Imagining the flood: rationalities of governance in sinking cities

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The rise in global sea levels poses a substantial, sometimes existential threat to coastal cities around the world, such as Bangkok, Lagos, or Jakarta. Adaptation projects range from hard infrastructure to nature-based solutions or 'planned retreat', often having severe implications in terms of equity and equality. Given the threat of urban flooding and submergence, this paper asks how 'the future' for these cities is imagined, and how sociotechnical imaginaries of climate futures inform policymaking. Using insights from poststructuralism and Science and Technology Studies (STS), I argue that the way of 'seeing' and 'knowing' sea level rise is constitutive of the rationalities that undergird the governing of rising water around the world. I trace the discrete operations of the discursive formations and imaginaries that have evolved globally around the issue of sea level rise, with their own distinctive logics. Analyzing a variety of globally circulating policy documents and local adaptation projects, I show how the governance of sea level rise is based on a very specific 'expert' knowledge that allows re-designing sinking cities 'from above'. This kind of knowledge, provided by a depoliticizing global network of consultants, designers, and development banks, privileges imaginaries of modernity and control using technology and engineering, as well as ideas on how populations in flood-prone areas are expected to govern themselves in the advent of rising sea levels. These imaginaries tend to marginalize alternative local adaptation practices, lead to unintended outcomes, and often discriminate against those who are already vulnerable to climate change impacts.

KEYWORDS

sea level rise, climate adaptation, climate governance, climate futures, discourse, depoliticization, STS, poststructuralism

1 Introduction

Given current emission trends, climate-induced sea level rise (SLR) is estimated to possibly affect the land of up to 15% of the global population (Strauss et al., 2021). Rising sea levels will displace millions of people and destroy their built environment and cultural heritage. Although frequently depoliticized (Remling, 2018; De Roeck, 2019), climate adaptation touches on inherently political questions of how we want to live in the future, how landscapes should be restructured in the advent of extreme weather, and whose livelihoods are regarded as '(un)viable' in a climate-changed world. These questions and their immanent social conflicts cumulate in so-called 'sinking cities' – cities whose sheer existence is threatened by SLR. In many cases, rising sea levels collude with land subsidence, reinforcing the threat of literal submergence (e.g., Ao et al., 2024). While the number of people exposed to coastal flooding is highest in Asia (Neumann et al., 2015), 'sinking cities' are a truly global issue, affecting not only metropolises such as Jakarta, Bangkok or Dhaka, but also cities in the United States, such as Houston, New Orleans or Miami, and cities in Europe or Africa, e.g., Rotterdam, Venice,

or Lagos. In these places, and under the umbrella term 'climate adaptation', billions of dollars are mobilized, hundreds of thousands of people are relocated, and mega-projects such as the Great Garuda Sea Wall in Jakarta or the artificial island Eko Atlantic (Lagos) are planned. As it is already apparent that some climate adaptation practices are prone to even increase vulnerability (Schipper, 2020; Eriksen et al., 2021) and tend to discriminate against those already marginalized (Leitner et al., 2017; Alvarez and Cardenas, 2019; Paprocki, 2021), it is of great importance to critically analyze adaptation discourse and practices to understand how and by whom climate futures are envisioned and brought into reality (Forsyth, 2021; Forsyth and McDermott, 2022).

In this conceptual paper, I aim to unravel the rationalities underlying the global governance of 'sinking cities', and ask: How is the future of 'sinking cities' imagined, and how do these imaginaries inform policy-making? My exploratory analysis is guided by assumptions from poststructuralism and Science and Technology Studies (STS) that understand representation as constitutive for the material world and emphasize the role of knowledge production and 'expertise' in governance. To understand the global–local relations in the governance of sinking cities, I apply a cross-scale analysis of dominant socio-technical imaginaries apparent in local contexts as well as in policy documents provided by global policy networks and international authorities such as the World Bank. Building upon James Ferguson's The Anti-Politics Machine (Ferguson, 1996), I argue that adaptation responses to rising sea levels are often crafted through a depoliticizing global adaptation complex which has its very own logic and rationalities. This adaptation complex produces a particular kind of 'locationless' knowledge that rationalizes and legitimizes adaptation interventions which often are socially unjust, render local future imaginaries invisible, and have adverse impacts on ecological sustainability.

The overall narrative of my paper goes like this: The global discourse on rising sea levels has yielded its own elite of 'experts' who produce a very particular and highly influential kind of knowledge, rationalizing SLR through risk assessments and mapping. These techniques and forms of knowledge tend to produce an eco-modernist imagination of climate futures, an imagination that must be brought into practice by engineers and designers rather than politicians, let alone urban populations. The 'locationless' logic of global expert knowledge allows the re-designing of sinking cities from above, thereby rendering SLR as an issue of space and investment rather than a social issue. Categories of risk and vulnerability introduce insurance as a particular instrument of governance that allows upholding a narrative of control and renders vulnerable populations as 'resilient' while legitimizing the evictions of those who appear to live in areas that are 'too risky'. Even though this 'risk knowledge' appears not to be translated systematically into policy decisions, I show how the particular configuration of authoritative knowledge has a political effect in predesignating the rationalities that underpin SLR governance in cities and foreclosing alternative futures. To develop this argument systematically, I will first introduce the theoretical framework (chapter 2) and methodological approach (chapter 3) of this paper. I will then provide some context on the institutions involved in the 'global governance' of urban coastal adaptation against SLR (chapter 4). In the following chapters, I analyze how a particular class of global 'experts' on SLR adaptation has emerged (chapter 5), and how these actors render SLR governable in a universalizing and depoliticizing

way (chapter 6). The remainder of the paper illustrates how different approaches to tackling SLR are rationalized: hypermodern megaprojects (chapter 7), nature-based solutions (chapter 8), non-structural measures (chapter 9), and planned retreat (chapter 10). My conclusion (chapter 11) discusses the limitations of the developed narrative and sketches out avenues for further research.

2 Theoretical considerations

Rising sea levels pose an abstract and future threat that is associated with uncertainty. This paper explores how a specific type of actors has become regarded as adaptation 'experts', how these actors make sense of SLR, how they translate the abstract threat of rising sea levels into an issue that can be managed and rationalized as 'business-as-usual', and the implications of this. I proceed from the poststructuralist assumption that "material reality does not exist independently of or prior to representational practices" (Appel et al., 2018: 9). Therefore, 'knowledge' is seen to have an intimate relationship with 'power' (Foucault, 2008), as knowledge production, public discourse, and future visions are constitutive of material reality. This means that SLR is not seen as a political problem per se. It must be "rendered governable" (Oels, 2005) – brought into existence as an object of political intervention through specific ways of seeing and knowing. The way how an issue is problematized and discursively constructed then enables, rationalizes, and legitimizes some forms of intervention while foreclosing others.

