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MASTER THESIS

NARRATIVES FOR A FUTURE-PROOF CITY: The case of Dordrecht, The Netherlands

Keywords: narrative; narrative analysis; climate change; weather; water; city; adaptation; mitigation

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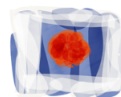**Student:** BENEDIKT MARSCHUETZ

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Towards safeguarding current and future generations from climate change

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Now is the time for action and answering one of humankind's greatest challenges:

we can achieve this all together and make history to enable our very survival

Abstract

Climate change and extreme events brought about by it increasingly threaten an urbanising humanity and imposes the need for adapting to arising challenges and mitigate further climate change due to the limitations of adaptation. Climate action, with many activities depending on behavioural changes, should be centred around people's lives and aspirations for a desirable future to let people identify with these measures and thus let them become part of desired futures, which will be certainly shaped by climate change. One way to elicit such desired futures is to focus on people's narratives, which are in principal stories and shared realities that bind people together, foster interaction among them, and let people make sense of the world they live in as narratives organize their experiences. Narratives unfold around key events, actors, activities, relations between them as well as embeddedness in time and space and are therefore holding crucial implications for future-proofing a place.

Studying narratives within a case study in Dordrecht, an island in the South-Western Dutch Delta, involved authorities and citizens eliciting their narratives around weather and water affecting the city. This research unearthed nine main narrative themes shedding light on the historical struggle of the city with water that is shaping its fate until today. Exposure to water and weather causing threats for Dordrecht that are increasing in their severity due to climate change related extremes and sea-level rise, as well as the vision for a climate resilient and safe future become obvious in the elicited narratives.

This study let both shared and diverging stories among authorities and citizens appear, with the shared underlying motivator of climate change employing a climate threat frame being critical for climate-proofing Dordrecht. Shared narratives involve historical struggles, outlooks for the future as well as both constraints and drivers for collective problem solving. Diverging narratives state specificities of threats and occurring measures to deal with them. Involved authorities are focusing more on water management and detailed strategies to deal with vulnerabilities arising out of climate change and its impacts, whereas inhabitants narrate more holistically on their experiences with weather, water, and mitigating climate change in order to safeguard the future of Dordrecht and its inhabitants. Finally, elicited narratives imply the need for actively involving authorities and citizens in collaborative governance arrangements focusing simultaneously on climate adaptation and climate mitigation to bridge the elicited divergence in this endeavour and act on anthropogenic climate change.

Content

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1. Executive summary

Identified narratives

This research identified <u>nine main narratives</u> by interviewing authorities and stakeholders involved in future-proofing the Dutch city of Dordrecht as well as citizens of the Vogelbuurt neighbourhood that is focused upon in specific. Narrations dealing with weather and water influencing the city and neighbourhood vividly provided insights into the historical embeddedness of them, the major flood disasters in 1421 and 1953 are commonly known by all interviewees. A focus on an ongoing struggle with water that is expected to worsen with uncurbed anthropogenic climate change was though divergently narrated about but employed some shared frames regarding the nature of the perceived threats. Experience with weather and water as well as observed threats are defining features for Dordrecht and a reference to the shared underlying motivator for action, i.e. climate change, could be identified in narrations about vulnerability and future-perspectives by authorities. Citizens themselves narrated richly about their experiences with effects brought about by climate change, with narratives providing guidance for them and thus, climate change and its effects that threaten the island of Dordrecht is commonly named by all interviewees. Identification with the city as an island under threat becomes also obvious in the shared narratives about identity, which can be seen as another reason for action as appearing from the diverging stories about measures to combat various threats. Although this research was focusing on weather and water-related stories and avoided any framing that includes climate change was such nevertheless high on the agenda, with citizens even expressing the explicit wish to both see and conduct climate action through both climate adaptation and climate mitigation as seen in the action narratives conveyed by them. Moreover, climate change is also part of the identified future vision of the city that is both climate resilient and safe.

Future visions

The identified shared understanding of climate change as being threatening and an expressed strive for a safe and resilient future as seen in the joint narratives on future-perspectives hold <u>fruitful implications</u> for collaboration, which has been also commonly narrated about with mentioning both drivers and constraints for collective problem solving. Narratives as stories that allow interviewees to make sense of the world provide structure and guidance, with the shared nature of some stories and frames within offering the possibility for collaboratively addressing climate change that is conveyed as causing worries for the future. In light of this was the strong desire conveyed to keep Dordrecht safe and liveable even with increasingly felt impacts of climate change, which is why a vision of climate resilience and a safe future could be identified within narratives by both authorities and citizens. Realizing this first future vision, a specific action programme is suggested that builds upon the shared understanding of climate change as main threat and implies the fulfilment of the second identified vision of conducting climate action as prominently conveyed. Based on the <u>results</u> of this research and the elicited narratives, <u>four main recommendations</u> can be made, which ought to be jointly implemented in a collaborative effort since they promote each other.

Four recommendations

First, a comprehensive <u>communication strategy</u> on climate action should openly disseminate information about the risks Dordrecht is facing and make obvious the underlying motivator of climate change. Communicating both climate threats as well as a positive picture that evolves when climate action in form of climate mitigation and adaptation is conducted may aid in gathering support for achieving a positive future. Since citizens narrated about observed issues and a lack of action tackling them it ought to be communicated how identified risks are currently dealt with, i.e. focusing on rescuing and safety measures,

how citizens may prepare themselves for major flood disasters, as well as what climate mitigating activities can further reduce carbon emissions that lead to such increasing climate risks in the first place.

Second, jointly developing a vision for Dordrecht that has climate change and water on top of the agenda aims on creating ownership and positive outlooks for the future of the city for both inhabitants and involved authorities. This vision ought to include facts about climate change and its impacts on Dordrecht as well as anticipated futures and narratives as elicited within this research. Such meta-vision for the future is supporting collaboration on achieving it as it is jointly developed, let actors commit to it in the long-term as also suggested by interviewees, and aids in realizing measures to reach an envisioned future brokered by both citizens and authorities. Finally, joint visioning also aids in enhancing awareness for emerging issues around water and climate change and thus support the following concrete climate actions.

Third, concrete climate action around both climate adaptation and climate mitigation expands already occurring activities towards actively incorporating citizens in the neighbourhood and across the city in the endeavour of future-proofing the city in a collaborative way, which was a narrated wish by interviewees. Climate adaptation as already conducted by authorities can be further expanded towards letting citizens contribute and prepare within rescue and safety programs that are aiding survival during an expected major inundation of the city, exacerbated by climate change. Activities causing co-benefits for social structure and well-being in the city were also narrated about, e.g. mandatory swimming lessons and involving children since they are catalysts for change and disseminating information to their peers. Climate mitigation was also named as crucial since partly already conducted by citizens, and thus ought to be taken up and mainstreamed throughout the involved institutions since transformative actions towards climate neutrality are of utmost importance for achieving the envisioned climate resilience. Following up and support such climate actions within policy packages make a systemic realization of climate actions easier to be achieved and scaled up as seen in the last recommendation.

Fourth, juridical and operational policies supporting climate-proofing Dordrecht ought to be developed as also expected by nationally brokered climate policies and make climate action that concretely involves various stakeholders the norm. Communicating and framing policies in line with the results of this research may gather significant support for them. Such policies aim on both mandating and supporting action on climate-proofing while also naming specific problem owners, as well as let climate adaptation and climate mitigation be collectively addressed and strategically implemented. Elicited constraints posed by hindering municipal policies ought to be eliminated in that regard to enable climate action and citizen-involvement. These policies are important to reach climate neutrality and resilience towards already happening and further expected climate extremes and are thus supporting to realize the vision for a future-proof Dordrecht.

Main message

Finally, having elicited the desire for a climate resilient and safe future in the city and active collaboration between citizens and authorities on this endeavour is this research critically supporting place-based climate action in line with the wishes expressed by interviewees. Narratives provided rich insights into both shared and diverging understandings of issues and their remedies and are through their shared nature and the utilized frames offering the possibility to gather the needed support for implementation. While authorities are focusing on strategic water management and citizens more holistically on weather, water and mitigating climate change are narratives and the frames within allowing to realize measures that meet the specific conveyed needs and desires for future-proofing the city. Climate action in form of both climate mitigation and climate adaptation can aid in safeguarding a future for Dordrecht and us all, give a positive perspective to citizens and institutional stakeholders, and let them identify with those measures since they are in line with their own intrinsically motivated desire for a climate neutral and climate resilient future.

2. Introduction

2.1. Societal background and problem

Humanity is living in a climate emergency with anthropogenic climate change being further increasing and thus the extremity of events such as floods and droughts are among the many challenges in this new geological epoch, brought about by humanity, i.e. the Anthropocene (Steffen et al., 2011). Climate change, brought about by humanity's release of greenhouse gases from among others burning fossil fuels, is changing the environment on an unprecedented level and human-induced rising concentrations of Carbon Dioxide (CO_2) in the atmosphere are causing further global warming (IPCC, 2013, 2014b). Changes in climate are also leading to large accumulations of energy in the Earth's climate system, i.e. among others the atmosphere, land and the oceans, and to effects such as warming in all those systems, sea-level rise and loss of ice-masses (IPCC, 2014b). These changes are increasingly affecting humanity's endeavour in various negative ways due to our common intrinsic dependence on the natural ecosystems for our very survival (UN, 2011). Climate change has already now lead to an increase of heat-waves, storms and extreme rainfall, and thus more frequent floods and droughts are particularly affecting places that are already vulnerable towards them, with a further exacerbation expected in case greenhouse gas emissions are not rapidly curbed (Future Cities, n.d.; IPCC, 2013, 2014b).

In agglomerations that accommodate many people are thus potentially large numbers of people at risk if measures to avert such are not taken, especially in places already affected by climate change. The Netherlands, which are focused upon in the present project, are specifically affected by climate-induced changes in the water levels of both sea and rivers as well as other extremes as it is situated to a large extend in low lying areas that are densely populated (Albers et al., 2015; Ligtvoet, van Minnen, & Franken, 2013; OECD, 2010). This imposes ultimately a need for action that is aiming at minimizing climate change, i.e. climate mitigation through abatement of fossil fuel combustion as it contributes mostly to anthropogenic carbon emissions (IPCC, 2014a; Nachmany et al., 2014). Moreover, mitigating climate change is simultaneously reducing the risks brought about by climate change, which is also seen as risk mitigation (White, 2010). Since already occurring trends in climate change and its effects might not be easily stopped though (White, 2010), specifically adaptation to already occurring changes that should happen sooner than later is important for such a place that is already under pressure from climate change (Runhaar, Mees, Wardekker, van der Sluijs, & Driessen, 2012). Adaptive measures are therefore further aiming on risk mitigation and reducing potential hazards to human lives. Generally though, even with adaptation measures taken is additional mitigation of climate change paramount as otherwise widespread disruptions with big impacts are expected to occur, thus affecting the entire planet and humanity, and including the risk of reaching critical tipping points and thresholds in the planetary system, threatening the very habitability for us humans (IPCC, 2014b; Steffen et al., 2018).

With more than 70% of Europe's population being concentrated in urban agglomerations, and in specific 40% of the Dutch population living in 36 cities, thus being highly urbanized and among Europe's most urbanized countries, are especially people living in cities crucial to safeguard our common future and act upon both mitigation of and adaptation towards climate change (Corfee-Morlot et al., 2009; Frankfort, Gehrels, van Nieuwaal, Ruijtenberg, & Palsma, 2015; OECD, 2010). This is accentuated by the fact that large amounts of people are though acting in a path-dependent manner, but a transition towards a more sustainable way of life can also easier penetrate all spheres of life in densely populated areas, which is why urban areas can be also positively contributing towards climate resilience if measures are properly and systemically designed and implemented, taking into account various co-benefits. Nevertheless, urban areas

are facing relatively high risks from negative effects of climate change as it is affecting many people simultaneously since a large amount of artificial areas is able to store more heat, thus leading to heat-islands in cities, and increases surface run-off from water leading to potentially widespread urban flooding during storms and extreme precipitation (Corfee-Morlot et al., 2009; IPCC, 2014b; Ligtvoet et al., 2011; Rosenzweig, Solecki, Hammer, & Mehrotra, 2011; UN, 2011). Thus, climate change is significantly threatening people in urban areas, including infrastructure and urban economic activities through the various outlined impacts, as well as human health since climate induced impacts pose threats to people's health through exposure to heat, pollution or disaster (Revi et al., 2014; Rosenzweig et al., 2011; Runhaar et al., 2012). Considering that Europe is due to a combination of factors already now experiencing on average a larger temperature-increase than the world-wide trend (Wardekker, 2011), dealing with the effects of climate change, among others sea-level rise, becomes even more important. While such challenges increase the need for action at the city-level is a future-proof city also difficult to reach as areas within cities may vary significantly, large amounts of built-space limit potential actions and their scope.

The magnification of climate change induced risks at the urban area makes action on building resilience towards them an important task ahead, i.e. in principal withstanding major disturbances and maintaining vital functions of the city to allow survival of its population in a dynamic way (Bruijn, Green, Johnson, & McFadden, 2007). Thus, climate resilience is crucial and is going to be achieved by both climate mitigation and adaptation, while at the city level co-benefits might significantly add in this endeavour since e.g. urban greening aids in dealing with issues such as heat-stress, floods and air pollution (IPCC, 2014c, 2014a). Urban resilience is therefore needed so as to improve cities' capacities to deal with complex challenges while looking at the entire urban systems and its different components (Revi et al., 2014; Wardekker, 2018). In front of the need for adaptive and mitigative measures are especially old city centres facing challenges in realizing them, especially if they are of significant cultural heritage can measures only be taken individually and in a sensitive manner. Finally, achieving urban resilience is dependent on the many residents too, with many people being both affected by climate change and measures and thus having a stake in the quest of a city that is getting ready for the mentioned anticipated climatic changes. As such are any measures taken to be centred around people's lives and aspirations for a liveable future to be successful in the long-term (Adger, Barnett, Brown, Marshall, & O'Brien, 2012; UN, 2011).

These aspirations become apparent in narratives as they link both stories and events happening in individuals' lives and define their social identities that further guide their actions towards good lives and a desirable future, including participation in climate adaptation and climate mitigation (Bremer et al., 2017; McBeth, Jones, & Shanahan, 2014; Paschen & Ison, 2014; Somers, 1994). Currently though, decision-making for adaptation is mainly happening in a techno-scientific manner and thus may lack local understandings, scope as well as legitimacy and support by citizens (Adger et al., 2012; Bremer, 2017; Hegger, Mees, Driessen, & Runhaar, 2017). With people being central in mitigative and adaptive efforts, cultural dimensions of climate change become important to be considered as well as how problems are socially constructed, expressed and shared (Adger et al., 2012).

Societal problems are among others conveyed through narratives, which are basically stories as seen further below, motivate agency, and link identities with a place and its circumstances and challenges, and thus also motivate people to committed climate action such as e.g. climate adaptation (Adger et al., 2012; Moser, 2014). Moreover, such narratives as they link identities with a place may aid in overcoming a lack of ownership and identification with adaptive measures (Paschen & Ison, 2014).

Focusing in specific on the Dutch city of Dordrecht, situated in a Delta prone to flooding as it is totally surrounded by water (Trans-Adapt, 2015), adaptation to risks posed by extreme events is a large and ongoing endeavour for all involved stakeholders. Thus, narratives for desirable futures in spite of these

risks are central in realizing local desires and resilience. Due to its location has Dordrecht been focusing since several years increasingly on the risk of flooding, exacerbated by an increasing climate change and the sea-level rise brought about by it, and participated in many international projects dealing with that issue (Dordrecht, 2009; Hulsebosch & Kelder, n.d.). A worst-case flooding is expected to severely disrupt the city, causes approx. 7 billion Euros in damage and potentially threatens hundreds of lives (Hegger et al., 2014). Furthermore, due to Dordrecht's division in areas that are embanked and such that are outside of the dikes are several place-dependent measures needed to increase resilience in the city as a whole. For such encompassing resilience is the city developing a multi-level safety concept, consisting of flood-prevention with dikes, spatial adaptation to climate change and crisis response that aims on increasing safety both in areas with higher vulnerabilities due to its location as well as for the whole city so as to being able to deal with a potential flooding of the entire city (Dordrecht, 2009; Hulsebosch & Kelder, n.d.; van Herk et al., 2011). Multi-level safety has been also taken up by the national Deltaprogram and within its regional branch Rijnmond-Drechtsteden is Dordrecht a pilot in order to develop and refine this concept even further (Kelder, Gersonius, & Hulsebosch, 2013). In addition to increasing the demand for primary safety for the city of Dordrecht due to an increasing risk of flooding is climate change brining about more extreme weather as well, among which are e.g. extreme rain events. Such extreme rain events, e.g. a particularly severe one occurred in Dordrecht in August 2015 and lead to widespread flooding across the whole city, mark the need for both spatial adaptation as well as changes in the sewage system of the city in order to deal with extremes that are expected to increase both in strength and frequency in the coming years as a result of anthropogenic climate change (Schot & Dijkstra, 2015). To be able to deal with these issues adequately, the city is increasingly focusing also on the population and its culture to develop adequate and suitable strategies for future-proofing the city, which becomes even more important considering that only around 12% to 15% of its approx. 120,000 people can be evacuated in times of a severe disaster affecting the entire island (EDUCEN, 2018; Hoss, Jonkman, & Maaskant, 2013). Focusing on its culture is important as culture ultimately also defines how risks are both understood as well as responded towards (EDUCEN, n.d.). Finally, to work on all those topics simultaneously the city opened a living-lab in Dordrecht, aiming on bridging practice, research and any gap to its citizens (Gemeente Dordrecht, Platform Duurzam Dordrecht, Plein06, Unesco-IHE, & Waterschap Hollands Delta, 2016; Kennisportaal Ruimtelijke Adaptatie, n.d.; Platform Duurzam Dordrecht, 2014), which was officially opened in April 2018 as "SpuiLAB210" (Ons Water in Dordrecht, 2018).

Directly in relation to the above described topics is this current project, which is adjacent to the international project *"Co-development of place-based Climate Services for action"* (CoCliServ), focusing on narratives for a future-proof city of Dordrecht, and specifically those narratives that are aiding in proofing the city against extreme events involving weather and water while achieving a locally envisioned future and increasing the inhabitants' quality of live. The international project CoCliServ is looking at 5 different locations across Europe among which is Dordrecht an official partner and case study as seen on the official homepage http://cocliserv.cearc.fr/. CoCliServ is focusing in depth on the needs for climate services so as to allow the future-proofing of the respective locations, incorporating the needs and desires of both authorities and citizens while locating those needs via the eliciting of local narratives (ERA4CS, 2016).

Due to the contribution of this thesis to the above-mentioned international project CoCliServ, and in specific to the tasks in work package one, do several parts of this thesis appear in official deliverables to that project, which include official project reports, project homepage as well as around the time of the thesis-publication also official publications of the CoCliServ project (Krauß et al., n.d., 2018b, 2018a). Those appearances on the Dutch part of the CoCliServ project are authored by both the author of this thesis, Benedikt Marschütz, as well as the thesis supervisor and manager of the Dutch part of the CoCliServ project, Arjan Wardekker respectively.

2.2. Scientific background, relevance and knowledge gap

Examining scholarly research upon narratives and climate change, a lack of research around the utilization of already existing narratives and their meaning for desirable futures of local societies as well as climate change related activities could be discovered. Existing narratives as conveyed by people bear among others desires that are embedded in narratives, and thus potentially display what really matters to people since theoretical aspects of narratives, presented further below, show the importance and centrality of narratives in people's lives. With many climate adaptative and climate mitigative efforts being dependent on behavioural changes, narratives are key for reaching a resilient society and let people identify themselves with local impacts and adaptations and make them personally relevant to them (Buys, Miller, & van Megen, 2012; ERA4CS, 2016; UN, 2011).

Whereas previous research focused on narratives' relations to human identity, the relationship between citizens' narratives and climate change, localized through perceptions of weather-related events was not present to the extend as individual narratives were at the core of the examinations. Creating resilience towards future climate-impacts by looking into own narratives was through a literature scan only found in one study on knowledge co-production and climate adaptation (Bremer et al., 2017). Nevertheless, a relationship between perception of changes in weather, people's worldviews and a belief in climate change has been identified by research (Capstick & Pidgeon, 2014; Andrea Taylor, de Bruin, & Dessai, 2014), and how new narratives and frames in communication can aid climate action by e.g. localizing climate-induced events. As risk-perceptions become apparent in narratives, they can also trigger adaptive measures (Grunblatt & Alessa, 2017).

Apart of the above outlined research was there based on a literature scan no study found that is situating climate action close to people's own aspirations for their future, elicited through narratives respectively, and making it therefore more promising in the long term (Buys et al., 2012; McDonald, Chai, & Newell, 2015; Shaw et al., 2009; Spence, Poortinga, & Pidgeon, 2012). This happened in part due to the separation in research between narratives, actions, and agents, and an absence from connecting narratives with the design of measures for climate action. Nevertheless, the importance of perceptions as becoming apparent in stories and narratives seems to increase as their meaning for climate action becomes more obvious as seen in several studies, e.g. a study on adapting to occurring climate impacts at a coastline is looking into individual visions for action (Moser & Boykoff, 2013).

While much research has been conducted on the construction of new narratives to promote climate action but not so much on using existing narratives and visions for a future that is certainly shaped by climate change is this project developing a novel approach that examines narratives for the design of measures around climate action based on these narratives in the latter. Aligning measures with stakeholders' own narratives and developing such measures around their narratives is therefore in line with people's aspirations for reaching their own desired futures, which is crucial for achieving long-term success in realizing these measures and thus climate resilience. Eliciting stakeholders' narratives to explore their views and interests about what a future under climate change ought to contain so as to live secure lives marked by climate resilience is therefore at the core of this research. Benefiting scientific research to gain understanding in narratives and utilizing them for the achievement of local visions for the future is this research also aiding towards developing methods for planning climate adaptive and mitigative measures that are in line with these visions. This research is therefore filling a void in scientific literature and aims on creating input for further scholarly output around utilizing existing narratives for realizing desirable futures under climate change and fostering climate resilience. Given the importance of narratives in

people's lives as well as that they are under a certain influence from happenings and institutions around them, the following research aim can be described.

2.3. Research aim and demarcations

This research aims on shedding light on locally held narratives that display and define a desired future, both of citizens as well as institutional stakeholders and public authorities, which will be certainly shaped by climate change. Further is this research eliciting these narratives' implications for climate action, i.e. the future-proofing of a region. Moreover, this thesis aims on pushing the boundaries of both sustainability research and social research to gain understanding of how climate action can be centred around people's lives while improving both quality of life and environment. For this aim, three demarcations can be conducted as seen in the following.

First, demarcating the research aim initially from a geographical context, a focus on the city level has been chosen because the majority of people are living in cities with numbers further increasing, and this level provides a big chance for a successful sustainability-transition due to high population densities that make service delivery more efficient (UN, 2011). Moreover, high population densities in cities also imply that individuals can be easier reached within this research. In contrast, achieving resilience towards climate-induced extremes at the city level is also a difficult task due to the high rate of urbanization (Ligtvoet et al., 2011) as well as other path-dependencies that can hinder climate action and a transition towards integrated sustainability (Barnett et al., 2015). Besides, while implementing measures is mainly a task of institutional stakeholders (Ligtvoet et al., 2011) are citizens increasingly considered as important. Climate action through both climate mitigation and climate adaptation is not only about impact-prevention but also encompasses how to achieve a good and liveable city for its inhabitants, which places citizens in addition to authorities in a crucial role for realizing measures that represent their socio-cultural realities (Bremer, 2017; Hegger et al., 2017; Wardekker, n.d.). With high population densities and the many different socio-cultural life-realities present in cities is a focus on them also interesting as varying narratives are expected to be present, which entail many implications for governing the implementation of measures to future-proof a city. Including cultural dimensions, manifested within narratives, is thus important for achieving success in realizing climate action in the long term (Adger et al., 2012). Finally, analysing narratives and the frames within them is relevant as a narrative that has meaning to citizens and is embedded in pathways for tangible futures let a majority of citizens be potentially employed in climate actions (Fletcher, 2009), with high population densities in cities and meaningful narratives held by many people offering even greater chances for successful realization of climate actions.

Second, another demarcation is conducted through the selected narratives of the four popular dimensions of narratives, which are 1) ontological narratives held by individuals, 2) public narratives as shared by groups or institutions, 3) meta narratives such as sociological notions and theories, as well as 4) conceptual narratives representing basically the language used to construct and explain societal concepts (Somers, 1994). The most relevant narrative dimensions for this research are the chosen ontological narratives, i.e. narratives held by individuals such as citizens; and public narratives, i.e. the ones held among others by groups or institutions embodied within their reports and work that are shaping ontological narratives to a certain extend due to their relationality (Viken & Nyseth, 2012). Given the scope of this project, nationwide-held ontological narratives have limited effect over the specific locally-held narratives of people in a specific city, as well as government-narratives are expected to have translated into the narratives of municipal- and locally relevant institutions. Somers' (1994) other dimensions of narratives, metanarratives, i.e. concepts such as industrialization, and conceptual narratives such as market forces, are not relevant for

this study as their explanatory character for defining local climate action for achieving a future-proof and resilient place is not given. Further are these two not relevant since it is expected that locally present narratives are more constituting for concrete local actions than narratives that emerge of larger and more generalized entities, considering nevertheless the possibility for some local impact of them.

Third and finally, demarcating the scope of the study within the afore mentioned contexts is this research focusing on the Dutch city of Dordrecht and the locally present issue of extremes around weather and water. Examining local narratives let place-specific narratives be elicited, which feed into CoCliServ and its design of desirable futures for the inhabitants. With hindsight to social and environmental justice, a specific focus shall be taken on those parts of society that might face social inequality in the city of Dordrecht, manifesting itself in the choice of the case, i.e. a representative neighbourhood as seen below. While analyzing both public and ontological narratives it is expected to elicit some overarching narratives that might define the city of Dordrecht and its aspirations for the future.

The main objective of this research is thus to fill the void in both sustainability and social research on the application of existing narratives and their implications for achieving a locally desirable future and making a place more resilient towards climate change. Examining local narratives of citizens and authorities, with the latter shaping the former to some extend through the use of frames, can this research be detailed by the following research questions.

2.3.1. Research Questions

The below stated main research question will be specified by several sub-questions.

What insights do local narratives in Dordrecht offer to develop a resilient and desirable future under the influence of climate change?

