

“Holding Course” Towards Environmental Injustice

An explorative analysis of the environmental injustices in the decision-making process of the 9th dredging of the Elbe River in Hamburg, Germany

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Abstract:

Responding to the pressure of economies of scale, port cities like Hamburg “hold course” towards a development strategy, meeting demands of upscaling navigational infrastructure through dredging. Research focusing beyond distributional injustices is scarce and remains technocratically driven. To further our understanding of these processes, I conducted semi-structured interviews and thematic content analysis of affected actors using environmental justice elements of recognition, participation and distribution and combined with the lens of science & technology studies through the addition of epistemic injustice to the framework. My analysis illuminates the underlying perceived issues of transparencies and high complexity in which actors interviewed lack resources, to fully comprehend and participate in the decision-making process, and, in which group identities get misrecognized. Perceived epistemic issues reveal a systematic ignorance of other knowledges and the suppression of counter-expert stories to be told or produced. To deepen our understanding of this topic, future comparative studies are needed.

Keywords: Dredging, Environmental Justice, Epistemic Justice, Science & Technology Studies, Hamburg, Port City

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List of Abbreviations

a.s.l.	Above Sea Level
EEA	European Environmental Agency
EF	Elbe Fisher
EJ	Environmental Justice
FEG	Friends of the Earth Germany
FF	Fruit Farmer
HPA	Hamburg Port
JO	Journalist
NABU	Nature & Biodiversity Conservation Union
RAED	Regional Alliance Against Elbe Deepening
SDG	Sustainable Development Goals
STE	Registered Society of Save the Elbe
STS	Science & Technology Studies
WWF	World Wide Fund For Nature

1 Introduction

Globalisation rooted in neoliberal environments and trade liberalisation have produced unsustainable economies of scale (Álvarez-SanJaime, Cantos-Sánchez, Moner-Colonques & Sempere-Monerris, 2015; Bell, 2015; Carse & Lewis, 2020; Schubert, 2020; Mitchell, 2002). As port cities represent crucial nodes in the global supply chain, a “weighty responsibility” (Fenton, 2020, p. 239) lies on them to meet the demands of increasing containerization and on ever larger vessels to stay multi-scalar competitive on multiple scales (Álvarez-SanJaime et al., 2015; Carse & Lewis, 2020; Karimpour, Ballini & Ölcer, 2020). To drive such development within a globalised world, port cities all over the world find themselves in a race to upscaling navigational water infrastructures (Carse & Lewis, 2020).

By conducting navigational dredging, port cities seek to secure their role in the era of economic globalisation by widening their water transportation networks (Bell, 2015; Carse & Lewis, 2020; Gustafson, 2020; Hein et al., 2020; Vanderostyne & Cohen, 1999). Although dredging is a phenomenon of various multi-scalar social, economic, political and environmental magnitudes, navigational dredging is an understudied research topic (Carse & Lewis, 2020); to date, little research and sustainability efforts have focused beyond the technocratic realm of this practice (Carse & Lewis, 2020; Gustafson, 2020; Karimpour et al., 2020; Lozano, Carpenter & Sammalisto, 2020). Nonetheless, contemporary research has highlighted the negative environmental distributional impacts of dredging such as, but not limited to, biodiversity loss, sea-water intrusion, and vulnerability against extreme weather events (Adesina & Adunola, 2017; Bianchini, Cento, Guzzini, Pellegrini & Sacconi, 2019; Carse & Lewis, 2020).

Transforming waterways by means of dredging leads to environmental justice (EJ) issues that clearly distinguish those who benefit and those who are debilitated by it. However, further analysis that investigates the underlying root causes of such injustices is crucial. Researchers have thus called for a more holistic approach that includes knowledges from various fields of studies which address the issue of the unequal distribution of impacts and the complex political dynamics and conflicts that generally surround infrastructural development and environmental management with concrete examples (Carse & Lewis, 2017; Fan, 2016; Gustafson, 2020; Lozano et al., 2020).

The 9th dredging Elbe River dredging event in the port city of Hamburg has been such an event in which environmental justice concerns have been raised. Since the last Elbe River deepening in 2002, the necessity of a 9th Elbe River deepening for both economical and livelihood reasons have been a highly publicised and discussed topic in the economic arena (Durner, 2019). The general “environmentally transformative and politically contentious” (Carse & Lewis, 2020, p. 1) nature of harbour deepening projects, paired with the historically perceived impact of the past eight deepening projects of the shipping channel in Hamburg, have given rise to contention amongst involved local actors. This contention has been judicially addressed, resulting in the legal approval of the projects’ framework (Carse & Lewis, 2020; Gustafson, 2020). As of February 2022, Hamburg has finalised its deepening of the Elbe riverbed in aims to make Hamburg’s tidal port more accessible for larger cargo ships, thus increasing their competitive edge towards other European ports (Carse & Lewis, 2020; Hamburg Port Authority, 2012a).

1.1 Thesis Aim and Research Question

My aim for this research is to explore a field of study that has been primarily addressed in technocratic research. It is to produce knowledge that unfolds the different interlinked aspects of environmental injustices experienced in the case of the 9th Elbe River deepening decision-making process. With the aim to go beyond technocratic research and explore underlying and interrelated aspects of distributional injustice in a holistic way, I apply elements of the EJ framework by Schlosberg (2007) to my case study.

Further, I complement the already existing framework of distributional, participatory/procedural injustices, and misrecognition with the aspect of epistemic justice. By combining this approach with semi-structured interviews and thematic content analysis, the interdisciplinarity of this theoretical approach seeks to go beyond a singular static perspective and rather incorporates views from different ontological and epistemic backgrounds to understand the perceived complexity of the decision-making process on dredging (Jerneck et al., 2011).

Hence, my study is constructed around the main research question:

What are the perceived environmental injustices in respect to the 9th Elbe River dredging in Hamburg?

To answer the aforementioned question, I am using four sub-questions:

I.) What are the perceived distributional injustices for the 9th Elbe River dredging in Hamburg?

II.) What are the perceived participatory/procedural injustices within the decision-making process for the 9th Elbe River dredging in Hamburg?

III.) What are the perceived misrecognitions within the decision-making process for the 9th Elbe River dredging in Hamburg?

IV.) What are the perceived epistemic injustices within the decision-making process for the 9th Elbe River dredging in Hamburg?

1.2 Contribution to Sustainability Studies

The contribution of my research to sustainability science is manifold as it covers several aspects that address contemporary sustainability challenges and goals. In alignment with Kates et al.'s (2001) plea that science must cohere with the agenda for sustainable development, my thesis directly contributes to Goal 9: Industry, Innovation, and Infrastructure; Goal 10: Reduced Inequalities; Goal 11: Sustainable Cities & Communities; Goal 14: Life Below Water; Goal 15: Life on Land; and Goal 16: Peace, Justice & Strong Institutions. Successfully implementing these goals necessitates an understanding in how political decision-making interacts with scientific and other types of knowledges. By consciously acting as an agent of change instead of a sole collector of knowledge, I actively contribute with this thesis to reflexive proactive knowledge production (Agyeman, Schlosberg, Craven & Matthews, 2016; Miller et al., 2014; Ottinger, 2017). My theoretical underpinnings allow me to study the phenomenon of the dredging of the Elbe River at the Hamburg Port in a systematic, cross-disciplinary, and flexible manner whilst simultaneously acknowledging different epistemic and ontological consideration in the nature-society interface (Jerneck et al., 2011; Kates et al., 2001). This reflexive approach in co-production of knowledge in this thesis is crucial to further explore and apply information, even in light of uncertainty (Cash et al., 2003; Kates et al., 2001; Wyborn et al., 2019). On a personal note, my aim with this research is to improve the transparency and complexity of my case study and provide relevant information to those who are seeking accessible knowledge from science (Wyborn et al., 2019).

By choosing the Elbe River deepening at the port of Hamburg as a case study, I am contributing to an underrepresented challenge in sustainability science to currently address sustainable port governance in an interdisciplinary manner (Fenton 2020; Fernández-Izquierdo, Ferrero-Ferrero & Muñoz-Torres, 2020). With dredging being an environmental and social phenomenon characterised by high complexity and uncertainty, this case study represents an ideal example of a sustainability challenge, requiring an integrative, interdisciplinary approach (Carse & Lewis, 2020; Karimpour et al., 2020; Kates et al., 2001).

As Miller et al. (2014) have highlighted, it is essential to go beyond problem orientated research and instead focus on connecting it with a solution-driven approach that has a particular focus on the understanding, as well as the interaction, between nature and society in a way that draws its reflexivity and its transdisciplinary approach from the science of sustainability. Moreover, science and technology studies has been increasingly acknowledged as an integral approach to “harness” for sustainability science to transition towards sustainable development (Bäckstrand, 2003; Cash et al., 2003, p.2; Wyborn et al., 2019). Several sustainability scientists argue that the transition towards sustainable development and just sustainability is co-dependent on each other (Agyeman, 2008; Agyeman et al., 2016). Drawing from science & technology studies and environmental justice, my study promotes cross-fertilization of these two disciplines and thus strengthens scholarly literature on interdisciplinary, analytical frameworks in practice; a field that has been primarily unrepresented in literature (Agyeman et al., 2016; Carse & Lewis, 2017, Wyborn et al., 2019). With my research I would further like to strengthen the literature on “just sustainability” for the governance of the port which creates a new window for ecological opportunities in a port city where “injustice and risk have long prevailed” (Robbins, 2019, p. 76).

1.3 Thesis Scope of Inference

Considering researching a topic that is characterised by multi-scalar complexity and a high degree of uncertainty, I find it important to discuss the scope of inference of my thesis. Firstly, the aspect of scale needs to be addressed. By choosing the port of Hamburg as my case study, I acknowledge the fact that every harbour has its own and unique socio-ecological context, as well as their associated challenges and opportunities in their respective fields. That implies that even though ports and their navigational dredging projects have similar attributes, inferences on this study cannot always be directly applied (Carpenter & Lozano, 2020). Another aspect of scale is that my thesis is exclusively focusing on the perceived impacts on regional actors within the Hamburg area. Whilst this water infrastructural project

has far reached EJ implications that go well beyond the regional boundaries of this project, this is a scale that is not addressed in my thesis but could be interesting for future research. Secondly, the aspect of time sets the boundaries of inference for my research. That said, my research is focusing on the contemporary perceived environmental injustices in the Elbe River dredging decision-making process. Given this is the 9th Elbe River dredging project that has been conducted with modern ways of dredging, I am certain that a historical analysis of past environmental injustices could shed light onto injustices that have occurred in past dredging projects from which we could learn from for the future (Meyer, 2020). Another time aspect of this thesis scope of inference is the awareness of the dynamism of knowledge production. Rather than seeing my research as a static contribution to the field of sustainability science, it refers to a specific point in time in which knowledge can continuously be built upon (Ottinger, Barandiarán & Kimura, 2017).

2 Setting the Scene

In this section of my thesis, I will provide the reader with the necessary background information to set the scene for exploring the environmental injustice aspects of the 9th dredging of the Elbe River at the port of Hamburg.

2.1 The Natural Waterscape of the Port of Hamburg

The Elbe River is a 1,094 km brackish water body that originates in the Northern Czech Republic and flows eventually into the North Sea at Cuxhaven, Germany (see Figure 1; Gustafson, 2020; Sievers, Zielhofer & Huesker, 2021). The estuarine river is a highly sensitive ecosystem which is characterised by a significantly high average tidal range of 3.62 metres. The tidal range is continually increasing as much as 160 centimetres in the past century - making it particularly vulnerable to climate and land use change (Hesse & Krysanova, 2016; Nijhuis & Pouderoijen, 2014; Sievers et al., 2021). Functioning as a habitat which is characterised by extreme factors, the Elbe is providing an ecological niche for very specialised, adaptive, and even endemic species to thrive. The Elbe River is the sole estuary inlet that connects the port of Hamburg to the rest of the world. The port itself is located at the heart of Hamburg (Netzband, Christiansen, Maaß & Werner, 1998; Neumann, 2014; see Figure 2).

