construction to 2070 and are postponing the abandonment of parts of the city generations into the future. Not least among reasons for these delays is uncertainty about the actual effects of climate change. The scaling and temporal effects of valuation practices are shaped by the constellations of actors that are involved in planning for the river and developing its concomitant values. Time perspectives will differ depending on available expertise and the stakes that are being considered. Complexity is heightened due to uncertainties around the prognosis of climate change and its global-level effects.

We would like to highlight the governance challenges that we find particularly relevant when it comes to the management of urban rivers.

First, there is a challenge to make valuation practices explicit and thus open to critique and/or influence. Valuation practices are often implicit; they are manifested in a number of practices and actor constellations and it is therefore difficult for members of the concerned public to have the information

and expertise to criticise and influence these practices. Some initiatives that we have described along our journey are tightly connected to visions of a River City, while others are more closely connected to flood management. The values that are emphasised in the various proposals and decisions are in part brought forward by various actors; most often, however, they are put forward by representatives of local government who are sometimes also enmeshed in other collectives such as public – private partnerships. The journey leaves us with a scattered view of the river's future landscape. The river, the sea, and the rain are all said to be at the centre of many of the city of Gothenburg's plans and initiatives and it is the city's ambition to be a role model for others. Gothenburg has proclaimed itself to be a forerunner in environmental and urban development and one of the world's most progressive cities in terms of addressing climate and environmental problems. Are these ambitions open to critique, and is it possible for citizens to follow and have influence on how values are assembled and shaped? Are environmental concerns and climate change bundled with other valuation practices that, in fact, displace the value of the ecology and/or the urgency of dealing with threatening waters? We argue that it is an urgent governance challenge to make such valuation practices explicit, not only to groups of concerned citizens but to the involved experts and decision-makers themselves.

Our study points to a second challenge that has to do with climate change adaptation. Understandings of water are fundamentally different, with each carrying its own strong presumptions about what constitutes water-related risk and how such risk should be valued and properly managed. What we can see in our case study is not unique; rather, it is something that has been attended to before. Flooding used to be an issue for engineers and was a 'vertical' question of how high the barriers could be; now, however, it is more and more a 'horizontal' question for planners as to how much land can be allowed to flood (Petersson, 2020). The challenge is to find ways to communicate between these vertical and horizontal perspectives, as they nurture different understandings of risk as well as values. Thus, in the flood risk supplement to the city council's newly approved Comprehensive Plan on how land and water should be used by the city (Stadsbyggnadskontoret, 2019b), the planning office emphasises the complexity and multidisciplinary of flood issues, stressing that Gothenburg city has a range of functions to fulfil and, when handling flood issues, needs to address the priorities and concerns of actors from city to state level, as well as private property owners and members of the local community. The planning office emphasises that there must be a transformation in how water in the city is addressed; they (ibid.) suggest that although the principal strategy is to build barriers, water troubles will increase within urban spaces and tensions between land exploitation and the making space for water will intensify. The planning office advocates that planning around flooding should emanate "from water's natural flow throughout the city" (2019b: 8), and that only after this is done can the many actors and values that are in tension be addressed. This aligns with the EU's floods directive (Directive 2007/60/EC of the European Parliament and of the council of 23 October 2007 on the assessment and management of flood risks) and has been described as a strategy that was adopted to loosen tensions that had built up around the political and administrative boundaries that have historically defined areas of responsibility around water. According to this strategy, orienting around the free flow of water should make it possible to transcend boundaries and become open to collaboration and coordination (Petersson, 2020). Hard defences such as flood barriers and protective walls are thus still the main option; they rely on the idea of separating water from land and nature from society and to isolate the problem of floods to the protection of confined geographical and administrative areas of responsibility. Even so, other strategies such as cooperation across departments, among experts, and at local, regional and state levels are being explored in order to find ways to learn to handle flooding in urban spaces.

A third challenge, related to the two first, is the performative aspects of valuation practices. The River City needs to be protected from flooding and the measures seen to be most adequate are expensive barriers. The higher the value of the area, the more difficult it is to protect, and the more value that needs to be generated in order to afford the protection measures. The area has been given an economic value (€25 billion); however, this is a contingent sum and its eventual value will depend on its valuation by the

investors and other actors who are implicated in the city's and the region's economic development. It is also dependent on how they act on such valuations in terms of investments, construction, and locating enterprises and attractive dwellings. The need for the cost of protection to be covered by an increasing exploitation of the area is mentioned in a discussion about balancing long-term values and exploitation values (Gothenburg City, 2018b). The question is, how are these to be balanced when there is a lack of transparency in terms of valuation practices in the first place, and when it is so difficult to identify and manage climate-related risks?

The enactment of values is an ongoing practice, but values are also stabilised or – to borrow Ranganathan's (2015) term – 'fixed', in institutions, physical buildings, and hard and soft infrastructure, and through decisions and actions, or non-decisions and inaction. If threatened values are not protected in time, they may simply get lost and even become impossible to restore. To make valuation practices more explicit is not the only remedy, but it certainly is a crucial piece of the puzzle.

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