This can be exemplified by the work of Mitchell (2009) who analyses how 'the economy' in Egypt has been produced by scientific experts as an independent and intelligible object that can be addressed through politics. In 'Seeing Like a State', Scott (1998) illustrates how modern states endeavor to make societies "legible," e.g., through practices of simplification, standardization, and quantification. This rationality of "high modernism" disregards the complexity of societal practices and processes. In consequence, states repeatedly impose failing schemes and produce outcomes that are fairly different from the intended goal. In his account of the "development industry," Ferguson (1996) examines how development actors such as the World Bank produce a very specific kind of knowledge that is deeply linked to their available policy options, thus producing an own reality that has little in common with the facts 'on the ground'. By generating their "own form of discourse," development actors constitute Lesotho as a particular "object of knowledge" (Ferguson, 1996: xiv). Development interventions, then, are "organized on the basis of this structure of knowledge" (Ferguson, 1996), having an effect in the real world that might differ from the intention of the World Bank: "[T]he most important political effects of a planned intervention may occur unconsciously, behind the backs or against the wills of the 'planners' who may seem to be running the show" (Ferguson, 1996, 20). Ferguson introduces the term "anti-politics machine" to illustrate how development interventions do not (only) follow the intentionality of individuals, but are subject to the anonymous, bureaucratic procedures of the development industry which provide outcomes that are often unexpected. My analysis is guided by the specific ways of 'seeing' and 'knowing', as they are analyzed in the aforementioned contributions, as well as by the discrete operation of particular discourses that take on a logic of their own.

As I will demonstrate, the governance of SLR is dominated by scientific assessments of the problem, technocratic discourses on 'resilience' or 'adaptation', and the persistence in engineering megaprojects. Political decisions, but also purportedly apolitical assessments of 'risk' and 'vulnerability', are informed by ideas about the social order (Forsyth, 2021) that are often imposed by external expert bodies. Social scientists have started to engage with how the natural environment is seen and represented, and how political actors act upon these representations (see, for example, Jasanoff, 2004; Miller, 2013; Lövbrand, 2014). The role of 'expert knowledge' (Miller, 2001) is particularly highlighted, with some contributions focusing on specific 'expert bodies' such as the IPCC (Beck, 2011) or the World Bank (Goldman, 2004). Recently, scholars have emphasized a need for dismantling the depoliticized nature of adaptation approaches and call for alternative ways of studying and governing climate adaptation (Eriksen et al., 2015; Nyamwanza and Bhatasara, 2015; Nightingale et al., 2019; Remling, 2023).

In this article, I aim to show how, among competing knowledge claims and future visions, one particular type of knowledge and different types of future visions have become globally dominant. To better understand how global experts 'see' rising sea levels and constitute sinking cities as a political object of intervention, I complement a Fergusonian analysis with concepts from Science and Technology Studies. I follow the idea that the divide between technology, science, and social relations is an artificial one and that rising sea levels as a political issue are co-constituted by the material world, scientific insights, technologies (reports, dams), and social relations. Social and natural orders, as it is argued by STS, are produced together (Jasanoff, 2013: 2) and mediated through each other. To understand what kind of future visions are mobilized for climate adaptation, I draw on the concept of 'sociotechnical imaginaries', understood as "collectively held, institutionally stabilized, and publicly performed visions of desirable futures (…)" (Jasanoff, 2015: 4). Such imaginaries are complex constructs, fostered and co-produced by material conditions, science, and a variety of actors such as the World Bank, national executives, and local initiatives. Sociotechnical imaginaries produce and stabilize a specific order and inform public understanding as well as policy decisions. They are space–time specific and differ from each other on various scales, thereby explaining the local divergence of sociotechnical configurations. However, some imaginaries are more powerful, as they are mediated by hegemonic discourse. In the remainder of this paper, I illustrate how a depoliticizing adaptation complex has been producing globally circulating sociotechnical imaginaries of climate futures which shape adaptation responses to SLR around the world, and what implications this has.

3 Methodological remarks

This paper draws upon a desk-based study of the discrete operations of the discursive formations and imaginaries that underpin planning practices for climate-induced SLR for coastal cities. I conduct an inductive and interpretive analysis of how relevant actors render SLR as an object of political intervention and act upon this threat. The specific challenge of my endeavor is to grasp the global–local relations of governance, to see the global picture without overlooking local contexts, and to understand local imaginations without dismissing the global network of export bodies, cities and scientists that shape them. My approach is loosely

informed by theory-building process-tracing (Beach and Pedersen, 2013: 16–18). I use empirical material "to build a midrange theory describing a causal mechanism that is generalizable outside of the individual case" (Beach and Pedersen, 2013: 16). In concrete terms, I use documentary evidence to reconstruct the emergence of dominant knowledge and sociotechnical imaginaries in city-level adaptation contexts, and to trace how these imaginaries take hold in local adaptation projects. My documentary sample includes policy documents from organizations such as the World Bank and the C40 network, grey literature from private stakeholders (such as risk assessments), city-level adaptation plans, and secondary literature on a variety of adaptation projects.

Moreover, to trace potent stories, imaginaries, and policy solutions for sinking cities, I draw upon the research technique of 'following' (McCann and Ward, 2012). 'Following' is an approach for "studying the chains, circuits, networks, webs, and translations in and through which policy and its associated discourses and ideologies are made mobile and mutable" (McCann and Ward, 2012: 43). This approach allows for identifying whose sociotechnical imaginaries persist, how they are reproduced, and how they inform policymaking in different places. I looked specifically for techniques of making 'the future' governable (e.g., conducting risk assessments), and for tangible imaginaries of the future. Sometimes, these imaginaries are visualized in shiny graphics or are apparent from visionary statements in city masterplans. Often, they are more implicit and formulated in technocratic language, requiring a thorough and interpretive assessment of underlying assumptions and ideas. As a first step, I identified relevant actors in the adaptation field and recurring framings of SLR through academic literature and primary sources such as city-level adaptation plans. I then 'followed' the 'adaptation experts' by analyzing their websites and grey literature. In this process, I focus particularly on artifacts of 'globalising' knowledge, such as vulnerability assessment tools, mapping tools, best practice examples, or adaptation manuals that are instructive of adaptation responses beyond individual city contexts. These are mainly issued by development banks, consultancies, and city networks. If possible, I traced which actors have been involved in designing city-level adaptation strategies, and by whom or what the dominant imaginary for an individual city is inspired. Through this methodological approach, the links between the global discourse and local adaptation projects become visible and are further evidenced by existing literature.

Due to the global scope and exploratory nature of this paper, it cannot take into consideration the more complex and small-scale processes of policy translation and mutation for individual cities (e.g., Hasan et al., 2020, 2021). While the picture certainly becomes more complicated when zooming in on individual cases, this paper develops a useful narrative that explains how a specific set of future imaginaries and related policy models has become hegemonic in global climate adaptation discourse. In the following chapters, I will illustrate how the creation of a 'global', depoliticized adaptation knowledge produces and rationalizes local adaptation interventions that often have unintended effects, render local future imaginaries invisible, and have adverse impacts in terms of justice and ecological sustainability.

4 The global governance of sinking cities

In the current era of climate governance, climate change is problematized as an "issue to be addressed in cities" (Broto and

Vanesa, 2017: 11). Although the functioning of the Paris Agreement relies mainly on Nationally Determined Contributions (NDCs) and a pledge-and-review mechanism, cities are considered especially relevant for climate mitigation and adaptation. It is expected that about 68 per cent of the global population will soon be concentrated in cities (Kundu and Pandey, 2020), many of which are the most vulnerable places to climate change. Access to rivers or oceans has historically been one of the main forces of urban development, and most megacities today are located on the coast. Considering rising sea levels and population pressure, this turns into a dangerous conjuncture that urgently requires policy responses. Although the UNFCCC provides some space for communication – for example, through the Ocean and Climate Platform or the Ocean and Coastal Zone's Climate Action Pathway –, the issue of sinking cities is seldomly addressed as an issue of concern at the annual Conference of the Parties (COPs), with responsibility being allocated to those cities that are already especially vulnerable.