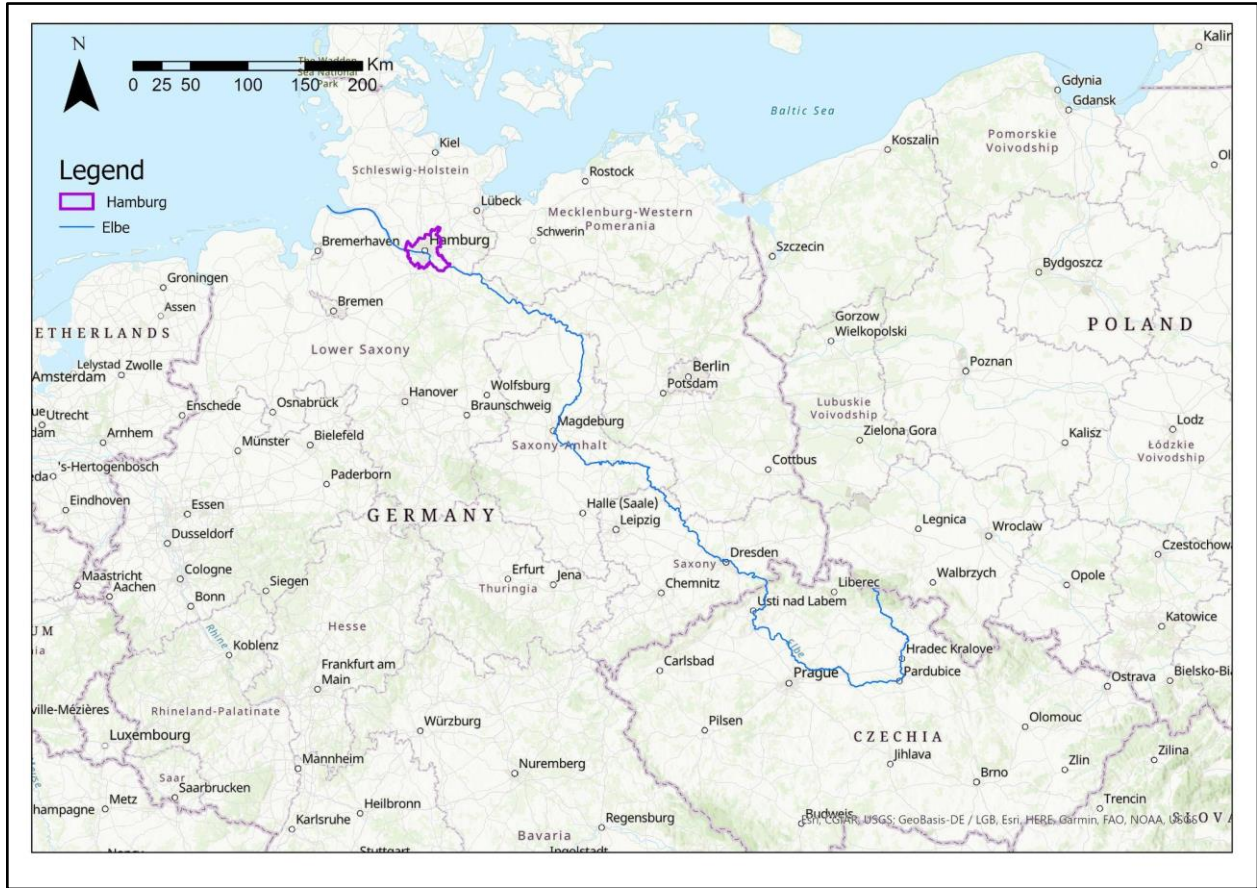


Figure 1. Map of the Elbe River and Hamburg (Own creation based on ESRI and European Environmental Agency (EEA) data)

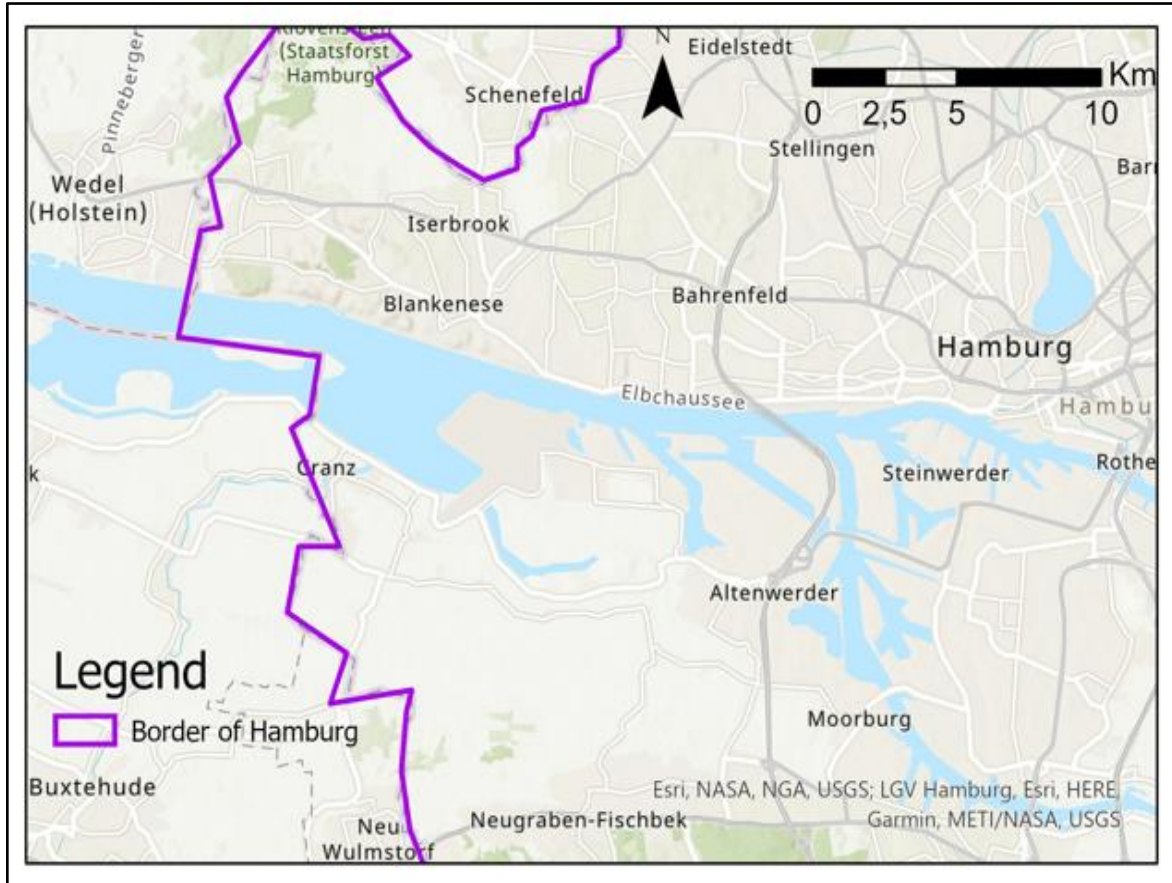


Figure 2. Map of Hamburg's Port Area (Own creation based on ESRI data)

2.2 Hamburg “Holds Course” Towards Development with 9th Elbe River Dredging

Hamburg represents the biggest harbour in Germany and the third biggest in Europe, after Rotterdam and Antwerp (Eurostat 2022; Federal Office of Statistics, 2022). The harbour of Hamburg is owned by the state of Hamburg and is governed by the Hamburg Port Authority (HPA), a governmental body under public law (Carpenter & Lozano, 2020). Maintaining their development strategy by consequentially “holding course” (HPA, 2012a, p. 91) towards a success-oriented development of the harbour that upscales their competitiveness in a globalised world, the port of Hamburg addresses the necessity to modify its infrastructural navigation channels. The distributional consequences of the aspired success, however, raise environmental injustice concerns as the project has been met with contention from both local and regional actors (Feldt, 2009; Gustafson, 2020).

2.4.1 Overview of Project Plan

The project of the deepening of the shipping channel at the port of Hamburg is a project administered by the HPA and the Federal Waterways and Shipping Administration. Dredging is a set of mechanical and hydraulic processes that extracts sedimentation from the ground of the river or ocean floor (Bianchini et al., 2019; Liu, Walling & He, 2018). Even though the HPA and the Federal Waterways and Shipping Administration are collaborating closely with each other, both have their distinct stretches that they oversee in the overall project. In consideration of the scope of this thesis, I will focus on the parts within the territory of Hamburg.

Though the project is referred to as the Elbe deepening, the actual project entails two main procedures (see Figure 3 and Figure 4): Firstly, the decrease of the maintained depth from previously -16.70 metres above sea level (a.s.l.) to -17.30 metres a.s.l. and -17.40 metres a.s.l. respectively. Secondly, a 20-metre expansion in width of different sections of the Hamburg shipping channel and a widening to up to 385 metres of a designated shipping encounter region between Blankenese and Hamburgs' frontier. The goal of these changes to the Elbe riverbed is to allow ships to arrive and depart with a draft of 13.5 metres tide independently and 14.5 metres tide dependently (HPA, 2012b).

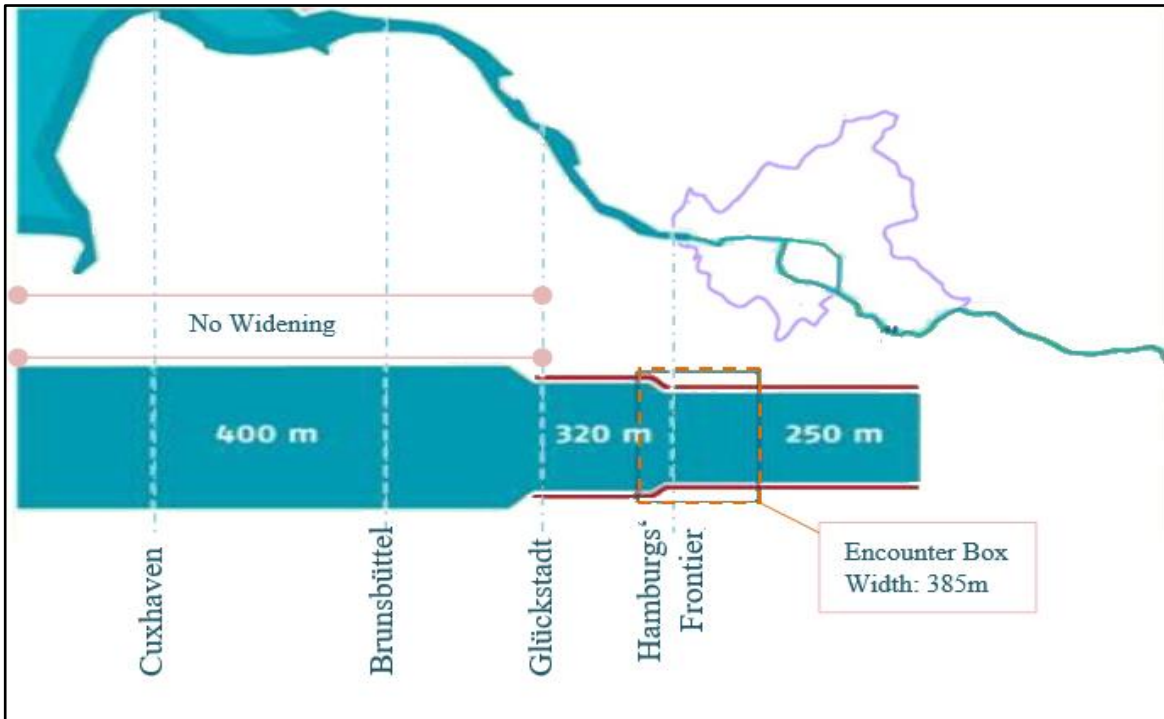


Figure 3. Depiction of the Elbe River Widening Plan as Part of the 9th Elbe River Deepening (Adapted from HPA, 2012b, p. 79).

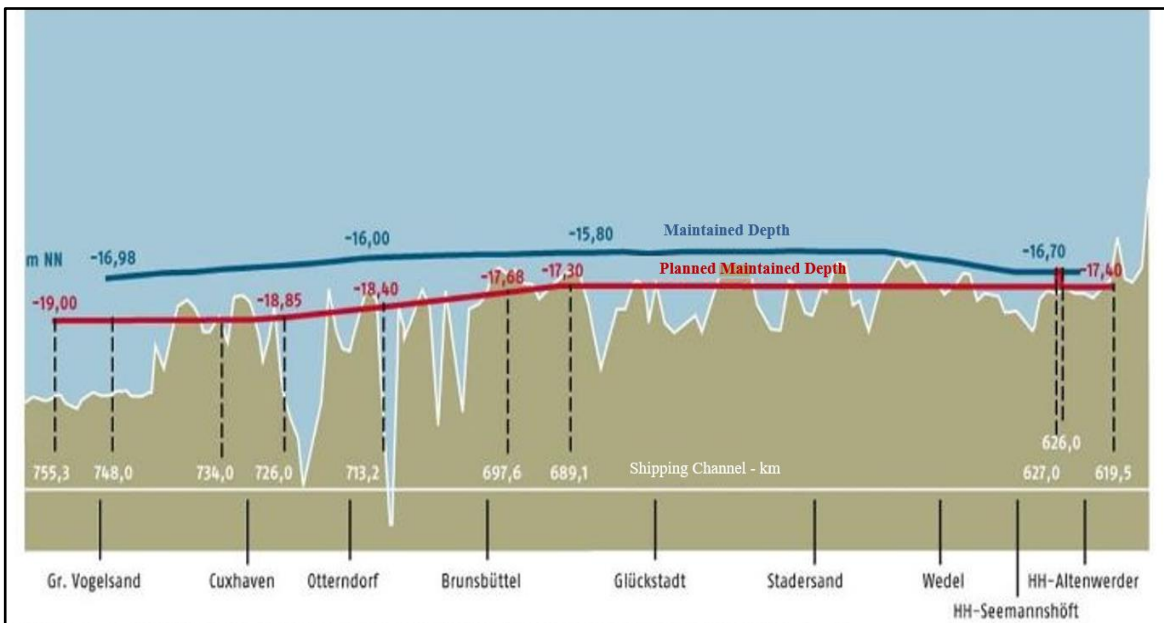


Figure 4. Depiction of the Elbe River Deepening Plan as Part of the 9th Elbe River Deepening (Adapted from HPA, 2012b, p.78).

2.4.1 A Decades-Long Decision-Making Process

Just like other ports around the world, Hamburg has a long history of dredging to drive the dominant idea of development forward (Gustafson, 2020). As illustrated in Figure 5, Hamburg has experienced eight river dredging events prior to the latest dredging, with increasing dredging depths over time.