Sub-questions:

1. *What public and ontological narratives can be defined in Dordrecht that have consequences for a desirable future, which is influenced by climate change?*
2. *How are these narratives historically embedded within a chronology of narratives?*
3. *What are the consequences of the elicited narratives on potential measures?*

Eliciting narratives of desirable futures, which will be certainly affected by climate change, is conducted by the aid of answering the sub-questions that look more closely at potential crossroads in the future that can change desires, the embeddedness of these narratives in history as well as their consequences for any adaptive measures. Schematically, achieving the research aim can be presented in the following framework.

2.3.2. Research Framework

Below, the research framework is shown in annotation to the main research question.
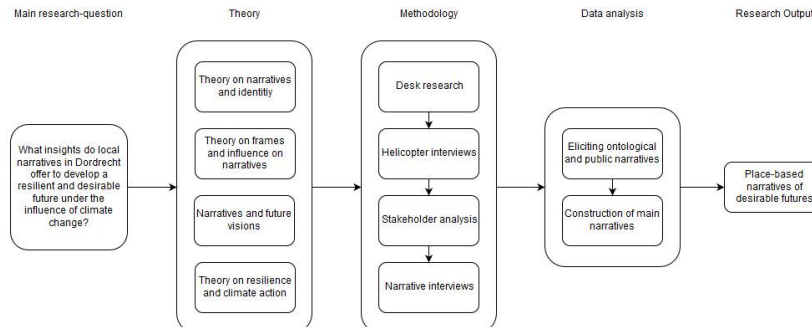

Figure 1: Research framework

This framework has been constructed, starting from the main research output back to the main research question and including the conducted main parts of this research. The mentioned steps will be described

in the following sections more in depth. Subsequently, the societal relevance of this research is singled out and shortly described.

2.4. Societal relevance of this research project

In order to reach desired futures while mitigating and adapting to climate change is a focus and centrality around people's lives key, which is why this research's focus on narratives that give meaning to past, present and future aspects of life is key to reach an anticipated future.

As climate change is further increasing and thus the urgency to act becoming paramount, both mitigation and adaptation of it needs to be part of society's future aspirations to be successful in the long run. For success in this societal endeavour of mitigating and adapting to climate change, related activities ought to be in line with narratives and identities of people, such as the ones elicited within this research. To develop processes that let people reach their desired futures, narratives of such need to be known and then taken up in the latter, which is why this research is of high societal relevance. If a climate resilient livelihood is a goal, i.e. proofing it against extreme events that come along with climate change as well as minimizing its contributions to it, narratives are underlying for the many pathways society can establish in order to reach a desired future, which is not necessarily known fully in advance and narratives can thus guide society in discovering a pathway that fits them best (Robinson, 2003). This research is therefore of high societal relevance both for the city of Dordrecht and its quest in becoming future-proof, as well as the many other coastal dwellings around the world that are facing similar issues. Furthermore, exemplary showing the fruitful implications of narratives for climate action is this research of societal relevance for communities worldwide and can pose as point of departure for future projects aligning local climate actions with local narratives and aspirations.

Finally, with the Sustainable Development Goals being fully acknowledged and implementation further pending is this research aiding towards reaching among others the goals number 11 and 13, and aiding in achieving resilient livelihoods for people and combating climate change and its impacts (IAEG-SDGs, 2016).

3. Theory

Achieving the already mentioned goal of a future-proof city of Dordrecht by utilizing a narrative approach, theoretical considerations on narratives, frames and their respective implications for reaching climate resilience are here elaborated upon. These theoretical foundations aid in eliciting and defining narratives for fostering place-based and anticipated futures and measures to achieve such, and spot crucial issues in the data through focusing on both framing and narrations as outlined in the following.

3.1. Narratives and identity

A narrative, in its simplest definition, is a story to convey information around a certain string of events, including the key actors, and gives through this story with a beginning, middle and end, insights into intentions and how any action in the latter unfolds (Bremer et al., 2017; Bremer & Funtowicz, 2015; Ingram, Ingram, & Lejano, 2015; Wiles, Rosenberg, & Kearns, 2005). More specifically, narratives allow people to make sense of the world they live in, particularly the social world, explain and mentally organize any experience, and constitute their social identities as people locate themselves or being located within social narratives (Somers, 1994; Wiles et al., 2005). Thus, narratives are so fundamental to human lives that scholars see them as *"[…] an ontological condition of social life […] and that people are guided to act in certain ways, and not others, on the basis of the […] repertoire of available social, public, and cultural narratives […]"* (Somers, 1994, p. 614). Humans can be therefore seen as "storied animals" since narratives compile in a unified and understandable way the stories evolving around various happenings in their lives (Bremer et al., 2017).

Whereas narratives are indeed stories, they consist of several features that can be summarized as being apparent in narratives as *"[…] constellations of relationships (connected parts) embedded in time and space, constituted by causal emplotment [and thus] renders understanding only by connecting […] parts to a constructed configuration or a social network of relationships […]"* (Somers, 1994, p. 616). This linking or connecting of events, i.e. emplotment, makes them together with their relationality to other events, circumstances or social realities a narrative within themselves. Narratives are therefore representing among others events, histories, facts, relationships, and include them into stories that are told in a specific way and thus, *"[…] how a history is told is as important as what is being told […]"* (Hewitson, 2014, p. 118). Although historical events might shape narratives to a large extend, narratives also display people's aspirations and assumptions of the future. Therefore, narratives are backward looking in their explanatory character but also contain elements about the future as they are usually told in a forward-looking fashion and comprise interacting activities that may occur repeatedly (Hewitson, 2014).

Narratives are also shared realities that bind people together in the formation of e.g. groups, being thus a social artefact that fosters interaction among individuals, and further let them inhibit both places of listener and speaker, i.e. the narrator, in conveying such narratives or stories (Bremer et al., 2017; Ingram et al., 2015). These interactions happen mainly through the relationality of the different types of narratives, which are according to Somers (1994) ontological narratives, the ones held by individuals; public narratives, hence the ones held by groups of people as well as institutions and authorities that let them collectively seek meaning in the world; meta-narratives such as the socio-economic concepts and theories capitalism and communism; as well as conceptual narratives that are constructs and representing the language used to explain societal concepts such as market patterns or institutional behaviour (Somers, 1994; Viken & Nyseth, 2012).

Finally, narratives are shaped by various influences as they let people convey messages through their ontological narratives while highlighting through frames those aspects that seem to be most important for them. Moreover, narratives also shape beliefs, with the latter shaping the former in turn too, and as salience of information and thus frames are key, are they described more in depth in the following.

3.2. Frames and their influence on narratives

Framing, i.e. selecting aspects of information and making them more important as to encourage the use of one interpretation of reality over another (Entman, 1993), is organizing realities and shape conceptualizations of a phenomenon so as to make sense and be able to communicate about it (J. De Boer, Wardekker, Van Der Sluijs, & Kolkman, 2011; J. De Boer, Wardekker, & van der Sluijs, 2010; Fletcher, 2009). As such are frames defining problems by pointing certain things out over others, interpret causes for that problem and making them visible, morally evaluate both causes and effects of the problem as well as recommend certain treatments and solutions to be applied (Entman, 1993).

In any meaningful communication and connection with others are frames central and need to be explicit and overlap to a certain degree (J. De Boer et al., 2011, 2010; Wardekker, n.d.). Furthermore, they are used automatically while assuming commonality, adapted to the potential receivers' understandings, and strategically adapted for others to follow one's own frame (J. De Boer et al., 2011). Frames relate therefore with narratives in a mutual relationship: they shape how a narrative is understood and organize its parts, and the narrative as such frames topics that relate to that narrative in a certain way (on narratives as frames see Patterson et al., 2016). This relationship becomes apparent through Entman's (1993) four places of frames in communication, which are 1) the communicator, who is guided by frames and include them in the conveyed information so that 2) the text or story contains frames, and 3) guide the receiver's perception, as well as 4) form their stock, which is culture as a set of shared frames. As such are frames particularly related to narratives as the former aim on making issues more salient, which in the latter form the conveyed story that becomes through selection and the relationality of these selected parts a narrative and thus a story in itself. Frames are created within language about specific perceptions of an event, out of which narratives as stories around these happenings are formed and are therefore containing also visions about how the future might unfold.

Perceptions of events and happenings as such are important since they can let things become e.g. a concern and potentially action may unfold in the following, which is specifically relevant in light of climate change and stimuli for climate action. Moreover, additionally to narratives and frames are perceptions important to be considered since they refer to the thinking of a phenomenon and are marked by selective attention to certain happenings (Goffman, 1986). To this extend do perceptions and frames overlap around selecting information, narratives are shaping certain perceptions, as well as they are all in an interrelationship with the culture individuals live in, and perceptions are to some extend also products of culture. With narratives and frames being closely connected, certain perceptions are displayed within them and thus conveyed by stories. Perceptions of phenomena are also affected by experiences and frames in use, e.g. those happenings that are relatively salient phenomena in people's lives are particularly affecting perceptions about them (Phillips & Dickie, 2014). What particular perception unfolds depends among others on beliefs, experiences, understandings, and framings of these elements (Wolf & Moser, 2011). Experience is an important trigger for certain perceptions as e.g. being affected by climate change can trigger concern and action about it (Buys et al., 2012; Capstick & Pidgeon, 2014), especially if supported by framing climate change in an accessible and tangible way (Lowe et al., 2006 on the example of movies about climate change). Moreover, perceptions are also formed by intuition and unconscious processing of information

(Grunblatt & Alessa, 2017), hinting also towards being responsive to the most salient information, which is shaped by framing.

Finally, the influence of frames on perceptions of climate change is so significant that they even render information on climate change and implications for both perception and action (E. U. Weber, 2010), as well as finally, aid in perceiving specific aspects of a problem (Moser, 2010). Frames and in the latter narratives define how humans define and perceive any risks related to e.g. climate change, and more generally are stories about past experiences shaping considerations for the future and actions such as adaptation within (Milojević & Inayatullah, 2015; Paschen & Ison, 2014). Therefore, narratives and visions for a climate resilient future, containing climate change and action about it, are prominently linked as shown in the following.

3.3. Narratives as visions for a climate-resilient future

Assumptions about the future and what such ought to contain or avoid are embedded in narratives as they mediate understandings of happenings at different times (Hewitson, 2014; Milojević & Inayatullah, 2015). As narratives are also shared realities can they construct common desires for the future that aid in identifying desirable and undesirable constructions of the future (Gidley, Fien, Smith, Thomsen, & Smith, 2009). The very meaning of a desirable or envisioned future is constructed in relation to the story about the present state and thus evolves around improvement, conversation and maintenance of this present state as well as tolerable and acceptable living conditions in such future (Moser & Boykoff, 2013). Thus, narratives about desirable and undesirable futures are especially relevant in relation to the present research's focus on climate change and good lives despite of various expected climate impacts on humanity.

Preferred futures and visions about them influence starkly how society develops and are thus always embodied in stories that are mediated by both individuals and society as a whole and in connection to past and preferred future states (Edwards, 2008). Narratives are displaying in a forward-looking manner often the status quo as they are embedded in deeper and underlying worldviews that legitimize them, but not necessarily display envisioned futures from themselves (Milojević & Inayatullah, 2015). Specifically focusing on a desired outcome can though result in narratives about envisioned futures. Moreover, narratives are affected by historical events and their chronology, which is why historical changes ought to be incorporated into the eliciting of narratives for desirable and envisioned futures (ERA4CS, 2016). Narratives in that regard show how the future might look like, both from a macro-perspective on society as well as in the specific live-situations of individuals, and in a backward looking manner can then pathways be established that let these desired futures be reached (Neuvonen et al., 2014). Finally, due to the shared nature of narratives can they display a collective desire on what ought to be achieved (Gidley et al., 2009). Considering the focus of this study is such achievement focusing on enabling climate resilience, i.e. resilience in light of climate change.

Resilience at the city level as focused upon here can be defined as the capacity to maintain key functions despite various short- and long-term stressors and extreme events, the ability to absorb such shocks until a certain degree and learn from these changes, as well as finally, the capacity to survive, thus withstand and tolerate disturbances, and adapt in case of such events (Eraydin & Taşan-Kok, 2013; Moser, 2014; Stead, 2014; Wardekker, n.d.). More specifically, urban resilience refers to tolerating as a city-system extremities without chaos and/or permanent harm and requires a holistic view that is not limited to only technical and managerial measures but also includes societal factors and the ability to cope with extremities, and thus includes adaptation to extremes, withstanding shocks and preventing as well as reducing possible damage (Eraydin & Taşan-Kok, 2013; Stead, 2014; White, 2010). As such is resilience towards various shocks

posed by climatic and environmental changes a meta-objective to be reached for any system, with cities as urban systems being affected in multiple ways and thus many systemic measures ought to be taken to foster resilience of it (Ilgen, 2016). Thus, resilience can be seen as a dynamic state, i.e. a dynamic equilibrium over time despite the presence of stressors (Bruijn et al., 2007).

As climate change affects increasingly cities and their inhabitants and negative effects will occur, climate action to foster resilience is the challenge ahead, and is while taking a normative stance, bound towards aiding in achieving a desired safe future, ultimately embedded within narratives (Levin, Cashore, Bernstein, & Auld, 2012). Resilience is always interpreted in light of a certain desired state, is therefore very power-laden and normative, and narratives and the frames in use display the notions of this desire (Cote & Nightingale, 2012), which makes narratives crucial for the very realization of any measure to combat climate change and adapt to it, and can let citizens become both driving and hindering forces in this endeavour (Hegger et al., 2017). Moreover, narratives are therefore co-producing knowledge about a place-specific future under climate change and add to relevant scholarly research while also making knowledge locally anchored and context-specific measures possible to be realized (Bremer et al., 2017; Paschen & Ison, 2014). In that way are narratives also adding to the creation of climate services as knowledge is co-produced, shed light on local socio-cultural dynamics as elicited by narratives, and by looking into the specifics of how to enable climate resilience also transforming the gathered knowledge so as to apply it in a practical and goal-orientated context towards building resilience (von Storch et al., 2011; Weisse et al., 2015).

Building resilience is ultimately happening around different interpretations of resilience, which shows in the varying narratives containing resilience and language in use (Wardekker, 2016), and resilience is generally shaped by culture and narratives that interact with responses to current and future climate change (Adger et al., 2012). Urban resilience in that regard offers also the chance to interpret and frame occurring challenges and actions to aid resilience in a positive way, which may ultimately also lead to more support that is gathered by positive frames in contrast to negative frames (Wardekker, 2018). Finally, while planning is important for increasing resilience are people inhabiting centrality and how they behave and act, and thus referring back to the significance of narratives with their centrality in people's lives, and these narratives' implications for climate action to foster climate resilience as it is the focus within the present research (Stead, 2014). This centrality of people's narratives and the quest for resilience becomes even more apparent in the methodology for this project that is focused on eliciting among others, people's own narratives as well as those embedded within authorities and institutions, which is described in the following sections.

4. Methodology

The current section on the followed methodology sheds light on overall strategy and data collection of this research, as well as how the data is analysed so as to arrived at the elicited narratives thereafter.

4.1. Research strategy

Focusing specifically on the city of Dordrecht let the research design of a case study become a convincing option as a limited amount of locations in the city, a neighbourhood respectively, will be examined more in depth and profound insight shall be gained through various qualitative research methods (Verschuren & Doorewaard, 2010). Being closely situated to the analysis of narratives as in the present study, the following analytical steps as proposed by Hajer (2006) for discourse analysis will be initially undertaken:

- desk research,
- helicopter interviews,
- document analysis, and
- interviews.

Therefore, employing several methods it can be differentiated between initially gathering and finally analysing data. From that point is the research strategy following a mixed methods approach, more specifically that of a sequential strategy that first qualitatively researches the narratives and examines them in the latter part more closely (Statistics Solutions, 2017).

In addition to the above described steps that are related to discourse analysis, especially interviews and data analysis have been altered and extended to meet the needs of the current project and the answering of the research questions, as can be seen below in the description of all steps undertaken. For an overview can the strategy of this project be summarized within the following steps:

- Desk research,
- Helicopter interviews and gathering of materials,
- Stakeholder analysis,
- Interviews on historical aspects concerning the city of Dordrecht,
- Narrative interviews for eliciting public narratives,
- Selection of the case study area, i.e. a neighbourhood respectively,
- Narrative interviews for eliciting ontological narratives,
- Data analysis and definition of the main narratives.

These steps represent the core of the research methodology and describe the steps graphically shown in the research framework more in depth. This more detailed graphical representation of the research strategy is shown below in Figure 2.
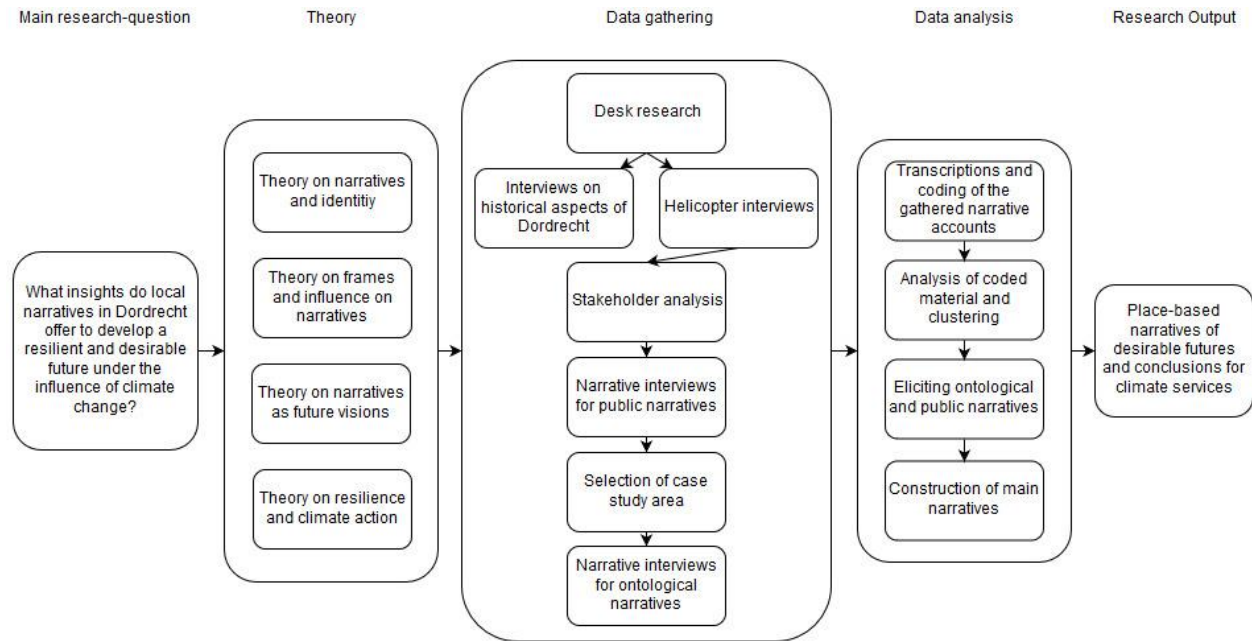
Figure 2: Research strategy

These shown steps are described more in depth in the following sections.

4.2. Data gathering

4.2.1. Desk research

In order to gather data, desk research, characterised by the utilization of already existing material (Verschuren & Doorewaard, 2010), is conducted in order to shed light on among others, studies using narrative analysis as a method, theoretical concepts on narratives as well as narratives and perceptions of local weather and climate so as to gain an overview of the scholarly field (Hajer, 2006). This step, conceptualized as literature survey, aims on eliciting insights and understanding of narratives based on scholarly literature, and ways to examine them in practice. Moreover, it is anticipated to gain insight within the scholarly landscape into both existing studies on climate-proofing regions and cities in general, as well as specifically the Netherlands due to the focus in this study.

Analysing documents from the municipality of Dordrecht and related institutions, i.e. among others policy documents, strategic plans, water management and adaptation plans, aims on eliciting deeper insights into public narratives. Important for a study on narratives both from a theoretical point of view as well as due to the practical aspects and research aims of this project is also to look into documents that shed light on the region's history, historical material and archives as well as local media so as to elicit a more detailed understanding of the historical embeddedness of narratives in Dordrecht. Specifically of interest are also documents for projects that are adjacent to CoCliServ such as SCORE (Daan & van Herk, n.d.; Interreg North Sea Region, 2017c) and BEGIN (Interreg North Sea Region, 2017b, 2017a), which are focusing on climate action respectively, as well as any other relevant documents on Dordrecht's focus as a climate-resilient city as outlined in the introduction. Finally, focusing on local material and eliciting possibly relevant stakeholders for initial consultation, is this step aiding in the conducting of helicopter interviews as described further below.

The research and its accompanied search query evolved out of municipal homepages on adaptation projects, water management, etc. and continued by looking into references to other projects, with the later again being looked into their references to other projects. Material on strategies around future-proofing the city marked the start of this task and distilled both stakeholders, institutions and other projects so as to gain an overview of the landscape of both actors and projects that are involved in future-proofing Dordrecht. Data on various stakeholders and institutions has been saved in an excel sheet that marks thus the base of the following analytical and exploratory steps, i.e. interviews with and analysis of stakeholders as elaborated upon below and is in the course of these steps further updated.

4.2.2. Helicopter interviews and gathering of documents

Selecting and contacting stakeholders with a good overview of the issues of interest in Dordrecht, i.e. helicopter-stakeholders, is conducted in accordance to their respective wide involvement in several projects around climate adaptation, climate action, and water management in Dordrecht. Stakeholders in that regard are understood in this study as actors who are either affected by an issue or can influence action or agenda on dealing with the issue at stake, future-proofing Dordrecht respectively (more definitions in Bryson, 2004). More specifically, those people that may have influence over decisions that let the city become future-proof are generally relevant stakeholders for this research (André, Simonsson, Swartling, & Linnér, 2012).

Conducting helicopter interviews with overview-laden stakeholders, i.e. helicopters, is chosen to gain insight into the institutional landscape and focusing on those actors that are believed to have a good overview in the field from varying angles (Hajer, 2006), and shed also light on the historical context of to be elicited narratives. Further shall those actors that are influential on others be illuminated and to be interviewed to elicit potential interviewees for public narratives in the latter. These helicopter-stakeholders are sought to further identify other stakeholders they consider as important, also known as snowballing technique to identify additional stakeholders and actors (André et al., 2012; Bremer & Funtowicz, 2015; Reed et al., 2009), as well as make strategic documents available. All elicited stakeholders are incorporated into a stakeholder database, also serving as base for the following analysis and can be found in Annex A. Once the contacted stakeholders with a good overview, replied positively to the initial request for a helicopter interview with them, a few open questions that are considered important have been sent out to them so as they are able to prepare for these fairly open initial interviews. These questions are aiming on structuring these methodologically open interviews and can be found in Annex B.

The following stakeholders have been contacted as seen in Table 1 that is based on desk-research, and a specific focus is given on those affiliated with the municipality of Dordrecht and their suggestions, in line with the quest evolving out of the overall project CoCliServ. The full list of all stakeholders that have been gathered within this study and are considered as relevant or were mentioned as important in various sources can be found in the stakeholder-database in Annex A, which is also important in the following of this study as it serves as an overview of all potentially relevant stakeholders. Based on this stakeholder-database those have been selected for helicopter interviews that posed the according to this research strongest relation to Dordrecht's quest in future-proofing the city and where confirmed by discussing internally their potential contribution to this project respectively. The final selection of all stakeholders that have been contacted can be seen below in Table 1. In that regard is already at this stage an initial and very limited stakeholder analysis conducted, focusing only on the factors of involvement and relevance for future-proofing Dordrecht (Bryson, 2004). All interviews are summarized and in part loosely transcribed based on handwritten notes of the main findings. For eliciting public narratives and identifying institutions that are

important context-setters for the quest of a future-proof Dordrecht, a further analysis is needed and the so far gathered material let a stakeholder analysis be conducted, which is described below.

Table 1: Overview of stakeholders for helicopter interviews within the elicited institutional landscape

Organization of the interviewee	Function of the interviewee	Helicopter-Interview
Gemeente Dordrecht	Climate adaptation and water-safety	Yes
Gemeente Dordrecht	Team-leader water and sewage	Yes
TU Delft; UNESCO IHE; Gemeente Dordrecht	Urban flood resilience, expert for Dordrecht	Yes
Independent specialist for climate adaptation and mitigation, landscape architect; representative for a citizen group in Dordrecht	Meeting participant 15 January 2017, Dordrecht	Yes
Waterschap Hollandse Delta	Meeting participant 15 January 2017, Dordrecht	Answers via email

4.2.3. Institutional stakeholder analysis

A stakeholder analysis, focusing on institutional stakeholders, to elicit context setters needs a clearly defined context (Bremer et al., 2017) and for its practicality a limitation in scope (Reed et al., 2009). The desired foci for eliciting public narratives are proofing the city of Dordrecht against negative effects from climate change, i.e. in specific water- and extreme weather-related events, as well as acting upon climate change as such. With this definition of the issue, the first step for conducting the stakeholder analysis is fulfilled and has been also upfront implemented into the questions for the afore conducted helicopter interviews.

The selection of stakeholders has been conducted in an iterative way, starting by identifying relevant organizations and respective actors within the material gathered through desk research, and has been then further specified with expert opinion through the helicopter interviews employing a snowballing technique (Reed et al., 2009). Specifically are only those institutional stakeholders selected that are influential over the issue and above defined context, and may have power and various resources available to shape the quest of a future-proof city, thus shaping also concrete activities (Bremer et al., 2017). Influence in that regard is understood as the totality of many different aspects of influence and includes knowledge, political status, social status and several others (André et al., 2012). This stakeholder analysis aids in illuminating influential stakeholders that are most promising for eliciting public narratives in the latter, and thus is the analysis restricted in its analytical size, i.e. conducting only relevant steps for identifying key-players. For a proper triangulation of sources (Verschuren & Doorewaard, 2010), the results of the helicopter interviews and a qualitative document analysis on the received documents is joined by a desk research on possibly further relevant actors so as to fulfil the task of an institutional stakeholder analysis to identify key players. For conducting a stakeholder analysis, literature has been consulted that focuses on the methodology that can be followed for conducting such. For additional sources and to further improve the prior desk research, a search query has been adopted that focused specifically on stakeholder analysis and climate adaptation.