However, SLR governance cannot be understood at the city level only. Analyzing the governance of SLR in cities as an 'assemblage' helps to understand it as a process in which global and local resources, knowledge, and understandings collude (McCann and Ward, 2012: 43). Urban policies are substantially shaped by globally circulating policy models and policy knowledge. The diffusion of similar decisions and practices has been conceptualized as 'urban policy mobilities' by critical geographers (Peck and Theodore, 2010; McCann, 2011). The concept of policy mobilities takes into account that different agents have different power capacities to 'mobilize' policies and that these policies mutate while being transferred to a different place. These mobilities between cities bring a specific type of knowledge and agents to the scene, such as policy professionals, consultants, philanthropists, or finance institutions (McCann, 2011: 113 f.; see Rose and Miller, 2010: 279). This is reinforced by the need of many cities, particularly in the global south, to attract private investment for adaptation infrastructure (see Bigger and Webber, 2021). Moreover, city governance of climate change is characterized by horizontal cooperation, benchmarking, and policy learning through best-practice examples (e.g., Nagorny-Koring, 2019). Although cities may formally have autonomy over their approach to adaptation, they are embedded in "translocal relations" (Yi, 2015) that shape how the threats of climate change are understood and which policy decisions seem adequate and feasible.

To avoid neglecting the complex interconnectedness of cities with other cities, national governments, international organizations, and capital flows, research should therefore consider the 'global-urban networks' that govern the rise of sea levels (Goh, 2020, 2023). While this term tries to conceptually capture the multi-scalar connections that sinking cities are part of, formalized networks between cities also form part of the governance landscape. Some of the networks have a regional scope, such as the Asian Cities Climate Change Resilience Network or the European Urban Resilience Forum. Other networks have global membership, such as ICLEI – Local Governments for Sustainability or the C40 network, consisting of nearly 100 climate-ambitious mayors. The latter has launched the Connecting Delta Cities (CDC) network that aims to address SLR and related issues for cities. Another network worth mentioning is the Urban Flooding Network. Leitner et al. (2018) furthermore identify a 'global urban resilience complex' that brings together a variety of public actors and private for-profit and non-profit actors. This complex, they argue, produces

norms and assessment tools, and it allows for the commodification of 'resilience', thereby rendering climate risks technical and allowing for the involvement of private actors. At the heart of the complex, it is argued, was the philanthropic Rockefeller Foundation with the 100 Resilient Cities Initiative. The initiative surprisingly concluded in 2019 (see Cox et al., 2022) and was followed by a new Climate and Resilience initiative initiated by the Rockefeller Foundation (The Rockefeller Foundation, 2019).

These networks, institutionalized or not, are especially relevant for this paper, as they produce, transport, and represent a body of hegemonic knowledge that has relevance beyond the single case. This specific knowledge operates and mutates in different contexts and produces diverging policy outcomes. Actors such as consultancies play an important role in transferring and 'translating' the global discourse on SLR for local contexts (Colven, 2020a; Hornidge et al., 2020). Laeni et al. (2021: 17) illustrate how the Dutch approach toward water management is framed and exported as a "global water solution" and then "translated" to be adopted in the Vietnamese context. This process of policy transfer usually involves intense negotiations and mutual learning, and the design of a policy can change significantly in this process (Hasan et al., 2019, 2022). However, key concepts and frames of the Dutch approach persist in this process and rule out forms of local knowledge (Laeni et al., 2021). I argue that the way in which 'authoritative' knowledge is produced, how one specific kind of actors are framed as 'experts', and how their 'expert knowledge' travels globally is constitutive of the rationalities that undergird adaptation governance at various sites on different continents. This is facilitated and enabled through a variety of instruments, provided by expert bodies, international organizations, or private actors, that help to render rising sea levels visible and governable. Examples are the Urban Adaptation Support Tool, the Smart Cities Marketplace by the EU Commission, and the role of insurance (see Collier et al., 2021). In the following two chapters, I aim to trace back the emergence of 'experts' whose knowledge is considered especially authoritative, and the way how this knowledge is produced. In subsequent chapters, I illustrate what this knowledge *does*, that means, how it makes some adaptation solutions appear more rational than others, how it shapes the way policy-makers approach SLR, and which consequences for social and ecological sustainability this has.

5 The genesis of global flood experts

Tracing the sides and processes of knowledge production, the Netherlands appear to be a natural starting point for unraveling the rationalities and imaginaries behind the global governance of rising sea levels. Building upon a long history of living with and adapting to the sea, the Dutch have established themselves as global 'experts' on the issue (Maas, 2019). The Netherlands has initiated networks such as Connecting Delta Cities and hosts the conference 'Deltas in Times of Climate Change'. Following their official geopolitical and economic strategy (Goh, 2021: 157), the Dutch are producing expert knowledge, which is exported to a variety of cities. Deltares, for example, is an officially independent, but partially state-sponsored, research and consulting institute that is considerably involved in the production of knowledge on the issue. Policy transfer is further facilitated through initiatives such as the Netherlands Water Partnership or the Water as Leverage program that works on 'bankable, scalable solutions' and

involves financial actors (NL Platform, 2022). This is complemented by 'memorandums of understanding', e.g., between the Netherlands and Indonesia, which should facilitate the transfer of knowledge through educational programs or the exchange of staff (Colven, 2017: 259).

Dutch expertise is involved in various places, such as Jakarta, New York, Chennai (India), Khalana (Bangladesh) or Semarang (Indonesia) (Goh, 2021: 89). Japan is another actor of high relevance in flood governance, with the Japan International Cooperation Agency being heavily involved in exporting knowledge and experts to developing countries. Flood infrastructure has been built with Japanese help in Vietnam, Indonesia and the Philippines – countries that all have been invaded by Japan during WWII (Yarina, 2018). Persisting neo-colonial power relations still determine policy exchange in the realm of flood governance. Although networks on flood governance are officially organized horizontally, knowledge production and adaptive capacities are concentrated unequally, introducing a certain kind of power to the governance of SLR. Against the legitimizing narrative of the intrinsic quality of Dutch expertise, Hasan et al. (2022) illustrate how the transfer of policy solutions is indeed the product of Dutch marketing and diplomacy efforts, future promises, and the cultivation of wider development cooperation objectives. Common storylines of policy diffusion from the Netherlands to the Global South "assume and confirm hierarchies of knowledge and expertise between the country of origin and the country of destination" (Hasan et al., 2022: 57), framing adaptation to SLR within the rationalities of 'development' and undermining local knowledge and imaginaries. Although the transfer of adaptation solutions is often hindered by constraining factors (Minkman et al., 2019), Dutch experts can problematize the issue of SLR in a certain way, thereby defining the solution space for adaptation responses.

However, as I argue, the specific configuration of power in SLR adaptation is not primarily characterized by the supremacy of two countries, but by the dominance of a specific kind of 'expert' knowledge that is co-produced by ministries, global consultants, development actors, engineers, and designers (as illustrated in the following chapters). In particular, solution-oriented 'climate services' provided by consultancies have emerged as dominant modes of framing and acting upon climate change impacts (Keele, 2019). As a product for paying customers, climate services are designed as packages of "useable" and "actionable" knowledge that aligns with the commercial or bureaucratic practices and epistemologies of their clients (Webber, 2017). Operating "client-focussed, solutions-oriented, resource-efficient and overall self-replicating" (Keele, 2019: 23), consultancies tend to frame local problems in a way that fits with already-existing frameworks, and that allows to simply expand the field of application for standardized climate solutions. Contributing to a hegemonic global discourse on adaptation, consultancies are prone to undermine the potential for transformative approaches and to promote technical solutions such as large-scale engineering projects (Keele, 2019).