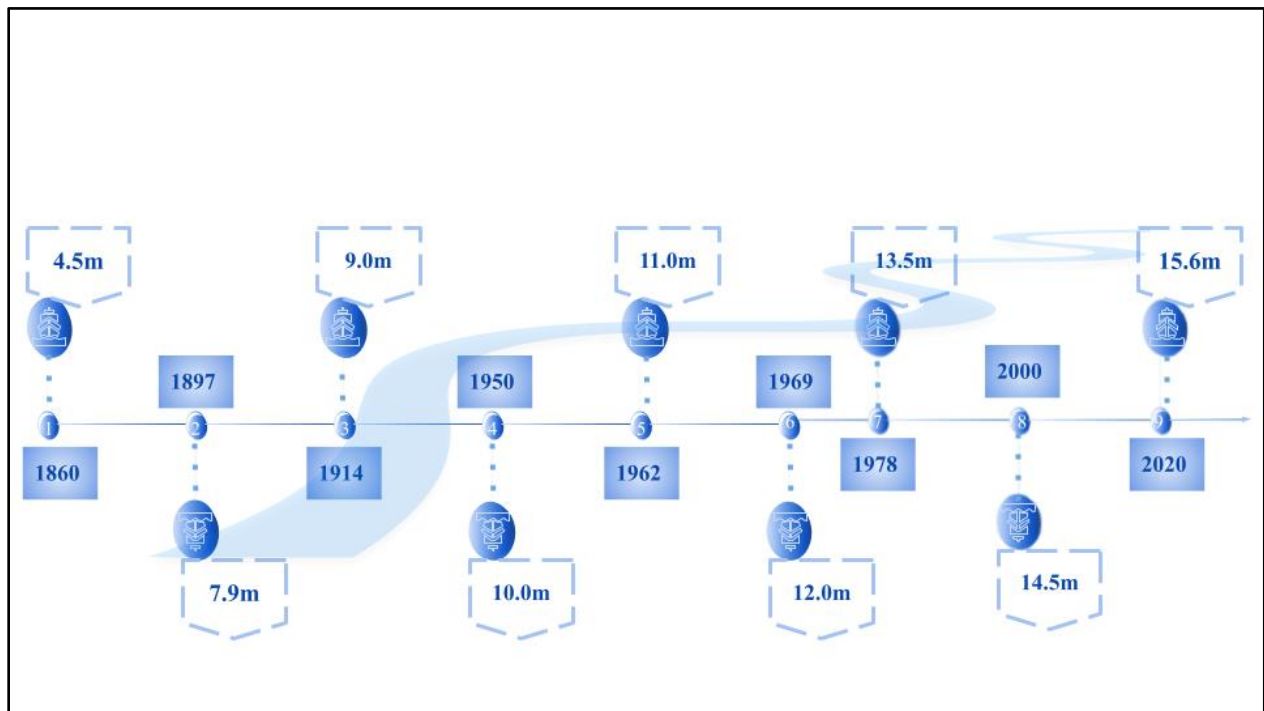


Figure 5. Hamburg's History of Riverbed Dredging in Depth per Metres from 1860 to 2020 (Own creation)

Plans for a 9th Elbe River deepening started right after the finalisation of the 8th dredging project in the year 2000, when Hamburg applied to the Federal Ministry of Transport for further channel deepening measures in 2002 (see Figure 6). Five years later the project plan has been publicly displayed - after the application for plan approval procedure and after the conduction of supporting feasibility studies. In response to the publics' opportunity to share their reflections and positions on the publicly displayed plan, three editorial changes in the planning documents were added into the project plan over the years. The last changes to the planning documents resulted in the approval of the project plans in 2012, which was in turn contested by thirteen appeals from individuals, NGOs, cities, municipalities, and other unions in front of the Federal Administrative Court as a reaction to the approval. In response to these appeals from opposing actors, three supplementary planning documents followed to "eliminate shortcomings" (HPA, 2020, p.3); the project, however, was not overturned. Dredging works in Hamburg started in the year 2020 and were concluded in February 2022 (HPA, 2020).

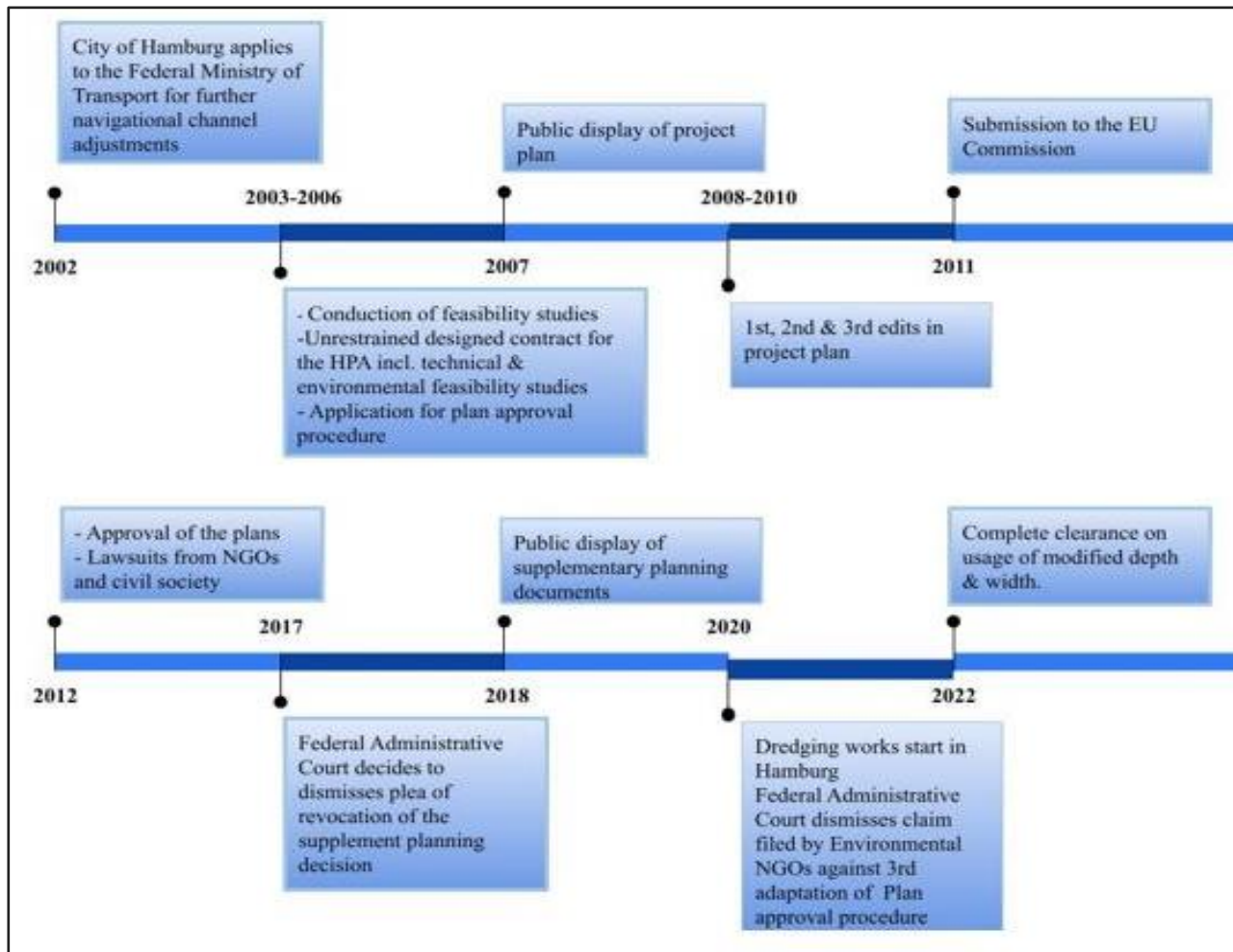


Figure 6. Simplified Timeline of Project Planning Events from the 9th Elbe River Dredging in Hamburg between 2002 and 2022 (own creation based on Hamburg Port Authority, 2022)

2.4.3 An Infrastructural Project of Contestation

Other scholars have contributed to the effort of confronting the dominating technocentric research of dredging in Hamburg (e.g., Feldt, 2009; Gustafson, 2020). Gustafson (2020) has for instance, explored the question of how sedimentation affects socio-ecological struggles in the urban landscape of Hamburg by applying the concept of metabolic rift to the case. Amongst other things, he argues that dredging creates distributional issues that work politically for some, but for some it does not. These distributional injustice issues are in stark contrast to the success-oriented development plan of the port city whose implementation finds reflection in the 9th Elbe River deepening project.

Various environmental groups are amongst those who have been actively advocating against the dredging project, most prominently the Nature & Biodiversity Conservation Union (NABU), the World Wide Fund for Nature (WWF) and Friends of the Earth Germany (FEG), who have joined their resources and combined interests against the project by creating an alliance. Other regional environmental societies have also formed in light of the infrastructural project decision-making process. The Regional Alliance Against Elbe Deepening (RAAE) as well as the Registered Society of Save the Earth (STE) have also addressed the uneven distribution of environmental impacts on the community and nature (Feldt, 2009; Gustafson, 2020). The impact of the sediment management on the waterscape of the Elbe River in Hamburg has been foremost addressed, highlighting the deterioration of the entire ecosystem leading to biodiversity loss due to the direct environmental impact into the hydrologic and geomorphic processes of this sensitive waterscape, despite the compensatory efforts (Gustafson, 2020).

In a reaction to the aforementioned ecological deterioration of the Elbe system that affects both present and future generations, other affected people have taken a vocal stance against the project. Local fishermen have historically experienced the consequences from past dredging projects and share now a heightened concern about maintaining their livelihoods in respect to the current dredging project and associated biodiversity loss and habitat destruction. Fruit farmers along Hamburg's coast fear the decrease in water quality, following the disruption of the natural boundaries of the river Elbe. The concern of sea water intrusion into drinking water and irrigation devices was one of the main pleas within the claim making against the dredging project (Gustafson, 2020).

3 Theoretical Framing

In this section of my thesis, I describe the theoretical framework that I use to conduct my research. Prior to exploring the intersection of environmental justice and science & technology studies that I am applying to my analysis; I am introducing the theoretical concepts of environmental justice and science and technology studies consecutively.

3.1 Environmental Justice

An essential analytical concept of contemporary urban political ecology is the concept of environmental justice (EJ) (Robbins, 2019). The terminology rose in popularity in the mid-1990s in Western European countries and expanded both in practice as well as academically but came originally from the United States

of America (Svarstad & Benjaminsen, 2020; Walker, 2010). Though it is both a social movement as well as a concept for analysis, I will use it for the latter purpose in my research. This critical tool grounds on the historically encountered phenomenon that the current political regime unequally distributes most of the environmental and social externalities among those who are powerless - most of the time from marginalised, excluded, or misrecognized groups made up of certain racial communities, gender types, and the urban poor (Bell & Carrick, 2017; Faber, 2017; Holifield, Chakraborty & Walker, 2017; Robbins, 2019; Walker, 2010). Thus, it is “political authority, power and influence” that dictates environmental decision-making (Bell & Carrick, 2017). Further, EJ criticises the political ideology behind the neoliberal driven political arena that orients itself on the individualistic and capitalistic interests of companies and corporations in the global market (Faber, 2017; Harvey, 2005; Holifield, Chakraborty & Walker, 2017). Phenomena that experience EJ issues are unique dynamic systems of high complexity in which political and economic forces are at play (Faber, 2017). EJ studies mainly focus on case studies that analyse power relations in the decision-making process and/or assess decision-making processes. EJ holistically aims to address several issues within one framework and is primarily drawn from democratic theory (Bell & Carrick, 2017; Taylor, 2000; Walker, 2010). A general claim of EJ studies is that the less power a community or group has, the more vulnerable it is when it comes to mitigating or adapting towards the negative externalities threatening these communities (Faber, 2017).

Acknowledging the vast extent of EJ concepts and framings, my thesis will draw from the development of Schlosberg’s (2007) EJ framework which focuses on four main aspects of EJ by drawing on justice theorists such as J. Rawls, N. Fraser, A. Sen & M. Nussbaum: Distributive justice, procedural justice, recognition, and the potential of capability development. The different forms of injustices are not mutually exclusive from each other, but are rather intertwined, dynamically reinforcing and maintaining each other’s impact within the socio-ecological environment of the specific case in question. Even though EJ is pluralistic, the different aspects can be theoretically analysed and explored separately from each other (Bell & Carrick, 2017). Schlosberg (2007) further stresses to expand the term of EJ with the concept of ecological justice, thus creating a more holistic discourse of EJ that combines social justice with environmental sustainability and addresses the human and non-human realms (Bell & Carrick, 2017; Schlosberg, 2007; Svarstad & Benjaminsen, 2020).

Distributive justice is concerned with the distribution of negative and positive externalities of environmental decision-making in an EJ setting (Schlosberg, 2007). This aspect of justice, which derives

from the theories of John Rawls, represents the traditional backbone of EJ scholarship. The majority of its application concerns itself with the question of what is distributed and the analysis of who is affected by it (Bell, 2004; Schlosberg, 2007; Svarstad & Benjaminsen, 2020; Walker, 2012). Whilst the theoretical conception of distributive justice is still finding common application in quantitative and spatial analysis, scholarly discourses led by Young, Fraser and Honneth within the EJ field have argued that not only distributional injustice of a phenomenon should be considered but rather also the investigation of the mechanisms that “construct” maldistribution (Schlosberg, 2007, p.4).