The initially conducted desk research let the stakeholders be already firstly assessed and categorized in whether they have low, medium or high relevance for future-proofing the city of Dordrecht. Their potential influence was qualitatively assessed while looking into available data on the respective fields of interest of the person and/or organization, as well as where possible also whether they had some previous relation to Dordrecht's quest of becoming future-proof, thus being present in that quest. Being present in that quest,

which is assessed based on literature as well as interviews, is relevant as the stakeholders are then expected to express themselves and, in that way, exercising a certain degree of influence over the issue. As such can therefore the application of several criteria be described that are utilized in selecting stakeholders for the following narrative interviews. Initially, a geographical location criterion, i.e. the relation to Dordrecht, as well as a functional criterion, i.e. the involvement in future-proofing, are applied in this selection of stakeholders (André et al., 2012). Knowledge as a third criterion mentioned by André et al. (2012) is applied since only those stakeholders are included that were also mentioned in any document or conversation and their link to climate adaptation and future-proofing in general became obvious. Whereas power is often assessed in stakeholder analysis (Bryson, 2004; Reed et al., 2009; STEP UP, n.d.), it has been chosen to be excluded as influence is in that currently still evolving quest of future-proofing Dordrecht much more relevant, especially considering a voiced importance of a variety of actors. Nevertheless, for the sake of scientific clarity can be stated that a certain overlap between influence on the discourse and exercised power exists, which is why influence on the discourse of a future-proof Dordrecht is also a more ambiguous variable. Despite such ambiguity is influence on the quest of future-proofing the city in the present context still perceived as the more fitting variable in contrast to power.

The respective stakeholders have been colour-coded so as to represent this initial classification with an ample-scheme, red, orange and green respectively (on labelling e.g. in Bryson, 2004). In the following, the helicopter interviews yielded insight into the landscape of stakeholders and yet again based on helicopter-responses, an additional classification on the relevance of actors has been conducted and comments on the stakeholder's prioritization been made. This resulted yet again in a colour code for each stakeholder to represent the respective relevance, a task that has been repeated taking into account the responses of interviewed helicopters were possible, including their suggested prioritization. While taking up these several rounds of classification and the respective comments by helicopters, key organizations have been identified, which included in many cases also specific people that were labelled as most relevant, and thus also being relevant for the following narrative interviews. In such way, the most important stakeholders, i.e. key stakeholders, are included in this research and their choice backed up by desk research, helicopter interviews and validation through incorporating gathered data into the analysis, which allows the mentioned choice of key stakeholders (Bryson, 2004). Moreover, internal meetings on the overall project CoCliServ round up the selection of key stakeholders.

For deciding whom to interview a prioritization is needed for the following narrative interviews. Thus, influence and sources of influence over issues are analysed in relation to the interest in the topic of future-proofing the city, to then interview only key-players with high influence and interest. The results from both helicopter interviews and stakeholder analysis aid in the selection of the case study area, which has been conducted together with the municipality and the Dutch project leaders of CoCliServ. Finally, the identification of key players via a snowballing technique will be continued within the following narrative interviews for eliciting public narratives so as to constantly re-evaluate the choices for narrative interviews and potentially gaining additional insights. An overview of all selected authorities for narrative interviews can be seen in Annex A. In order to gain a more thorough understanding of the history of Dordrecht and thus knowing specificities of the city that may arise within the narrative interviews as well as eliciting the historical embeddedness of narrative is in the following the conducting of interviews on historical accounts more thoroughly described.

4.2.4. Interviews on historical accounts

For gaining a proper overview of important and relevant historical happenings affecting Dordrecht, three interviews aimed at eliciting these historical accounts are conducted. To elicit the historical embeddedness

of narratives in the latter, meetings with people knowledgeable on history and relevant happenings around weather and water are conducted. The people were selected based on an identification through the helicopter-interviews as well as opportunistically while conducting site-visits in Dordrecht. The interviews on historical events were chosen to be "conversations with a purpose" and involved everything from information sharing, narratives, and others, i.e. narrative-style interviews (Paulson, 2011). As such are these "historical interviews" also aiding in preparing the following narrative interviews. Moreover, exploring the field more in depth, which history aids in tremendously, can this phase be also seen as part of the preparation phase for narrative interviews (Jovchelovitch & Bauer, 2000).

These historical interviews were conducted in a semi-structured manner and followed some very open pre-defined guidance questions, which were then opportunistically both asked and followed up by some further questions. Initially and after shortly introducing the project, the conversations were focusing on the history of the city and the relation to weather and water, both recent and more distant history respectively. From that initial topical guidance, the conversations evolved into more detailed aspects of the history, e.g. including locations of relevance in the city. Their transcriptions elicit insights that do account as narratives and thus a coding that surfaces only these narrative accounts is conducted as described in the following section on coding. While most accounts by the three interviewees were fact-based are the narrative sequences describing in a much more fine-grained manner the scene, settings and any actions around an event that has been elaborated upon (Angus, Levitt, & Hardtke, 1999). Thus, transcribing these narrative sequences in detail has been chosen as it is believed to be the proper way of documenting the gathered accounts, with the remainder of the interviews being only summarized. With these historical interviews being finished, public narrative interviews are started, which are followed by a decision on selecting the case study areas for eliciting ontological narratives. This selection, although happening in the course of the public narrative interviews, is described in the following section.

4.2.5. Selection of the case study area

Initially it is aimed that members of the municipality of Dordrecht pinpoint one or two areas of interest for an in-depth analysis that are representative for the city and meet the needs of both the project CoCliServ as well as of the municipality in implementing strategies to future-proof the city of Dordrecht. In the beginning it was assumed to select preferably two case-study areas within some basic selection criteria, which will be updated with input from relevant stakeholders in the following. These were as of the earlier phases of this project and CoCliServ the following:

- area targeted by at least one intervention/project related to sustainable development, e.g. related to the projects BEGIN and SCORE;
- area not targeted by any municipality-led intervention for future-proofing it;
- general representativeness for wider part of the city in terms of social and demographic characteristics

In the course of the public narrative interviews several potential case study areas have been made explicit and were presented to both the Dutch project leaders of the CoCliServ project and the municipality so as that a decision on it could be made. Further, the Dutch project management and key representatives of the municipality met in order to determine one or two case study areas. The decision that has been made is that the area Reeland as well as specifically the neighbourhood Vogelbuurt within this area will be focused upon since the municipality is starting to actively work on climate adaptation with the citizens in that area (Kelder, 2018; Public interviewee 2+3, 2018). In the following, the actual conducting of narrative interviews will be described more in depth for both authorities and citizens.

4.2.6. Narrative interviews

Narrative research focuses on individual narratives, making interviews the suitable method of eliciting them with a limited pre-structuring chosen for all narrative-interviews within this study (Verschuren & Doorewaard, 2010). Initially approaching and contacting stakeholders for public narrative interviews, identified within the prior conducted stakeholder analysis, included a short presentation of the research project and the topics that are specifically of interest. A short summary of the research has been attached to all email-requests, which can be found below in Annex D. Eliciting narratives through specific narrative interviews ought to happen ideally within isolated interviews but regarding feasibility are the interviews aiming for letting just one single person answer at a given time in cases more people are present within an interview. Requiring consistency, interview protocols are developed for eliciting public and ontological narratives in a semi-structured manner, which are centred around the research questions, and utilized for around 20 narrative interviews, excl. historical and helicopter-interviews respectively. During the interviews it is carefully paid attention to not pre-frame any answers by the way questions are phrased.

In order to properly acknowledge the importance of the interviewee's own wording, the interview-protocols and their questions are aimed on guiding the interviews but not regulating them, hence the utilization of a semi-structured interview-methodology. All interviews initially gather some basic data such as interview-location, relevant details about the interviewee that allow an assessment of knowledge in the field as well as for citizens any group-membership or affiliation with authorities respectively. Both protocols and interview structures are tested upfront on researchers in the field to determine suitability for eliciting narratives, including a translation into Dutch. Further, a short topical summary of the intended questions has been produced in English and Dutch language and disseminated to the interviewees for preparation. This dissemination of material for preparation has been only conducted for the public narrative interviews as it became through the stakeholder analysis obvious that these actors know the field of interest, future-proofing Dordrecht respectively, very well. All interviewees for public narratives receive, in case they do not have such printed themselves, a print-out of this short summery and a contact form for any potential follow-up conversation and exchange during the interviews. Due to the need to avoid the pre-defining of any answers and accounts it has been absented to disseminate any material to citizens for eliciting ontological narratives, especially since it cannot be assumed that these people are familiar with the field of future-proofing the city of Dordrecht. Print-outs of a map from Dordrecht have been made and are present during all public and ontological interviews so as to give all interviewees the chance to show specific locations on a map, making the interviews more practical and applied in their setting. The respective protocols for public and ontological narrative interviews have been printed and are taken to the interview location, noting that these are for the use of the interviewer only. These mentioned documents are prepared and brought in "interview-packages" to each of these interviews, which can be found in Annex E. Due to potential language barriers, all interviews are recorded in audio format upon agreement. Therefore, any misunderstanding by the author might be solved while analyzing the recordings, serving also as a base for future research.

Approaching narratives at two main levels, the micro level, i.e. the individual ontological, and the macro level of society, i.e. the institutions' public narratives, respectively, let local narratives be examined and perceptions on both problems and aspirations for the future as well as a perceived good quality of life displayed (McBeth et al., 2014). Hence, focusing specifically on life-events and the connected actions shed light on narratives and thus, episodic interviewing in a snapshot perspective is conducted (Mattingly & Lawlor, 2000; Paulson, 2011). Whereas the number of interviews is small, it is nevertheless suitable for this type of research as the elicited narratives are analysed in context of various sources in the latter. The interviews are transcribed immediately after they occur to avoid any loss of non-recorded interview

aspects (Verschuren & Doorewaard, 2010), which are especially relevant for narrative interviews and their non-verbal expressions (Wiles et al., 2005). Finally, interviews are transcribed in such way as that keywords and main narratives are visible and can be analysed in the following. In the following, the development of the interview protocols is elaborated upon more in depth due to their importance for the elicited narratives.

4.2.6.1. Development of the interview protocol for public narratives

Initially, a draft protocol with all relevant topics of interest, based on the research questions, has been created so as to elicit narratives from public authorities and institutional stakeholders. This first draft has been internally discussed and validated consecutively and incorporated knowledge and ideas gathered through several meetings, thus following a grounded approach. In the following, the draft protocol has been applied in a mock-up narrative interview internally, and lessons learned incorporated into the final protocol as well as the preparation for the actual conduction of the interviews. Piloting the protocol internally within such mock-up narrative interview showed that it is feasible to conduct the interviews based on the final protocol as shown in <u>Annex E</u> and also limit them to approximately one hour.

While centrality has been given to the research questions throughout the development of the interview protocol, a focus on episodic experiences of specific events around weather, water, and relevant issues has been followed in contrast to such that focuses on individuals' entire lives (Bremer et al., 2017; Paulson, 2011). This approach has been chosen as it allows in the most suitable way the exploration of narratives in the latter, and aiding the answering of the research questions, which is centred around episodes and events rather than the whole lives of interviewees. Moreover, a semi-structured approach of the protocol let the interviews be more consistent and not deviate on the nature of the covered topics, considering the guidance the protocol ought to achieve (Weston et al., 2001). With the interviews being semi-structured by the protocol, they appear to be rather narrative interviews with a purpose, i.e. aiding the answering of the research questions, instead of being strictly pre-determined inquiries, as well as the procedure ought to occur in a flexible manner (Bremer et al., 2017; Reed et al., 2009). This flexibility becomes especially apparent as the interviews aim to elicit narratives as well as specific information regarding weather and water related issues in Dordrecht, which is why importance is given to the opportunistically asked follow-up questions that aim on inviting the interviewees to explain certain things more in depth. The length of the interviews is aimed to be around one hour since internal tests showed this as being feasible, flexibility on that end is conducted in light of the interviewees' availability and willingness to talk.

4.2.6.2. Development of the interview protocol for ontological narratives

Focusing on citizens and their narratives and experiences with weather, water and climate change in Dordrecht, a protocol for eliciting these is developed, based on the protocol for public narratives. Generally, the deviation of the protocol for ontological narratives from that for public narratives is limited and mainly present as the focus on institutions and authorities has been changed to the life-realities of individuals. Another aspect taken into consideration is the wording of the questions as it is assumed that citizens do not speak the same technical language as the authorities interviewed for public narratives, which makes a different linguistic choice for the questions a necessity and thus also the style of them more open-ended and without imposing a certain style of language (Berry, 1999; Jovchelovitch & Bauer, 2000). Finally, the questions are aimed to motivate the interviewees to reflect and narrate on the topics presented in their own words (Rosenthal & Loch, 2002) while avoiding any strict pre-framing of their answers.

While the interview protocol for ontological narratives is very similar to that of the above described public narratives is the length of the interviews aimed to be aligned with the availability of the citizens to be interviewed. After validating the interview protocol internally through discussions, the final version, which

can be found in <u>Annex E</u>, has been printed to be taken to the actual interviews together with the already mentioned map of Dordrecht.

While all narrative interviews are conducted in a similar manner as described above, is the following section shedding light on the data analysis and how the accounts are analysed so as to answer the research questions and elicit narratives and insights for future-proofing the city of Dordrecht.

4.3. Data analysis

4.3.1. Introduction to narrative analysis

Primarily and in line with the main <u>research question</u> as well as sub-questions are the interviews and gathered material qualitatively analysed to elicit main narratives. Initially, the narrative interviews are described in a keyword and narrative-identifying manner and where possible, stories are represented meaningfully so as that narratives can be identified (Bremer et al., 2017). Narrative analysis aims on shedding light on specifically the plot, characterization, and narration (Lejano, Tavares-Reager, & Berkes, 2013), thus focusing on complications, reactions, and possible outcomes (Fløttum & Gjerstad, 2017), and this is done by re-reading, re-listening and re-watching the recordings (Bremer et al., 2017). For that end, a preliminary analysis is conducted so as to prepare for the development of the codebook as described further below, and preliminarily identifying some initial narratives throughout this development. Specifically of interest might become also frames throughout the analysis as they are able to show relationships between narratives. A preliminary coding scheme has been further developed towards the final version and while this process and the schemes are described below more in depth can their extensive versions be found in <u>Annex C</u>.

For eliciting narratives are primarily the interview transcripts utilized and thus coded for the narrative analysis. Whereas this might pose a limitation is the focus on spoken accounts, thus the respective transcripts, sufficient to elicit narratives as these accounts represent the stories on what is considered as important and what ought to be achieved in the future. As the coding is just conducted on the transcripts, are these statements then further backed up by a review of the gathered literature containing information on statements in the interviews, and thus are the spoken accounts and the elicited narratives backed up by literature and official reports as shown in the section on <u>results</u>. Finally, as a focus is specifically on Dordrecht and local issues, coding of only transcripts is sufficient as reasons and intentions become clearer in spoken accounts in contrast to reports and other official documents.

While this general introduction to narrative analysis paves the ground for conducting such analysis are in the following sections the undertaken steps and developments described more in depth, followed by a description how the elicitation of narratives is executed.

4.3.2. Preliminary analysis and preparation for coding the interviews

In the aftermath of the interviews are all of them transcribed as a base for further analysis, and the program NVIVO 11 was employed to generate for an initial quick overview word frequency diagrams, prior to the actual coding of the interviews. These frequency diagrams are based on the interviewees' responses, focusing on a word-frequency interval of 100 and a minimum word-length of 4. For these diagrams to make sense, an initial search query including all transcripts was more in depth studied and to have a proper overview that allows insights into the subject at stake, i.e. water, weather and climate related issues, the first 50 words that were not nouns were included into the "stop-word" database in the programme to exclude these words from the diagram respectively. Additionally, all statements by the interviewer were excluded

to present only the interviewees responses. The only words that were not nouns that have been allowed in the diagrams were those that were, based on the original transcripts, meant to be nouns but due to language-constraints by the interviewees stated in another linguistic form. It has been chosen to consider the original wording as verbalized by the respective interviewee to avoid a potential misinterpretation at this stage of the analysis. After updating the stop-word database, a frequency diagram for all interviews together has
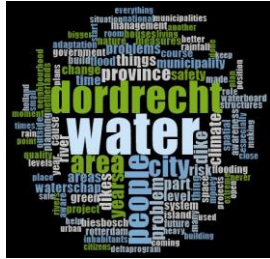
been generated as well as thereafter for each of the interviews separately. Generally, no surprises were found but the in the latter conducted narrative analysis shows that the specific focus of the respective organization also appears in the importance, i.e. font-size, of certain key words in the frequency diagrams.

Figure 3: Frequency diagram, public narrative interviews, all organizations

This preliminary analysis aids the following coding of the material, as this preliminary analysis also consists of the production of short paragraphed summaries from all interviews, and finally helps the analysis of the to be located narratives in the latter. Note-taking on both the material as well as the coding-endeavour aids in general the respective qualitative analysis of the material (Wertz et al., 2011), which is why this step was crucial to gain a more in depth understanding of the responses. These short summaries of the gathered data let the researcher become even more familiar with the accounts and re-reading was conducted for both the purpose of polishing the transcripts and summarizing them, and marks an important task for the development of the final coding scheme (Syed & Nelson, 2015) as well as narrative analysis in general (Bremer et al., 2017).

Familiarizing with the data is an important aspect of the analysis, not to be dismissed is also the integral step of analysing literature and writing on it so as to gain an overview of what to code in the data, a step that has been incrementally conducted throughout this research. In the following, the code-book that is to be employed for the coding of all interviews, public and ontological respectively, to elicit the various narratives will be described more in depth.

4.3.3. Coding-scheme

Elaborating on the development of the coding scheme as displayed in the following is conducted in a detailed manner as such is of critical importance in order to understand how this research is arriving at the elicited narratives, and also backing their definition respectively.

4.3.3.1. Development of the coding scheme

Coding the material gives more detailed insights into the sources of this research, which in that case consists of interview transcripts and interview notes forming the base that is to be coded, and are crucial for any further analysis (Babbie, 2007). While coding, attributes to a certain portion of data are made in form of short phrases, i.e. codes, representing the essence of what is being said and makes the analysis of many sources using the same codes, possible (Saldana, 2016). For being able to analyse the data more in depth as well as gaining a proper overview, the respective codes are clustered into categories, aiding also in the initial first cycle coding and where needed a second cycle coding for a more detailed consideration of the data and the coded elements within. As such is coding a significant part of the analysis as it aids in the understanding of the gathered accounts (Weston et al., 2001). While coding interview responses it is attempted to surface meaning in the data and interpret the accounts and conveyed narratives for eliciting trans-interviewee narratives, i.e. shared narratives, that can be then validated with the aid of reports and any further material on that matter (Saldana, 2016).

The development of the codebook, i.e. the documentation and explanation of the coding scheme (Weston et al., 2001), was initially based on the literature gathered already during the development of the research proposal and centered around the research questions (Syed & Nelson, 2015). In the following it has been incrementally changed based on further insights gathered from additional sources of literature gathered within the progressing project, feedback from CoCliServ, as well as insights from the interviews in terms of a useful approach and elements to be included where marked by importance. For a more detailed and fine-grained coding scheme, the literature gathered was employed and studied more in depth, including their references for a further increase in the scope of it. The preliminary codebook as developed during the proposal evolved out of literature review of the displayed sources and the mentioned elements as being highly relevant for the study of narratives and was gradually updated as well as internally further discussed and leading therefore to its improvement. Crucial for a sufficient and thus final codebook is that the codes ought to capture and grasp the important parts of the data, for answering the research questions respectively.

An approach that aided the process of developing the final codebook has been to deal with this development in a creative manner as the codes need to match the data it is applied to, which became possible due to the upfront conducted preliminary analysis of the data. This can be summarized as codebook-development that is both data-driven as well as theory-driven (Saldana, 2016), and is mostly developed a priori, i.e. before the application on the data (C. Smith, 2000). Additionally, online resources on content analysis and coding by Neuendorf (2018) presented examples about successfully applied coding schemes, of which 22 have been considered more in depth and the quite straight-forward presented codes have been incorporated in a similar manner to the present codebook to the extend as giving hints towards possible codes for such project.

The codebook as seen in Annex C, which needed to be specified and described for its practical application, contains apart of the categorization in main category, sub-category and the respective code itself also a description of the code, which therefore set criteria for both inclusion and exclusion (Saldana, 2016; Weston et al., 2001). Criteria for inclusion and exclusion are especially important as they pose the rules that need to be followed for a proper coding of the data, and make the codebook reusable for other projects and thus aid in the validity of the codebook (C. Smith, 2000). For the purpose of ease have these criteria been incorporated into the description of the codes, which were gradually developed and improved in the process of the codebook-development. Such validity of the codes is also important as their application needs to be consistent among all data coded in the following process, which is why the descriptions of the codes have been updated and slightly changed in the course of the initial application so as to make it clear when a code is to be applied on the data, specifically paying attention to issues arising out of codes that label similar elements.

The coding scheme is hierarchical in order as different codes become subsumed within categories (Saldana, 2009), which mainly aid in the coding endeavour as well as partly in the definition of the narratives as categories can be more easily displayed and thus encompassing several similar-themed codes. Categories allow in the following also to compare statements by the different interviewees more easily (C. Smith, 2000), e.g. while looking into responsibilities or other mentioned topics. For defining narratives as such, the main categories, representing themes, need to be considered for a proper overview, prior to defining a narrative based on its elements that become apparent by looking at the level of the coded elements in the data. Therefore, importance was also given throughout the codebook-development so as to properly define the codes and that categories or themes make sense thereafter. Examining themes is also important as they capture important aspects about the data and give crucial insights into the overall picture or discourse the story is situated within and relate specifically to the research questions (Braun & Clarke, 2006). While coding for themes has been initially conducted in the course of the development of the codebook it has not been followed up in the actual coding of the data as a high level of detail needs to be maintained, i.e. coding

at the level of individual codes instead of categories. This refers yet again to the importance of properly developing the definitions of the codes.

The codebook has been streamlined in its development so as to make its application on the data less ambiguous and as consistent as possible, while defining as many codes as needed to answer the research-questions. Thus, leaving out or merging with others all those codes that are not directly aiding in answering the research questions and defining narratives for future-proofing the city of Dordrecht became paramount in streamlining the coding scheme. Applied iteration, which basically was conducted by applying a semi-final coding-scheme on one of the transcripts, led to several changes to improve the applicability of the respective coding-element and resulted then in a final coding scheme to be applied on all transcripts, both public narrative interviews as well as individual, i.e. ontological ones, thereafter. The development of the codebook as such was a dynamic process but transgressed within its final form towards being a static and fixed manual that is to be applied on all the data, letting open the possibility for changing the descriptions or making them more clear in the course of the coding exercise (Syed & Nelson, 2015). For successfully applying the below described final coding-scheme on the data, it has been aimed to limit the discriminant capability as much as possible, which basically refers to how well data can be coded with the respective code (Campbell, Quincy, Osserman, & Pedersen, 2013).

4.3.3.2. Final coding-scheme

Based on the afore described development of the codebook is in the following the final version of the coding-scheme described more in detail, specifically its elements. All the categories and codes are retrieved from various sources in the literature and are presented in the respective descriptions here. Whereas the shown narrative-codebook in Table 2 represents the summarized version of it is Annex C containing the extensive version of the codebook that includes detailed descriptions and criteria of all codes.

The initial main category, "actors", is referring to one of the core features of what constitutes a narrative as already described in the section on theory about narratives. Actors, which are both those that are "acting" in stories and conveying the stories, are the basic characters in stories told by narrators (Bremer et al., 2017; De Fina & Georgakopolou, 2015; Lejano et al., 2013; Mattingly & Lawlor, 2000; Somers, 1994), which is why their specification and differentiation (Fløttum & Gjerstad, 2017; Milojević & Inayatullah, 2015) is crucial in this research and its aim in eliciting narratives. The respective codes are referring to them as being crucial in a story and are connected to a specific action and location.

For the second category, "context", it is important to consider that this specifies what constitutes a narrative and thus conveys the wider and surrounding aspects of what the narrative is nested in (Mattingly & Lawlor, 2000). Context includes basic narrative-elements such as the pinpointing of both time and place in the story (Somers, 1994), i.e. the orientation of the narrative that is among the base-features of it (Bremer et al., 2017; Wiles et al., 2005). The respective specifications of both time and place aid in the answering of the research questions and locate relevant aspects in the elicited narratives more precisely. The last sub-category within context, the conceptual focus respectively, refers to how the narrative unfolds in its setting, i.e. more distant or closer to the actor in the story (Wardekker & Lorenz, 2016), which therefore has been specified by wider surrounding developments as well as such that refer to the specificities of developments concerning the actor and its life-situation. This aims to locate the narrative in its wider societal context (Fraser, 2004), something that is particularly important for the analysis of them in the latter as narratives embody these contexts to a certain extend (Wiles et al., 2005).

The third main category, "content", addresses the actual substance the narrative is dealing with. As already described in the theory is framing central to human conversation and is thus the first sub-category within

content due to its centrality in narratives. Crucial about a narrative is the complicating issue or event that marks a problem, which becomes visible as problem due to the framing of the story (Bremer et al., 2017; Fløttum & Gjerstad, 2017; Mattingly & Lawlor, 2000). For analyzing the meaning of narratives and the different meanings of problems to the various stakeholders, a differentiation is made between issues that are experienced by others, i.e. a subjective description of an event, or of such that is experienced by the actor in the story itself, i.e. an experiential description of an issue or complicating matter (Angus et al., 1999). This distinction is further aiding in defining whose problem an issue is since it is often told with a temporal difference (Connelly & Clandinin, 1990). Coding for causality is even as crucial since a narrative in itself depends on the causal chain that links different elements of the narrative in a progressive order (De Fina & Georgakopolou, 2015; Lejano et al., 2013) and thus aiding in pinpointing narrative episodes in the data, i.e. spotting storylines across the data and specific causal claims by interviewees. It is further specified by coding for a particular cause for a mentioned problem or issue, which gives insights for potential measures addressing particular causes of problems (Fløttum & Gjerstad, 2017). Following up on that are suggested solutions coded too in case those have been mentioned directly in reference to a particularly mentioned problem or complicating issue in the story (Fløttum & Gjerstad, 2017). Finally, moral judgements refer to evaluative components in the story and guide through the narrative by relating to how something should or could be (De Fina, 2009) and allowing others by conveying such moral elements to judge the story (Bremer & Funtowicz, 2015). Categorizing for perceptions relates though to framing but is relating in this context to how any happening is perceived by the actors in the story, and refers therefore to the salience of mentioned happenings (J. De Boer et al., 2010). The second sub-category, perception, relates to the audience or observers of happenings, strategies as well as what seems to be crucial and important for them and puts the issues in the story into the perspective of the actors (De Fina & Georgakopolou, 2015; Wardekker & Lorenz, 2016). As nested within this category, identity refers to the conveyer of the story itself or to a sense of being, which strengthens and supports the claim of identified narratives to a certain extend (Lejano et al., 2013) and on the other hand a narrative let appear the concept of identity in a story (Wertz et al., 2011). The other perception-related codes aid the answering of the research questions as well as in learning lessons for their follow-up, which is specified by the coding for perceptions of events or issues, strategies and actions as well as generally of the perceptions of things that actors in the story value. Perceptions become visible through conveying narratives, which is why coding is yet again important for eliciting narratives (Wertz et al., 2011).