The synergistic relationship between engineering and government in the design of adaptation solutions is by no means accidental but emblematic of the co-constitution of a particular form of knowledge and a specific type of power that is characteristic of modern statehood (see Carroll, 2006). The figure of the technical expert is deeply linked with modern types of government (see Scott, 1998; Mitchell, 2009). The authority of these global experts is based on a kind of "locationless logics" (Mitchell, 2009) of their knowledge that privileges their solutions over local knowledge forms. This is reinforced through the convergence of knowledge production, e.g., by consultancies, with the requirements of the wider development industry, and, not least, private investors. However, the "modes of authority" through which expert knowledge is legitimized "rest on very particular conditions of knowledge production and circulation" (Harvey and Knox, 2015: 9). In the next chapter, I illustrate how SLR is rendered intelligible in a way that privileges global 'experts' as government agents and that allows for the introduction of very specific rationalities and technologies of governance which are discussed in the subsequent chapters.

6 Risk, resilience, and vulnerability mapping: constituting 'sinking cities'

The C40 initiative has published a guide for cities with the title "How to adapt your city to sea level rise and coastal flooding" (C40 Cities, 2022), providing straightforward instructions for policymakers. The first instruction is to "understand the city's vulnerability to coastal flooding and sea level rise." This should be achieved through vulnerability mapping or modeling. States may use resources, e.g., from the IPCC or NASA that indicate the level of expected SLR in different regions of the world. From a poststructuralist perspective, these modes of knowledge production can be understood as modes of problematization, through which SLR is "rendered governable" (Oels, 2005) as an object of political intervention. Digital screening tools allow their users to model different flood scenarios by changing the variables year, pollution level and "luck." These technologies transform people's perception of SLR from an abstract scenario into a concrete threat for places located on the flood map. At the same time, SLR appears to be an issue that can be 'managed' through the adjustment of defined parameters.

Mapping is a way to imagine what the future would look like without any countermeasures taken. Understanding the management of SLR requires examining these technocratic processes of mapping and risk assessment and deciphering their underlying assumptions and implications. As it rests on an uncertain future, mapping relies upon the construct of 'risk' and the idea of scenarios that are more likely or less likely. This is a highly political issue, as states must decide on a particular risk that is acceptable to bear. The tropes of 'risk' and 'uncertainty' are used extensively in policy and consulting documents. However, one should be careful to adopt these tropes, as the idea of uncertainty seems to be overstated, having an instrumental use, and relocating power. It is evident what kind of developments will occur sooner or later, and it is more helpful to understand 'uncertainty' as a narrative that structures rationalities of governance (see Paprocki, 2021: 80). Applying categories of risk and uncertainty to the issue of SLR has significant consequences for governance, as it brings its own class of 'risk experts' to the scene, such as RMS, a risk-assessment company recently acquired by Moody's. Risk assessments have become dominant governance tools, and the costs of adaptation measures are linked to a specific level of 'risk'. Finally, the category of 'risk' helps to keep the issue out of the public sphere and parliament debates, as the imagined scenarios are just 'possibilities' that must be assessed and monitored by external experts.

Modeling SLR, mapping flood-prone districts and conducting risk assessments or cost–benefit analyses are by no means processes of 'objective' scientific enquiry. Rather, they operate as performative "techniques of futuring" (Hajer and Pelzer, 2018; Oomen et al., 2022), legitimizing a specific set of interventions and forging consensus over future imaginaries (Andersson and Westholm, 2019; van Beek et al., 2022). Maps are a distinct way of seeing and producing individuals, households and ways of living, imposing a "spatial order of knowledge" on the subject (Mitchell, 2009: 90) and having a severe impact on the material world (see, for example, Elliott, 2019). Instead of representing reality, maps are "powerful ways of making statements about the world" (Wood, 1992). Through maps, SLR governance is rendered as governance of space, in which 'vulnerability hotspots' should be protected. Aid agencies and foreign donors have stakes in this process, jointly deciding whether populations must be displaced, or whether another economic model for a region must be established (see chapter 10). These technocratic assessments also have a performative dimension: In a biopolitical logic, they define a population and a space that is 'at risk'. Introducing a "political ecology of risk" as a "constellation[…] of science, value and fear" (Johnson, 2010: 186), maps can also incentivize a kind of self-governance in which individual citizens internalize their role as a 'vulnerable' population, accepting 'structural measures' (chapter 7 and 8) or taking preventative measures such as flood insurances (chapter 9).

Furthermore, mapping establishes a semblance of naturalness, framing vulnerabilities as the logical consequence of physical geography, subsidence, and SLR, thereby erasing the deeply embedded socioeconomic forces that have created these vulnerabilities in the first place. Maps represent rising sea levels as an issue of space, rather than an issue of people and livelihoods, thus rendering social considerations invisible in planning for the future. The dominant ways of global knowledge production on the issue rest upon extractivism "as a value system based on quantifiability" (Çaylı, 2021: 1388), in which only 'hard' material 'facts' are salient to governance and render the understanding of nature that underpins responses to SLR. This focus on quantitative metrics embodies a specific political culture that determines how the interplay of 'experts' and policymakers produces knowledge and translates it into public policy (Tichenor et al., 2022). Increasingly, risk evaluations and management strategies are based on Machine Learning Technology, hiding the implicit values and assumptions made by the programs in a "black box," and presenting the results as a de-personalized, objective knowledge (Machen and Nost, 2021; Nost and Colven, 2022).

Risk assessments and mapping are tools that allow for universalization. Through their use, policy advice can be given from a distance, World Bank experts can assess the situation from their offices, and potential investors can evaluate the risk factors of a region by themselves. The guide by the C40 network continues with further solutions to SLR by using best practice examples, indicating in their report *when* and *why* "a city might apply an approach like this" (C40 Cities, 2016). The document pretends to convey a global and universal knowledge, the applicability of which depends on individual city-level factors such as "governance structures and markets," the "level of leadership a city can exert" and the "degree of external support" that should inform a city's ambition (C40 Cities, 2016, p. 8 f.).

I have illustrated that knowledge production and knowledge circulation are mainly conducted by an elite of experts, using tools that have a depoliticizing and universalizing character. These modes of knowledge creation are mobilized as an ostensibly 'objective' basis to make distinctions between which areas and livelihoods are "viable" and which are not (Paprocki, 2022). They convey the idea of a "biological foundation" for claims of unviability, "while leaving intact unstated assumptions about the social conditions that shape these ecological conditions" (Paprocki, 2022: 3). Such claims, made by external 'experts', operate within the political-economic context of development while undermining alternative, bottom-up future imaginaries (Paprocki, 2022). Having understood the kind of knowledge and technologies of knowledge-production that inform policymaking, I can now turn to different approaches that are pursued to adapt to rising sea levels. My analysis aims to link these approaches to how sinking cities have been constituted as objects of policy intervention, acknowledging that the 'rationalities' involved in SLR governance only appear as 'rational' in the very specific context in which SLR is approached and discursively constructed by global experts (see Flyvbjerg, 1998).