Procedural, or as it is also termed, participatory justice, is one of the additional key elements contributing to the concept of EJ (Schlosberg, 2007). It is defined as the (cap)ability of affected people to participate in the meaningful process of decision-making in an equal and just way, which also includes the prerequisite of informed decision-making in both directions, top-down and bottom-up approaches (Ottinger, 2017; Schlosberg, 2007).

Justice as recognition is finding its basis on the theoretical contribution of N. Fraser (2001), which emphasises the necessity of social recognition for a just and equal representation of society regardless of race, gender, class, or ideology in the decision-making process, thus recognising their individual identity as well as their knowledge (Ottinger, 2016; Schlosberg, 2007).

The potential of capability development in EJ studies is grounded in the capability approach theory as introduced by A. Sen and M. Nussbaum, which conceptualises the argument that for an EJ practice, peoples’ capability to participate in the decision-making process is interrelatedly linked to the recognition and distributional consequences of the political ecology at play (Day, 2017; Schlosberg, 2007).

3.2 Science & Technology Studies

Science & technology studies (STS) confront the questions of how science and technology influence the social sphere, and vice versa, in a world that faces immense environmental, social, and economic uncertainties; a world in which technologies as well as socio-technological infrastructure are driving inequity (Law, 2016; Ottinger, 2013). STS is an interdisciplinary field and as such draws from various fields of studies such as democratic political theory, feminism theory, discourse theory and Actor-Network-Theory (Farías & Blok, 2016; Law, 2016). Within the recent decades, STS has had a high impact on various

interdisciplinary fields of studies particularly in the urban landscapes including environmental movements, global economy and in the indigenous ways of knowing (Farías & Blok, 2016; Law, 2016).

STS research is generally solution-orientated with an emphasis on community-based, scientist-activism and just-oriented paradigms. The claim of STS is that the use of hegemonic knowledge creates an unjust system where some versions of truths or facts are acknowledged whilst the others are delegitimized by the hegemonic discourse, especially in light of controversies. STS perceives that knowledge and truth are created within a social background that is characterised by absolute and discrete peculiarities (Ottinger, 2018; Walker, 2010). Knowledge, truth, and science are thus “irredeemably ideological” (Law, 2016, p. 33). In other words, STS views that science cannot be objective but instead is political, which is explicitly and implicitly visible to the social world, and demands a rethinking of the “social contract between science and society” (Blok, 2007, p. 163; Hacket, Parker, Vermeulen & Penders, 2017; Law, 2016; Ottinger, 2017). STS argues that the power of science is used in hegemonic discourses and legitimised by those in power as the main, and sometimes only, source of knowledge acquisition whilst other knowledges such as community knowledge are being left out in the inclusion of decision-making in environmental affairs. It is therefore concluded that “scientific facts are not discovered” (Frickel et al., 2010, p. 446) but rather created; a phenomenon which has been described as “a systematic non-production of knowledge” (Frickel et al., 2010, p. 446). The scientization of politics is thus, an “increasingly organised, institutionalised and managed form” (Hacket et al., 2017, p.764) creating and influencing the social world (Blok, 2007). STS therefore offers multiple approaches in how to explore which knowledge claims have been dominant in the hegemonic discourse of those in power as well as which of them gets misrecognized, misunderstood, and undone (Frickel et al., 2010; Moore, Kleinman, Hess & Frickel, 2011; Ottinger et al., 2017). The latter concept, undone science, encompasses information that is unfunded, incomplete, or unacknowledged by the elite and can be used as a strategic manoeuvre to suppress counter-knowledge that is questioning their political position towards a phenomenon (Ottinger et al., 2017; Proctor, 2008). The knowledge gaps that emerge from this are interlinked with the struggle of competing and disadvantaged groups/communities to participate in the creation of alternative research agendas that could have promising social benefits, which considering STS, are inherently linked with techno-political decision-making as such (Frickel et al., 2010). In a political context, contentious issues of equity and justice are frequently removed from public debate by transforming them into narrower scientific questions. However, Law (2016) also emphasises the fact that even though we might be able to unravel the different interests at play and how it shapes science and technologies, it does not reveal the legitimacy of the

produced science. Thus, this field of study helps to identify and highlight other knowledge systems and how they have been handled in the current governance regime which has been previously “systematically devalued” (Ottinger, 2017, p. 92). Although STS addresses epistemic concerns and thus complements the framework of EJ, further research is required to address the gap of true errors in knowledge claims (Ottinger, 2017).

3.3 Opening a Blackbox: Science & Technology Studies for Environmental Justice

To gain a deeper understanding of the injustices within the environmental decision-making of the Elbe River in Hamburg, I would like to draw on insights from STS on EJ aspects by analysing how scientific knowledge production practices, and expert knowledge shapes an unequal landscape of EJ (Frickel et al., 2010; Ottinger et al., 2017; Ottinger, 2017). Using the lens of STS supplements the aspects in procedural justice thoughts in EJ in which it further argues that procedural justice cannot be attained if the information available on the environmental decision-making topic is suffering from explicit and implicit knowledge gaps in science regarding the matter (Ottinger, 2017). Hence complementing procedural justice aspects by investigating how knowledge claims are constructed, presented, legitimised, distributed, and recognized in the techno-political decision-making process and how this process is interacting within the community level is of relevant importance (Ottinger, 2017; Ottinger et al., 2017). In fact, I argue, along with a growing number of other STS scholars, that STS vitally contributes to the epistemic conceptualization of environmental injustices and as thus should be integrated as a distinct component into the framework (Fan, 2016; Ottinger et al., 2017; Williams & Moore, 2019). In relevance to my study, STS investigates the social and epistemic underpinnings of hegemonic and counteractive knowledge claims which empower, or discredit proposed knowledge claims (Ottinger, 2017).

Present scholarship combining EJ with the lens of STS studies has mainly focused on North American case studies (Frickel, Gibbon, Howard, Kempner, Ottinger, & Hess, 2010; Ottinger et al., 2017). Even though the initial interdisciplinary research of STS and EJ has primarily focused on structurally disadvantaged groups, it has widened its scope to scenarios where communities do not occur to be structurally disadvantaged (Ottinger et al., 2017). Despite studies existing, the need for concrete case studies to further the understanding of how procedural and epistemic aspects within EJ and STS interrelate remains crucial for future scholarship (Mendes Barbosa & Walker, 2020; Ottinger et al., 2017).

I believe my case study of dredging in the Elbe River at Hamburg port area would benefit greatly from the combinations of this theoretical approach to explore and understand the injustices of the river dredging project on a deeper level. Based on the findings in this chapter, I deduced the following theoretical framework that I will use to explore my data with (see Figure 7).

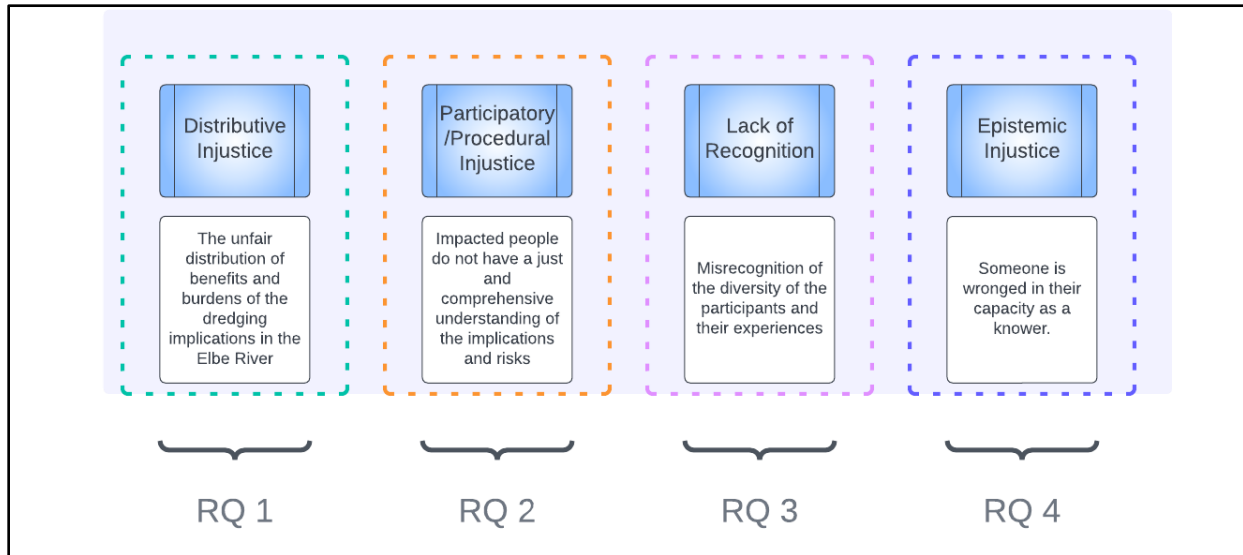


Figure 7. Theoretical Framework Combining EJ elements with STS's Concept of Epistemic Injustice (Own creation)

I am consciously excluding the aspect of capability development as a distinct element to my theoretical framework for my analysis, instead I will complement the three elements of the EJ framework, distributional justice, procedural/participatory justice, and recognition, with epistemic justice. I argue that this combination of elements is more suitable to address my research question and aim of producing this thesis, because the aspect of epistemic justice explores the underlying structures of actors and government on a more profound level; one that enables me to explore the complexity and structural root causes of environmental injustices experienced within this phenomenon (Ottinger, 2017; Svarstad & Benjaminsen, 2020; Williams & Moore, 2019).

4 Methodology

In the previous chapters I framed the case and developed a theoretical umbrella. I now develop the contextual framework which provides methodological sound guidance to explore environmental injustices in the context of the 9th Elbe River dredging in Hamburg.

4.1 Research Design & Positionality

For my research questions, I chose the case study design which is characterised by focusing on the complexity of a location and is primarily associated with qualitative research (Bryman, 2016). Fahy & Rau (2013) criticise a major obstacle in conducting research in sustainability science, which is the lack of recognition of the researchers' world views when it comes to methodological choices and its respective clarity, particularly when it comes to interdisciplinary projects such as this thesis. Social science is generally subjective (Diefenbach, 2009). It is thus of great importance to make my own inherent background explicit (Pyett, 2003). Nonetheless, it is eminent to contest these assumptions by asking myself critical questions throughout the research process, whenever I deem it suitable (Diefenbach, 2009). Depending on how we evaluate material and social conditions, it will influence the way we communicate the findings of the conducted research. Therefore, the reflexivity of my worldview as the conducting researcher is of crucial importance to increase credibility, legitimacy, and saliency of my research (Cash et al., 2003).

I am taking a constructivist approach which practices the worldview that there are different realities of truths, and that truth does not exist without meaning and experiences (Archibald, 2020; Creswell, 2009). Truth, in the constructivist paradigm, is subjectively dependent on the observer's perception of a phenomenon. The observer is the carrier of knowledge who is "intelligent, reflective & willful" (Moses & Knutsen, 2019, p. 10), but who in practice is conditioned by the society with whom the individual is interacting over space and time (Moses & Knutsen, 2019). Hence, I aim to explore the complexity and the dynamics of truths of the respective actors towards the phenomenon studied (Creswell, 2009; Moses & Knutsen, 2019). In line with the constructivist approach, it is therefore important to analyse case specific phenomenology with the potential to compare it to other related case studies to generate further insights on this phenomenon, whilst at the same time, being critical towards the asserted certainty of the facts presented within the dominant discourse (Moses & Knutsen, 2019).

Acknowledging the fact that every harbour has its own and unique socio-ecological context, as well as their associated challenges and opportunities in their respective fields, the general challenges towards sustainable development remain similar (Carpenter & Lozano, 2020). However, it is crucial to acknowledge the dynamics and complexity between every waterscape and the interaction between its social, cultural, and environmental parts across its entirety, and to bear with that in mind that no single

solution can be applied, and that every situation and place is unique and faces its own unique problems, thus requiring its own unique solution (Meyer, 2020). With this ontology I intend to expand our morals, sympathies, and political understanding of the different realities at play and how they affect governance and EJ issues in this regard (Moses & Knutsen, 2019). I intend to use a qualitative approach in this study to explore my aforementioned research question through inductive and deductive reasoning to analyse the interviewed actor's perception of the truth in regard to decision-making in the context of the 9th Elbe River deepening in Hamburg (Creswell, 2009).

4.2 Semi-Structured Interviews

In line with my case study design, I used qualitative semi-structured interviews as a data collection method. Semi-structured interviews are a list of questions, guiding the interview in a certain direction (Kallio, Pietilä, Johnson & Kangasniemi, 2016; Wengraf, 2001). Semi-structured interviews are particularly useful because they are enabling the interviewee to participate in the data development when the researcher is asking a mixture of explorative, probing and follow-up questions, which are both semi-prepared and semi-improvised, thus, creating a certain degree of flexibility (Kallio et al., 2016; Wengraf, 2001). A certain level of previous knowledge in this topic is required to obtain rich and detailed answers and to use this knowledge for a “structural, logical and coherent” (Kallio et al., 2016, p. 2959) analysis (Bryman, 2016; Kallio et al., 2016; Wengraf, 2001).