Lastly, the fourth category "visions", refers to the representation of the future and visions for such in narratives, which are crucial within them (Hewitson, 2014; Mishler, 1991), and differentiating in that regard between assumptions as well as intentions for the future. Intentions as displayed in narratives (Bremer et al., 2017) are important for answering the research questions as well as enlighten that part of the conveyed narratives that is aiding in constructing understanding of the future (Viken & Nyseth, 2012).

Following, a summarized version of the final codebook is displayed, shown in its entirety in Annex C respectively.

Table 2: Summarized narrative-codebook

Main category	Sub category	Code
Actors		Citizens, incl. citizen-collectives or organizations
		Businesses, for profit and not-for profit businesses
		Local government
		Regional/national government
Context	Temporal focus	Recent history (since 1750 until 2015)
		Distant history (prior to 1750)
		Present (2015-2020)
		Future
		Temporal reference
	Place / Location	Street
		Neighborhood
		City
		Regional
		Super-regional
	Conceptual focus	Surrounding happenings and developments
		Specific life-situation and developments
Content	Framing	Subjective description of an experienced problem/issue: overview of events
		Experiential description of an experienced problem/issue: specific event that is a problem/issue
		Causality
		Cause for that problem / issue
		Solution for that problem / issue
		Moral judgements
	Perceptions	Identity
		Perceptions of happenings / events
		Perceptions of strategies / actions
		Perceptions of elements of value
		Other content
Visions		Assumptions about futures, including the process that happens in the future
		Assumptions about outcomes
		Intentions about actions and outcomes

This above shown final coding scheme is applied on all the transcripts, as elaborated upon below.

4.3.4. Coding

Coding the data is conducted by analytically studying it in depth and apply codes on sections of data so as to aid in both structuring the material and gaining a more detailed insight into the conveyed messages. Initially and aiding in developing the coding-scheme, the data is lump-coded for broader categories that easily rise to the surface and become apparent so as to gain a thematic overview of the stories (Braun & Clarke, 2006; Saldana, 2016), which simply aids in discovering various elements and nuances in the data. With upfront developed codes in the codebook is the coding following an inductive approach, which also fits with the need to elicit those narratives that are meaningful and important in the endeavour to future-proof the city of Dordrecht (C. Smith, 2000). Throughout coding, some descriptions of codes, as mentioned

earlier, were slightly updated so as to reduce ambiguity as much as possible while applying them. Coding has been conducted in two circles, with an initial application that is followed by a potential improvement of the former by checking for both errors and missed elements. For a more fine-grained and detailed coding are only those elements in the interview transcripts coded that rise to the surface and become apparently important (Saldana, 2016), something that is also aided by the afore created preparatory analysis of the data.

The unit of analysis or coding unit, i.e. a specific section of the data that is to be coded (Campbell et al., 2013; Syed & Nelson, 2015), is for the level of a specific code in line with the aim of this research for eliciting narratives. Therefore, a set of a few words, a sentence or even up to a whole abstract are coded, depending on the specific circumstances regarding the meaning as presented in the data (C. Smith, 2000). Crucial in that regard is that the meaning of the conveyed message becomes fully apparent in each of the coded elements, even if coded parts are displayed individually the core message needs to be visible as the following narrative analysis is looking in depth at these coded sections. A unit of analysis can also receive more than one code if the meaning of the story falls into several codes and these are crucial to be coded separately. Although all the codes are applied within this coding exercise are the mentioned categories and sub-categories not applied as codes and only aiding the following narrative analysis.

Finally, it is important to consider the reliability of the codes, which means that the same units of data are coded in the same way (Syed & Nelson, 2015). To achieve such, internal verification of the codes and their application is conducted in the form of meetings and sample application of the codes, which aims on increasing reliability of the applied codes and consistency among all applications due to the lack of a second researcher and the resulting intercoder-agreement. Moreover, it is important that the codes used in coding are representing what they are intended to, which ought to be achieved by detailing the definitions and rules in the codebook so as to improve its validity (C. Smith, 2000). Apart of the mentioned reliability, also known as reproducibility, are stability, i.e. constant use of a code over time, and accuracy, which in that case refers to the accurate application of a code on the data (Campbell et al., 2013), relevant to mention as attention is given to them while coding. Lastly, while coding is important is it just one of the steps contributing to the analysis of the coded data and thus the eliciting of narratives that is described in the following.

4.3.5. Narrative analysis

Based on the previous analytical steps is the actual narrative analysis clustering responses initially around appearing themes that aid in answering the research questions, i.e. in principle the elicitation of narratives from both authorities and citizens. While conducting this clustering on the base of studying the coded material more in depth, quotes from the interviewees will be used to both back-up the found narrative themes and subsequent definition of narratives, as well as to leave conveyed stories coherent and maintaining the interviewees' messages and language (Bremer et al., 2017). Once some main narrative themes are found in the coded data, a more detailed analysis of the data is conducted to elicit further specifications backing up and refining those narrative themes. Moreover, clustering accounts to themes let an understanding of macro-narratives be gained and provides valuable insights into the main phenomena that the interviewees are focusing upon, noting the relation to the research questions that guided the development of the interview protocols (Angus et al., 1999).

For answering the research aim, main points and specifically voiced ideas, events, etc. are made explicit by extracting them from the data to be able to cluster coded elements around similar or even same topics and anchoring accounts to such mentioned phenomena (Murray, 2000). Clustering material around happenings and narrative themes aids to arrive at definitions of specific and concretely defined narratives in the latter, and is thus disaggregating the data into segments that centre around certain main topics in the data-

fragments (Fraser, 2004). Thus, analysing the unfolding plots and the language in use let narratives be defined more precisely. Looking at aural features of the stories, which were recorded when particularly important, the specificities of the conveyed messages become more apparent (Wiles et al., 2005). Throughout this process are notes taken on the findings to actualize them in descriptions of the elicited narratives. Analysing the structure for commonly voiced issues is also aiding in defining the narratives for future-proofing Dordrecht. Filtering initially for single codes and then clustering the responses is conducted in an iterative way since codes are studied several times in order to extract the data needed to define the narratives and gain a proper understanding of the different nuances of the conveyed stories (Wertz et al., 2011). Thus, the already mentioned re-reading of material within the analysis of human talk and narratives marked a crucial and import part of this research step (Bremer et al., 2017). While such a qualitative approach is in comparison to a quantitative one loosely defined, is due to the varying nature of human talk not one approach with a set of criteria to be followed, but rather such steps undertaken that fit best to the present research (Connelly & Clandinin, 1990), which the described steps here ought to be.

One aspect that is of particular importance and has been already referred to in the description of the coding exercise is that narratives need to always link to the whole of the story without any avoidable fragmentation of the data (Connelly & Clandinin, 1990; Fraser, 2004). Therefore, the clustered codes and the references extracted from them are always to be seen and analysed in the context of the whole narrative section that is including the key features of the narrative such as actors, the narrative-unfolding in time and other relevant elements for that particular narrative. In that way it is aimed that the meaning of the narratives as extracted from the data is closely linked to the intended meanings by the respective interviewees, specifically noting the snapshot perspective of the written narratives since the accounts are made in relation to the constant unfolding of happenings in real-life (Connelly & Clandinin, 1990). Looking at an interpersonal level of analysis, i.e. in principle the exchange between the interviewee and interviewer or any reference made to other actors, let the meaning of the spoken accounts be seen more in light of a potential message the interviewee aims to convey, which refers also to the position the actor inhibits and from where the story is told (Murray, 2000). In order to show the elicited data that is meaningful in itself a more inductive mode of representation of the narratives is chosen that allows insights without any extensive interpretation of their meanings through the researcher (Connelly & Clandinin, 1990).

Further are commonalities and differences aimed to be elicited in how different actors talk about certain issues in their stories, and where possible are patterns of association explored that aid in clustering accounts around narrative themes and in the latter narratives (De Fina & Georgakopolou, 2015; Fraser, 2004). For a more nuanced picture of the narrative accounts, specifically in light of the need to unearth lessons for measures on future-proofing Dordrecht, are the specificities of both differences and commonalities more closely looked at so as to be able to define "winning-coalitions" of actors that may be able to successfully work together on the quest of future-proofing Dordrecht, as will be taken up in the section on recommendations. Such suggestions for coalition-building are also improved while looking into the purpose of the conveyed stories and shedding light on the intended meaning of the story, i.e. what the interviewees aimed for with the way they framed and conveyed a message (Wiles et al., 2005). It shall be noted that this last step marks the final bridge of the narrative analysis towards the discussion as this aspect of analyzing stories is by far the most subjective one as it is up to the researcher to define those intended meanings, but it nevertheless backs up the definition of narratives through their elicited implications.

Lastly, the following queries in the program NVIVO were conducted so as to arrive at the data and to analyze them more in depth, which is basically filtering coded responses by the level of codes and displaying them. A total of 13 queries has been conducted as seen below in Table 3, a respective main code

category refers to filtering for all its adjacent sub-categories respectively. The above-mentioned clustering and analysis were focusing on each of these query-results as shown below.
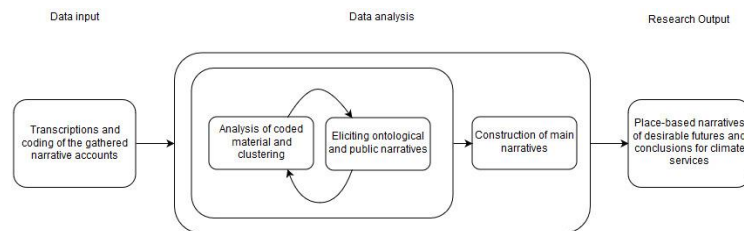
Table 3: Code-queries for narrative analysis

Query	Codes
1	"Temporal reference" + "Distant history" + "Recent history" + "Present"
2	"Subjective description of […] a problem" + "Experiential description of […] a problem" + "Perceptions of happenings/events"
3	"Specific life-situation and developments"
4	"Surrounding happenings and developments"
5	"Actors"
6	"Cause" + "Solution"
7	"Causality"
8	"Moral judgements"
9	"Identity" + "Perceptions of elements of value"
10	"Visions" + "Future"
11	"Perceptions of strategies/actions" + "Perceptions of happenings/events"
12	"City" + "Neighborhood" + "Street"
13	"Other content"

In the following are the results of this narrative analysis presented more in depth and reflected upon shortly, as well as backed up with sources from the literature where this is possible.

5. Results and analysis

This section on results is initially shedding a closer light on the historical embeddedness of the elicited narratives, which are presented thereafter. Initially, the historical development of both the Netherlands and Dordrecht is presented, followed by an overview of historical and more recent events in relation to weather and water in Dordrecht. Below this overview of the historical embeddedness, the results of the actual narrative interviews are shown, differentiated in public and ontological narratives. As seen below in Figure 4 is the analysis conducted in an iterative way since re-reading and re-analysing of both the elicited narratives and the respective data backing them up is strengthening the validity of the results, based on the transcribed interview data respectively. This iterative way of both analysing the data and eliciting the respective ontological and public narrative leads to a strong foundation for the construction of the main narratives as seen below. Finally, in line with the research strategy of this project is the main output a set of place-based narratives of desirable futures and implications for climate action and climate services.

Figure 4: Flow diagram of the research strategy to analyse data and elicit the results

5.1. Historical embeddedness

Shedding light on the historical embeddedness of the further down elicited narratives as well as crucial historical happenings that influence them is among the main aims of this project. The current section is initially discussing the geo-historical development of the Netherlands, prior to looking closer to the advance of Dordrecht through history. Finally, this section is ending with those historical events dealing with weather and water that had an important impact on the city of Dordrecht.

5.1.1. Geo-historical development of the Netherlands

The area of the current Netherlands lies in the delta region of three of Europe's main rivers, the Rhine, the Meuse, and the Scheldt respectively, which let the sediment brought by them, gradually gather in this region since the last ice-age 11,000 years ago (Gemeente Dordrecht, 2013a; Jak & Kok, 2000). In front of this background, land started to accumulate from around 5500 BC with large peat areas starting to develop initially, until around 100 AD the area becomes more stable (Herrebout, de Vries, Hochstenbach, & Smits, 2015). Accounts on the vanishing of the Roman Empire from that area around 300-600 AD describe the landscape as becoming yet again more wild after some Roman settlements gradually vanished and with them their drainage systems (Herrebout et al., 2015). Increasingly, land starts to form and a growing population started to settle on it around 1000 AD. Population growth was marked by technical advances so that cultivation of this rather wet area became possible by creating drainage systems, which in turn lead to the first wide-spread decrease of the surface level (Gemeente Dordrecht, 2013a; Herrebout et al., 2015). Peat landscapes dominated the landscape for the most of history, marked by the purple colour in Figure 5 respectively. Some 1,000 years ago the landscape became more human-dominated, as noticeable by the grey, green and black colours below, marking drained and diked areas next to rivers, polders as well as cities. In relation to this and a big storm-flood in 1163, the first Waterschap, i.e. a water management authority, was created in Leiden located in the Rhine-area of South Holland, which is the "Hoogheemraadschap van Rijnland" (Herrebout et al., 2015; Unie van Waterschappen, 2018).
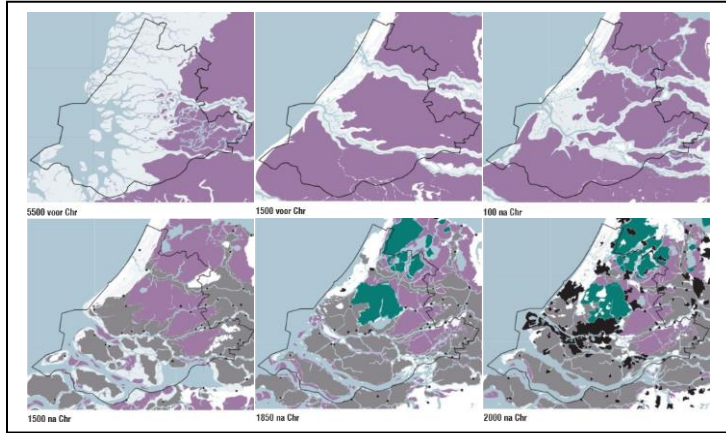
Figure 5: Physical development of the Netherlands (Herrebout et al., 2015)

With larger areas being drained, more technical advances to remove excessive water were made so as to increase arable areas and those fit for human settlements. Among them were drainage systems, dikes, as well as enclosure dikes at the points were rivers met the sea, leading there to growing settlements such as Rotterdam or Amsterdam in order to ship goods as boats were not able to drive further without interruption (Herrebout et al., 2015). Among the most significant technical advances were windmills, which from around 1400 aided in draining the polders (Herrebout et al., 2015; Unie van Waterschappen, 2018).

With advanced drainage systems in place are the Netherlands, basically part of a large Delta region, draining water from a large area of Europe into the sea, as seen in Figure 6.

Water has been very present and defining from the very beginning of the current Netherlands and continues so now and in the future. For the city of Dordrecht as it is focused upon here, which is surrounded by water respectively, it is even more so a defining topic as can be seen below in the section on the historical development of Dordrecht.

Figure 6: Dutch Delta region (Gemeente Dordrecht, 2013b)

5.1.2. Historical development of Dordrecht

The location that is today known as Dordrecht has as such a very long history too, and is among the oldest cities in the Netherlands, with settlements dating back to the beginning of the 12th century, between 1120 and 1122 respectively, and city-rights dating back to the year 1220 (Baarda, n.d.; Dordrecht, 2018h; Monumentenzorg Dordrecht, n.d.). Firstly, the city was mentioned in 1120 and started as a small settlement along the river Thure, and was called Thuredriht (Historical interviewee 1, 2018; Historical interviewee 2, 2018; IsGeschiedenis, n.d.). Due to its strategic location of being surrounded just by a few rivers did Dordrecht receive in addition to city-rights also "stapelrecht" in 1299, meaning that all wares that pass by the city need to be offered for sale within the city (Historical interviewee 1, 2018; Monumentenzorg Dordrecht, n.d.).

Dordrecht developed around that river, with the current Voorstraat being the oldest street of the city and forming the historic centre of it respectively (Citizen 1, 2018). Whereas not much is known about the time prior to the big flood, the St. Elisabeth flood in 1421 AD respectively, historians and archaeologists tried to reconstruct the landscape prior to it. This landscape, which was called the Groote Waard, was as far as it is known shaped by many smaller creeks and rivers, as can be seen below in Figure 7, and shaped by some dikes that were built in order to make the land suitable for agriculture (Hos & Dorst, 2010). They refer

further to a lessening chance of floods in the area as from approximately 1270 AD all rivers in the Groote Waard area were controlled and the land drained. This drainage resulted in a lowering of the surface of the land inside the diked areas and therefore increased at the same time the risk in case of a potential breach as these dikes were improperly constructed (Hos & Dorst, 2010; Nienhuis, 2008).
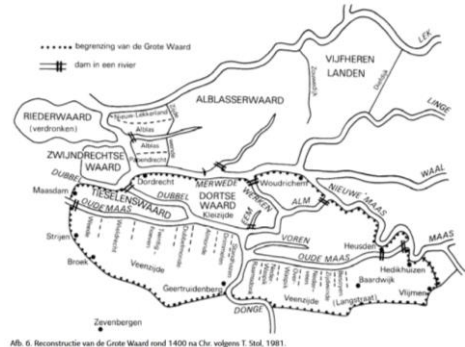

Figure 7: Reconstruction Grote Waard, approx. 1400 AD (Hos & Dorst, 2010)

It is suggested that the regulation of the landscape and its adjacent lowering of the surface increased the pressure on the dikes to such level that the risk of a breach due to a flood increased tremendously since the entire area is generally prone to flooding from both rivers and the sea. In addition to such increasing risk of flooding, political turmoil, a disorganized polder-board and a suggested lack of maintenance increased the chance for a devastating breach even further (Historical interviewee 1, 2018; Nienhuis, 2008). Whereas widespread flooding has been reported from 1287, 1288, 1374, 1376, 1394 and 1396, the famous St. Elisabeth flood in 1421 AD changed the whole region substantially, which was followed by another St. Elisabeth flood in 1424 AD (Hos & Dorst, 2010; Nienhuis, 2008). One fatal occasion in the night of 18-19 November 1421, which was basically a combination of a storm flood approaching from the sea in the West and causing a dike breach, and the rivers Maas and Waal bursting through the northern dams, resulted in tens of villages disappearing from the landscape as seen on the right.

Figure 8: Dike breach St. Elisabeth flood (Regionaal Archief Dordrecht, 2018a)

Thus, both landscape and the city of Dordrecht changed tremendously due to this flood, and even destroyed the oldest house in the city, the "Huis te Merwede" that existed from around 1300 respectively (de Nood & Baarda, 2004). Whereas the exact circumstances occurring that night vanished within history, an altar panel as seen in Figure 9 and created only 70 years after that flood is showing inhabitants packing their things and moving to higher grounds, suggesting that they knew how to cope with floods and living with water (Gemeente Dordrecht, 2018; Historical interviewee 1, 2018). Furthermore, pictures within the Grote Kirk church and the local archive showing some of the effects on the city and how inhabitants reacted and tried to rescue themselves during that flood (NTR, 2014).

Figure 9: Altar panels (Gemeente Dordrecht, 2018)

While Dordrecht's inhabitants previously claimed a lot of land from the water, this flood reclaimed large parts of the area for water and changed the city's character and location towards that of an island surrounded by water, which it remains as such until today (see more in de Nood & Baarda, 2004). The character of the flood has been one that is until today posing severe challenges and potentially threats to the city: a combination of high tides from the sea and large discharge levels on the rivers.

Figure 10: Dordrecht prior to 1560 (Kaartcollectie Binnenland Hingman, n.d.)

Figure 11: Dordrecht about 1600 (Gemeente Dordrecht, 2018)

After the flood, water flooded the whole region and basically created a vast open area of water as can be seen in the pictures below. Many accounts, including paintings and old maps in various regional and national archives as well as museums showing the area as being only water and marshlands until around 1600.

With receding water levels in the area, people started to yet again building polders, with the first one dating back to 1603 respectively

(Historical interviewee 1, 2018). Interestingly, the area that appears nowadays as Dordrecht is already quite visible in an extract from a map dating back to 1620.

Figure 12: Dordrecht with Dubbeldam in 1620 (Jacob Jan, 1747)

From that date onwards, the city develops significantly in size until the latest polder forms in 1926 around the Biesbosch on the island of Dordrecht as can be seen below in Figure 13 (Monumentenzorg Dordrecht, n.d.). A more detailed map of the development of polders in Dordrecht can be also found in Annex G.

Figure 13: Development of the polders in Dordrecht (Unknown, n.d.)

Whereas several even severe floods happened until people started to build the first polders in Dordrecht, much less is known about them, potentially also due to their less severe effect on the already destroyed landscape around Dordrecht (Nienhuis, 2008). Nienhuis (2008) refers to the big Allerheiligen Flood in 1570, which affected large parts of the North Sea due to a big storm approaching by sea, followed by several floods from rivers affecting basically the whole Delta region including Dordrecht, accounts on Dordrecht are not known in detail though.

Currently, Dordrecht is surrounded by one main dike ring and some smaller regional dikes that are located within the city as seen below in Figure 14. These dike rings aim on protecting the city

from severe floods and have various safety standards, their implications are elaborated upon further below within the public narratives.

Figure 14: Current map of the dikes protecting Dordrecht (VRZHZ, 2015)

In addition to this brief overview over the historical development of Dordrecht is the following section elaborating shortly on specific events affecting the city. These events are related to weather and water and their implications will be shortly described, providing thus the background to the elicited narratives thereafter.

5.1.3. Historical weather and water-related events affecting Dordrecht

As already mentioned above had the St. Elisabeth flood of 1421 the by far most severe impact on the city and far-reaching implications. The most significant one is that Dordrecht lost control over the river and thus loosing also a big source of its income as now water was surrounding the city and no hegemony over a certain stretch of shippable river could be enacted any longer (Gemeente Dordrecht, 2018). Moreover, various accounts illustrate that this flood devastated in addition to the city of Dordrecht a total of approximately 72 villages in the entire region (EDUCEN, n.d.; ICATALIST, 2017b). Ultimately, the St. Elisabeth flood brought about the end of Dordrecht's "golden age", which resulted in a relative decline compared to other cities in the Netherlands profiting from the Dutch "golden age" thereafter (Historical interviewee 1, 2018).

Apart of the St. Elisabeth flood did many more floods occur in the centuries after it, which are partly embedded in the cultural memory of Dordrecht, i.e. things such as written and material sources incl. memorials, museums or even ways of housing construction such as elevated ground floors (ICATALIST, 2017a, 2017b; van Son & van Nes, 2014). The sources found that can be labelled as cultural memory of Dordrecht's relation with water are flood-stones, marks about the heights of historic floods respectively, exhibitions in two museums dealing with water and in particular the St. Elisabeth flood as well as the

Watersnoodramp of 1953, several books and newspapers mentioned several floods and can be found within the regional archive, pictures of floods that are on display across the city as well as even a poem written about it and visible on a local school. Additionally, water shaped the entire region to a large extend until the present moment, with a reconstruction of the geo-physical changes of the area around Dordrecht, marked in red within Figure 15.
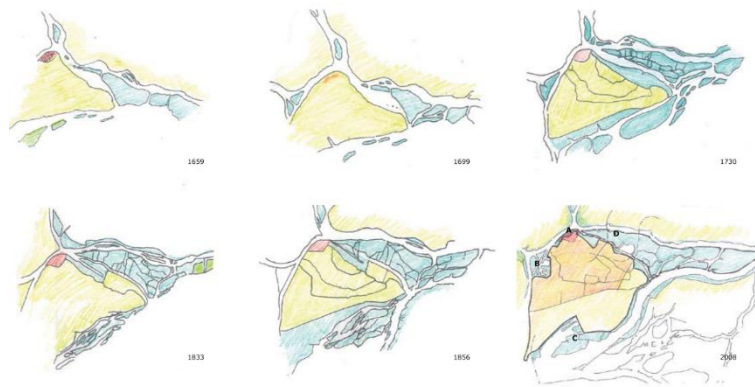
Figure 15: Geo-physical changes of Dordrecht (Bax, van Walwijk, van der Stelt, & Hermans, 2008)

Interviews on the historical embeddedness revealed together with written accounts and flood-stones in the city of Dordrecht more recent historical floods in 1901, 1906, 1916, 1928, 1936, 1953, and 1954 as can be seen below in Figure 16 (Historical interviewee 1, 2018; Marschuetz, 2018a; Stead, 2014). Together with the cultural memory, i.e. specifically the physical artefacts, and the elicited floods that are conveyed as being important can those be also termed as physical narratives. Those physical narratives are basically telling a story through the display of something that is considered as important. A walking tour across the historic city centre of Dordrecht is displaying at 19 spots visible reminders of past floods affecting the city and can be also seen as physical narratives (Dordrecht, 2009; van den Berg & van Schalk advertisting, n.d.; Waterschap Hollandse Delta, 2013).

Figure 16: Flood-stone in Dordrecht (Marschuetz, 2018a)

The latest major disaster occurred so far in 1953 and are known as Watersnoodramp (Jak & Kok, 2000). This particular flood was a combination of a high spring-tide and a north-westerly storm, leading to an increase in the water level and the pressure on the dikes, which ultimately led to severe breaches affecting large parts of the Netherland and killing over 1,800 people (Rijksoverheid, 2017b). This particular flood also affected the embarked areas of Dordrecht and is thus well remembered and embedded in chronologies and the cultural memory of the city (EDUCEN, 2018). In the aftermath of this storm, a Delta-Commission was formed in order to develop plans and measures how to protect the country from future-disasters. Based on that Delta-Commission, tidal barriers across the Netherlands, also known as Delta-works, were constructed together with many other safety measures along the coast and water-ways (Delta Commissie, 2008; Rijksoverheid, 2017b). These Delta-works are until today visible reminders of that disaster in 1953, and it can be suggested to even term them as physical narratives as they are ultimately connected with both disaster, stories about it as well as references about current and future-safety.

Apart of major floods that shaped the city of Dordrecht significantly is much less known about weather phenomena such as heavy rain events. The only found references to rain events were made to occurrences in 1568 as well as 1809, with no known specifics about them (Regionaal Archief Dordrecht, 2018b, 2018c). Whether rain is of less importance in comparison to floods cannot be certainly stated but the many references to floods in comparison to the absence of those accounts mentioning historic rain events suggest that floods have a much more important meaning to the city of Dordrecht.

Nevertheless, Dordrecht as a city is continuing to exist and flourish even after those mentioned events. The city has been undergoing an immense population growth from over 38,000 people in 1900 towards approximate 107,000 inhabitant in 1980 and is fluctuating between 118,000 to 120,000 people since the current millennium (Baarda, n.d.). Finally, water is shaping until now the character of the city and its neighbourhoods, and its meaning for shipping is also again more significant since the surrounding water let more than 150,000 ships a year passing by and making it thus one of the most frequented areas by ships in Europe (de Nood & Baarda, 2004). While the current brief overview about water-related phenomena affecting the city has been dealing with the more distant past, is the following section dealing with recent events in that category.