7 Projections of modernity: sea walls and artificial cities

The C40 Cities (2022) advise vulnerable cities to "improve coastal flood defences to reduce the likelihood and severity of flooding". This could be done by the restoration of coastal ecosystems, by "man-made physical structures," or by a combination of both. Big infrastructure projects are a particularly interesting case in the governance of flooding and rising sea levels. Famous European examples of hard infrastructure are the Maeslant Barrier in Rotterdam, the Mose Barrier in Venice, and the Thames Barrier in London. The Netherlands as a particularly important actor in this realm has historically been relying on big infrastructure projects and hydrological engineering (Goh, 2021: 92), and these are the kind of projects that have been particularly pushed by Dutch engineers and officials in the past. Today, such engineering approaches are very common, e.g., in Asian cities such as Ho Chi Minh City, Tokyo, Jakarta or Manila (Cao et al., 2021). Tokyo, for example, banks on so-called super levees, characterized by their width and the incorporation of housing and business buildings, in addition to a staggering underground discharge canal.

It is evident that these walls, despite their enormous costs, will soon be not sufficient to protect endangered coasts. An often-raised critique of dikes is that these do not reduce water levels but redistribute risk and exposure to floods since water will always find another way (van Voorst and Hellman, 2015). As cities are privileged actors that are protected, water is often redistributed to rural areas, inhabited by poorer peasants. "Hydrological engineering" is an approach preferred by global 'experts' that privileges middle-class and elitist population groups while undermining the ecological security of the urban poor (Leitner et al., 2017). The IPCC finds that physical infrastructure such as sea walls "has the highest risk for maladaptation over time" (New et al., 2022: 2620). Sea walls could "result in lock-ins and increase exposure to climate risks in the long-term" (IPCC, 2022: 29). The point here is not to make an argument on low policy effectiveness but to use these findings as a starting point to unravel the rationalities behind building massive walls and dikes. If sea walls are expensive, ecologically harmful and protect cities, if anything, only in the short

term – why are they so popular as 'adaptation measures' around the world?

I argue that the implementation of big infrastructure projects stems from the kind of actors involved on the one hand and the appeal of hypermodern sociotechnical imaginaries on the other hand. The problematisation of SLR as an issue of infrastructure and finance privileges the expertise of engineers and rationalizes imperatives of capital accumulation. The operation of the involved corresponding "technopolitical networks" (Colven, 2017) can be observed, for example, in Jakarta, where the 'Great Garuda Sea Wall' was meant to protect the city from rising sea levels. Planned as a common project of engineers from the Netherlands and Indonesia, the Sea Wall was also expected to contribute to land reclamation, allowing 17 islands to be erected behind the dike. Together, the sea wall and the islands were planned to show the Garuda – the god of birds in Hindu and Buddhist faiths and the symbol of Indonesian independence. However, the project was severely criticized by activists, academics, and local populations. As the main threat for Jakarta is land subsidence (up to 15 cm per year), land reclamation does not address the most urgent problem (Colven, 2017). Although the land reclamation project with the garuda-shaped sea wall was no longer included in an updated flood safety plan (Colven, 2020a), it provides relevant insights into the rationalities of planning against SLR.

The example of Jakarta points toward an ideational link that can be identified between 'great infrastructure' and 'modernity'. In the past, the World Bank has pushed toward dams in developing countries, with often devastating consequences (Nixon, 2011). Visions of the future in sinking cities are dominated by eco-modernist promises of economic growth, high-tech and prestige. The purpose of big infrastructure, in many cases, is not (just) to keep the water out of the city but to demonstrate strength and prestige to attract even more investment. Colven (2020b) shows how the issue of groundwater extraction and land subsidence – a much more urgent problem than SLR – has been neglected in Jakarta, while the high-profile project of the Great Sea Wall has been heavily pushed by the government. This can, according to Colven (2020b), be explained by the differing "visibility" of infrastructures, making it politically unpopular to address subterranean infrastructure. On the contrary, highly visible infrastructure creates a semblance of safety, encouraging further investment in risk zones (Malm, 2013: 824). Dikes as an example of big infrastructure incorporate rationalities and effects of governance that go well beyond their immediate purpose of keeping the water out of a city (see Siriwardane-de Zoysa, 2020). They serve as a clear demarcation between land and the sea, and they can operate as a form of "urban spectacle" (Ong, 2011), symbolizing governance action in the absence of effective measures for the most vulnerable.

The rationality of spectacle embodies a sociotechnical imaginary in which humankind can address the consequences of climate change through technological advances and extraordinary engineering expertise. 'Hyperbuilding' is meant not only to attract investments in sinking cities but also to represent 'sovereignty' over SLR and aspirations to become a 'global' world-class city (Ong, 2011). This is most obvious in the case of Jakarta's Great Garuda Sea Wall which is "driven by a dream of national becoming'", marking the beginning of a new era (Wade, 2019: 168). In the view of policymakers, one of the worst threats from rising sea levels and flooding is that investors might stay away in the future, being afraid of harm to their assets. Big infrastructure is an act of signaling awareness and responsibility to

these investors, opening adaptation projects up for private investment. Material infrastructures are "dense social, material, esthetic, and political formations," and their appearance is deeply related to the envisioning of the future (Appel et al., 2018: 3). Infrastructure itself is a political agent in a way that it represents a visual, material, and symbolic 'promise', thereby underpinning political narratives about the future.

This can be illustrated through the case of Lagos in Nigeria. The megacity approaches the threat of the ocean by land reclamation, raising an artificial city called Eko Atlantic, and constructing the Great Wall of Lagos. Eko Atlantic is not only meant to relieve population pressure from Lagos but also to establish a new financial center with skyscrapers (Eko Atlantic, n.d.). Eko Atlantic is a public-private partnership, funded by private donors. Its creation has been delegated to the China Communications Construction Group and advice comes from the Dutch consultancy Royal Haskoning. Risk assessments and future simulations by Royal Haskoning undermined local knowledge and helped to mobilize a legitimizing risk discourse, framing the planners of the mega-project as "heroes with the requisite scientific expertise, knowledge, and financial resources to rescue Lagosians from otherwise inevitable threats posed by climate change and nature" (Ajibade, 2017: 91) The official website of Eko Atlantic advertises the artificial city as "an investment opportunity on an unprecedented scale" (Eko Atlantic, n.d.). Although declared as a project that will solve a variety of issues at the same time while being environmentally friendly, it is far from compelling that the city overall will have a positive impact in terms of ecological and social security (Ajibade, 2017).

Recently, Indonesia has adopted a similar approach by passing a law to build a new capital city on the island of Borneo, named Nusantara. Three criteria had to be met for the New Capital Design Competition: The plans for Nusantara had to reflect the Indonesian identity, must be environmentally friendly, and 'modern'. As a 'smart city' powered by renewable energy, Nusantara is a utopian vision of 'sustainable development' (Zoll, 2021). The new capital is built for only about 1.5 million people, most of whom will be government bureaucrats. Those who suffer the most from the water will not be able to afford to live in the new capital. Therefore, it is evident that Nusantara serves more as an object of growth and 'development' (corresponding to Indonesia's goal to become a 'developed country' by 2025) than as a real solution to Jakarta's water problems. As the construction of the city in the rainforest of Borneo is expected to contribute significantly to environmental problems and to harm indigenous and poor populations, *performing greenness* must be understood as an approach to be recognized as a world-class-city, rather than representing actual concerns with the environment.