4.2.1 Participants & Data Collection

Prior to choosing the respective interviewees, I made sure these were suitable for the problem I seek to investigate. Following Fans' (2016) urge to explore “the practical experience of a community, especially the voices, knowledge claims and perspectives of those involved in activism” (p. 426), I aimed to select various actors that have been presented in chapter 2. A comprehensive table on the reasonings of my selected interviewees can be found in Table 1. To me as an active agent of knowledge production, it was important to get data from actors who have been locally impacted by the decision-making process of the Elbe River deepening, and whose perception I would like to explore in the realm of environmental injustices. Interviewees were questioned on the main themes to enable the participants to talk freely about their views on certain areas of interest. The purpose of the follow-up questions was then, if necessary, to steer into a certain topic and, or, to make the main theme more comprehensive for the interviewee (Wengraf, 2001). I held nine interviews which lasted between 24 and 114 minutes in the

period of October 2020 and March 2021. In consideration of the current restrictions regarding COVID-19, two interviews were held in person, five over video conference and an additional two over the phone. A general version of the interview guide I used can be found in Table 2 in the appendix A.

Table 1. Overview of Selected Interviewees

Acronym	Interviewee	Reasoning of Selection
FEG	Friends of the Earth Germany (German: Bund für Umwelt und Naturschutz)	Exploring insights into the perspective of a nationally acting registered society.
EF	Elbe Fisherman	Exploring insights into a group that has a strong cultural and historical relationship with the Elbe & uses the rivers' ecosystem services to sustain their livelihoods for generations.
FF	Fruit Farmer	Exploring insights into a group that uses the rivers' ecosystem services to sustain their livelihoods for generations.
HPA	Hamburg Port Authority	Gaining insights of the perspective of Elbe River dredging from the leading authority.
JO	Journalist	Gaining insights of the perspective of someone who has been an observer of the dynamics of the decision-making process in the public arena for a long time.
NABU	Nature and Biodiversity Conversation Union (German: Naturschutzbund Deutschland)	Exploring insights into the perspective of a nationally acting registered society.
RAED	Regional Alliance Against Elbe deepening (German: Regionales Bündnis gegen Elbvertiefung)	Exploring insights of a community alliance that has been established for the sole purpose of voicing themselves against the Elbe River deepening.

STE	Registered Society of Save the Elbe (German: Rettet die Elbe. e.V.)	Exploring insights of a registered local environmental conservation society that has been actively voicing their insights to the community, particularly through `alternative harbour tours`.
WWF	World Wide Fund for Nature	Exploring insights of a globally acting non-governmental agency.

4.2.2 Data Compilation & Analysis

4.2.2.1. Transcription

After obtaining the data through the recording, I converted the oral data using the software Happyscribe and cleaned it for spelling errors. To increase the reliability of the transcript, I went over the verbatim transcription a second time to inspect for mishearing or misinterpretations. I acknowledge that at this stage, interpretations of the data in the beginning (e.g., setting commas) can already influence researcher bias. However, I decided to not write down elements such as pauses, giggles and sighs and left this part out due to the scope of my analysis (Kvale & Brinkmann, 2015)

4.2.2.2 Analysis

To analyse my transcribed data, I applied a thematic content analysis. The methods' flexible attributes grants "theoretical freedoms" that enabled me to "provide a rich and detailed, yet complex, account of data" (Braun & Clarke, 2006, p.78; Bryman, 2016). This method allowed me to derive themes and subthemes inductively and deductively from the data of the interviews (Braun & Clarke, 2006). To improve the structural distinctiveness of my method, I integrated Braun & Clarke's (2006) "theoretically and methodologically sound" (Braun & Clarke, 2006, p. 78) guideline, as outlined in Figure 8. To improve the credibility of my method, I selected both deductive and inductive approaches. Deductively I chose the EJ aspects and the STS derived epistemic aspect as overarching themes; inductively I produced the sub-themes in respect to the themes developed from my theory. Deciding to identify themes on a semantic level allowed me to preserve consistency as well as transparency of my methods' approach (Kvale & Brinkmann, 2015). After transcribing the interviews, I used NVivo to analyse the obtained information. The initial categorisation of themes was based on the aforementioned background

knowledge and iteratively adapted throughout the process of coding and analysing (Bryman, 2016). After deciding on my methodological framework and, in consideration of my theoretical underpinnings, I arrived at a conceptual framework of my research that represents the structural backbone of my studies under which I seek to explore my research question. A simplified version of it can be found in Figure 9.

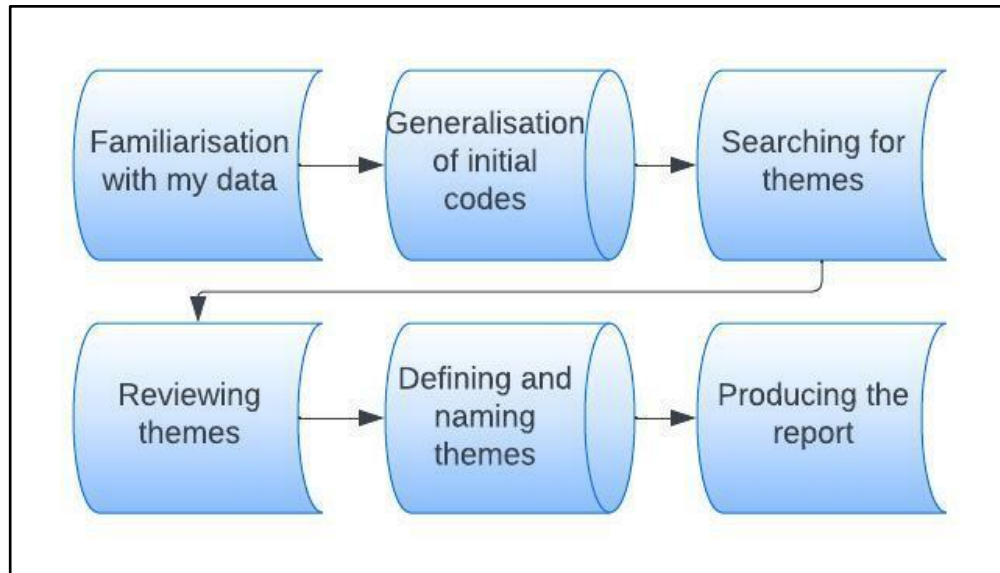


Figure 8. Braun & Clarke's Six-Steps of Thematic Analysis Guide (Own illustration adapted from Braun & Clarke, 2006)

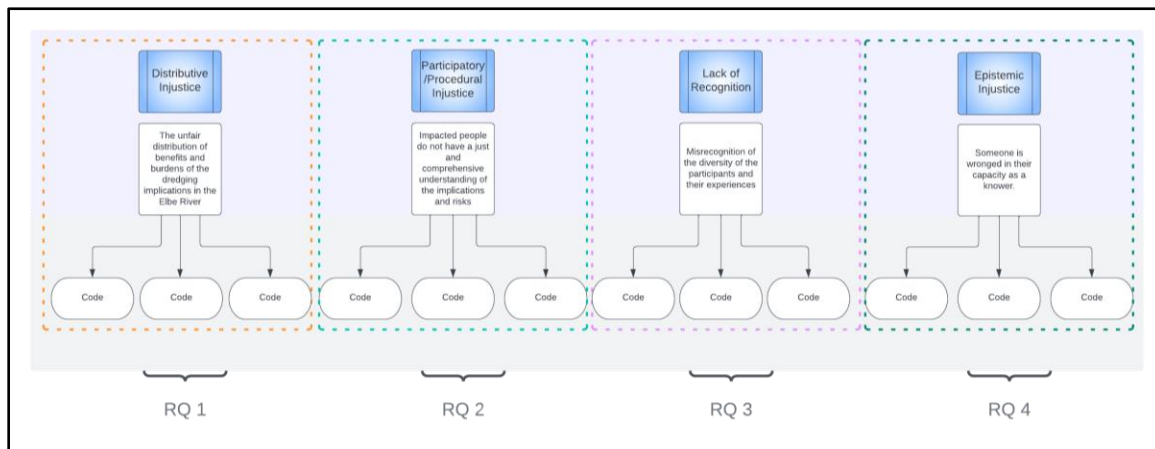


Figure 9. Simplified Version of the Analytical Framework (Own creation)

4.3 Ethical Considerations

Producing knowledge which is as complete and comprehensive as possible without compromising ethical integrity is one of the main focuses of my research; it coheres with the utilitarian ethical perspective (Kvale & Brinkmann, 2015). This entails the embodiment of a morally accountable and trustworthy scientist who is characterised by integrity, empathy, sensitivity, and commitment towards ethical issues. To increase consistency in these aspects of my study, I carefully aligned my ethical considerations with Kvale & Brinkmann's proposed protocol "Consent, Confidentiality and Consequences and the Researchers' Role" (2015, p. 91-97) through every step of the process of creating knowledge. Subsequently, the interviewees received the information of informed consent and confidentiality in the beginning of the interview, and I recorded their consent. A detailed description of informed consent and confidentiality can be found in the interview guide in Table 2 appendix A.

Competent interviewing craftsmanship requires the production of knowledge but also "the improvement of the human situation investigated" (Kvale & Brinkmann, 2015, p. 85). Ways of improvement within the scope of my interview could be empowerment, emotional release, development of new capabilities and co-production of knowledge. Lastly, the interactive process of knowledge sharing and knowledge production through interviewing requires careful reflection on quality criteria. Within the proposed protocol of Kvale & Brinkmann (2015), quality criteria of an interviewer have been proposed, which I aimed to integrate. Respectively, quality criteria were the following: to be knowledgeable, clear, gentle, and sensitive, open, steering, critical, remembering and interpreting. A more comprehensive understanding of these criteria can be found in Table 3 in appendix B.

4.4 Snowball Sampling

As a complementary method I used the snowball sampling technique, which is described as a "purposeful collection method in qualitative research" (Naderifar, Goli & Ghaljaie, 2017, p. 2). It relies on reading information based on the recommendation from the previous source (Dudovsky, 2019). This technique was used throughout the process of research to obtain background information relevant in other steps of this research (Diefenbach, 2009).

4.5 Limitations of Methodology

Within social sciences, qualitative interviewing is notorious for its limitations. It is, therefore, important to be aware and reflective of these limitations and their impact on the research project (Kvale & Brinkmann, 2015). Regarding my choice of using a case study design for my research, it is important to note that in the matter of the “external validity and generalisability” of my case and its results, it does not function as representation for other cases such as historical dredging events or dredging events in another region of the world (Bryman, 2016, p. 69).

In respect to the conduction of the interviews, several points of limitations must be considered. Firstly, I am aware that only those who are selected to be interviewed have the possibility to share their knowledge and information and thus affect the conclusion of my research (Diefenbach, 2009). Only interviewees selected have the opportunity to put forward their worldviews and, therefore, influence the outcome of the research (Diefenbach, 2009). Secondly, due to the pandemic, I held different types of interviews - in person, through telephone and by videoconference. For me as an interviewer it was important that the interviewee felt comfortable, particularly throughout the knowledge production process. As Gillham (2001) points out, the interviewees would feel more open to discuss the topics mentioned, if they had the opportunity to choose the interview style, thus creating a sentiment of equity. This conceptualisation urges the interviewer to be flexible and adapt to the individual needs of the interviewee to achieve this atmosphere (Herzog, 2012). However, it is important to acknowledge the impact of the different types of settings available during an interview, since it does affect the interactions between interviewee and interviewer, which subsequently influences the knowledge that is produced (Herzog, 2012; James & Busher, 2012). Bryman (2016) notes that interviews held over the phone reduce the risk of interviewer bias, where interviewees respond to certain characteristics of the interviewer when they would meet in person. Furthermore, a non-face-to-face interview can also increase the possibility for an interviewee to respond more freely (Rheingold, 1994). On the other hand, the interviewer is limited in responding to observations of, for example, facial expressions that indicate confusion or discomfort, thus decreasing another dimension of interaction between the interviewer and the interviewee. In general, Kvale & Brinkmann (2015) note that it is important to acknowledge the effects of “body language, tone of voice, types of questions, empathic versus confronting interviewing styles” (p. 156). Another point of limitation is the differences in the range of duration of the interviews. According to Irvines’ (2011) study about the differences on the interview setting, face-to face interviews seem to be longer than those conducted on

the phone and suggested that a potential reasoning for that could be that less elaboration and details are being provided. Albeit experiencing outliers, in terms of the duration of time within the held interviews, I discovered they were not associated with those categories. In the same article, Irvine (2011) also argues that even in her comparative study it is difficult to argue what, or to what extent, the individual would elaborate on their answers depending on the setting of the interview.

6 Results & Analysis

In this chapter I am presenting the results of my study and exploring the injustices of the 9th Elbe River dredging in Hamburg based on my data and conceptual framework that I have developed in the previous chapters. Within this chapter I aim to answer my overarching research question: What are the perceived environmental injustices in respect to the 9th Elbe River dredging in Hamburg? A simplified overview of my results can be found in Figure 10.