5.1.4. Recent events in relation to water and weather

Researching more recent water- and weather-related events in Dordrecht it can be upfront stated that it is emerging that people are nowadays less aware of water and floods. Such lessening awareness can be particularly seen since the construction of the Delta-works after the disaster in 1953 that has been protection large parts of the Delta ever since. As the region and thus also the city of Dordrecht became less affected by both floods and water as such, the latter became rather a nuisance to people and acceptance to water can be seen as having decreased (Nienhuis, 2008). Nienhuis (2008) reports further that *"[…] before 1950 [water] was accepted as 'normal', belonging to the all day life – fields under water during winter and after heavy rain – [while it] has led to complaints and annoyance in recent decades […]"* (Nienhuis, 2008, p. 237).
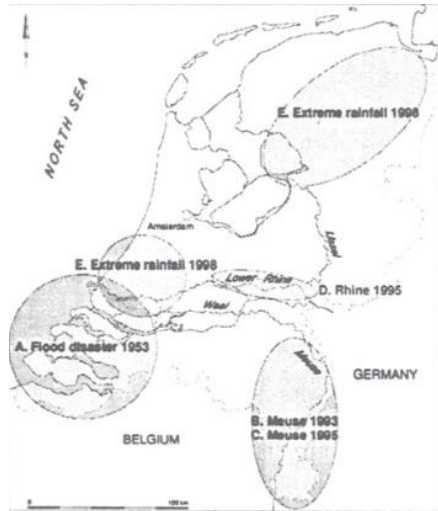
Figure 17: Floods affecting the Netherlands (Jak & Kok, 2000)

Nevertheless, the disaster from 1953 is still very vivid in people's memory, and pictures on houses in Dordrecht aid in remembering this event as can be seen in Figure 18 (Historical interviewee 2, 2018). Personal communication, i.e. one of the helicopter interviews for this study, reveals also local problems with water due to heavy rain events back in the 1960s (Helicopter interviewee 2, 2018). From spoken accounts a flood in 1995 was recovered as having affected Dordrecht. Several floods affecting the Netherlands occurred in the last decades, 1953, 1993, 1995 and 1998 respectively, which can be seen in Figure 17. The event in 1995 lead to evacuations of around a quarter million people as river-

floods were threatening several dikes (Rijksoverheid, 2017b). Heavy rainfall in 1998 caused floods and some floods in the Western part of the Netherlands, in addition to some strong precipitation in 2003 with similar effects (Jak & Kok, 2000; Public interviewee 11, 2018).

Figure 18: Remembrance of the flood in 1953 in Dordrecht (Marschuetz, 2018b)

Another flood that occurred rather recently, i.e. in 2012, brought relatively high waters with it and particularly affected the old city centre of Dordrecht although not much damage had occurred due to it (Hulsebosch & Jacquemart, 2012). Furthermore, on 30 August 2015 a severe rain-event with 90 mm of rain in 2 hours affected several parts of the city and caused local inundations in the city (Platform Duurzam Dordrecht, 2014; Robbemont & Waals, 2015). This particular storm in 2015 caused problems on 21 locations, houses respectively, across the city and affected several neighbourhoods (Helicopter interviewee 2, 2018; Helicopter interviewee 3, 2018; Platform Duurzam Dordrecht, 2014).

Another recent event in 2018, a big storm on 3 January 2018 respectively, led for the first time since their construction to a situation where all Delta-works closed along the Dutch coast, as revealed by some of the interviews that are closer described in the following (Helicopter interviewee 1, 2018; Helicopter interviewee 2, 2018; Public interviewee 1, 2018). Finally, yet again another storm in 2018 affected Dordrecht and broke 73 trees in the city and is referred to as causing additional awareness for weather related events in the city (Helicopter interviewee 2, 2018).

Whereas the previous sections on the historical embeddedness of the following narrative interviews were laying out the base for all "stories" around weather and water related phenomena in Dordrecht are the following sections presenting detailed insights into the various narratives. Initially, those narratives elicited from interview-data gathered by authorities are presented within the below shown public narratives.

5.2. Public narratives

Among the central quests in this project is the eliciting of narratives, with the results of public authorities and their respective narratives presented below. A brief overview of both participants and conveyed stories is presented subsequently.

5.2.1. Selected Stakeholders for interviews

Following the methodology described above, the gathered material let a prioritization of actors be conducted and thus a selection of the most influential stakeholders. The ample-based assessment of the stakeholders, resulting from desk research, helicopter interviews and integration of the data respectively, let the following organizations be selected as being most relevant for conducting narrative interviews with.

- Municipality of Dordrecht / Gemeente Dordrecht
- Waterboard Holland Delta / Waterschap Hollandse Delta
- Province of South Holland / Provincie Zuid-Holland
- Delta programme Rijnmond-Drechtsteden / Deltaprogramma Rijnmond-Drechtsteden
- Safety Region South-Holland South / Veiligheidsregio Zuid-Holland Zuid
- WWF / WNF
- *Specialist on climate adaptation and water management: Anne Mollema

*) Unfortunately, this stakeholder could not be interviewed or reached.

Finally, the full list of organizations can be also again found in <u>Annex A</u>. Next, a short overview of conveyed stories is elaborated upon below.

5.2.2. Overview of conveyed stories

Prior to the results of the interviews, an overview of the conveyed stories is provided here in the form of word frequency diagrams generated with the program NVIVO, in chronological order according to their happening respectively. These diagrams provide an initial insight into the foci of the respective interviews and mark an important initial step in this narrative analysis. Such overview is especially aiding the further analysis of public narratives as the conveyed stories were containing much information in sometimes complex ways, which is why such snapshots on them let those stories appear to be structured as a first step. While all diagrams focus on the same main topics is their different main focus interesting to notice as well as the relative balance or imbalance of the mentioned words as recognizable on their letter-sizes and distribution, which is why all of them are provided below so as the differences can be spotted.

The interview with the Deltaprogram focused around the following topics, with the authority's long-term planning horizon to safeguard the Netherlands from water appearing.

Figure 19: Frequency diagram, public narrative interview, Deltaprogram

The interviews with the Waterschap Hollandse Delta focused in a total of 4 interviews around the following topics.
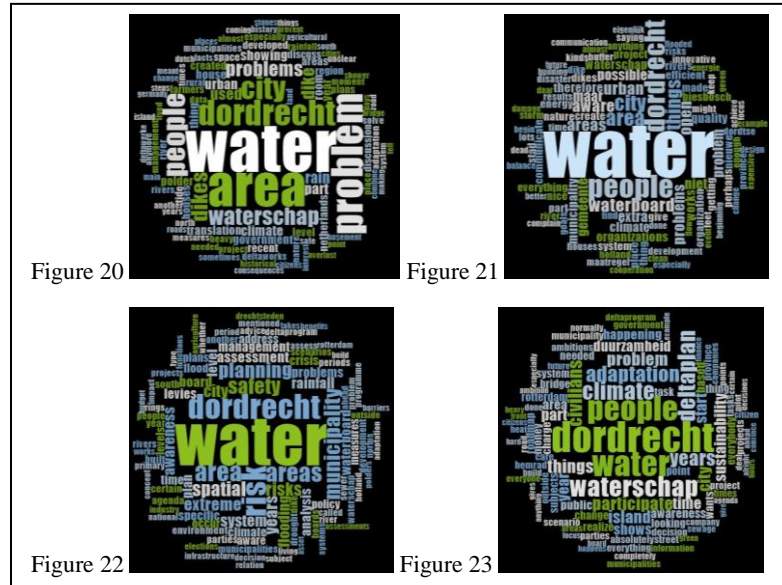

Figure 20
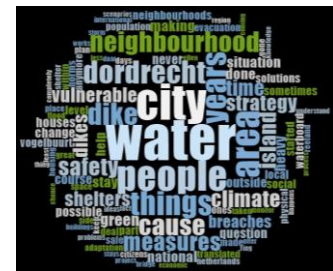

Figure 21

Figure 22

Figure 23

Figure 20: Frequency diagram, public narrative interview, Waterschap Hollandse Delta

Figure 21: Frequency diagram, public narrative interview, Waterschap Hollandse Delta
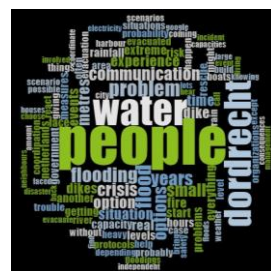
Figure 22: Frequency diagram, public narrative interview, Waterschap Hollandse Delta

Figure 23: Frequency diagram, public narrative interview, Waterschap Hollandse Delta

The interview with the Municipality of Dordrecht focused around the following topics and is marked by a relative balance between the conveyed main topics as can be seen on the similar sized words.

Figure 24: Frequency diagram, public narrative interview, Municipality of Dordrecht

The interview with the Province of South Holland focused around the following topics, yet again showing a rather balanced overview of key-words.

Figure 25: Frequency diagram, public narrative interview, Province of South Holland

The interview with the World Wide Fund for Nature, WWF, also known as WNF in the Netherlands focused around the following topics, interestingly but obvious from the organization's mission is the word nature appearing on a rather prominent spot.

Figure 26: Frequency diagram, public narrative interview, WWF
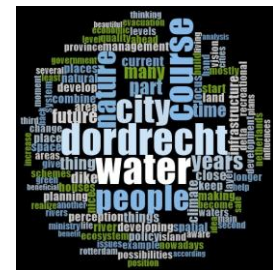
The interview with the Safety Region South Holland-South (VRZHZ) focused around the following topics.

Figure 27: Frequency diagram, public narrative interview, VRZHZ

Whereas a closer description of these word frequency diagrams has not been conducted, they are offering valuable insights for the following analytical results of public narratives by providing overview and an initial structure.

5.2.3.Analytical results of public narratives

The following sections are presenting an overview of the main narratives that were found, which are all containing several sub-narratives within them respectively. These main public narratives that can be identified are historical narratives, vulnerability narratives, adaptation narratives, identity narratives, socio-economic narratives, future perspectives narratives as well as finally, governance narratives. Each of these respective main narratives contain several sub-narratives that describe them more in detail and depth, especially since the broader categories alone leave out the more fine-grained picture the data draws. As in many cases data received for analytical purposes more than one code, the following separation into main narratives and sub-narratives clustered around them is what becomes apparent from the conveyed messages and their analysis. Furthermore, due to an appearing overlap of certain narratives and references that point towards other narratives are they made explicit for the sake of clarity, where such becomes obvious respectively. Each of the main narratives is shortly introduced, prior to the clustering and description of the sub-narratives.

5.2.3.1. Historical narratives (public)

The following historical narratives displaying initially those that are dealing with historical events occurring in the more distant past and are understood as historical per se. Followed on this are those stories gathered that are focusing on some rather recent occurrences of weather- and water-related phenomena.

Historical narrative

An emerging theme is dealing with events that have been happening in the course of history, i.e. in the distant and up to the more recent history. This narrative, labelled as historical narrative, sheds light on the historical and ongoing struggles of the city with water- and weather-related events. Some of these mentioned events appear to have some additional meaning for the present moment and present endeavors as well as for the future of the city. Such additional meaning can be especially seen within the "motivational narrative" that motivates actors in the story for conducting a certain action while referring to past experiences with weather and water as one of the motivators for such action.

Another observation is that beside the explicit focus on historical happenings in the narrative protocol, interviewees appear to utilize a specifically emphasized language to state the importance of historical events and phenomena. Conducting search queries within the gathered data, i.e. the ones explained in Table 3, the initial query 1 is giving valuable insights into historic accounts. The following list represents the in the data mentioned events of importance in chronological order, including interviewees mentioning them.

- St. Elisabeth flood, 1421 (Historical interviewee 1, 2018; Historical interviewee 2, 2018; Public interviewee 2+3, 2018; Public interviewee 4+5, 2018; Public interviewee 8+9, 2018);
- Severe disasters and floods in the region around Dordrecht, 1923 and 1953 (Public interviewee 2+3, 2018);
- Watersnoodramp, 1953, which was the last flood that seriously affected Dordrecht (Public interviewee 6+7, 2018);
- Evacuations East of Dordrecht that lead to a new awareness for water, 1959 (Public interviewee 4+5, 2018);
- High waters in the rivers in the 1990s that led to the adaptation programme "room for the river" (Public interviewee 1, 2018), specifically 1993 and 1995 (Public interviewee 8+9, 2018), with 1995 and also 1996 in the proximity of Dordrecht (Public interviewee 6+7, 2018);

- Severe rainfall, 1998, 2003, 2015 (Gemeente Dordrecht et al., 2016; Public interviewee 11, 2018; Public interviewee 8+9, 2018; Public interviewee 8, 2018; Robbemont & Waals, 2015; Schot & Dijkstra, 2015);
- Closure of the storm-flood barriers across the entire Dutch North-sea coast, January 2018 (Public interviewee 1, 2018).

Mentioned in many interviews as being of specific importance is the distant historical event of the St. Elisabeth flood from 1421. This flooding, as already described above in the section on the historical embeddedness, severely affected the city and has according to the many interviewees mentioning this event meaning until the present day.

The importance of these above outlined historical events becomes also obvious in the many accounts that directly and indirectly refer to them as being among the reasons and motivations for certain measures and actions, as e.g. seen in the motivational narrative below. Nevertheless, and with hindsight to the awareness for water in the city is it interesting to note that it appears that people in the 15th century were used to floods since a picture of the St. Elisabeth flood shows that *"[...] the Wildrecht, the inhabitants of Wildrecht going with their stuff in a boat to Dordrecht to find safety. And you see it doesn't look chaotic. It's very organized. No panic, just get the boat, get your stuff and we are going to Dordrecht [...]"* (Historical interviewee 1, 2018) as can be seen in Figure 9. This part of a historical narration backs up a historical narrative and specifically stresses the implications of the St. Elisabeth flood, while much can be assumed for the by then occurring awareness for floods too.

While floods are among the reasons why the Dutch people constructed sophisticated dams, has the specific combination of a spring tide and a north-westerly storm, from times also high water in the rivers, been causing significant impacts, such as the most recent one in 1953 with many casualties being remembered (Stead, 2014). This emergent historical happening, the big flood from 1953 also known as "Watersnoodramp", affected large parts of the South-Western Netherlands, including Dordrecht, and has been mentioned in many interviews as being an important event for the city, more in depth described above respectively. Moreover, as already vividly mentioned was also the St. Elisabeth flood caused by a Westerly storm from the sea, causing the dikes to break. This specific constellation appears as a strong motivator to predominantly pay attention to these kind of events in relation to adaptation measures and can be therefore also seen below in the event-centered vulnerability narrative and the motivational narrative.

Table 4: Historical narrative quotes

Historical narrative quotes
"[...] you have heard about St Elisabeth flood. And I think it has been a very important happening for Dordrecht, long ago, long ago! For Dordrecht it was perhaps the end of a very high economic position of the city. [...] So I think that was a very important event (laughing). And it's also of high meaning for the position of Dordrecht in relation to all the dangers of the water: the tide, the influence of the sea, the influence of the rivers [...] and also an important historic moment was the Watersnot 1953 [...] (Public interviewee 4+5, 2018).
"Dordrecht was a city [shows on a map the Binnenstad]. ... Then the Elisabeth flooding came of it ... enormous flood, worse than we had in 1953... cause you can see all except the city was flooded [shows on map] .... many villages were flooded too ... [shows surrounding villages] they all went under water ... submerged totally under water." (Historical interviewee 2, 2018)
"[...] so if there is a very high water in Germany, all the melting water from the mountains comes around here and also have to be in the sea, gone to the sea, ... well if that happens no problem, so you can't see water rising really, a bit .... when it becomes a problem is when you get a storm, so that was in 1953, very larger storm here, so all the water went up into the land, and all the water from Germany went here,

> *so you can see everything here, and then you get all the water here and large amounts of rainfall and snowfall […]"* (Historical interviewee 2, 2018)

Recent historical events narrative

As seen above in the list of historical events, more recent happenings were also among the burdensome ones for the city of Dordrecht, and as it is hypothesized that recent events are closer in people's memories, they are clustered within this "recent historical events narrative". The above analyzed historical narrative is dealing with events happening in the more distant past as commonly understood as historic. In contrast, the here displayed recent historical events narrative is focusing exclusively on events occurred in the very close past. Such distinction is thus relevant as the interviewees focused on both more long-term past and the more recent past, as well as finally are recent events as conveyed by public interviewees also relevant for citizens as they were potentially affected by them in contrast to more distant occurrences.

Recent events affecting the city involved events that are considered as troublesome for inhabitants that were affected by *"[…] some weather-related events, which is lots of rain and then some wind events. [But] That's not that it was giving big trouble to the people […], the roof of 8 or 10 houses came off (laughing). It's for the people who face these problems it's a huge problem but for the scale of the city it's […] not in terms of disaster or crisis"* (Public interviewee 6+7, 2018). Further were there references to an extreme precipitation during the summer of 2015, which will be further elaborated below (Public interviewee 2+3, 2018; Robbemont & Waals, 2015). The most recent events occurred in January 2018 when the city warned citizens in the old city center outside the dikes three times about high water in the rivers (Public interviewee 8, 2018). While such references to recent events were made several times in the interviews, both in relation to a phenomenon affecting the city as well as in targeting the effects of it with measures, do these occurrences not necessarily show that the city is specifically vulnerable for such phenomena but rather that it is exposed to water in general. By contrast, vulnerabilities are elaborated upon in the following narratives below.

Table 5: Recent historical happenings narrative quotes

Recent historical happenings narrative quotes
"So, if you look more to the more recent history, 1993 and 1995 were important, correct me if I tell nonsense, because there was a lot of problems in the city around, with too much water from the rivers. And there is always a problem on this side, if there is a lot of water from Germany, and ... also the direction of the wind ... in this space is a problem." (Public interviewee 8+9, 2018)
"And 1953 was the flooding disaster, we had in 1998 and in 2015 and 2003 the problems with extreme rainfall in Dordrecht. And that experiences led to a new assessment of the water risks in those areas and adjustment of the plans, and not already the plans for risk mitigation, but also the plans for, of preparing crisis management." (Public interviewee 11, 2018)

5.2.3.2. Vulnerability narratives (public)

The following vulnerability-related narratives are focusing on Dordrecht's water-prone location, initially in general and then focusing on a specific constellation of events burdening the city. Further are these present vulnerability narratives displaying a specific exposure to water and they manifest themselves through certain perceptions about it, which are both thereafter expounded upon in their respective narratives.

General vulnerability narrative

Due to the location of Dordrecht, which is surrounded by water from primarily the rivers Maas and Rhine as well as the sea is the island of Dordrecht generally more vulnerable to flooding than many other locations in the Netherlands (Gersonius et al., 2016; ICATALIST, 2015). As this becomes apparent throughout the interviews and specifically by looking at queries 2, 3, and 4 as shown in Table 3, a general vulnerability narrative captures this circumstance well, followed by a more specific event-centered vulnerability narrative below.

The vulnerability of Dordrecht is on a general matter almost entirely given due to its location or at least linked to it, and as this becomes very apparent in the data analysis an own narrative for such general vulnerability appears and can be identified. While the event-centered vulnerability narrative as displayed below shows the specific risk and impacts arising from a constellation of both sea- and river-related challenges, can be in relation to the present narrative stated that *"[…] Dordrecht is [generally in] a very special situation because there is the risk of sea water, of the high tide, and there is the risk of the river. And that comes together in this area […]"* (Public interviewee 4+5, 2018). In that regard as seen in the previous storyline is Dordrecht marked by a general vulnerability, which arises specifically out of its position of being surrounded by water and lying in part under the sea-level, as well as due to a limited amount of exits from the island, five exits respectively (Public interviewee 8, 2018; Raadgever et al., 2016; van Herk et al., 2011). That location is specifically vulnerable as the entire city is potentially affected by a disaster and submerged under water, which is thus different to most other locations in the Netherlands (Public interviewee 2+3, 2018). Whereas that vulnerability of Dordrecht can be identified both specifically and more in general is a distinction important as different aspects of these narratives also have various implications for visions about safeguarding the city. Such separation could potentially lead also to a two-fold vision for the city as a general vulnerability may be termed as "living with the water", which can shift both visions and unfolding measures thereafter as seen e.g. in Rotterdam (Dunn, Brown, Bos, & Bakker, 2017). Hence, a richer more fine-grained differentiation of the various appearing narratives also has important implications for future-proofing the city and crafting measures in detail as more potential supporting narratives for them can be found and thus potentially support by the various stakeholders (Wardekker, n.d.).

Whereas water is currently being present everywhere around the city, as the narratives around future perspectives and challenges show further below is there a significant amount of insecurity present since municipal policy makers in case of more severe climate impacts *"[…] do not know what kind of dikes are then needed to keep our island safe, frankly. I myself am not entirely reassured. You live here near the sea […]"* (Public interviewee 2+3, 2018), referring indirectly to the vulnerability of Dordrecht.

The vulnerability of the city is even more obvious due to the reference to a vulnerability in reference to a specific location, the Eastern location Kop van 't Land respectively, that leads to the worst-case scenario of a flood (Public interviewee 4+5, 2018; van Buuren, Ellen, van Leeuwen, & van Popering, 2015), since *"[…] if here the dike breaks through, […] then floods within the shortest time the entire area under water. And then not with a few centimeters, but with meters, and then of course you have a very different situation for your population."* (Public interviewee 2+3, 2018). Furthermore, at *"[…] this point comes to the river and when the river is high, and when this dike breaks, the water is within just few hours in the town […] But […] in the [MIRT] examination it's bleek (transl.: it turned out) that this dike, with height just a few metres, was very stronger than we all thought. So that the most worst scenario is, the risk of the most worst scenario is very small."* (Public interviewee 4+5, 2018). So in theory is this particular location very vulnerable and potentially leads to severe impacts on the island (Gemeente Dordrecht, 2013b; Kelder & Gersonius, 2014) so that improvement of this dike is constantly claimed for (Public interviewee 2+3, 2018).

However, despite such potential threat by that dike is it also stronger than expected by the involved authorities (VRZHZ, 2015) and has been very recently improved (Public interviewee 8+9, 2018). Nevertheless, staying vigilant was also among the conveyed messaged, thus referring to the absence of any absolute safety, which is why so much attention is paid to water.

Finally, more generally is the coast of the Netherlands vulnerable to water-related extremities such as storms, which is why different authorities are aiming to protect the country and especially the *"[…] coastline for a storm that happens once every 10,000 years. (specifically stresses that year number) […]"* (Public interviewee 1, 2018). Despite such relative vulnerability is protection of the Netherlands seen as being worth, even though a lot of money is spent on it, marking here also support for perceptional narratives as well as adaptation narratives. In the following, the stories about specific event-centered vulnerabilities will be analyzed.

Table 6: General vulnerability narrative quotes

General vulnerability narrative quotes
"[…] the history made this national park the Biesbosch, the history showed us that if you don't maintain dikes well it's very vulnerable." (Public interviewee 2+3, 2018)
"I am aware of that the past high waters we had, I think in the 80s, this was the last time very very high waters, and of course Dordrecht is very vulnerable for flooding, and people can get stuck there because there are only a few roads to get off the island, so evacuation is very difficult if you do that too late […]" (Public interviewee 12, 2018)

Event-centered vulnerability narrative

One particularly relevant event, that has been historically threatening the city of Dordrecht and large parts of the Netherlands is the combination of a Westerly storm approaching by sea, thus pressing water from the sea towards the dikes and further inland, in combination with high river discharges. This combination of events can lead to a collapse of the dike-ring around Dordrecht (VRZHZ, 2015). Dordrecht, which is located in the Rhine-Delta at the transition-zone between river and sea (Gersonius, Kelder, Anema, van Herk, & Zevenbergen, 2014), has experienced such event as shown in the historical embeddedness and narratives, and is specifically vulnerable to them. Therefore, involved organizations pay specifically attention to these kinds of phenomena, which is why the conveyed stories can be snatched within this present event-centered vulnerability narrative as seen by analyzing the in <u>Table 3</u> mentioned queries 2, 3, 4 as well as partly also 6 and 7.

The Deltaprogram as part of Rijkswaterstaat, which is an executing division of the Dutch Ministry of Infrastructure and the Environment (Delta Programme Commissioner, 2017), is looking mainly at water that is potentially threatening from the sea because *"[…] this [storm flood barrier] is normally open so the river just goes into the sea but here we have a storm barrier cause if we expect high sea levels by storm, cause it's the north sea, and if wind comes from the north west it brings all the water into the north sea, and water get up here, then we close here our, and keep the sea outside […] if high river water comes, it comes (laughing), and we have to check everything flows to the sea safely, so we can't interfere over there. And to the sea we can interfere cause we can close it or close it not."* (Public interviewee 1, 2018). With that organization being among others responsible for keeping the Delta of Holland safe, this constellation appears to be particularly important across several interviews, which is why it is focused upon. This centrality of an event that is focused upon is appearing in several interviews and is always, as shown above, mentioning the situation of high river discharges and storm-related high water from the sea that come together in Dordrecht, which is therefore a particular issue for the city (Public interviewee 10, 2018; Public

interviewee 12, 2018; Public interviewee 8+9, 2018; Public interviewee 8, 2018). Due to this specific threat by that particular complicating issue, i.e. the combination of a storm and high river-discharges, an own narrative around the vulnerability arising out of this could be identified, adding substantially more nuanced views to such vulnerability in comparison to the general vulnerability narrative above.

Whereas historically the vulnerability of the city is well known by the interviewed authorities, they also prepare actively at the moment for such specific events threatening the city and thus any measures taken, and it appears that this particular threat to the city is also something that is seen nowadays as a normal state for the officials of the city of Dordrecht. Several accounts refer to such constellation as happening in the future, thus such situation is currently a hypothetical situation the authorities prepare for, but as the impacts on the city are potentially tremendous it is also conveyed in a more warning tone that tributes the vulnerability of the city to some extent. Therefore, this event is mentioned here in the present narrative as well as appears in the narrative about future perspectives of solutions and challenges below. Even while referencing here towards a very specific event is this narrative also showing the exposure to water and thus supporting its narrative, which is addressed in the following, especially since the interviewees note the short warning time indicating the exposure to this kind of risk. Particularly that short warning time has important implications for evacuation strategies, which will be more in detail elaborated upon in the future-adaptation narrative as it is expected that such event-constellation occurs in the future.