These rationalities and ambitions are tied to a discourse that renders SLR as an issue that requires expert knowledge, thereby incorporating risk 'experts', consultants, and development actors in the process of governing. Development experts, such as World Bank professionals, frequently re-frame urban flooding as an 'opportunity', embedding the issue in a 'win-win'-framing (Yarina, 2018), implicating that coastal adaptation should have co-benefits. This global expert class has its very own modes of knowledge production and its own tools of intervention. They can provide reports, pursue investments in infrastructure projects (preferably through private-public partnerships), and contract other experts, such as architects and designers, to draft plans for a flood-prone city. Big infrastructure

'projects', which can be co-financed through international private investments, thus suit the modus operandi of global experts. The overabundance of 'expertise' in dealing with SLR, together with the legitimacy borrowed from science and technology in 'seeing' and 'constituting' sinking cities as places of intervention, constitutes the hubris of claiming mastery of nature (see Scott, 1998: 4). The taming of risk through rationalizing SLR and drafting masterplans privileges techno-political solutions that have taken on a dynamic by themselves, conflating adaptation to climate change with political aspirations to transform these cities into futurist dreamscapes. Furthermore, walls and reclaimed land can serve multiple purposes at the same time, thus materializing an ideology of 'modernity', signaling political attention, and creating a narrative of control that accommodates global finance.

8 Designing the future: nature-based solutions

In addition to land reclamation and sea walls, the C40 cities advise to "[d]esign buildings and infrastructure to reduce the impact of coastal flooding" (C40 Cities, 2022). 'Design' is an often-used trope to talk about how a city should 'look like' to be resilient against SLR, even if the physical infrastructure cannot prevent flooding. Therefore, design is essential for future imaginations which are often represented through shiny graphics and illustrations of genteel urban places. Increasingly, imaginaries of flood-resilient urban infrastructure and design are linked to 'nature-based solutions' (NBS). Brought forward by the European Commission in 2015, the concept rapidly diffused globally, turning into a dominant strategy in many cities in Southeast Asia (Herbeck and Zoysa, 2022). According to the European Commission (2015: 4), "[n]ature-based solutions harness the power and sophistication of nature to turn environmental, social and economic challenges into innovation opportunities." This framing of NBS as a chance aligns with the 'God's-eye' way of seeing, knowing, and planning against SLR, together allowing for fantasy and urban dreams, the realization of which just becomes a matter of finance.

The ultimate 'design' of sinking cities, again, is outsourced to another category of experts whose planning processes center around particular ideas of aesthetics. The Rockefeller Foundation, for example, has worked closely with Arup, a London-based services firm concentrating on engineering and consulting for the built environment. The foundation is not simply an institution that equips cities with capital for adaptation projects; it actively shapes concepts and ideas of 'adequate' adaptation, e.g., through its own City Resilience Framework or its 'City Water Resilience Approach' (The Rockefeller Foundation and ARUP, 2014; The Rockefeller Foundation, The Resilience Shift, SIWI, and ARUP, 2019). Rockefeller encourages cities to work with international organizations or global consultants such as AECOM which is a strategic partner of a variety of sinking cities (Leitner et al., 2018: 1281).

After Hurricane Sandy hit the US in 2012, the former US Secretary of the Department of Housing and Urban Development visited the Netherlands to learn about protection from the sea, letting him re-think US approaches to flooding (Berg, 2017). A year later, based upon the expertise of the Dutch special envoy on water, then-President Obama launched the Rebuild by Design-initiative as a design competition, funded by the Rockefeller Foundation. Today, Rebuild by Design is cooperating with five cities in the US. Hurricane Sandy

showed that the existing flood infrastructure has been dramatically inadequate and the city/nature binary of hard infrastructure was regarded as outdated (Wakefield, 2020: 765). The 'modernist' infrastructure thus had to be remodeled – either by adding even more modern imaginaries of 'smartness' or by incorporating what is considered 'nature' into adaptation projects. 2012 was a moment that allowed for alternative imaginaries and urban experimentation. One winning application for the Rebuild by Design-initiative came from the SCAPE studio. The SCAPE landscape architects, together with urban designers, proposed to use oysters as 'natural solutions' to water-related disasters, thereby reframing oysters as 'living infrastructure' similar to hard infrastructure such as dikes and pipes. The project was granted $60 million, and construction began in April 2021 (New York State Governor's Office of Storm Recovery, 2022). Nature-based solutions rely on the idea that a 'natural balance' with nature should be restored and that a "self-healing, resilient city" (Wakefield, 2020: 767) is possible.

However, it required a lot of narrative work and legitimizing practises of architects, designers, and biologists to prove that oysters are indeed 'critical infrastructure', and that they are effective in flood mitigation. While the trope 'nature-based solutions' suggests that 'letting nature be nature' is enough to adapt to SLR, Wakefield (2020) illustrates that a neoliberal surveillance and productivity apparatus must be used to make the oysters behave in the desired way to serve the intended purpose. There is nothing 'natural' about nature-based solutions; instead, global experts had to discursively produce the idea of 'living infrastructure', which is even more reliant on human engineering and a dystopian mastery of nature. At the same time, it remains entirely unpredictable whether the oysters will ultimately subordinate their behavior to plans for flood governance (Wakefield, 2020). Framed as an innovative approach to re-align climate adaptation with the natural world, nature-based solutions to SLR tend to reflect the same old rationalities of managerialism, assumed control over nature, and planning hybris as large infrastructure projects (see also Yarina, 2024).

Another 'nature-based solution' that is meant to overcome grey infrastructure is the 'sponge city'. In 2014, China launched a 'Sponge city initiative', declaring that 80 per cent of urban areas should become 'spongy' by 2030. Thirty pilot cities were selected, in which the implementation of sponge-like structures ought to be financed through the central government, local governments and the private sector (Wishart et al., 2021: 5). Examples of sponge cities in China are Lingang, Nanganqu, and Wuhan. This alternative imaginary of green sponge cities, often combined with tropes of 'smartness', offers a vision for cities in the Anthropocene. Global experts have adopted this vision to sell it around the world. For this purpose, London-based engineering and consulting firm Arup has developed a tool based on artificial intelligence to measure the 'sponginess' of cities (ARUP, 2022). This is done through a simple formula, summing the amount of blue and green space in a city, soil type factors and the water runoff potential. Other consultancies and architecture bureaus are also highly involved in this process, such as the Canadian-based company WSP or the globally operating architects from Chapman Taylor. The conjunction of urban design, modern technology (such as AI) and (engineered) nature lies at the core of an emerging imaginary for 'global' cities, combining biopolitical technologies and narratives of control with a 'recentering' of nature. The governance of wetlands within a neoliberal logic has therefore been described as a 'worlding

practice', in which landscape designers and engineers aim to materialize 'globality' (Wang, 2020).

Classical engineering and nature-based solutions are often co-existing, such as in Shanghai. Arup won an international competition by the Shanghai Water Authority to draft a stormwater master plan for the city. The city has built a 520 km long sea wall with mechanic gates similar to the Thames Barrier while incorporating 'green' and 'blue' infrastructure, thereby integrating 'natural' water cycles and infrastructure. The engineering bureau has used "remote sensing imagery and machine learning technologies" (ARUP, n.d.) in the development of the plan, which further illustrates how authoritative knowledge claims and imaginaries are conflated with technology and notions of (artificial) 'intelligence' or smartness. The master plan is frequently linked to aspirations of becoming an "excellent global city," as stated in the Shanghai 2017–2035 development masterplan (ARUP, n.d.; CIWEM, n.d.). In 'redesigning' cities such as Shanghai in the advent of SLR, architects and designers work within the same logic of 'locationlessness' that I have described above. Design competitions attract the attention of professionals from big, often Western cities, who use maps and the given geological and geographical information to redesign cities from a distance. The architect, then, is spatially separated not only from the construction workers who bring the plan into being but also from those who are to live in these re-designed places. Delegating urban planning to international architecture bureaus not only privileges the agency of one type of 'expert' over local people but also reproduces a specific logic of planning from above, thereby having a depoliticizing effect.