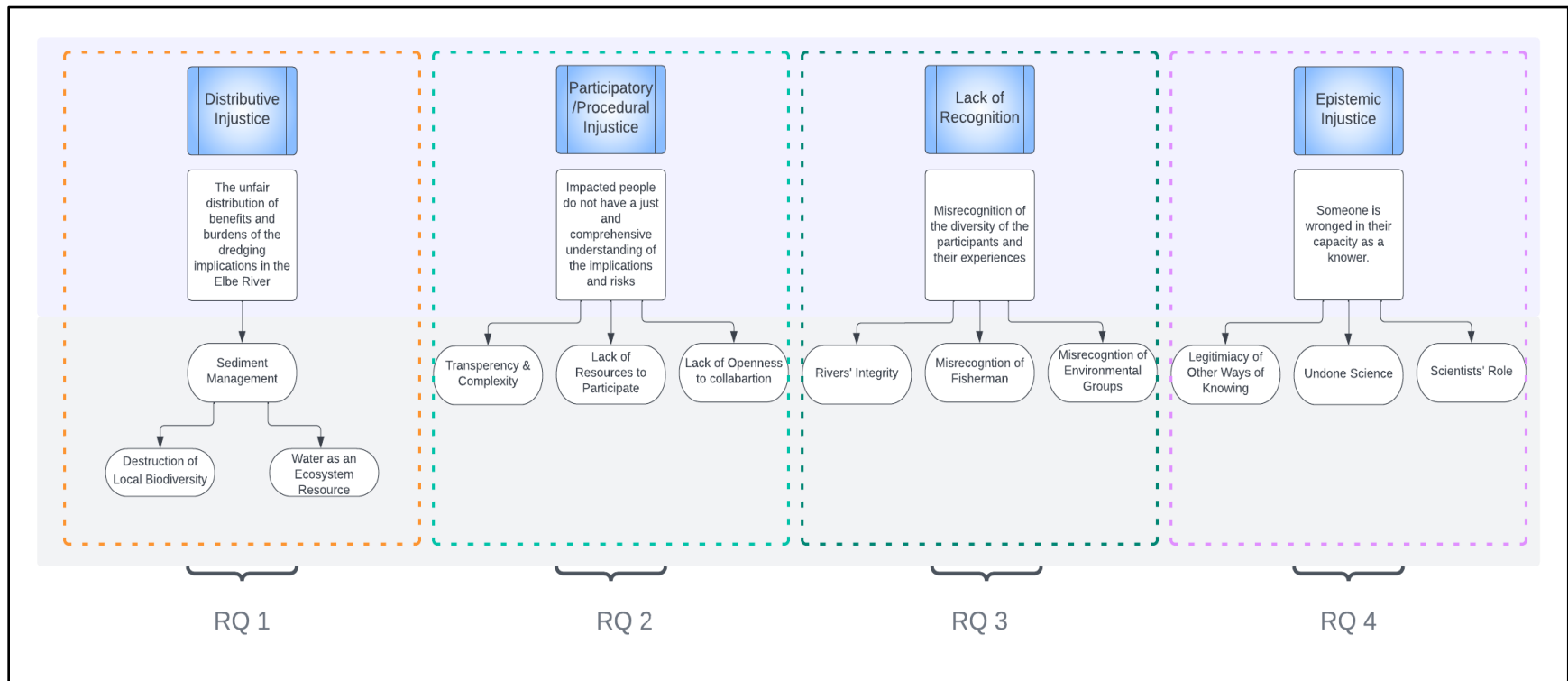


Figure 10. Overview of Results Developed from Thematic Content Analysis and Conceptual Framework (Own creation)

6.1 What are the Perceived Distributional Injustices for the 9th Elbe River Dredging in Hamburg?

As previously mentioned in chapters 1 and 2, other scholars have acknowledged and addressed distributional injustices or their concerns that the 9th Elbe River dredging project create. Nonetheless, I argue that analysing this aspect under the scope of inference of my research contributes to the credibility of previously published research on that case study (Fan, 2016). Analysing the data from my interviews enabled me to confirm and expand the observations Gustafson (2020) has explored and where he claims that “the workings, failures, and social costs of dredging are dependent on the various flows and movements of sediment” (Gustafson, 2020, p.4).

Several interviewees have argued that the deepening of the riverbed had led to a deterioration of the ecosystem due to the direct environmental impact on the hydrologic and geomorphic processes of this sensitive waterscape, despite compensatory efforts. The RAAED explains that “[...]it will be increased tidal pumping. That has already been like this since the last Elbe deepening, so the flood is coming in faster whilst it retrieves slower, and every time sediment remains. [...] That means tidal pumping into the harbour increases.” He further continues those compensatory measures provided by the supplementary planning decision will be “a fight against windmill vines, [...] severe storm floods will be higher. [...] And that means higher destruction of nature.” That the governance of the Elbe River well surpasses the ecological limits of the river has been argued by the interviewed fruit farmer: “One cannot do this and that. One day the Elbe will take revenge”.

The increase in turbidity and speed by which water streams into the estuary directly impacts the functioning of the ecosystem as well as its ecosystem services to the community (Gustafson, 2020). FEG explains that the ecosystem shifts, from an estuary with a distinct halocline to one which is shifting inwards to the estuary, resulting in an increase in salt content in Hamburg’s estuarine waterscape. “We are destroying habitats and thus also the habitat for all plant and animal species” (FEG). One example of this that has been mentioned in all but one of the interviews, is the impact it has on fish species that are affected by it.” The sediment is in constant movement, which leads to turbid water, and this is detrimental for fish. It is exactly as if you would only breathe bad air.” (EF).

The loss of biodiversity that is caused by the dredging in the Elbe River has direct implications on the means of livelihood for local fishermen in Hamburg. STE: “Through dredging, the fish stock will be lowered

to an extent that is [for the fisherman] economically not viable anymore. “We are having strong pressure on the fisheries and are due to that very constricted” (EF).

For the fruit farmer interviewed, this forced shift means a slow loss of an ecosystem service that they have relied upon for generations; regarding climate change and the already experienced impacts of it, such as extreme weather events, it also raises questions of intergenerational distributive injustices. Furthermore, the interviewed fruit farmer shared his perceived uncertainty regarding any future environmental impacts. “For growing fruits, it is essential that the water quality is maintained. And when the Elbe deepening is there, this salinity level is coming ever closer [...]. Because if the water quality deteriorates, we can no longer use it for irrigation for frost protection as well as can’t use it for irrigation in the summer for [the] climate if the threshold values are constantly increasing. [...] Those who do not produce a good quality [of fruits], fall through the cracks” (FF).

Apart from the Elbe ecosystem’s capacity to sustain one’s livelihood, as a fruit farmer or fishermen, recreational ecosystem services such as hobby boating have also been negatively affected by the dredging event in the Elbe River. The fruit farmer, who is also driving a boat on the river as a hobby, describes his experience when he is driving to one of his former favourite places on the Elbe River, the Mühlenbergerloch (German Loch = English hole): “When we are on the Elbe, we go by boat, and you can absolutely see the Mühlenbergerloch. One cannot call it Mühlenbergerloch anymore, by low tide it is a Mühlenberger silt hill, and one can see that the sedimentation is ever increasing”. This up-silting is happening especially outside the shipping channel.

These distributional injustices have all addressed the socio-cultural and socio-economic linkages to the ecosystem of the Elbe and the services it provides. Without acknowledging the importance of staying within the ecological boundaries of our system in the present and future, just sustainability cannot exist and distributional injustice prevails (Agyeman et al., 2016).

6.2 What are the Perceived Participatory/Procedural Injustices in the Decision-Making Process for the 9th Elbe River Dredging in Hamburg?

Although I acknowledge that it is difficult to institutionalise the aspects of incorporating some of the idealistic concepts of procedural justice that have been theorised about, I agree with other scholars that

it is essential to coproduce literature on participatory (in)justice matters to contribute to a participatory decision-making process that is “fairer than usual” (Bell & Carrick, 2017, p.106) (Agyeman et al., 2016).

6.2.1 The Intransparencies of a Complex World

Like most sustainability challenges, the 9th Elbe River deepening in Hamburg is characterised by being highly complex. The interplay between being a technically and scientifically complex problem, whilst being transparent to enable participation in a just and meaningful way, has been a wicked challenge throughout the project and it is indeed a highly subjective matter. Whilst the HPA claims that “we have at least tried to make everything a bit more transparent”, the FEG argues that “the Hamburg Port Authority would perceive that as transparent. Mr. Müller, who is somehow walking in Blankenese on the beach, would perceive it as less transparent”.

For this section of my analysis, I distinguish between the two main periods in time where the lack of participatory justice matters has been commented on quite outspokenly by most of the interviewees, which was the intransparency of information from the project planners in terms of public outreach as well as the intransparency of information during the decision-making process at the jurisdictional level.

Whilst some information has been displayed to the public as too superficial, others have been deemed as too complex, making it difficult for a person to feel integrated into the decision-making process and deciding between “rights and wrong” (STE). This has resulted in some of the members of the public “playing on a hunch” (STE) when it comes to one's own position in the policy-decision-making for or against the Elbe River deepening, “because I cannot decide over something, where I do not have knowledge of or do not have information about.” (FEG). At the court proceedings, again, the interviewed journalist perceived the (cap)ability to follow the process as particularly challenging. He remembered it as follows: “It was a crazy event. There was a whole valley full of experts [...], and it was also very technical. Then it got very detailed. [...] The normal citizens cannot understand that. That means it became increasingly a debate among experts. [...] and there were not really protests in the sense that there were demonstrations.” As demonstrated above, the perception of access to information varies from one party to another but is generally perceived as inadequate. According to Schlosberg (2007), access to information is one of the three principles of participatory justice. Though it is also crucial to distinguish between having access to expert knowledge and understanding the information that has been made accessible to the public. Shrader-Frechette (2002) goes beyond the procedural justice terminology in which community

members do not only have a voice in decision-making, but also the right to informed consent like “medical patients” (p. 44). Schlosberg (2007) agrees that the dominant discourse of expert knowledge might not be sufficient to reach true, or just information participation; a notion that has been experienced by most of the interviewees in resonance to the scientization of politics (Blok, 2007).

6.2.2 The Lack of Resources to Participate in the Discourse of Experts

The clear lack of resources to understand and metabolise the complex techno-scientific information of the Elbe River dredging and its meaning behind it for oneself or the community has been revealed during the conduction of the interviews. This is intertwined with the lack of holistic and transparent information mentioned in the subchapter above. Time is a limiting factor when one needs to understand as well as address the perceived uncertainties to participate meaningfully into the decision-making process. The interviewed journalist remembered the weight of the information by stating: “It would have been an academic study that one had to do, to really understand everything in detail. And so much time, so much time of the other one, is a bit unrealistic [for] normal citizens or also normal journalists”.

Another limiting factor is the resource of money. Though the HPA representative stated that every citizen did have the opportunity to “suit against approval decisions, if one does not agree with it”, the lack of financial resources indicates the constraints to do so in front of court. STE planned to suit against the approval of the project plan but ended up not doing so due to lacking financial means: “[...]But we didn’t do it, due to financial risk. Well, we have put some money aside for cases like these, however, the fee in front of the federal court is much higher”. The equal share of resources to examine information or the lack of it, is an aspect of participatory justice (Hunold & Young, 1998). The lack of such resources as observed above deprives the participants from their “independence and voice” and thus of participating in a just way (Schlosberg, 2007, p. 28).

6.2.3 The Lack of Openness to Collaboration

Lack of openness to collaboration inhibits in its most essential way the freedom to participate in the policy decision-making process of the Elbe River dredging (Schlosberg, 2007). Several interviewees complained that their inclusion in the planning could have prevented the decades-long battle in front of court as well as the lack of participation at the court, as their participation in the court was hinging on their limited economic resources. The planning documents have been opened to the public *after* they have been

conceptualised in which the public can participate. A procedure that has been termed “Pseudo-Participation” by NABU: “We don’t have community participation but instead only community information and afterwards only the opportunity to suit. [...] We would like to participate [...].” The lack of openness to collaboration on the project has also been voiced by the HPA itself, though, with the note that it is an agreement that both parties must agree upon. As the HPA representative explains: “Everyone had the impression that the fronts were so immovable in regard to the Elbe River deepening project [...] I could imagine that in a long-term perspective, it would be best, if we manage to have a more cooperative approach.” Schlosberg (2007) emphasised the necessity for just participation to empower the community by implementing community-based participatory research from the very start of the project's conceptualisation, and “to build relationships with the researchers” (p.70). The importance of such community participation is the ongoing proactive and participatory production of such knowledge as knowledge is not a static concept but is exposed to changes over time (Fan, 2016; Ottinger, 2013).

6.3 What are the Perceived Misrecognitions within the Decision-Making Process for the 9th Elbe River Dredging in Hamburg?

6.3.1 The Misrecognition of Fishermen and their Interdependency of Natures Recognition

Elbe fishermen have experienced a lack of recognition during the decision-making process of the 9th Elbe River dredging. Whilst experiencing the 8th Elbe River dredging in 1999, the German government had juridically proclaimed that Elbe fishermen would be having a more integrated relevance in the future decision-making process of the Elbe governance. However, EF argued that: “This contract is not complied with at all, and the Hamburg senate has not obliged to it, that is not their thing. Generally, one can wipe their buttocks off with this contract [...]. We have no right to say in the matter. On the contrary we are being frowned upon.” “The fishermen rights of actions are astonishingly smaller than the ones for environmental and conservation associations and they have no right of entitlement for the ecosystem service” as (STE) explains. “And even though a family has fished on the Elbe River for 100 years or 10 generations [...], it does not count.” (STE). By ignoring the historically binding contract that acknowledges a degree of status of a full partner in social interaction, it prevents the fishermen from “participating on par with others” (Fraser, 2001, p. 3); A historical pattern of misrecognition of fishermen’s status that “renders invisibility” (Schlosberg, 2007, p. 140; Fraser, 2001).