In addition to such specific vulnerability to floods, is the emerging issue of heat stress already affecting the city of Dordrecht, which is also expected to increase significantly in the future as the future perspectives narratives show. A specific impact arising from heat stress already occurred since a bridge in Dordrecht could not close, thus traffic was interrupted. In that particular case the old harbor area was not reachable by any motorized vehicle as the only bridge that is designed for the use of vehicles could not close as it was too warm and the heat expansion of the material blocked the bridge from closing (Public interviewee 8, 2018). Whereas heat-stress is increasingly threatening human settlements around the globe, is Dordrecht with its many bridges that need to open and close constantly specifically vulnerable to the phenomenon of heat stress. Finally, all those event-centered vulnerabilities appear to be also motivating for action, which is more thoroughly addressed in the motivational narrative. Below, the exposure to water is elaborated upon and is conveyed from a vulnerability-perspective, thus part of the vulnerability narratives.

Table 7: Event-centered vulnerability narrative quotes

Event-centered vulnerability narrative quotes
"Dordrecht will face very high level, water levels, in storm incidents, more frequently and more severely. So not every year, but once in so many years, we are quite sure that there will be westerly storm winds in which we have to close all the sea-openings, and then in the meanwhile there will be a lot of rain in Germany for example, where the rivers get very high and then you close for 2 days or so all the gates, and the city will drown. So that's something they have to prepare themselves for." (Public interviewee 12, 2018)
"So our strategy is for that we'd like to go horizontal, so from the island, but sometimes not possible, and this especially when there's a western storm and sea rise and even spring tide with full moon, and together with high water river discharge. And if that comes together then it's very difficult to get out of this island. Cause ... you only know 2 days in advance that this heavy storm is landing actually here, and once it does, you have 24 hours, the first 24 hours you can say go off. And the last ones, the storm is that heavy that it is very dangerous to go over this bridge cause the storm is too heavy. [...] So that's very difficult but that's just the way it is. That is when you live in Dordrecht, that's the way it is [...]" (Public interviewee 2+3, 2018)
"There are situations thinkable, in combination of high water from the river and high water on the sea. That it come together and it could theoretical reach levels that the dike could breach yeah. Problem is

> *that if that happens, we will foresee the high water from the river, but it could be under the warning level, and then with a summer storm, which is much more difficult to predict, in just 10, 12, maybe 18 hours there could be a situation that the dike could break. So the warning time for the people is very short before we know that we have to do anything, in fact it's too late to do it."* (Public interviewee 6+7, 2018)

Exposure to water narrative

Dordrecht is due to its location naturally more exposed to water, which brings about questions of protection, and becomes also apparent in the vulnerability-related narratives above. This narrative specifically sheds a light on overall exposure to water, meaning that water is present throughout the city, as can be seen by studying the queries 2,3,4, as well as partly 5 and 9 more in depth as seen in Table 3. While often seen as something that needs to be adapted to and protected from is water also crucial for the national park Biesbosch, which is seen as an asset for the city (Public interviewee 2+3, 2018), and thus exposure to water is also seen positively in some instances. Exposure to water can be also seen as Dordrecht as a whole is living with the water due to its omnipresence around the city and a narrative focusing on that aspect of the stories can be identified.

Historically, the citizens in Dordrecht were used to be exposed to the water and adapted to it since floods were occurring several times a year:

"So, they were accommodated to the water and the overlast (transl.: nuisance/disturbance) of the water. Because there was only a tide, and the tide, the difference in tide was more than a metre before the Deltaworks, so they accommodate [sic!] to the tides and the kalamiteiten (transl.: calamities)." (Public interviewee 8+9, 2018)

While being located directly at the water, Dordrecht faces especially in the areas outside the dikes the risk of high waters, which is called "buitendijks" area (Houdijk, n.d.). Although the houses and residents there are mostly adapted to the water and pose even as example for new urban developments (van Son & van Nes, 2014), experiences with high water mark the exposure of the city to water and are in some instances still a surprise as seen below in the reference to a person standing behind a water-proof window, which is referred to as being uncommon (Public interviewee 1, 2018; Public interviewee 8+9, 2018). Nevertheless, a study on the perceptions of citizens in the "buitendijks" area also shows that not many of them plan to increase measures against flooding, which could be also pointing towards them being used to their exposure towards water (Hulsebosch & Jacquemart, 2012). With regard to future-proofing that area found the same study that whether measures are considered depends on the frequency a flooding in the city occurs, which then determines when measures such as protection of property or furniture against flooding are taken (Hulsebosch & Jacquemart, 2012).

Apart of such specific instances as in Dordrecht are the Netherlands due to its location generally more exposed to water from both rivers and sea in comparison to other countries, which has been also reflected upon in the narrative interviews. Such specifically Dutch vulnerability has been e.g. marked by a reference to the size of the country and the effect of a flood in comparison to e.g. the USA. Specifically mentioned was also the combination of being more vulnerable in the Western part of the Netherlands that is also economically stronger than the Eastern part of the country, with the latter being less at risk from a major flooding due to being located above the sea-level (Jak & Kok, 2000). This relatively higher vulnerability also manifests itself by the fact that the Western part of the Netherlands, the Randstad area respectively, is the economic center of the country, most people are living there and this area is also harboring most capital, which is therefore potentially threatened (Delta Commissie, 2008; Houdijk, n.d.). This circumstance of a

relatively higher risk for that area also appears in the motivational narrative and is there e.g. specifically pointed out by Public interviewee 1 (2018).

Moreover, being exposed to water becomes also obvious as a narrative when stories relate to measures that are taken in reference to specifically mentioned events:

"The city was almost completely flooded, but just not yet. And, although we have had to deal with high water levels in recent years, after the disaster of 1953, a great many measures have, of course, been completed within the framework of the delta works, which now also offer a great deal of protection to our region […]" (Public interviewee 2+3, 2018)

Exposure to water, while being mainly framed around water coming from both sea and rivers, also occurs due to e.g. rain, as has been mentioned among others as being a future challenge and can be seen below in narratives around future perspectives and challenges. Dordrecht faces apart of these challenges also groundwater levels that are very unevenly distributed in their heights across the city, resulting in case of too low levels in the rotting of the wooden fundaments many houses are built upon (Gemeente Dordrecht, 2013a; Public interviewee 11, 2018), marking the need for effective groundwater management (Witteveen+Bos & H+N+S landschapsarchitecten, 2002). Groundwater levels are crucial not only for housing foundations but as they are correlated with land subsidence and a potentially lower surface level increases the chance for floods, it is also important to pay attention to groundwater in relation to flood protection (Delta Programme Commissioner, 2017; McEvoy, van de Ven, & Blind, 2016). While groundwater is thus an issue for the Netherlands as such (Eraydin & Taşan-Kok, 2013), it correlates also with heat stress and the water shortages brought about, another issue that will be addressed further below in the future related narratives.

While it is referred to as mainly occurring in the future, a recent severe rain-event that has been strongly emphasized was in *"[…] August 2015. Cause that was a very very heavy rain, really heavy rain. ... so that was a very very extreme one. ... it was on the complete island, also on the Drechtstede, and we head really severe flooding. […] in Reeland, that is such a neighbourhood, is very very vulnerable […]"* (Public interviewee 2+3, 2018). This extreme rainfall as shown also below and in Robbemont & Waals (2015) is exemplary for an increasing problem affecting urban areas in general as well as Dordrecht, and exemplary for being exposed to water. This particular event was several times also referred to as causing the city that is surrounded by dikes, as having filled up like a bathtub as the water could not be removed (Public interviewee 2+3, 2018; Public interviewee 8+9, 2018) due to Monsoon-like rains (Public interviewee 8, 2018). Between 60-92 mm of rain in a few hours lead to an increase in water-levels of 0.4-1.4 m and the resulting flooding (Robbemont & Waals, 2015). Dordrecht's specific exposure to water and risks from heavy rainfall becomes exacerbated by the fact that in many locations badly penetrable soil in the form of river-clay is present, which makes the island more stable against erosion during floods but at the same time rainwater accumulates easily on the surface and causing local floods as exemplary seen above (Delta Programme Commissioner, 2014; Gemeente Dordrecht, 2013a; Hos, 2008; Hos & Dorst, 2010). Particularly relevant is that it was also taken up by a living lab around water and addressed in its course, which showed the exposure to water also to a wider audience (Gemeente Dordrecht et al., 2016), and discussed with citizens thereafter (Public interviewee 8+9, 2018).

Furthermore, being exposed to water became also very apparent as in 2018 the municipality warned the citizens of the old city centre three times about high water levels potentially requiring measures to be taken by citizens, e.g. placing sand bags in front of doors (Public interviewee 8, 2018). Finally, being exposed to water is also termed as something that people ought to understand, including the measures to be taken

around water, which can be seen below in the adaptation narratives more in detail. With exposure to water comes also a certain awareness for it, which is elaborated upon in the following narrative.

Table 8: Exposure to water narrative quotes

Exposure to water narrative quotes
"The regenbui (transl.: rain shower) came so in that gebied (translation: area) ... there was a lot of overlast (transl.: nuisance) in this area here […] really heavy rainfall […] and I lived there for 70 years, and that was the first time that my wife sent me an image to the basement to clean it because I also had troubles with water in my house (laughing). Interesting thing what I heard from inside the Waterschap is that when you look at Dordrecht, and all the dikes are very high, very up to date, that it's almost like they call it a bathtub, these are dikes and all the rainfall was coming in here, and they couldn't get it out […] to pump it over the barriers into the rivers, the whole system was completely full. The sewage and the natural systems. So we secured ourselves from the rivers but that means that when the water is coming by rain we have another problem." (Public interviewee 8+9, 2018)
"Because of the heavy rainfall here there was some evenings held for the citizens by the municipality and Waterschap combined, and our verhaal, message, was that you cannot technically build for such heavy rain, you can only prevent for so much. So our botschap (transl.: message) was also somethings you cannot prevent. so that's quite different story prior to before. Before we said, if the dikes are ok there is a slight chance you are safe. But for such heavy rain […] you have to do something for it yourself as well. The government agents or bodies cannot prevent everything, so look at your own house, look at your garden, is it all paved with stones or. So it's a different approach. […] We do our part, but if we do our part but in his garden it is paved with tiles, ... he is causing his own problem. He can .... duurzage de regenpipe (transl.: cut off the rain pipes) […] so that they are not going into the sewer. 40% of the water it goes to sewer, to clean it, is rainwater. So it's strange to clean rainwater." (Public interviewee 8+9, 2018)
"And in January it happened 3 times (! stresses that). And you get a bing on your phone, "Bing", "tonight", always at night, "the waterlevel will rise to I mean 4m 20". And you can look at the map you got from the municipality of Dordrecht, Ok my street is around 5m, let's say, so for me there is nothing to worry about. But it closer and closer and closer, so it starts to get interesting. There are some people that needed the sandbags (shows on map some houses next to the open water), these people they had to put the sandbags here and here. So for them the water was that high that they needed to take measures, and if it happened, happens 3 times in one month, instead of once in a year or two years, yeah you get awareness in." (Public interviewee 8, 2018)
"So that works to get the water awareness in Dordrecht, and they have also the water plan, they are living in water, it's in the river, but in the city and in the polders there is also the water, they are living with water (stresses with), and they are aware that water benefits for the economically but it can also be a threat, and in that mix there is a communication policy and there is much done in cooperation between the municipality, the waterboard, the safety region and the environment agency about the water risks." (Public interviewee 11, 2018)
"[…] and the fact that for New Orleans that didn't bother that much because America is a very big country, and if there is a problem here (showing a small area in comparison to a big one), ah ok then you can go 100miles further away. But if we would have these problems in the heart of the Netherlands, cause the west-coast is the most developed part, most people living there, it would, for the Netherlands it would half of the country would be gone or would be in serious trouble […]" (Public interviewee 1, 2018)
"[…] the floods of the 90s what we said, we have a strong picture in some of our presentations of a guy, he lives in Dordrecht, he lives in the Buitendijks, ... and the water on the river is very high, and he lives in the buitendijks, and he is an artist, his working space is under water and they have a picture of him, from the water, and you see him on the other side of the room, of the window, […], while the water is at that level (laughing, and showing that it is very high and that he'd be flooded as he shows the water being

> *higher than the floor, somehow mid level in the room). [...] but that's a very strong picture on wow, water can come that high [...]"* (Public interviewee 1, 2018)

Perceptions of exposure to water narrative

Throughout several interviews, in line with the topical guidance by the protocol, perceptions of various actors were voiced, mostly related to the exposure to water. Thus, such appearing perceptions are supporting a respective narrative as resulting from the analysis of among others the in Table 3 shown queries 9, 11 and in part also query 2.

A prominent example of perceptions about being exposed to water is related to actual experience. After the big disaster in 1953, another flood in the Eastern part of the Netherlands occurred and resulted in evacuations that led then to a renewed awareness to pay attention to water safety. Occurring events that create problems are believed to increase the awareness for water, such as e.g. the floods in 1993 and 1995, and thus are such events reminders for the exposure to water and to stimulate action (Public interviewee 12, 2018; Public interviewee 8+9, 2018). It is conveyed that when the Rhine transports large amounts of water and the rivers in the region are very wide, people are also more aware of the water around them, so *"[...] it's the actually threat that helps you to keep the actual thing [...]"* (Public interviewee 1, 2018). These events in general also show that the perception of being exposed to water was prior to them decreasing as many people were surprised by these events (Public interviewee 8+9, 2018). An emerging perception is also the ambiguity around future developments of water related issues. Such uncertainty about the future also prevails despite such a very advanced protection system as present in the Netherlands, which is referred to as luxury while comparing it internationally (Public interviewee 2+3, 2018).

Another factor that appears to influence perceptions is the location of Dordrecht as being surrounded by water. Due to its location it is pointed out that citizens of Dordrecht, in certain areas of the city respectively, have likely a higher awareness of being exposed to water, aided by the active promotion of a high-water walking tour in the center (Public interviewee 11, 2018; van den Berg & van Schalk advertising, n.d.), which refers e.g. to the old city center that is located outside the dikes. Moreover, due to a general awareness for water is the city of Dordrecht already actively preparing for more extreme events, underlining the importance of the exposure to water and thus the awareness for it.

Yet, awareness for water is also not evenly distributed across involved and affected actors and stakeholders, which therefore needs to be taken into account while designing measures to mitigate risks arising out of water (Raadgever & Hegger, 2018). Whereas an awareness to water generally seems to be present in some locations, the constant improvement of dikes by authorities let many people not realize that *"[...] they live under the water level. So it's no item. It's always safe, never overstroming [flooding], and that's not the whole truth. There is always a risk, and we have always to manage the risk and the implementations of it. [...] And I see very much authorities are a little [...] afraid to tell people, inhabitants, there is always a risk. They don't talk about it. [...] and don't tell it to people. [Whereas] In Dordrecht it's, they are much opener and much more active to speak with the people about, open speak about possible risks, and what do you think about the risk, when. The little risk, but when the water comes, what would you do."* (Public interviewee 4+5, 2018). Pointing out the increased awareness for water in Dordrecht is often limited to authorities and people living outside the dikes, "buitendijks" area respectively, and not reaching very much to those not affected by water (Public interviewee 8, 2018). This limitation seems to be even more emphasized by conveying that there is no mental problem around water in the city as many do not realize being located under the sea level as shown above (Public interviewee 10, 2018; Public interviewee 4+5, 2018; Public interviewee 8+9, 2018). Moreover, experiencing problems with water is often also correlated

with higher awareness, which in turn results in many people who do not have problems having also no interest in such topics (Public interviewee 10, 2018).

The already mentioned extreme rainfall in 2015 though appears to have increased awareness for water and extreme events to some degree, and as seen also in the motivational narrative, inspires measures to be taken. Lastly, it is interesting that authorities acknowledge the need for dikes but that such discourse about safety through dikes is also leaving out remaining risks, and therefore the need for other measures, supporting the existing and future adaptation narratives, is given in Dordrecht as well as the Netherlands in general (Public interviewee 2+3, 2018; Public interviewee 4+5, 2018).

Important for the following adaptation narratives as well as those for futures is the mentioned misperception of the vulnerability of Dordrecht that stems from the experience of minor floods in the "buitendijks" area, i.e. outside the dikes, which is not similar to the whole city being submerged in water for some time, considering the force of such amount of water flowing through the city (Public interviewee 6+7, 2018).

Finally, perception is apart of exposure also defined by culture and what an individuum perceives as e.g. a risk, which therefore varies within any society and so also in Dordrecht and the various stakeholders (J. De Boer, Botzen, & Terpstra, 2012; de Jong, da Silva, & Bea, n.d.; Rijksoverheid, 2017b). Only under certain conditions, e.g. personal exposure to risk or if culture and a certain worldview let an actor become active, translates perceptions into action (Capstick & Pidgeon, 2014). With regard to adaptive measures and climate change is it suggested by some stakeholders that at the local level are people made aware of their exposure and relative vulnerability, which translates into discussions about further actions. Considering the need for involving citizens more closely, as shown below in the collaboration narrative too, their perceptions around water matter because their support is needed for many measures. Moreover, an extreme situation as already pointed out, is believed to aid in increasing their awareness for water-related issues and makes thus discussions easier. Despite a sometimes low or missing awareness are people in Dordrecht nevertheless more supportive for adaptive measures, which may depend on a rather open discourse around water by authorities (Public interviewee 4+5, 2018). The previously discussed vulnerabilities and exposure to water- and weather-related issues make adaptation to them an important act to safeguard the city and proof it for the future, which appears in several ways in the interviews and is discussed in the following.

Table 9: Perceptions of exposure to water narrative quotes

Perceptions of exposure to water narrative quotes
"Lucky enough in Dordrecht, there is, cause they have this buitendijks part, and they also have the .... Voorstraat ... that they practice every year with wooden plans to keep the flood away. So there is some awareness over there, and they had [...] an exhibition a couple of years ago, it's not that huge but it's there. so I think that the awareness in Dordrecht is yeah, probably better than in the rest of the Netherlands, they are more aware about living with the water, it's an island yeah, it's an island between all the rivers [...]" (Public interviewee 1, 2018)
"I think it's a very interesting question because maybe it's modern times but the awareness of living with water used to be very high or used to be normal, especially in cities like Dordrecht. But for us as a Waterschap, sometimes we talk about, we need to bring back this awareness because it helps to achieve our goals because people see us as something, let's say, safety, it's not something that comes from nothing." (Public interviewee 8+9, 2018)
"The rain is good for the discussion about klimaatadaptatie, climate adaptation, so and we experience it that when there is rainfall of about 100mm, there is a big problem in that area. [...] and that helped us to discuss measures to solve the problem." (Public interviewee 8+9, 2018)

5.2.3.3. Adaptation narratives (public)

To start with are these adaptation narratives initially based on some motivation for action to mitigate some of the afore mentioned risks, captured in a motivational narrative in the following. Thereafter, occurring adaptation measures are elaborated upon.

Motivational narrative

An aspect that emerged prominently from the interviews is that especially historical happenings seem to strongly foster and motivate for measures to avoid such events in the future *"[…] and to be ahead of the next disaster, and […] to come to integral solutions […]"* (Public interviewee 1, 2018). Initially, motivation emerges from the known impacts of historical happenings affecting both region and city, and thus the strive to avoid them happening in the future. A particularly strong notation seems to be the mentioned St. Elisabeth flood, which had such a particularly negative impact on the city among others due to badly maintained dikes around the city. Such knowledge about the importance of dike maintenance is motivating authorities until the present day to focus on dikes and their state and has been mentioned in many of the accounts, thus resulting out of analyzing a variety of the queries in <u>Table 3</u>. Further is the knowledge that a specific constellation of events such as described above, a storm from the West with high tides and high discharge levels at the rivers respectively, specifically threatening and knowledge about such threat together with the fact that such already occurred in the past strongly motivates for action too. And more generally, as the Western part of the Netherlands, the Randstad respectively, is home for most people and has most capital and wealth accumulated, is the potential risk for a flood also severe since most income for the country is made in this region and a disruption can be seen as disastrous (Delta Commissie, 2008). Thus, knowledge about such risk is a further strong motivator for action, as pointed out below in the exemplary quotes. While much overlap occurs with both historical and vulnerability narratives is the explicit conveying of motivational aspects by interviewees leading to the definition of the present motivational narrative, which is therefore deviating from the previous narratives. These motivational narratives include references that are event centered, contain actors, as well as location and implications, and are therefore supporting the creation of a specific narrative around them.

Previously, water safety in Dordrecht was mainly dealt with by the ministry for infrastructure and the waterboard, and only in 2005 after hurricane Katrina in the USA, the city looked more in depth into water safety (Public interviewee 2+3, 2018), thus an event that motivated further action. Among the motivational aspects is generally the knowledge about possible happenings that render preparational tasks to arrive at concrete measures in the following, which is e.g. fostered by the time that is statistically left until an event possibly occurs. Knowledge about specific risks is also among the motivational aspects for adaptation. For example, the need for adaptation also stems out of the knowledge that at a dike breach at the Eastern location of Kop van 't Land, the worst known flood for Dordrecht can occur (de Bruijn, Lips, Gersonius, & Middelkoop, 2016; van Buuren et al., 2015). Such knowledge about a specific threat and the general exposure of the city towards water poses therefore the need for a variety of responses and safety measures (Public interviewee 2+3, 2018), also addressed in the "general vulnerability narrative". Knowledge about the potential effects of a breach at this location, Kop van 't Land respectively, motivates to maintain this part of the dike in a safe state, and thus it is constantly improved, also in hindsight of potential threats up to the year 2050 (Gersonius et al., 2016, 2014).

Moreover, as climate change is increasingly threatening through various events the city of Dordrecht, as seen further below, it also motivates for action as the effects of climate change are increasingly felt as conveyed by interviewees: *"It's only started later with climate change that we had to do something. It felt more heavy rain that we were involved with the sewage system."* (Public interviewee 2+3, 2018). Such

reference is also pointing out that usually the municipality is not involved in things like climate adaptation measures, or at least they were not in the present case. Extreme events also motivate authorities to look at possible measures to be taken, which include beside the already mentioned floods also extreme rain events, such as one in 2015 that heavily affected the entire region, and combine various organizational tasks to address issues in a systemic manner (Public interviewee 4+5, 2018; Public interviewee 8+9, 2018; Robbemont & Waals, 2015; Schot & Dijkstra, 2015). Among others does motivation also stem from the fact that an increasing number of people ought to be protected and that it is crucial that citizens are knowledgeable about actions they can do when there is an extreme event, which also motivates the municipality to work on future-proofing Dordrecht.

Lastly, becoming also apparent in the future-challenges narrative, it has been mentioned several times that things need to remain safe and dry as well as that preparation is a must (Public interviewee 2+3, 2018), which is a normative statement and in the context of the story it has been part of supporting a motivational narrative as it hints towards the need for action.

Table 10: Motivational narrative quotes

Motivational narratives quotes
"To put things on the agenda for the politics it helps that sometimes things occur yeah. It can, and then I referring to last January e.g., we closing the stormfloodbarriers over there, the Maeslantkering. [...] and I think in Dordrecht ... cause they have this exercise of these flood barriers they make it to this major city street. and yeah. people, it's noticeable, and you have ... in the old city where you can see hei the flood of 1953 came to here, the flood of 14 hundred came to here and etc. so that, so those things help i guess [...]" (Public interviewee 1, 2018)
"[...] some of the gefolge van di (transl.: impacts consequences of the) St Elisabeth flood [...] on the position and the people and the economy of Dordrecht is in the mental map of the town and there is a feeling on that we will never again [...] (transl.: experience it again) ... and I think this is also still leading for the notions in the MIRT examination, and ... the waterveiligheidsplan (transl.: water safety plan), so it has meant Dordrecht is very active and loop for op en loopt voorop zeg maar in de (is a frontrunner at) the operating and handling of water management and water safety. Much more than in other towns or other areas. And what I think is important [...]" (Public interviewee 4+5, 2018).
"I think the historical events are very important for us to make our case, cause before the St Elisabeth flood the city of Dordrecht was a very important city. And there was a weak maintenance of the dikes in those days, so we know what that means now. So we are very keen telling that story." (Public interviewee 2+3, 2018)
"That also our rivers, our rivers almost flooded in 1990 also, and therefore Rijkswaterstaat, our big brother, has made many projects next to the rivers" (Public interviewee 8+9, 2018)
"The rain is good for the discussion about klimaatadaptatie, climate adaptation, so and we experience it that when there is rainfall of about 100mm, there is a big problem in that area. Our technical system is dimensioned at about 20, 24mm rain within 24 hours, and when it has raining a week in this area and there is a rainfall within a few hours of 100mm then there is a big problem, and that helped us to discuss measures to solve the problem." (Public interviewee 8+9, 2018)
"[...] if you know that you have behind one dike thousand people, and that were thousand people in the 60s, and now we are 50years later, these 1000 people are 2000 people. and maybe you should protect 2000 people better than thousand people, they have bigger houses, there are more offices, there is more infrastructure, etc. So that's the reason that we looked at our norms for water safety to look in more detail of it. [...] For the Dordrecht area e.g., this is one dike ring, so it's a ring of a dike, and it used to have one norm (showing on the map the main dike ring around Dordrecht). and what we said is oh, and now we say, oh if the dike goes here, it' s much more damage than if the dike goes here, cause we have, this is a very old dike, and this is only 20 families, farmers, and this is 100,000 people." (Public interviewee 1, 2018)

This shown motivation translates in many cases into concrete adaptation measures, captured within the following occurring adaptation narrative.

Occurring adaptation narrative

This narrative is involving measures that are currently undertaken, i.e. occurring adaptation, or are in the active planning-stage for implementation and addresses mainly issues that are known to occur now. As such notations have been mentioned both implicitly and explicitly, an own narrative around them can be defined as it captures such references well, which are yielded by investigating the queries 5, 6, 7 and partly query 12 as shown in Table 3. In contrast, the below stated future perspectives narratives have a focus on possible concrete solutions, which are not undertaken yet, as well as adaptation to future scenarios and extremes, mainly at the planning stage but yet again not happening at the present moment.

To start with, building and maintaining dikes is among the oldest adaptation measures in the Netherlands, which occurred historically in order to live in an area influenced by water as seen above in the section on history, and is nowadays a necessity since without it the Netherlands and Dordrecht could not exist and happens therefore without any doubt (Public interviewee 10, 2018; Public interviewee 2+3, 2018). Historically, water management in the polders posed the need for government structures in order to successfully maintain the polders and dikes, which is why waterboards were created, the first democratically chosen government authorities respectively (Public interviewee 8+9, 2018; Waterschap Zuiderzeeland, 2018). In relation to dikes is there a conveyed aspect that generally people are feeling now lucky to have them, which is why they also maintain them. Maintenance and improvement of dikes is a constant endeavor and also an adaptation to changes in water-levels and extremes, with bigger projects in Dordrecht finished in 2017 (Public interviewee 11, 2018). Moreover, primary dikes are the main levies protecting in that case the city of Dordrecht, but also secondary regional dikes within the city play a role in that regard (Public interviewee 4+5, 2018). Nevertheless, as already pointed out within the narrative about perceptions is such focus on dikes as final solution also posing risks in light of expected future challenges, which is why further measures are suggested, becoming more obvious in the narrative about future adaptation measures.