9 'Non-structural measures': the governance of the self

Although massive amounts of money are spent on the creation of big infrastructure and nature-based solutions, it is evident that these adaptation measures alone are not an adequate response to ever-increasing flood risks. According to the global discourse, 'structural measures', consisting of hard infrastructure, should therefore be complemented by 'non-structural measures' that ought to "manage risk by building the capacity of people to cope with flooding in their environments" (Bloch et al., 2012: 33). These approaches, according to a guide published by the World Bank, include emergency planning and early warning systems, awareness campaigns, land use planning and resilient reconstruction using tools such as flood insurance (Bloch et al., 2012). According to the World Bank, "[f]lood risk awareness is the cornerstone of non-structural flood risk management" (Bloch et al., 2012: 290). Education is rendered as the central tool to prepare populations for flood events. It is suggested that awareness can be enhanced through visible clues, such as flood marks, or "awareness monitoring." Non-structural measures can thus be characterized as tools of neoliberal governmentality, using instruments of responsibilization to engage the individual citizen in the governance of his own risk (see Lemke, 2001).

It is revealing that the collective term 'structural measures' is generally tied to hard infrastructures such as sea walls or river regulation, while 'non-structural measures' are used in the governance of the population. Structural reforms of the social conditions for those most vulnerable are some of the most promising solutions but remain excluded from the discourse. Rendering SLR as a problem of a lack of

knowledge or unwillingness to change behavior, in contrast, allows for the introduction of 'management' techniques (Butler and Pidgeon, 2011) and the incorporation of even more private actors in the process of governance. Companies such as Coastal Risk Consulting, for example, offer individualized risk assessments for individuals or companies to facilitate investment and private adaptation decisions (Coastal Risk Consulting, n.d.). I argue that 'non-structural measures' complement the narrative of control that is dominant in the discourse on sinking cities. Great dams and nature-based solutions are used as symbolic practices of taming the flood, whereas awareness campaigns and insurance are techniques to transform dangerousness into calculable risk, thereby rendering SLR an individual problem of citizens and taming contingency.

Non-structural responses add another dimension to the rationalization of SLR, thereby building on and complementing the knowledge forms outlined above. Newer concepts of flood defence entail a rationality that can be described as 'living with the water', in which the consequences of flooding are normalized and rationalized through the instrument of insurance. The insurance industry is deeply intertwined with the bird's-eye view on sinking cities outlined earlier, as well as with international experts that refer to the insurance industry as a central player in creating 'resilience' (see, e.g., World Bank, 2015; ICLEI, 2018). Financializing risk and exposing the individual to the knowledge of global experts allows for a specific kind of "governing at the distance" (Rose, 2010): The God's-eye way of seeing and approaching SLR through maps and risk assessments transforms sinking cities into calculable spaces that can be administrated through technologies of risk. Online tools, official flood maps and risk assessments by experts expose individual citizens and their residential areas as risk agents who can calculate and manage their lives as the "enterprise of oneself" (Gordon, 2009: 44; see Watts, 2020). This mode of governance incorporates a very specific imaginary that classifies citizens as either 'vulnerable' or 'resilient', where the 'vulnerable' citizen can easily be made 'resilient' to flooding through enough information that enables the citizen to prepare for floods individually, and that allows insurers to determine the 'correct' charges to keep their clients secure. 'Resilience' is a way of seeing that is intensely linked to power, as global experts and insurers tend to privilege 'quantifiable' resilience based on geographic data and measures taken over resilient livelihoods developed by local populations. While sea walls or high-profile design decisions serve as spectacular enactments of climate futures, individualized 'resilience' operates as a more subtle sociotechnical imaginary that is highly instructive of how the social status quo is maintained and co-produced in the advent of rising waters.

Insurances rest upon the optimistic belief that hard infrastructure will serve its purpose, thereby complementing the narrative of control in sinking cities. Where business-as-usual does not seem viable anymore, insurance can stabilize the status quo by offering a substitute for loss. They are crucial to keep the debate on sinking cities below the political level, thereby enabling the continuation of accustomed ways of living and relating to nature. The notion of 'resilience' through insurance has a performative dimension that works as "immunology" for vulnerable populations to take even more risk while not contributing to the alleviation of the actual threat (Kaika, 2017). Through the instrument of insurance, SLR is no longer considered a threat to humanity, but just another individualized risk that can be compensated for. Insurances do not only construct and

communicate risk but economize it by giving endangered assets a specific value (Elliott, 2019) – a number that is then often cited in policy documents on flood governance. These techniques are far from being transformative – but they still have a significant effect by simulating control and giving rise to an emerging industry of insurers and reinsurers. Insurance is not only a way of governing beyond the state (Ericson et al., 2003), but also a specific way of seeing by implementing a system of surveillance, demarcating those who are to be protected, and allocating blame to the individual.

The United States is a case where flood insurance is used extensively. The US Flood Insurance Program, managed by the Federal Emergency Management Agency (FEMA) and delivered by 50 insurers and NFIP Direct, provides insurance coverage for communities that have adopted adaptation measures. The program is based on official Flood Insurance Rate Maps (FIRM). FEMA has created risk maps for 100% of US coastal areas. A 'risky area' here is defined as an area with a "1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage" (FEMA, 2022). Any person living in such an area is required to have flood insurance. Citizens can appeal against the classification of their homes on the flood map and suggest changes (see Lea and Pralle, 2022), which illustrates the character of such classifications as political battlegrounds rather than objective facts. FEMA advises to "reduce your risk," "insure your risk," "share information on risk" and "know your risk and your community's risk" (FEMA, 2022). FEMA actively encourages citizens to be aware of their risk, get insurance and take measures based on provided decision-making matrices (FEMA, 2014). Introducing a threshold that defines acceptable risk and contrasting it with unmanageable risk is a technology of control that entails processes of inclusion and exclusion (see Rose, 2010: 262 f.). Based on the notion of risk, and the calculation of risk through a mystical calculation of 'risk factors', individuals and livelihoods may appear 'too risky' – not only for themselves but also for society and the insurance system, thus legitimizing practices such as eviction or making people pay for their ascribed vulnerability.

10 "Prepare for a planned retreat": rationalizing evictions

Although global experts frame SLR as a technocratic problem that can be fixed with risk assessments and costly infrastructure projects, it is evident that either flooding or flood protection will come with substantial impacts on vulnerable populations. Expert knowledge, risk assessments and practices of urban planning create an imaginary of the future that has yet to come into existence – often through policing or even military engagement. As the World Bank puts it: "Naturally, implementation may prove to be much more difficult than assessment, as residents may fear and resist relocation of their homes, or other disruptions associated with structural adaptation strategies" (The World Bank Group, 2011: 57). The quote from the World Bank already indicates that population relocation is often not due to SLR but aims to enable the construction of large infrastructure.