6.3.2 The Misrecognition of Environmental and Conservation Associations

The lack of respect towards the multifaceted dimensions of the environmental and conservational associations' identity, hinders the environmental and conservation associations from participating meaningfully in the process of decision-making. As the NABU representative explains: "Of course they are only hearing *Oenanthe conioides* [German: Schierlings-Wasser-Fenchel], or *barbastelle* bat, or corncrake. [...] Of course, as an environmental association, one is always prone to be reduced to something that we, under the right circumstances and under the light of the protection of species rights, have the possibility to juridical get through. [...] But that is not our interest, we have the aspiration to be perceived in a more multifaceted way". As Schlosberg (2007) highlights, the need of a community environmental identity to address the misrecognized and ignored identities of environmental supporters and activists is an important aspect of recognition. They are hence denied the status as a "full partner" (Fraser, 2001, p. 3).

6.3.3 The Environmental Misrecognition of the Elbe River as a Distinct Integrity

Understanding recognition in a structural sense allows me to include non-human misrecognition aspects into this analysis (Schlosberg, 2007). Whilst analysing the results for recognition, it has become apparent that the interlinkage of environmental equity and cultural recognition is a central part of recognition within EJ (Schlosberg, 2007). The importance of it is to recognise the uniqueness and integrity of the Elbe River as well as to acknowledge similarities between the human and natural realms of recognition (Schlosberg, 2007). "It is nature [...] and if it doesn't work, it doesn't work anymore. [...] But someday there are limits exceeded." (FF) There is a clear lack of recognising the Elbe River of having a "bodily integrity" in the political decision-making process of the Elbe River dredging (Schlosberg, 2007, p. 136); a kind of integrity that acknowledges the river's resilience and ability to self-regulate, and self-correct (Schlosberg, 2007).

RAED furthers this thought by illustrating the misrecognition of the bodily integrity of the Elbe River by the current project plans: "The compensatory structures will not work, [...] that's just the way it is in hydraulic engineering. This is due to the equation of continuity that the river takes its space. [...] One can imagine a small creek and I throw a big stone in there. Now the following happens: The water has to run past a stone in there. And now at the cross-section, where the stone lies, [it] is smaller than before and behind it, the water is accelerated and slowed down again there. This acceleration increases the force of

erosion and then this erodes, and this goes on until the river made its cross-section everywhere again. [...] The river [the creek] takes back its area and counterbalances the sections of disturbances in another way.”

Recognising the Elbe River as an integral part of the shared community and its capacity to flourish would expand the conception of recognition and benefit the strive to a more environmentally and ecologically just approach of the current decision-making process (Schlosberg, 2007). This kind of ecological sensibility as described by Rodman (1983) would pave the way to go beyond the acknowledgement of recognising nature for nature itself, but also for the acknowledgement of our own selves’, as nature is an integral part of our identity (Hayward, 2001; Schlosberg, 2007). Carse & Lewis (2020) have also argued against the dominant fragmentation of the water bodies functioning and integrity that prevails in dredging projects and further emphasised the need to acknowledge the crucial role sediment transport plays in ecosystems and local livelihoods.

6.4 What are the Perceived Epistemic Injustices Within the Decision-Making Process for the 9th Elbe River Dredging in Hamburg?

In the previous sections I explored aspects of EJ in my researched case study. In this section I am aiming to complement the works of Schlosberg (2007) with the additional approach of epistemic injustice.

6.4.1 The Legitimacy of Other Ways of Knowing

The difficulty for fishermen to participate in a meaningful way is hindered by epistemic injustice issues in which the dominant discourse does not recognize other ways of knowing such as lay knowledge. In the interview RAED highlights this rift by talking about the epistemic injustice of claiming the cultural way of knowing from the Elbe fishermen, and to them sharing their knowledge to participate in the decision-making process, as illegitimate by the hegemonic knowledge discourse. “We can only say what the fishermen tell us. But they don't get the big stage either. So, one could say [to the HPA]: So, now. They [the fishermen] have already said a few numbers of declines. But those are not scientific ones. Data says good, I used to catch so much per hour before. Today I only catch this much or [...] I must fish longer. They then increase their working hours in an attempt to make up for it in this way.” RAED further reminisced about the time when fishermen used to have some kind of power within their knowledge to participate: “Environmental conservation is no longer a question, or less and less a question of spontaneous protest. So, the fisher, who used to catch sick fish out of the Elbe and indignantly dump their full buckets [of the

fish] in front of the environmental protection agency. These are forms of action that were intuitively understandable, maybe for everyone, and of course didn't require a lot of scientific research. [...] But then the trend increased. You have to research it properly and justify it scientifically.” This theme addresses a particular string in epistemic justice, hermeneutic injustice, which is the inability to articulate, and thus participate in the policy-decision-making process, in a way that is deemed legitimate. The question of legitimacy is usually set by those who are leading the dominant knowledge discourse. In this case, as in most other related scenarios, this dominant knowledge discourse is expert knowledge (Ottinger, 2011; Ottinger, 2017).

6.4.2 The Unevenness of Knowledge Production: Undone Science

Epistemic injustice can also shed light on how the dynamics of knowledge production structure information that is being produced or not produced and how participation in decision-making is restricted (Mendes Barbosa & Walker, 2020). In the aforementioned subchapter on hermeneutic justice, I explored the current hegemonic way of how knowledge should or must be produced to be deemed legitimate to be acknowledged in decision-making in the Elbe River deepening in Hamburg. In this section I am illuminating the absences of knowledge which are produced by the reign of epistemic injustice. On several occasions during the courses of my interviews, the participants have shared their way of how environmental impact assessment reports or external case studies funded by the government are perceived as incomplete and lacking an attribute or perspective that would give grounds for a legitimate claim for or against the implementation of the Elbe River dredging in Hamburg. One very distinct example of a perceived systematic non-production of knowledge has been shared and termed by RAED as “alibi function”. The shared studies' purpose was to assess the morphological impact of the sediment transport over time. However, the claims were made that the methodology was not robust enough to adjust for an environment that is especially overtime, characterised by great uncertainty and complexity. RAED: “We must use a different calculation model and we have to take a long-term view if we want to make any statements [...]. We have to take a completely different timeframe. [...] With a forecast period of 2 days, this measure has been approved [...] In Antwerp they are at 90 years of forecast period”. Other systematic non-productions of holistic knowledges have been also mentioned by other interviewees: “Everything that does not fit into the picture will be blindsided and decisions in front of the court will be made, which are based on studies that are 10 years old, which are not state of the art anymore.” (FF) In an international perspective, Adesina & Adunola (2017) have similarly observed that in the case of dredging in Lagos,

Nigeria, scientific assessments will be used to “curtail” the negative impacts of dredging (p.78). Highly publicised hegemonic knowledge claims which have been labelled by FF as “Knock-Out Arguments”, due to their informational impact to influence the informed decision-making of the public - regardless of the fact if counter-knowledge has been systematically not been produced or is getting marginalised (Andersson & Westholm, 2019; Ottinger, 2016). Respectively, we can observe, based on what Frickel et al. (2010) call an “epistemic status of ignorance and uncertainty” (p.6).

6.4.3 The Scientist – Power & Knowledge

Within the previous two subchapters I have looked at epistemic injustices on different levels. I explored how hegemonic knowledge misrecognize and restricts other ways of knowing to participate in the decision-making process of the Elbe River dredging. But I also delved into the unevenness of knowledge production in the shape of undone science.

As previously discussed, expert knowledge is necessary to communicate knowledge claims and to participate meaningfully in the political decision-making process of the Elbe River deepening. However, the possibility of having the freedom to decide whether to participate is being oppressed by the dominating discourse. The theme of the difficulty of producing the data that “stands trial” has been echoed in several of my conducted interviews. For instance, when WWF described the difficulties as an environmental organisation to produce expert knowledge to argue juridically sound against the HPAs planning procedure documents and their associated environmental assessments which were standardised by experts. “[...] We as environmental organisations we have the problem, [...] we could only find a pensioner who calculated hydraulic engineering models for us, because no big institution or company wants to work for environmental organisations, because they are worried, they will no longer get any future project assignments from the other party. I mean we as environmental associations are not such powerful clients, meaning a company like this might not be able to make a living from us in the long term. They also need assignments from the economy. And as long as it is like that, one will not get a just assessments.” (WWF) There are several things to note here about the plurality of this problem. First, one can observe that there is an inclination towards deeming legitimate knowledge production as primarily being conducted by the leading party, due to their economic resources which can pay for the increasingly technocratic and expensive research; resulting in an uneven distribution of power when it comes to scientific knowledge production or non-production (Frickel et al., 2010; Williams & Moore, 2019). A

phenomenon that interweaves a political agenda of “power, knowledge and ignorance” (Frickel et al., 2010, p. 467). Occupying a monopoly of expert knowledge means to hold an obligatory passage point, as Bruno Latour (1993) coined it (Chesta, 2021). A system that excludes counter-experts from participating is thus an epistemic injustice (Williams & Moore, 2019). Second, I argue it is crucial to address the injustice perceived by scientists themselves. In a scenario where scientisation prevails, and is shaped by hegemonic institutional structures, they are deprived of their freedom to choose their contribution to knowledge as they fear the potential loss of professional credibility and economic constraints (Frickel et al., 2010; Ottinger & Cohen, 2012; Ottinger, 2017).

7 Conclusion

This thesis contributes to the explorative research of EJ issues considering “holding course” towards navigational infrastructural development. Furthering the research of other scholars who have analysed distributional justice issues with respect to dredging through semi-structured interviews and content analysis, my thesis sheds light to the underlying EJ issues at play at the decision-making process of the 9th Elbe River deepening in Hamburg. Confirmed with my analysis, perceived distributional injustices of various sorts arise through mechanically changing the natural geomorphic landscape and changing hydrological processes that lead to unsustainable estuarine sediment management; this affects both ecosystem and biological diversity and communities dependent on its ecosystem services. The injustices experienced by the dredging project, however, go well beyond who is the winner and who is the loser.

Participation in the decision-making process is hindered by the intransparency and complexity of a topic that has been increasingly becoming a debate among experts, rendering the quality of informed comprehension of impacts of such an infrastructural project questionable. In a discourse that is dominated by expert knowledge, a lack of resources such as time and money acts as a barrier to the participants' opportunity to justly comprehend and engage in the project. By excluding citizens from earlier stages of the project's development, a democratic and participatory decision-making approach was hindered and resulted in a contentious debate that lasted for over two decades in front of court.

In my study, participating environmental and conservation associations perceive a lack of misrecognition, with disrespect towards them as the tell-tale notion, as they are being reduced and recognised for just a singular interest of theirs, such as the preservation of a singular species of fauna. They shared that this is over-shadowing their multifaceted identity and thus deprives them of the possibility to be recognised as

a full partner in the decision-making process. Moreover, Elbe fishermen are finding themselves misrecognized as well, which seems to date back further than the 9th dredging event. My findings also reveal that misrecognition goes beyond the human realm, as the bodily integrity of the Elbe River is also perceived to be systematically ignored.

The contribution of STS scholarship towards EJ highlights the perceived epistemic ignorance of other ways of knowing as experienced by interviewed NGOs and community groups alike. Whilst still contesting their right to participate in the decision-making process that is dominated by expert knowledge, the lack of resources to enter the expert discourse disempowers their chances of a democratic and participatory decision-making process.

Overall, the way forward towards just sustainability despite a great level of uncertainty is to understand the underlying processes of injustice that hinder democratic and participatory decision-making procedures of a navigational infrastructural project of such magnitude, as is the case that Hamburg exemplifies. Even though the focus is on broadening the depth of our contemporary understanding of the experienced injustices within the 9th Elbe River deepening in Hamburg, this study also provides a way forward (Fan, 2016). I endeavour in my pursuit of contributing to further knowledge production with this study, and to increase awareness amongst involved stakeholders to lead the way forward and change the course towards a more sustainable world.

7.1 Outlook for Future Research

Furthering this research with comparative cross-national context studies to understand the interplay between undone science, community knowledge and technocratic practice in EJ aspects could be a promising step towards the transition to just sustainability (Frickel et al., 2010; Ottinger et al., 2017). Continuing the spatial aspect of future research, I argue that it will expand our knowledge of such complex phenomena if we also look at multiple scales, e.g., how and if the infrastructural project affects environmental injustices in a spatially broader context. With respect to the aspect of time it would be intriguing to investigate how knowledge claims and knowledge production have changed over time. This could be in terms of the 9th Elbe River dredging project which decision process took over 20 years to finalise, or in broader terms the historical dredging events that the city of Hamburg has experienced over time. Lastly, my research contributes to the exploration of a phenomenon in light of environmental injustices. A promising next step towards just sustainability would be to co-produce solutions with the

community. On a theoretical basis it would be beneficial to further develop the concept of epistemic injustice in STS to address true errors in knowledge claims (Ottinger, 2017).