Another occurring adaptation that is related to dikes but actually the opposite of damming a river is the program "room for the river" that aims on giving the rivers more space to accommodate large amounts of discharge and to limit the velocity of the water (Public interviewee 8+9, 2018), which is primarily a project by Rijkswaterstaat but in South-Western Holland also supported by the Province of South Holland. Creating room for rivers is a challenging task involving many affected parties and is nowadays regulated by spatial policies. Nevertheless, it is conveyed that sometimes legal ambiguity about a specific location let project developers sometimes plan projects too close to rivers, which is why room for the river is of particular importance to be paid attention towards as that room is important for safety (Public interviewee 1, 2018). One such example is the Biesbosch, a tidal landscape next to Dordrecht shaped by the influence of water from both rivers and sea, which though increasingly used by humans serves also as a floodplain that aids in reducing the pressure on the dikes around Dordrecht, specifically the ones towards the East. Nowadays, dikes were partly removed as part of the project Nieuwe Dordtse Biesbosch so the water can flow more easily through the area and has more space in case of a flood (Public interviewee 1, 2018), which is therefore aiding the protection of the city and adapting to a change in flood-risks (Nieuwe Dordtse Biesbosch, 2018).

An historic adaptation measure occurred for a long time since the buildings in Dordrecht were built in such way that they are withstanding higher water levels and people adapted to them by e.g. using the basements *"[…] only for things who have no problem with water. So, you put your bike in the basement but not your books …. No wooden floor, no parkette on the floor […]"* (Public interviewee 8+9, 2018). Moreover, houses

were built with higher ground-floors and higher entrances to adapt to high water-levels (van Son & van Nes, 2014).

Whereas the municipality and other actors are looking into adapting to changes in weather and water, concrete and occurring projects are so far limited to maintaining dikes, space for water, historic measures on houses as well as to adaptation measures taken in relation to the above-mentioned strong rainfall in 2015, elaborated upon in the exposure to water narrative. In the aftermath of this event, investigations showed that the water gathered especially in low-lying places and holes. Thus, the city adapted to them by e.g. making sure these holes are paid attention towards and kept as open surface to gather water also during future events (Public interviewee 2+3, 2018). Adaptation to extreme rainfall occurs also in form of pumping water out of houses, but specifically the Safety Region South-Holland South is *"[…] even more realizing that that isn't an option because you have always the risk that the fire truck is pumping it through the front door out and the same water is coming into the house from the backdoor. So we are more getting to the options of you should, extreme rainfalls, you should respond before it has fallen, and if it is fallen you should react with high capacity pumping from the waterboard or the local government, which is normally … in the sewer system. That should be installed in the sewage system as an extra option. But pumping in streets isn't an option, that's our experience from the last 10 years. It should be in the system cause otherwise you won't get it out […]"* (Public interviewee 6+7, 2018). This particular narrative segment is supporting both the current narrative of occurring adaptation, but also the narrative on motivation for action.

Among other conveyed measures were technical solutions in the sewage system that are planned and in the process of implementation so as to be able to deal with more severe rain events (Public interviewee 8+9, 2018; Schot & Dijkstra, 2015). In the follow up of this rain event in 2015, individual measures were also discussed by different actors, but generally are there limits to how much adaptation to such extremes is possible, considering that the sewage system cannot be designed in a feasible manner for them and thus other measures such as increasing retention ought to be taken (Public interviewee 10, 2018). Therefore, different sorts of buffers to extreme precipitation were mentioned as being among the solutions to avoid wider flooding due to rain events, e.g. buffers implemented across the city (Schot & Dijkstra, 2015). Lastly, the municipality of Dordrecht is actively looking into the various neighbourhoods of the city in order to realize concrete projects to adapt to already happenings extremes. These measures are currently in the planning stage or some initial local measures in relation to floods caused by heavy rain events. Specifically, the neighbourhoods Wielwijk and Vogelbuurt are presently targeted by the city, with the former already since approximate one decade under revitalization that continues into the future as outlined by a recent political agreement (Dordrecht, 2018b). Interestingly in that regard, the municipality shifted just in recent years from mainly urban flood management to spatial adaptation and climate adaptation as well as multilayer safety (Public interviewee 2+3, 2018), motivated as outlined in the previous respective narrative. While working on such issues it became increasingly clear for local authorities that evacuation is one aspect of such measures for adaptation but as happening in the future it is discussed below in the future-adaptation narrative. Dordrecht is thus the first Dutch city with a comprehensive water safety strategy *"[…] that gives perspective to the citizens what they have to do when a dike breaches […]"* (Public interviewee 2+3, 2018). Moreover, Dordrecht appears to be a frontrunner in climate adaptation, partly due to the necessity out of its relatively high vulnerability (Public interviewee 12, 2018), with specifics outlined in the future-related narratives.

Dordrecht is nowadays due to the many water- and weather-related challenges it faces generally active in adapting to them, as well as future-proofing the city as seen further below, with most work being currently located at the planning stage and just some of it being already implemented. This involvement of Dordrecht as captured within this occurring adaptation narrative is voiced in several interviews and stressed to the

extent that *"[…] here is also every reason to do so […]"* (Public interviewee 2+3, 2018), referring to many of the extensively mentioned challenges.

Finally, the already mentioned messages with warnings by the municipality that are distributed to citizens, mentioned within the exposure to water narrative above, is also a certain occurring adaptive measure to mitigate potential risks (Moser & Boykoff, 2013; Provincie Zuid-Holland, n.d.; Runhaar et al., 2012). Further is the city annually distributing information to all residents living outside the dikes to remind them of that fact (Awareness, 2016). Such informative adaptation measures to potential risks are also prominently conducted at the national level by the homepage "www.overstroomik.nl" that allows citizens to see the flood-risk for their location as well as suggested actions to both prepare for such and act when it is occurring (HFA, 2014; Overstroom ik, 2018; Raadgever et al., 2016; Raadgever & Hegger, 2018).

While much work is conducted on future-proofing the Netherlands as such, i.e. climate mitigation and adaptation as already mentioned earlier, is within this project and the elicited stories related to future-proofing the city of Dordrecht also a certain identity appearing, which is central in the narrative accounts and presented in the following identity narrative.

Table 11: Occurring adaptation narrative quotes

Occurring adaptation narrative quotes
"So we are of course trying to make sure that this whole neighbourhood is far more a sponge. ... Hopefully, it will, make sure that it doesn't get there, but that's difficult. There are, in Reeland, that is such a neighbourhood, is very very vulnerable, because they have a lot of these holes. And we are now trying in a higher area of the Reeland to help, there is a lot of investment from housing corporations, tearing down houses and rebuild. We are trying to make sure that you can do something with making sure that the water that falls there stays there. So that are just solutions that you can only take when there are some things going on there. So that takes time" (Public interviewee 2+3, 2018).
"Every year the citizens of Dordrecht get an envelope in the mail from the municipality of Dordrecht and it gives you information about the high water. (shows picture of the mail on the phone). We get it in September and it says "High water season 2017-2018, yearly melding". And it gives you all the information what to do and it gives you an opportunity to give your phone or your email to some kind of melding, meldkammer (notification). And interesting fact .... in January, first time I had experienced it, in January there were 3 times after, followed up by a week and a half, 3 times in one month that there was exceptionally high water risk." (Public interviewee 8, 2018)

5.2.3.4. Identity narrative (public)

The specific situation of Dordrecht, being surrounded by water respectively, and the common mentioning of it being an island, contributed to the capturing of similar accounts like this within an "identity narrative", as e.g. conveyed in query 9 based on Table 3. This identity narrative captures well all those features of Dordrecht that are conveyed as being special and important to that particular place. Interesting to note is that many stakeholders refer to the "island" of Dordrecht, which appears to be a defining feature for Dordrecht from their perspective as it is voiced throughout many stories, and further appears in many official publications about water, weather and climate change in relation to the "island of Dordrecht" (de Bruijn et al., 2016; Hegger et al., 2014; Hulsebosch & Kelder, n.d.; Raadgever & Hegger, 2018; Trans-Adapt, 2015). In addition to this character of being an island is water also important to define the city's identity, which is marked by the reference to other cities and their relation to water across some narrative accounts. Water is, as already seen in the preliminary overview of the conveyed stories, the word frequency diagrams respectively, an important and defining feature for the city, partly discovered due to the focus of

this research but also mentioned often in reference to Dordrecht's identity of being an island and shaped by water. Additionally, a state of being vulnerable as a city appeared often together with the account of being an island and surrounded by water, thus vulnerability seem to support to some extend the identity of the city, which is why it backs up an identity narrative. Vulnerability seems therefore to be for some actors in part also defining the identity of Dordrecht, which can be also seen above in the vulnerability narrative.

An emerging reference to the historic importance of the city, which also refers to the city's identity, is that it has been wealthy, rich, and smart, until the St. Elisabeth flood. The St. Elisabeth flood therefore serves also as a motivator and backs up the motivational narrative, motivating for safety measures respectively, to never experience something alike again (Public interviewee 2+3, 2018). Moreover, references were made to Dordrecht's historical and cultural importance, which at least indirectly supports an identity narrative that draws upon the specific elements that make Dordrecht in the stakeholder's eyes important. Finally, the city has been also mentioned as have been prior to Rotterdam among the biggest harbors in the Netherlands (Public interviewee 8+9, 2018), and yet again supporting a narrative about the specific identity of the city.

Table 12: Identity narrative quotes

Identity narrative quotes
"So that is really based on historical facts but we have experienced. We were very very wealthy and important city, and never regained it after that flood. So that is something we should make sure it never happened again. […] we were very rich and important and after that [St. Elisabeth flood] we never regained that position anymore. So we very wealthy because of the trade through water, so water is very interesting always in the growth and the economics of the city, and it still is. It's a maritime region, so we need this and it's very good to have an open corridor to the sea […]" (Public interviewee 2+3, 2018).
"[…] so I think that the awareness in Dordrecht is yeah, probably better than in the rest of the Netherlands, they are more aware about living with the water, it's an island yeah, it's an island between all the rivers so […]" (Public interviewee 1, 2018)
"At the same time ... because of the fact that Dordrecht is an island, if something happens, there are only a few places you can get off. It's a bridge, a bridge and a tunnel. A tunnel and a bridge, that's it." (Public interviewee 8, 2018)
"[…] jap, that's why I think about water, we are an island of course, you don't want the water, you can go build a dike like this and then like this but you can but you don't want have water in the city, but Utrecht without water is not Utrecht, and Dordrecht without water is not Dordrecht […]" (Historical interviewee 2, 2018).
"Surrounded by rivers always, but also the relation with the Biesbosch. And the Biesbosch was not only an area with rivers but with tides, economische functies [economic functions], fishing, make polders, so for agriculture it was interesting, and also the culture of willows and reeds […]" (Public interviewee 4+5, 2018)
"[…] as I know it, it's some kind of Venice town, practically a completely built island, lying in the river Rhine […]" (Public interviewee 12, 2018)

While referencing to the specifics of Dordrecht is the following socio-economic constraints narrative similarly defining for the city and outlined below.

5.2.3.5. Socio-economic constraints narrative (public)

The present socio-economic constraints narrative is shedding some light on those accounts that mention the importance of socio-economic constraints to the city as such as well as to future-proofing it. Initially, this narrative is aiding in eliciting the connections that changes in the environment and acting on them, and socio-economic vulnerabilities have with each other (Hackmann, Moser, & St. Clair, 2014). A voiced issue around the socio-economic setting of the city of Dordrecht has been around its economic position, as it is considered as comparatively low, which makes the funding of adaptation projects a challenge that cannot easily be overcome without external budgetary support for such projects. This situation is especially present due to the strong stance of the maritime industry, which is not a strong economy so that *"[…] I think the economy of Dordrecht and Drechtsteden is very kwetsbaar (transl.: vulnerable) […] It's possible that between now and 20 years that it crashes. ... Also ... the inhabitants are not so rich, so there is a socio-economic problem in Dordrecht. And I think the improvement of that is complexer (means: more complex), to make sustainable for the future, than the physical parts of a sustainable future […] For municipalities that have socio-economic problems there will be very less money for green and blue […]"* (Public interviewee 4+5, 2018). These mentioned issues contain complicating phenomena, the economic situation of the city, as well as the actors in the story, and thus support the socio-economic constraints narrative. Monetary constraints in Dordrecht also manifest themselves in many projects as being too expensive for the municipality alone, which among others marks the need to the below shown narratives around governance.

Apart of financial constraints, the city is aiming to tackle existing social constraints, i.e. poor and less socially coherent neighborhoods, together with physical constraints. The following narrative section marks these issues even more clearly by naming the issues and the complicating phenomena for solving these issues in relation to the location:

"[…] there you see the complexity because these are wijken (transl.: neighbourhoods) who are from the 50s ... relative old houses ... who have to be renovated with poor inhabitants, and all wijke waar de bodem engeklunge is (transl. meaning:: where the soil subsided), wateroverlastprobleme (transl.: water nuisance, trouble), how do you manage then wateroverlast (transl.: water nuisance, trouble) e.g. in a wijk (transl.: neighbourhood), who has problems from all parts of life you can say. It means a lot of money to improve that but the money […] is not coming from the people […] so it's the complexity. In a poor wijk (transl.: neighbourhood) de verharding is groter, kleinere tuinen (transl.: the hard surface/non-penetrable surface is larger, smaller gardens). That relationship I think it's very complex and how you organize that." (Public interviewee 4+5, 2018)

These many challenges make locations that experience them in a combined manner also significantly more vulnerable to climate impacts, as e.g. referred to in the following narrative section.

"Interesting thing in the city centre, there are more expensive houses in the city centre, but that's also not green and not much space for the water to ... there is a lot of verhaarding ... (transl. meaning: that the water can't penetrate into the ground since much hard surface cover in the centre). But there is also a neighbourhood, I think that is also the neigbourhood the Spuiboulevard, that whole area that is also not as strong, but also the future of the business, the working programme and living area, I think ... (transl.: the reason why they act there is because there is not so much quality to live and work in that area/neighbourhood), there is a lot of lack of quality in that area for living and working so there is a chance to make that more […]" (Public interviewee 4+5, 2018).

Furthermore, following up on such perceived low quality of life and the persistent challenges for adaptive measures, realizing them can also enhance quality of life and thus positively contribute to both physical and

social resilience towards climate change (Ilgen, 2016). An expected increase in local quality of life might also gather support for measure taken in the neighborhood. Social resilience, i.e. in principal how a society becomes resilient towards disruption and in that regard meaning things such as social organization, capital and networks, is positively connected to civil action and also disaster relief and aid, which is why it is important to consider such socio-economic constraints and implications for resilience in the city of Dordrecht (Eraydin & Taşan-Kok, 2013; Tschakert et al., 2017). Lastly, many of the referred environmental challenges are expected to increase in the future, which is thoroughly dealt with in the following narratives.

5.2.3.6. Future perspectives narratives (public)

Whereas the previous sections dealt mainly with issues that did occur or are occurring now is the present section focusing on future challenges and various possible responses to them and are therefore also aiding in answering the <u>research questions</u>. Initially, mentioned future challenges are displayed and shortly reflected upon based on both interview-data and literature. In the following are solutions and possible adaptive measures for mentioned future challenges displayed.

Future challenges narrative

In line with the interview protocol that aimed on eliciting among others future challenges let those accounts addressing them be clustered within a future challenges narrative, mainly shown as the in <u>Table 3</u> described query 10. Whereas different phenomena and happenings have been mentioned is among the main issues *"[…] first of all for Dordrecht to keep Dordrecht safe in a way that's liveable for everyone, and …. in combination with other issues which live in the city […]"* (Public interviewee 1, 2018). This is an ongoing challenge continuing in the future for both Dordrecht and the Netherlands as a whole and referring to among others the quest to future-proof the area in light of climate change induced issues and sea-level rise.

As such are the challenges for the Netherlands strongly dependent on overall climate change on the planet (Ministerie van Infrastructuur en Milieu, 2016), and in the following which scenario of climate change may unfold as different challenges arise out of them (Ligtvoet et al., 2013). In line with such ambiguity about the future and strongly emphasizing both experienced issues as well as morally stating the main objective is the following statement from the data pointing towards insecurities arising out of future events but also the need to act:

"[…]and on the other hand, it still feels uncomfortable because you don't know how those scenarios are going to develop, except that we face the challenge of climate adaptation, which we are already seeing together. Also, in view of the periods that we have gone through, with intensive rainfall, which is also a nuisance here, so really current. And then the question is how we can tackle this with the inhabitants, how we can create a situation that will also keep their feet dry in the future. A little inconvenience perhaps, but it must remain safe." (Public interviewee 2+3, 2018)

Specifically the statement to keep Dordrecht's feet dry appears several times in relevance to future challenges of Dordrecht, and is supporting adaptation and motivating for action in general (Public interviewee 10, 2018; Public interviewee 2+3, 2018). Such reference to "dry feet" is also directly referring to the challenge of climate change related floods and other nuisances caused by extreme events, exacerbated by climate change (Ministerie van Infrastructuur en Milieu, 2016; Rijksoverheid, 2009; Witteveen+Bos & H+N+S landschapsarchitecten, 2002). Climate change, which is now being increasingly addressed in a discourse around the severity of its effects (Public interviewee 1, 2018), poses challenges to Dordrecht that lead to a situation that *"[…] with this climate change, you know these extremes are unpredictable how high they come. So it's because of the kind of climate change we experience now with these extremes, you can't say that we, that there are no worries about breaching a dike, it's not that we not good at it, we know how*

to make it, but it's just not something you can do only for these extreme you cannot build it that high." (Public interviewee 2+3, 2018).

Both sea-level rise and an increase in the peak-flow river discharge are threatening the city and the country (Delta Programme Commissioner, 2017; Gemeente Dordrecht, 2013b; Ligtvoet et al., 2011, 2013; McEvoy et al., 2016; Rijksoverheid, 2009, 2017a) that is overall flood sensitive and thus requires special measures to keep it safe in the future (Ligtvoet et al., 2011). Especially the combination of a storm from the sea, already leading to higher water-levels, exacerbated by climate change, and higher water levels on the rivers is a threatening situation as already shown in the event-centered vulnerability narrative. In the future it is expected that what *"[…] we now think that happens every 15 years, but if we have sea level rise, every 15 years becomes every 10 years, becomes every 5 years, so yeah, it depends how fast the sea level rise goes of course but yeah, with the expectation of sea level rise, you expect that the closing [of the storm flood barrier] will occur more often and at the end then we are 50 years further, we have to replace them maybe […]"* (Public interviewee 1, 2018). Furthermore, increases in river-discharges are expected to occur in the future, yet again dependent on the severity of climate change (Guerreiro, Dawson, Kilsby, Lewis, & Ford, 2018).

Apart of the uncertainty about the severity of those extremes are also many issues being voiced as increasingly threatening the city of Dordrecht in particular and posing a need for specific adaptive measures, with the statement below being an example for the list of issues thereafter, which in part already occurred in Dordrecht. Among the difficulties in adaptation is that *"[…] pluvial flooding, big rain, etc. that's not in our system [of the Deltaprogram], but maybe you can, if you look at, it's now we call it ruimtelige adaptatie, spatial adaptation …. and then you look at heat stress, dry periods in the summer, and also fluvial flooding. Maybe that solutions for those problems can help you, can be in the same time be solutions for other problems. And that's to look at. […] or other things of just bringing more water in at some parts it could help you for heat stress, etc. […] "* (Public interviewee 1, 2018). Apart of the challenges are also adaptation strategies pointed out by the same interviewee, further discussed below in future adaptation and solution narrative.

A mentioned challenge such as extreme rainfall is an issue that requires for a successful solution governance, thus also supporting the governance narratives below, especially due to varying responsibilities since e.g. the waterboard only pumps the water from the canals but land-owners need to find solutions to get the water there in the first place (Public interviewee 10, 2018). The following list of issues is according to the interviewees an account of the main challenges for Dordrecht in both present times as well as increasingly in the future and are expected to impact the region of South Holland particularly as it is very low-lying or even under the sea-level (Provincie Zuid-Holland, 2009; Waterschap Hollandse Delta, 2013).

- *Pluvial flooding, from rain* (Public interviewee 1, 2018)
- *Flooding from the river, fluvial flooding* (Public interviewee 11, 2018; Public interviewee 2+3, 2018; Public interviewee 6+7, 2018)
- *More water in general, among others due to climate change* (Public interviewee 11, 2018; Public interviewee 4+5, 2018)
- *Heavy rain* (Public interviewee 1, 2018; Public interviewee 10, 2018; Public interviewee 12, 2018; Public interviewee 2+3, 2018; Public interviewee 4+5, 2018; Public interviewee 6+7, 2018)
- *Heat stress* (Public interviewee 1, 2018; Public interviewee 11, 2018; Public interviewee 12, 2018; Public interviewee 2+3, 2018; Public interviewee 4+5, 2018; Public interviewee 8+9, 2018)
- *Drought* (Public interviewee 11, 2018; Public interviewee 4+5, 2018)
- *Lack of green structures* (Public interviewee 4+5, 2018)

- *Decreasing water quality* (Public interviewee 10, 2018; Public interviewee 8, 2018)
- *Salinization of the groundwater due to salt water intrusion from sea during droughts* (Public interviewee 11, 2018)

In addition to these physical challenges imposed on the city of Dordrecht, which are in their severity in part also uncertain (Gersonius et al., 2016; Wardekker, 2011), might a principal challenge arise out of the uncertainty whether people will continue to invest and live in a city that is expected to flood with increasing frequency and intensity as climate change is worsening over time. As such it is expected that the frequency of floods from both rivers or sea as well as heavy downpours increases in the future with climate change, considering that heavy precipitation increases approximately by 12% per degree global warming significant problems might occur (Delta Programme, 2017; Delta Programme Commissioner, 2017; Raadgever & Hegger, 2018; Runhaar et al., 2012). Uncertainty whether an increasing risk for Dordrecht will cause its population to move to other parts of the Netherlands is both causing ambiguity as well as motivates for action to have a perspective for a future of the city and its population as stated by interviewees. An increasing frequency of floods in Dordrecht let around 20% of the respondents of a survey in the areas outside the dikes consider moving away (Hulsebosch & Jacquemart, 2012), backing thus generally such voiced worries by the interviewees of the present study.

Responding to all those major ambiguities around the future of Dordrecht is a task that appears to create among others the need for action so as to avoid the worst-case scenarios to realize, noting though the conveyed uncertainty as seen by the linguistic choices made in the various statements.

An implication out of such motivation for action despite major challenges is that in case a major flood occurs, people that aid the recovery process by starting it in their neighborhoods are paramount because *"[...] in New Orleans where everybody was gone and while it took years (!stressed) before they came back, years! And it started with little pioneers and then it grew around these pioneers. But if you really want to restore, then you really have to make sure that you've got a certain amount of your population there, to have that interest in helping restore your community."* (Public interviewee 2+3, 2018). Thus, it is crucial that people are continuously present within the city, which supports the present narrative of a future challenge as well as the one around the motivation for adaptation that makes people remaining on the island more likely, and lastly the narrative of future adaptation below.

Finally, all those challenges depend on happenings that occur beyond the direct influence of local stakeholders as the municipality stresses that *"[...] at the end of the day it is also about developments that are above of and beyond our control. You can only try and influence it nationally or in Europe. Ensure that the necessary measures are taken. In order to prevent the sea level rise from going faster than is currently anticipated, because I do not know what kind of dikes are then needed to keep our island safe, frankly. I myself am not entirely reassured. You live here near the sea [...]"* (Public interviewee 2+3, 2018). Voicing the limited possibilities of a city, it indirectly supports the following future adaptation & solution narrative and ways to keep the city as safe as possible under the occurring circumstances and changes.

Table 13: Future-challenges narrative quotes

Future challenges narrative quotes
"There are signs that there is the question whether you can keep this area dry in the long run. Or that there will be a new large population movement, that people will then go to the higher areas. I think at a time when there are companies that are going to relocate one day, because I think they will be the first to realise what kind of capital they represent, and what the future then is for this kind of company here. If this happens, so once a move has been started, then I do not think there is any point in keeping it, because then the economic value of this area will very quickly be lost. People will not want to invest in

> *this anymore. If there is already half a metre of water on the quay here every year in the area outside the dikes [means: Binnenstad], the question is whether people are still willing to continue investing."* (Public interviewee 2+3, 2018)

> *"[...] because they will far reach into the next century. And then the impacts of climate change will be really severe, that will be bigger than the worst case scenarios that are in the news now always, because they are all fixated on the 2100 time horizon."* (Public interviewee 12, 2018)

> *"Maybe some time we have to offer the fact that the Maeslant-barrier is still open, maybe we have to offer that. Cause that is the best protection for us. [...] Definitely climate change does make a big difference for our city."* (Public interviewee 2+3, 2018)

Future adaptation & solution narrative

The present narrative is gathering those accounts that mentioned specific adaptation and solution strategies to future challenges such as those outlined above and is thus shedding light on future-proofing the city of Dordrecht. As already introduced is the municipality of Dordrecht actively looking into evacuation and safety plans as part of adapting to extreme effects of climate change on the city. The currently followed strategy involves among others horizontal evacuation of citizens from the island, in case this is not possible as seen above in the specific vulnerability of the city due to its location, *"[...] we have to accept that and make sure that they have to stay here and make sure that they can stay high up. So then we go by vertical evacuation. So the first day we have, 24 hours, we first like to move the vulnerable persons, so we have to know them and we have to make sure we get them out. And then the waterboard knows which dike possible [sic!] breaches first. And we make sure that the postcodes closest by are also allowed to go if there is still time. So we can, and then when they are gone, the next postcode can go. So that is something you have to do. But that is a strategy that is made by us, and that's not something that is done nationally."* (Public interviewee 2+3, 2018). Horizontal evacuation as being the officially preferred strategy is due to the short warning time of max. 1-3 days in advance, as already shown in the event centered vulnerability narrative, only possible for approx. 12-15% of the 120,000 people in Dordrecht due to a limited amount of exits from the island (EDUCEN, 2018; Hoss et al., 2013). Such horizontal and vertical evacuation is both bundled and taken up within a "multi-layer safety" strategy that is currently under development and can be seen as the core of this future-adaptation & solution narrative. In any case, vertical evacuation is a known strategy that is currently developed even further so as to provide safety in case of a disaster (Dordrecht, 2009; HFA, 2014; Overstroom ik, 2018; Trans-Adapt, 2015; van Buuren et al., 2015). Whereas evacuation is generally nothing new, integrated strategies for many people are seen as something that becomes more pressing in the future due to the described issues caused by climate change, which is why it can be seen as an adaptive measure to future challenges.