Evicting citizens from their homes seldom is an 'objective' necessity, but a deliberate choice that favors one set of measures over others, actively excluding alternative local imaginaries of climate futures (Farbotko and Campbell, 2022; Farbotko et al., 2023). This is often legitimized by racialized and gendered attributions of 'vulnerability' (see Weatherill, 2023). Risk analyses and flood maps are ways of 'seeing' landscapes through some of their specific geographical characteristics, and

– strengthened by the work of insurers – private property. However, they structurally 'oversee' people (especially the poor and those living in unofficial homes), social relations and ways of living. Furthermore, ecological and geographical factors determine the way global experts approach the 'viability' of livelihoods. Paprocki (2022) shows how dominant scientific narratives, often backed by international 'experts' and donors, legitimize the eviction of large numbers of people by rendering their livelihood "unviable," thereby ignoring the political economy of 'unviable' places and foreclosing alternative solutions. In Bangkok, for example, a certain amount of flooding is seen as inevitable, resulting in salination and erosion. One strategy to adapt is seen in the conversion of agricultural space into ponds for shrimp agriculture, replacing rice production with the production of exportable shrimps, thereby reframing flooding into a market opportunity (Paprocki, 2019). Although shrimp production contributes to the displacement of the most vulnerable populations, and although those who are least vulnerable profit the most, shrimp production is highly fostered by actors such as the World Bank. Therefore, external actors foreclose existing visions of the future by enforcing an alternative future imaginary that is dominated by shrimp agriculture.

Sociotechnical imaginaries of sinking cities reframe how citizens are expected to interact with their environment, and how they ought to live with or apart from the water. The implementation of the Jakarta Sea Wall project, for example, legitimizes the displacement of so-called kampungs to allow drainage of the rivers behind the flood wall (Yarina, 2018). These kampungs, constituting at least one-quarter of the population of Jakarta, are regularly framed as the main cause of flooding (Leitner et al., 2017) and rendered illegal to enable their eviction, while the negative impact, e.g., of shopping malls, is ignored. This adds to development narratives, in which the informality of kampungs is presented as "incompatible with development and modernity" (Colven and Irawaty, 2019: 2). Similarly, Alvarez and Cardenas (2019) show how slums have been discursively constructed as the cause of Manila's flood risk, while the property of the private sector and elite classes are ignored. Although hazard maps indicate that both slums and middle-or elite-class properties lie in areas with a high risk of flooding, only slums are demarcated as being in 'danger'. This is because middle-class populations are considered 'resilient' due to the architecture of their houses and their socioeconomic status (Alvarez and Cardenas, 2019). These ascriptions legitimate the eviction of 'undesired' populations for the sake of their own 'protection', serving the implementation of modernist future imaginaries (Ramalho, 2019). As Ajibade (2019) suggests for the cases of Manila and Lagos, evictions serve aesthetic and economic imperatives, as they are required for the implementation of shiny, high-profile big infrastructure.

The narrative of the urban poor as the main drivers of urban flooding is essential to pursue adaptation measures that systematically discriminate against those most vulnerable. Some of these measures are export products from Europe, such as the Dutch concept of 'making room for the river' (see Rijkswaterstaat, n.d.). The idea here is to relocate dikes further inland and to build new high-water channels to ease pressure from the dikes during high-water events. This requires relocating or abandoning land and livelihoods. In the Netherlands, this was achieved through depoliticizing "models, metrics, and technical schemas that reduce complex reality into imageable and manageable components" (Yarina, 2024). According to the World Bank, the concept of making room for the river should also be applied to Manila, where a 'clearance zone' with fixed distances to the river is established. However, the demographic structure and population pressure in the Netherlands are

rather different from Manila, where the implementation of this concept leads to the eviction of 125.000 people (Yarina, 2018). The forced relocation also is a dramatic restructuring of how the urban population relates to water: As in other local communities, Filipinos have their own knowledge of how to deal with floods, and they have developed their own architectures, such as houses on stilts (Yarina, 2018). Global actors such as the World Bank render these human-nature relations ineligible, instead relocating 'vulnerable' groups to spaces remote from their homes.

The idea of 'planned retreat' remains silent over who is planning the retreat of whom and how violence is inscribed in the act of allocating or expelling populations, or as the World Bank calls it, "involuntary resettlement". I have shown how evictions are rationalized by techniques of mapping that render populations, especially unofficial housing, invisible. These techniques and their (in-)visibilities impose a "techno-economic valuation lens as the standard for adaptation" (Ajibade, 2019: 312). Classifications and dichotomies such as resilient/vulnerable, viable/unviable, or desirable/non-desirable, as produced by the knowledge regime on SLR, legitimate evictions or enable imposing insurance in a discriminatory way. Although the participation of urban populations in this process is heavily stressed in a variety of documents, the global resilience complex proposes general frames of feasibility and desirability which are then taken for granted, thereby rendering fundamentally different interpretations of and solutions to SLR invisible and unviable.

11 Conclusion

Recently, much attention has been paid to the drivers of maladaptation (Magnan et al., 2016; Atteridge and Remling, 2018; Eriksen et al., 2021). Rather than understanding unintended consequences of urban coastal adaptation projects as 'side-effects', this paper asks whether these instances can rather be understood as systematically produced, rationalized, and legitimized through a depoliticizing global adaptation machinery. Challenging understandings of adaptation governance as 'rational choice' based on 'objective' science, I argue that adaptation decisions and planning processes can only be understood by deconstructing how a certain kind of understanding SLR has become hegemonic; how it informs concepts of vulnerability and resilience; and how these ideas are diffused globally.

Climate futures are built in the offices of engineering companies and global consultants whose technocratic risk assessments and best-practice examples are complicit in pretending a kind of control, allowing for visions of new global financial centers, smart cities, and resilient citizens. I have argued that responses to SLR are weirdly detached from the social contexts of SLR. The reason for this circumstance can be traced back to the practices of knowledge production on the issue, and the hegemony of universalizing and depoliticizing knowledge claims made by global experts. Considering my findings, techniques of risk assessment and mapping do not seem to inform adaptation measures as much as they legitimate doubtful practices, leading to results that will ultimately not protect us from SLR, but allow for 'business as usual' and the inflow of foreign capital. My findings provoke the question of whether risk assessments and risk mappings in the bureaus of experts have any instrumental utility, or whether they (unintentionally) serve a more symbolic purpose in simulating mastery over a situation of uncertainty

and anticipated disaster (Clarke, 1999). Although risk assessments and maps seem not to be systematically translated into coherent policies, they still shape how SLR is approached and rationalized. However, the imagined futures are contested (e.g., Colven and Irawaty, 2019; Goh, 2021; Arnall and Hilson, 2023), and the friction between local counter-imaginaries and 'locationless' top-down approaches provides a large potential for (re-)politicization.

The narrative I have developed in this paper necessarily draws upon simplification and disregards factors such as national regulations (Mehryar and Surminski, 2021), local cultures (Krüger et al., 2015), and how they relate to the global adaptation discourse. It also cannot adequately account for the global imbalance of power, the heritage of colonialism, and the need for adaptation finance that makes some cities more susceptible to a depoliticizing global discourse than others (see Bigger and Millington, 2020; Bigger and Webber, 2021; Hilbrandt and Grafe, 2022). The extent to which the global discourse and rationalities as outlined above take hold on local scales should be subject to future research. In particular, it is worth studying the global actor network of policy entrepreneurs, international engineering consultancies, scientists, and multilateral development agencies through which future imaginaries are generated and circulated globally. Recent advances in Artificial Intelligence and Natural Language Processing potentially allow for an analysis of an unforeseen number of local adaptation plans for involved actors, similarities, and narrative structures. Growing research on 'maladaptation' and socioeconomic injustices in adapting to rising waters make it imperative to illuminate the global drivers, rationalities, and power relations immanent in the depoliticized designing of climate futures on a more comprehensive level.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

FS: Conceptualization, Investigation, Methodology, Writing – original draft, Writing – review & editing.

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Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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