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Appendix A

Table 1. Interview Guide. Questions might have changed to fit the interviewees' background accordingly. (Own creation)

Introduction	
German	English
<p>Guten Tag Herr/Frau _____. Noch einmal vielen Dank, dass Sie sich die Zeit für mich nehmen, um mit mir einige Fragen für meine Masterarbeit durchzugehen. Vorab würde ich Sie gerne informieren, dass dieses Gespräch zum Zwecke meiner Masterarbeit mit Ihrem Einverständnis aufgezeichnet wird. Sollten Sie dies nicht wünschen bitte ich Sie dies zu sagen.</p> <p>Noch einmal zu mir, mein Name ist Dana Dedeck, und ich studiere zurzeit an der Lund Universität in Schweden Nachhaltigkeits- und Umweltwissenschaften. Momentan befinde ich mich in meiner Masterarbeit, welche um die Fahrrinnenanpassung und die Politik ökologischen Diskussionen dieser handeln wird. Hierzu würde ich Sie gerne als Repräsentant der _____ interviewen.</p> <p>Vorab würde ich Ihnen gerne die Formalien über dieses Format erläutern. Wie bereits erwähnt, wird dieses Interview mit ihrem Einverständnis aufgezeichnet. Die Daten werden ausschließlich für meine Masterarbeit verwendet, welche nach erfolgreicher Verteidigung auf der Universität Webseite veröffentlicht werden wird. Ihre Daten können auf Wunsch anonymisiert werden, sodass bei eventueller Direktzitation, Ihr Name damit nicht verbunden wird. Sollten Sie sich gegen oder für eine Anonymisierung entscheiden, können Sie diese Entscheidung jederzeit widerrufen. Möchten Sie, dass</p>	<p>Good day Mr./Mrs. _____.</p> <p>Thank you again for taking the time to go through some of my questions for my master thesis. Prior to the conduction of the interview, I would like to inform you that as part of my master thesis, and, with your permission, the interview will be recorded. If you do not wish to be recorded, you can state it anytime.</p> <p>Back to myself, my name is Dana Dedeck, and I am currently studying M.Sc. in Environmental Sciences and Sustainability Studies at Lund University in Sweden. At present, I am working on my master thesis which involves the deepening of the Elbe River and its political ecological discourses. Hereunto, I would like to interview you as a representant of _____.</p> <p>Before we start, I would like to clarify some formalities of the format of this interview. As I mentioned in the beginning, the interview will be recorded, if you permit so. The obtained data from the recording will only be used for my master thesis, which, after a successful defense, will be published on our universities' website. If desired, the data can be anonymized, resulting in that in case of direct citation, your name will not be associated with the citation. You can revoke from your respective decision anytime.</p> <p>Would you like me to anonymize your data recording? Additionally, it is to say that you are participating in a voluntary</p>

<p>ich sie anonymisiere?</p> <p>Zudem ist zu sagen, dass es sich hierbei um ein freiwilliges Interview von Ihnen handelt. Das heißt, sollten Sie zu einem bestimmten Zeitpunkt verspüren, dass Interview abubrechen bzw. eine der Fragen nicht zu beantworten, können Sie dies selbstverständlich zu jedem Zeitpunkt tun.</p> <p>Haben Sie zu diesem Zeitpunkt noch Fragen oder Unklarheiten?</p>	<p>interview. Thus, should you feel like you would like to stop the interview or do not wish to answer a question, you can of course do so at any point in time.</p> <p>Are you having at this point in time any questions or uncertainties you would like me to clarify?</p>
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Theme	Purpose	Question in German	Question in English
Background knowledge of interviewee/ institution/ NGO	Opening the conversation and obtaining background information regarding the interviewee in question	<ul style="list-style-type: none"> ● Können Sie sich selbst einmal kurz vorstellen? ● Wie sind Sie dazu gekommen beim ____ aktiv zu werden? ● Welche Rolle spielt Ihre Position für Ihre Organisation ● Könnten Sie mir in Ihren eigenen Worten erzählen, wofür ____ steht und was für eine Philosophie dieser vertritt? 	<ul style="list-style-type: none"> ● Could you please introduce yourself and your institution? ● Could you describe the reason of why you became an active member in ____? ● Which role are you partaking in your institution? ● Could you tell me with your own words your institution's philosophy?
Elbe & Development	Introduction of the topic with an open question, followed by probing questions	<ul style="list-style-type: none"> ● Könnten Sie mir in Ihren eigenen Worten beschreiben, welchen Stellenwert die Elbe für ____ hat? ● Wie stehen Sie der Elbvertiefung /Fahrrinnenanpassung gegenüber? 	<ul style="list-style-type: none"> ● Could you describe with your own words, the value of the Elbe River to you and your institution? ● Could you please share with me how you view the deepening of the

	to guide the interview in a semi-structured format.	<ul style="list-style-type: none"> ○ Welche positiven und negativen Aspekte hat diese für Sie? ○ Mit welchen Aspekten beschäftigen Sie sich am meisten? 	<p>shipping channel in Elbe River?</p> <ul style="list-style-type: none"> ○ In your opinion, which positive as well as negative aspects does the project of the Elbe River deepening pose? ○ With which aspects do you think are you primarily involved with?
Management & Development of the harbour and the Elbe River dredging	Ensuring the interviewee has the freedom to explore her/his perception of the phenomenon of the decision-making of the Elbe River with me.	<ul style="list-style-type: none"> ● Wie würden Sie den Prozess der politischen Entscheidungsfindung, welche die Entwicklung der Elbvertiefung geprägt hat, beschreiben? ● Empfinden Sie den Entscheidungsprozess über die Elbvertiefung als Transparent für die lokale Bevölkerung und dessen Akteure? ● Wie empfinden Sie werden die Akteure und die Bevölkerung in den Entscheidungsprozess/ Planungsprozess miteinbezogen? 	<ul style="list-style-type: none"> ● How would you describe the process of political decision-making in the development of the deepening of the Elbe River? ● From your perspective, do you feel the decision-making process has been transparent for the local community and its actors? <ul style="list-style-type: none"> ○ Why do you think that is? ● From your perspective, how do you evaluate the inclusion of the local community and its actors into the decision-making process?
Management & Development of the harbour and the Elbe River dredging	Ensuring the interviewee has the freedom to explore her/his perception of the phenomenon of the decision-making of the	<ul style="list-style-type: none"> ● Wohin sehen Sie die Entwicklung des Hamburger Hafens gehen? ● Wie sehen Sie die allgemeine Hafententwicklungsstrategie des Hamburg Port Authority bis 2025 „Kurs zu halten“? ● Aus Ihrer Sicht, was wäre eine wünschenswerte Entwicklung/ Richtung des Hamburger Hafens allgemein und aus Sicht der 	<ul style="list-style-type: none"> ● Please, describe in your own words the direction in which the development of the harbour is going? ● How do you view the general harbour development strategy of Hamburg to “hold course to 2025”? ● Please, describe in your own words a desirable development of the

	<p>Elbe River with me.</p>	<p>Elbvertiefung hinzusteuern?</p> <ul style="list-style-type: none"> ○ In einem Kurz-Film der HPA, welcher am 24.07.2019 veröffentlicht wurde, spricht Andreas Scheuer, Bundesminister für Verkehr und digitaler Infrastruktur, von der Notwendigkeit des Hamburger Hafens leistungsfähiger zu werden - mit der Verantwortung für das Klima, die Umwelt und der Schöpfung. Wie stehen Sie diesem Zitat gegenüber im Hinblick auf die gegenwärtige Hafententwicklung? ○ Ein Kritikpunkt war z.B. auch, dass der das derzeitige Hafen Konzept, was wir vorhin schon angesprochen haben Kurs zu halten, nicht mit der Zeit des Hafens geht. Dabei wird sich unter anderem auf den wissenschaftlichen Artikel "Die Zukunft des Hamburger Hafens Determinanten, Trends und Optionen der Hafen Entwicklung", des HWWI'S gestützt. Welcher aussagt, dass die Prognosen des Container Wachstums von 25 Millionen TEU für das Jahr 2025 in Realität weiter weit unter dieser Zahl sein. Und dass die momentane Coronakrise dieses weiter mindern wird. Fazit dieses Artikels ist, dass es von Interesse sein, einer breiteren und langfristigen Perspektive zu denken, um Wettbewerbsfähigkeit und Dynamik im Hafen langfristig zu stärken. Wie stehen Sie dieser Haltung gegenüber? 	<p>Hamburg Port and the Elbe River channel deepening?</p> <ul style="list-style-type: none"> ○ In a short video clip published by the HPA on 24.07.2019, Andreas Scheuer, the federal minister for transportation and digital infrastructure argues about the necessity of the port of Hamburg to become more productive- with the responsibility to the climate, the environment, and the creation. - Could you describe in your own words how you view this citation in light of the current development of the harbour? ○ One point of criticism was, for example, that the current port concept, which we have mentioned in the interview before, does not keep up with the times. This argument is amongst other sources based on the scientific article "The Future of the Port of Hamburg: Determinants, Trends and Options for Port Development" by the World Economic Institute of Hamburg. The report states that the forecasts of container growth of 25 million TEU are in reality far below this figure and that the current Corona crisis will further reduce this. The conclusion of this
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		<ul style="list-style-type: none"> ○ In dem Report der HPA zum Hafen Entwicklungsstrategie, den wir vorhin schon erwähnt haben, wird auf Seite 79 benannt "Das Vierfache natürliche und anthropogene Veränderung entlang der Elbe haben in den vergangenen Jahrzehnten das Tide-Regime beeinflusst. Wie versuchen Sie mit den bereits existierenden ökologischen Auswirkungen und den Potenziell folgenden Auswirkungen, insbesondere in Bezug auf das Verschlechterungsverbot und Verbesserungsgebot der Europäischen Wasserrahmenrichtlinie umzugehen? 	<p>article is that it is of interest to think of a broader and long-term perspective to strengthen competitiveness and dynamism in the port. How do you feel about this attitude?</p> <ul style="list-style-type: none"> ○ In the HPA report on the port development strategy, which we have already mentioned before it states that "the fourfold natural and anthropogenic changes along the Elbe have influenced the tidal regime in the past decades. How do you try to address the already existing ecological impacts and the potential of subsequent impacts, in particular in relation to the European Water Framework Directive that prohibits a deterioration of water bodies?
Round-up		<ul style="list-style-type: none"> ● Haben Sie noch weitere Informationen, die Sie mir zu diesem Thema mitteilen möchten? 	<ul style="list-style-type: none"> ● Do you have any further information that you deem relevant to share with me regarding this topic?
<p>Legend:</p> <ul style="list-style-type: none"> ● Open question ○ Probing question 			

Concluding remarks	
German	English
<p>Vielen Dank, dass Sie sich für mich Zeit genommen haben. Ich würde mich freuen, wenn ich Sie zu einem späteren Zeitpunkt, sollten 1-2 weitere Fragen auftauchen, hierfür anschreiben kann. Falls bei Ihnen später Fragen oder Unklarheiten auftauchen sollten, können auch Sie mich selbstverständlich jederzeit erreichen.</p> <p>Tschüss.</p>	<p>Thank you for your time. I would be happy if I have the opportunity to contact you at another point in time, if 1 or 2 more questions should arise during the course of my research. Should any uncertainties or questions arise on your site, you can naturally contact me at any point in time.</p> <p>Goodbye.</p>

Appendix B

Table 2. Qualities of an Interviewer Craftsman (Kvale, S., & Brinkmann, 2015, p. 194)

Knowledgeable	He or she has an extensive knowledge of the interview theme and can conduct an informed conversation about the topic. This interviewer knows what issues are important to pursue, without attempting to shine with his or her extensive knowledge.
Structuring	The interviewer introduces a purpose for the interview, outlines the procedure in passing, and rounds off the interview by, for example, briefly telling what was learned in the course of the conversation and asking whether the interviewee has any questions concerning the situation.
Clear	He or she poses clear, simple, easy, and short questions, speaks distinctly and understandably; and does not use academic language or professional jargon. The exception is in a stress interview; then, the questions can be complex and ambiguous, with subjects' answers revealing their reactions to stress.
Gentle	The interviewer allows subjects to finish what they are saying and lets them proceed at their own rate of thinking and speaking. He or she is easy going, tolerates pauses, and indicates that it is acceptable to put forward unconventional and proactive opinions and to treat emotional issues.

Sensitive	He or she listens actively to the content of what is said, hear the many nuances of meaning in an answer, and seeks to get the nuances of meaning described more fully. The interviewer is empathic, listens to the emotional message in what is said, not only hearing what is said but also what is not said. The interviewer feels when a topic is too emotional to pursue in the interview.
Open	The interviewer hears which aspects of the interview topic are important for the interview, listens with an evenly hovering, attention, and is open to new aspects that can be introduced by the interviewee and follows up on them.
Steering	The interviewer knows what he or she wants to find out and is familiar with the purpose of the interview, what it is important to acquire knowledge about. The interviewer controls the course of the interview and is not afraid of interrupting digressions from the interviewee.
Critical	He or she does not take everything that is said at face value but questions critically to test the reliability and validity of what the interviewees tell. This critical checking can pertain to the observational evidence of the interviewees.
Remembering	The interviewer retains what a subject has said during the interview, can recall earlier statements and ask to have them elaborated on, and can relate what has been said during different parts of the interview to each other.
Interpreting	He or she manages throughout the interview to clarify and extend the meanings of the interviewee's statements, providing interpretations of what is said, which may then be disconfirmed or confirmed by the interviewee.