These several layers of such "multi-layer safety" strategy consist of the primary dike-protection, preventive measure through spatial planning as well as last resort emergency response, which includes both evacuation and safety measures (Delta Programme Commissioner, 2014; Gersonius et al., 2016, 2014; Hulsebosch & Kelder, n.d.; Public interviewee 11, 2018; Robbemont, 2010). Among preventive measures is also Disaster Risk Reduction (DRR) crucial in that regard (HFA, 2014). DRR involves among others the preparation of the population for being partly self-reliant (Hulsebosch & Kelder, n.d.; Kelder et al., 2013; Raadgever et al., 2016) since in the worst case they are rescued to shelters on the island as they are currently under development (Public interviewee 2+3, 2018). These shelters will be developed and the city is currently looking into possibilities within higher buildings and how citizens could transform some rooms quickly into shelters in case of a major disaster that makes horizontal evacuation for the whole population not possible (Hogeschool Rotterdam, n.d.), also addressed in the risk governance narrative below.

Together with the further below described narrative on linking opportunities and measures to achieve something greater that goes beyond a single measure, the quest by Dordrecht to build an additional 10,000 to 15,000 houses opens a window of opportunity to *"[...] combine water safety and climate resistance [...]"* (Public interviewee 2+3, 2018). In addition to these newly built houses is the ongoing energy transition according to the same interviewees also making it potentially possible to have all needed energy generating devices on the roof, which make it possible to survive also more severe flooding and having access to crucial services that would be otherwise out of order if continuously placed in the ground.

While preparation for extreme events is certainly present, adaptation to various effects of climate change is increasingly happening and addressed by various institutions, and let those actors such as the Province of South Holland become more involved that have not yet been so much present within the city (Public interviewee 4+5, 2018). In addition to new actors addressing the issue, another conveyed message suggests that planning ought to happen for the long-term, e.g. the next 200 years, and needs to include systemic planning measures to be implemented in order to keep Dordrecht as a city liveable in the future. Such long-term visions in adapting to future challenges are especially crucial since although until now dikes were seen as main solution as seen e.g. in the perception narrative, but in the future other measures such as integrated and systemic adaptative measures will be needed too as conveyed by interviewees.

Figure 28: Green corridors in the Netherlands (Gemeente Dordrecht, 2013b)

Regardless of some very big challenges, adaptation to climate change in Dordrecht offers also many opportunities since the southern part of the island, the Biesbosch respectively, is an area with much green surface that offers many possibilities for the urban area if connected (Public interviewee 12, 2018), such as seen in Figure 28 and described below.

All adaptation measures and solutions are believed to offer positive perspectives for citizens so as conveyed in the stories and backed by some exemplary research (van Herk et al., 2011). Thus, people that are on the island in shelters during a disaster are also expected to help in rebuilding the city (Gersonius et al., 2016), which has many advantages as already seen in the future-challenges narrative and the reference to citizens being absent from recovery.

Apart of adaptative measures are also such conveyed that are concrete solutions for some of the voiced problems. These are in part also captured in the governance narrative and linking opportunities as many are also voiced in relation to them, but generally can these be included in the current narrative as these measures ought to let the city deal with future challenges.

In reference to the voiced issue of a lack of green structures in the city, which are crucial to deal with heat stress, water related issues as well as a low quality of life, specifically relevant is that the existing structures are separated and not well connected. Crucial in that regard seem to be also accessibility to green areas as it enhances the quality of living in the city. Moreover, more green and blue areas in the city can aid in accommodating to heat-stress, let water be retained more easily and has also positive effects on the quality of live in an area, as e.g. shown also below in the linking-opportunity narrative. Many measures such as e.g. green roofs, more open water channels, increasing the number of trees, etc. (McEvoy et al., 2016), can be implemented in a participatory manner of many actors, pointing also towards the further down described governance narratives. Such a green-blue transformation is crucial for the city to be climate-proof and involves generally many more measures (Verheij, 2018).

A concrete adaptive project providing a solution to some of the challenges is the project Nieuwe Dordtse Biesbosch, which is also described in the linking opportunity narrative since several aspects are dealt with together within this project, as well as it can be indirectly seen in Figure 28 that shows the Biesbosch, with the new project extending it into the city respectively. Although addressing many challenges expected to arise due to climate change, is this project also increasing local water quality specifically, which is expected to decrease with increasing climate change, and provides a buffer for both water and heat (Nieuwe Dordtse Biesbosch, 2018; Public interviewee 10, 2018; Public interviewee 4+5, 2018). Moreover, studies show that for a proper future-proofing of the Delta region, more space for water is needed to accommodate also future increases in discharges and sea-level, which could be achieved by more flexible borders between land and water instead of a strict large-scale separation of them (Public interviewee 12, 2018; van Winden et al., 2010). While the risk for a major flooding is a future challenge exacerbated by increasing sea-level and river discharges, it also requires risk governance to deal with it, which is thus shown below more in depth within governance narratives.

Whereas a prominent spot on the future adaptation agenda is taken by a major flooding caused by a dike breach due to the paramount safety risk it brings along, adaptation to rain is needed in new ways as hinted towards already in e.g. the occurring adaptation narrative since more extreme rain is threatening the city already now (Platform Duurzam Dordrecht, 2014). For any future adaptation project, a decision needs to be made *"[…] if you want the really big sewage system so you will never have problem with heavy rainfall then our taxes will get up, will get higher because it has to be paid for. So if you want your taxes to be lower the risk will probably be higher. …. and the political parties at that time will have to communicate that message … have to make a decision what road you gonna choose, is it more risks for the citizens, and OK your taxes will be the same for the next 10 years."* (Public interviewee 8, 2018). This narrative account also supports the following collaboration narrative as governance is needed for such a decision to be made in an acceptable manner and grasps the main challenges around future-proofing the city in a nutshell.

Finally, while Dordrecht aims on conducting many mitigating measures, both for different risks arising out of and for climate change itself, is mitigation in form of emission reductions, which also national and international agreements aim for, continuing to be among the most prominent and important solution so as to avoid the most devastating effects of climate change (Delta Programme Commissioner, 2017; Public interviewee 12, 2018; Public interviewee 8+9, 2018). The following quotes provide an overview of the conveyed stories by interviewees.

Table 14: Future adaptation & solution narrative quotes

Future adaptation & solution narrative quotes
"[…] the surroundings of Dordrecht are on the one hand really industrial […] and it's a big urban city, it's all city and not so nice and not so nice, but on the southern part they have, it's quite of a strong border, there you have a lot of potentially very beautiful and vital nature. The Biesbosch, but also the island of Dordrecht itself, and especially the Eastern part, so that's another thing which makes it very interesting in thinking about future planning of the city. […] But of course that's quite expensive, and again it's also, it's on a place where it's not so safe to live compared to many other places in the Netherlands. So are people prepared to pay so much? And I'm eager now to challenge them to see where they can, the position of the city with all those beautiful nature area around it, which also can be improved, but if they can combine that two. Both in making living in the city more attractive, but also the financing part of, all the city development they want to, will they manage to capitalize the natural ecosystem-services, which are so close by? And maybe even capitalize it in such a way that it delivers money to improve the ecosystem." (Public interviewee 12, 2018)
"[…] now we've got this water safety plan and we make sure that there are shelters. So we gonna build shelters, not really build but we make sure, we gonna look for high buildings and ask the people if they

can look into transforming it quickly into a shelter. And if it's possible, maybe we have to pay them something, but make sure that there are shelters in the city. So if we cannot get off the island, stay safe in shelters." (Public interviewee 2+3, 2018)

"I've always been really hammering on go for something else, look into a different strategy. We are very good in these dikes but I don't think we should see it as the solution. In the future I doubt it is the solution." (Public interviewee 2+3, 2018)

"[...] it looks all green but it's all not really accessible [...] it's fragmented, it's not really accessible. It's all sporting areas that are enclosed, so there's no continuous park structure you can actually enjoy. [...] I think there are a lot of things you can improve there but it's not only about climate change. Climate change is recent, it's also for recreational reasons that you can improve those green structures and also the quality of living for the surrounding neighbourhoods [...] It's good because it's some kind of green buffer, and for climate change it's also good if you have bigger green structures around the city, but I think to penetrate [with nature and generally green areas] more into the city and make that valuable, for climate change but also for, if you gonna intensify, build more houses in the city, you also need to intensify the quality of green structures that are just next to it [...]" (Public interviewee 4+5, 2018).

"So we have to do something with heavy rainfall, that will for sure come more often. And that means water buffering, that could be a start, where possible build higher, where possible, make people more independent from electricity, because at one hand you see that the probability of power failure because of extreme weather or flooding increases, while at the same moment also the dependency for everything is increasing very fast." (Public interviewee 6+7, 2018)

To implement such future adaptation and solution projects in practice, various forms of collaboration, hence in principle systematic governance is needed, which is shown in the following governance narratives.

5.2.3.7. Governance narratives (public)

The following governance narratives are initially gathering those accounts that are related to collaborative governance, followed by narrative accounts on linking opportunities for future-proofing Dordrecht. Being crucial for the present endeavour of safe-guarding the future in Dordrecht, an elaboration on the gathered narrative accounts is provided too.

Collaborative governance narrative

Due to the nature of the expected challenges arising in the future as seen above, and increasing importance of the already occurring ones, collaboration between various institutions and actors to find solutions to them is important, as being also summarized in the following statement by an interviewee: *"[...] Most of the problems of the future, e.g. climate change, it is impossible that one partij (transl.: party) does itself. You need always collaboration between authorities and inhabitants, between authorities and matskapelige organisaties (transl.: social organizations/authorities), between different authorities [...]"* (Public interviewee 4+5, 2018). This conveyed message convers in a short form, while not being a narrative per-se, what ought to be done, and thus supporting the collaborative governance narrative. Collaborative governance is also institutionalized within the national climate adaptation strategy, that explicitly names collaboration between various actors as crucial (Delta Programme Commissioner, 2014; Ministerie van Infrastructuur en Milieu, 2016; Provincie Zuid-Holland, 2009). That institutionalization in this national strategy foresees that *"[...] we have to achieve it all together as one. It's area focused (the tasks), so it's not focused on a specific duty but it's focused on an area [...]"* (Public interviewee 8+9, 2018). Collaboration occurs therefore around certain areas where issues need to be solved in a collaborative way (Public interviewee 8, 2018), as well as occurs on water safety also historically since a long time (Rijksoverheid, 2009). Nevertheless, such collaboration is expected to occur more often as it is

institutionalized also by the latest Delta Programme with a specific section on spatial adaptation for climate change, involving authorities, companies, NGOs and citizens collectively (Delta Programme Commissioner, 2017) since it is believed that *"[…] then the chance of success is much greater […]"* (Public interviewee 2+3, 2018).

Since Dordrecht has such a specific threat arising out of its location in relation to water, several organizations are successfully collaborating to address it in an integrated manner. Such collaboration occurs around several issues, specific projects or e.g. the MIRT examination on multi-layer safety in Dordrecht, involving the municipality, waterboard, province, safety region as well as the Ministry for infrastructure and environment (Delta Programme Commissioner, 2017; Public interviewee 1, 2018; Rijksoverheid, 2017a). Due to the intrinsic interest of the city in safety, collaboration appears to occur in an easier way as measures continue to be taken, and generally is collaboration believed to be improving according to some interviewees. Collaborative governance is furthermore extending also increasingly towards citizens in various projects (ERA4CS, 2016; Interreg North Sea Region, n.d.), including the ones of the selected neighborhood Vogelbuurt where the below presented ontological narratives held by citizens are elicited from (Kelder, 2018).

Citizens and their perceptions are currently to the extend included within the collaborative governance narrative as that they at least pay taxes for measures taken to future-proof their surroundings, which to some extend at least manifests in their awareness for such issues, especially considering that in the future many more measures ought to be taken and involving them as conveyed in an interview is this an important observation (Public interviewee 10, 2018). Additionally, climate change poses challenges on Dordrecht that often need tailor-made solutions involving citizens from the very beginning as they are also holding crucial knowledge about their neighborhood (Public interviewee 8+9, 2018). Thus is the city discussing challenges and possible solutions within the areas of realization with the citizens and actively incorporating them in various projects such as e.g. in Dordtwijk area, Wielwijk area, the old harbor in the historic center, a newly developed area at Dordste Kiel IV, Stadspolder district and generally in developing the afore mentioned multi-layer safety strategy (Delta Programme Commissioner, 2017; Gersonius et al., 2012; McEvoy et al., 2016; Public interviewee 11, 2018; Public interviewee 2+3, 2018; van Herk et al., 2011). Apart of such occurrences is involving citizens seen as something that should occur more often (Public interviewee 2+3, 2018) since authorities are often far away from the citizens with little active exchange apart of some initial pilot projects. Participation by key players is important and a lack of involvement by some of the crucial actors perceived as being a reason for complaints about such lack of involvement. Interestingly, relationality between organizations and actors seems to be, according to the narrative accounts that can be themed as governance narratives, an important setting, which is pointing also towards collaborative governance in a wider sense. Another aspect of collaboration is that ongoing collaborative governance efforts in solving issues seem to enhance awareness for the concerns of other involved and affected parties and thus improves collaborative governance even further.

Collaborative governance is in addition to developing concrete projects also needed to deal with the risk that arises out of the specific vulnerability of Dordrecht, which is perceived as something that *"[…] is really difficult cause [sic!] no one has ever looked into how can we rescue 100,000 people from the roofs."* (Public interviewee 2+3, 2018). This need for collaborative governance is even further emphasized as due to the absence of experience with such rescue operations and thus risk communication on such a broad scale, there is also no experience with people's reactions in times of a major crisis (Public interviewee 6+7, 2018), which is why governance that is involving various actors and strategies seems to be paramount (Driessen, Dieperink, van Laerhoven, Runhaar, & Vermeulen, 2012; van Herk et al., 2011). Moreover, social media let *"[…] people […] not only listen to the local government, expecting that they know what they do, but*

also listen to all kind of "experts" in the country, knowing it better, and maybe telling them to go because you can't trust the government or whatever, so that's unpredictable [...]" (Public interviewee 6+7, 2018), marking the point for risk communication to be included in any governance strategy. Moreover, problems in Dordrecht mean problems in South-West Holland and may include different advices that make crisis communication even more challenging (Public interviewee 6+7, 2018). This becomes also apparent in Figure 29 as many areas in South-West Holland are situated under or only marginally above sea-level, which is why a major flood affecting the region particularly severe.
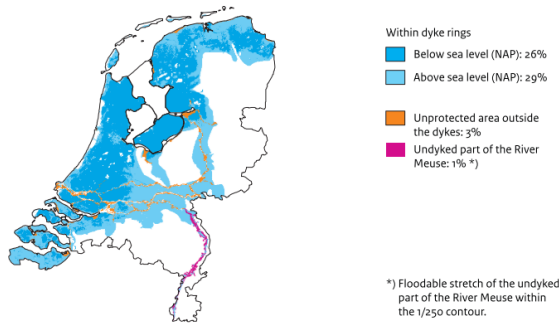
Figure 29: Areas in the Netherlands under the sea-level (Ligtvoet et al., 2013)

One implication of this, indirectly suggesting policy measures to be taken as also elaborated upon further below in the section on recommendations, is *"[...] to focus more on rescuing than on evacuation. So that we have to face that in the case of the flood, maybe more than 100,000 people will be trapped in their houses or high buildings in Dordrecht, and that we have to prepare a way to bring them in safety, using whatever,*

boats, ferries, and the water level is around 2 metres in Dordrecht, more or less, depending on where but it's more or less average 2 metres [...]" (Public interviewee 6+7, 2018). Such focus on rescuing is also voiced in the future adaptation & solution narrative above that specifically includes shelter as such measure for rescuing people in case of a major dike breach affecting the entire city.

Apart of the direct risk for Dordrecht as a city that is surrounded by water is collaborative governance also considering the whole region since *"[...] you have a certain risk in Dordrecht [but] you have also a certain risk in Zwindrecht or Hookse Waart or Ouderste Waart, and the relative strength or weaknesses between the rings of the dikes or levies determines what can occur in all those rings [...]"* (Public interviewee 11, 2018). So in principle, the entire South-West of Holland (Public interviewee 6+7, 2018) as pointed also out above and seen in Figure 29 is potentially affected, making collaborative governance a voiced necessity. This regional risk is crucial to consider as any emergency responses need to be coordinated for the whole region. Collaborative governance is partly directly voiced as a necessity, and partly implied by the way some of the interviewees conveyed their stories, with the latter not always making them explicit, what by contrast is tried to be achieved in the present narrative. Finally, while governance appears to be paramount, wherever measures are taken they often offer the possibility to link them, more thoroughly seen in the linking opportunity narrative below.

Table 15: Collaborative governance narrative quotes

Collaborative governance narrative quotes
"[...] I guess, ... one of the successes are, we work with the Gemeente Dordrecht (municipality), we work with the Veiligheisregio (safety region), we work with the waterschips (waterboards), we work with the province, we work with Rijkswaterstaat. It's 5 organizations, different organizations.... working together on programs. That's maybe obvious, but it's not always the case (laughing)." (Public interviewee 1, 2018)
"And for your governance input, it was also very nice to work together [in the MIRT examination] between the municipality, the waterschap, the veiligheidsregio, and the province. All the knowledge and belange (concerns), come together in a team of workers, amtenaare (civil servants), and that meant very much in the way of working together and also that insicht (insight) and the different authorities in the

belange (concerns) of each other. ... For me it was a very nice experience […]" (Public interviewee 4+5, 2018)
"Hmm and this Deltaprogramma, it helped to make aware that climate adaptation it's not something of just the Gemeente (municipality), or just the Province, or just the Waterschap (waterboard). […] everyone who has something to do with public space or whatever has to be part of it." (Public interviewee 8, 2018)
"You have to take people with you, you have to involve people very closely because then the chance of success is much greater. And I think that this is where the opportunities lie, particularly for these neighbourhoods [Wielwijk and Vogelbuurt neighborhoods respectively]. Because people see that their neighbourhood is improved, that quality is added, not only physically, but also social structure." (Public interviewee 2+3, 2018)
"And then you have all kind of scenarios which may occur when things get wrong, what kind of measures you take ... and train the scenario teams .... also the right participants in your environment because you address the water crisis not alone but you have also to do with municipalities, with safety boards, with fire departments, with the public civilians and in companies themselves which also address questions. So it's basically network management. A kind of information management and crisis communications is much important, and your resource management, your own people, which means you have to take measure in these conditions." (Public interviewee 11, 2018)
"[…] we have this protocol of upscaling .... we got the safety region. So if it's not that big. But when it's really a matter of a storm then it's quite quickly a national issue. And that's very interesting you ask because we have a very regional strategy, and for now we are working on the evacuation routes because that is national, and we have our own ideas about the evacuation. So now we are really making sure that it fits into the national evacuation routes. So it will be taken over quite quickly by the national government to coordinate it all. But we've got a very local strategy, so we have to make sure that that fits in, so that's one of the things we have to do as well. And we already started, it was only decided this strategy I think a month ago. And then I think 2 weeks later we started already to make sure that are ideas about the evacuation routes is well fade into the national strategy." (Public interviewee 2+3, 2018)

Linking opportunity narrative

At its core belonging to governance, the present linking opportunity narrative sheds light on those aspects that were mentioned as allowing several measures to be linked and thus increasing their success. Due to the need to include in such linking-activities several stakeholders, governance appears as a necessity, which is why the present narrative is part of the governance narratives.

By linking several measures taken by various actors it might be according to the stories possible to improve the resilience of the city in a way that it goes beyond the effects of any single action carried out independently. This linking of measures and opportunities is explicitly mentioned in several stories and started to occur in recent years more often, with increasing impacts of climate change being among the mentioned triggers for that. For example, more blue and green areas in the city can aid in limiting heat-stress, accommodate extreme precipitation, and at the same time positively contribute to the quality of living in the city (Future Cities, n.d.; Gehrels, 2016; Ministerie van Infrastructuur en Milieu, 2016; Rijksoverheid, 2009).

The mentioned quest in building new houses let several opportunities be addressed simultaneously as already mentioned in the future adaptation & solution narrative and is thus also supporting a linking-opportunity narrative as such linkages were explicitly mentioned as offering the chance to future-proof the city. Being in part also an adaptation project for anticipated future challenges, the project Nieuwe Dordtse Biesbosch as e.g. seen above in the future adaptation & solutions narrative, aids in creating space for water

as well as more natural areas, providing clean water for the city, and due to the many issues that are addressed simultaneously within this project is it also supporting the present linking-opportunity narrative. Initially it was a project about recreation for the city of Dordrecht but more generally does it connect several green and blue structures across the region on the regional and local scale (Public interviewee 4+5, 2018), as e.g. seen in <u>Figure 28</u>. Moreover, generally are measures that increase green areas in the city also leading to societal co-benefits due to the involvement of various groups of citizens that work in these green areas. The below displayed accounts from the interviews present a good overview what benefits the linking of several actions can provide. Thereafter, the narrative that contains policy recommendations is elaborated upon.

Table 16: Linking opportunity narrative quotes

Linking opportunity narrative quotes
"[…] it's always to possible to fix a new bicycle road, but if you have a bit more ambitions then only a bicycle road it should be nice to think a front of that and try to look in what time part do you think this dike is coming, ok so we have 10 years left, or something like 8 to 12 years or whatever, and what problems do we have for the just the spatial problems and also the movement problems, can we combine […]" (Public interviewee 1, 2018)
"And now there will be gardens, and they don't want to make the gardens too big, because that's not something what people like, so there is more public space and you can maybe open then these gates again cause it's farm land and it's less vulnerable for, and there is green. And green is a school for children and people with a mental disability. And they very much like to do work in the outside, green. So they are really happy to do so. So they are asking actually work. So we are creating work there cause there's more green, so they can have a role in that. So that is interesting. So all these things help to see each other more ... interesting for people that have to have such work, and it's safety, and the green is climate adaptation." (Public interviewee 2+3, 2018)
"The improvement of the dikes means there was the moglighet [possibility] of nature building in wide surroundings. And it was the impulse for nature building in the Biesbosch, in this area, in this area (showing on the map), because of the combination, nature building meant here that agaric polders were uitgegraven [excavated], and the dikes were, doorstoken [teared down]. These agraric polders were get part of the Biesbosch, and the tide landscape of the Biesbosch." (Public interviewee 4+5, 2018)
"For instance, we are going to build a lots of new houses in the coming years because there is a big question for that, and if you gonna build you also wanna do it in a more sustainable way, and also more, in the resilience for climate change should be a part of it. So we tried to give these, the whole building project, also an extra focus on that part. So that's like one of our tasks to, otherwise they will be build all the traditional way and we won't think of these aspects, more green, space for water in the city […]" (Public interviewee 4+5, 2018)
"Because when you are doing that, just as here in the outside, you have also a chance to make your water system more robust because you are already working in the area and you can improve your water systems or your water system at every new development." (Public interviewee 11, 2018)

Policy recommendation narrative

Lastly within the governance narratives, those that are containing both explicit and implicit recommendations for policies and actions are gathered within the present policy recommendation narrative. Such suggestions and recommendations were partly made within narrative lines and partly by conveying more simple storylines conveying them. Interestingly, many interviewees voiced explicitly that something ought to be done about certain issues, coded among others within the code "moral judgements". Mostly, these statements are suggestions about issues that should be addressed and that certain things such as e.g. extreme rainfall have to be considered in their opinion, which is partly overlapping with the narratives

around linking opportunities and collaborative governance. Nevertheless, due to the specific tone of focusing on recommendations, an own narrative captures such well. Below, a short overview of such statements is presented prior to a reflection on them.

Table 17: Policy recommendation narrative quotes

Policy recommendation narrative quotes
"So we have to do something with heavy rainfall, that will for sure come more often. And that means water buffering […]" (Public interviewee 6+7, 2018)
"We have to work on this, and that can be done in relation to the task of creating housing. If you have any new developments somewhere, conduct them simultaneously in order to develop more green and more blue […]" (Public interviewee 2+3, 2018)
"And must look at the developments in Dordrecht, Dordrecht is making new housing environments, new industrial environments, and we must be at the front of that development (stressed front!). Discuss the problems with water in the area […] And I think what we must do is be as city and as a Waterschap in the beginning of development plans, we must look at the water, and what it means to water for the location you want to build that houses." (Public interviewee 8+9, 2018)
"I think that will be that Dordrecht actively starts to demonstrated and influence that you cannot consider a city like Dordrecht on its own, that you have to see it in the context of the whole river system." (Public interviewee 12, 2018)
"[…]my ideal scenario would be that in a couple of years, everyone who build a new house or a new company area, that they not only they look at the duurzamheid [sustainability] aspects, but also the climate addition aspects […] and will lead us to some kind of … place where climate adaptation is just as common as duurzamheid [sustainability]." (Public interviewee 8, 2018)

Initially, a problem owner is recommended to be identified as it appears from interviews, which thus can be the base for actually working on an arising issue as a lack of such is often also hindering any action (Runhaar et al., 2012). In the following and more concretely, one way to foster climate adaptation and maintaining green areas while e.g. building new neighborhoods is regulation because *"[…] you cannot just leave it up to the builders ... and that's why you have to think of how you can make sure that it's done in a sustainable way […]"* (Public interviewee 4+5, 2018), thus paying specifically attention to more green and blue structures in cities. While this indirectly also recommends governance is this account supporting a policy-recommendation narrative as it hints towards spatial planning policies that are needed. Such spatial planning includes all the risks for certain areas, among which are risks arising out of water such as e.g. in Dordrecht, to be then assessed and if needed measures to mitigate them can be suggested or spatial developments changed in their scope (Houdijk, n.d.; Public interviewee 11, 2018). It is expected that many of these issues are taken up in the Dutch "Omgevingswet", an integrated and systemic spatial policy that also includes environment, nature and water-related issues respectively (Rijksoverheid, 2017b), thus perhaps partly fulfilling the conveyed recommendations made here.

Another recommendation that appears in interviews is that different stakeholders have different data but as the data is not bundled it makes it challenging in practice to work with many different data sets around similar issues, so a combined database is preferred for those interviewees that mentioned such issue, similar to the database of the Dutch climate atlas, "Klimaateffectatlas" respectively (CAS & KNMI, 2017) and among the aims of the project SCORE (Daan & van Herk, n.d.). In reference to the mentioned extreme rain event in 2015, different authorities were involved and examined the situation locally, separately though, and generating thus separate datasets thereafter. This separation was perceived as negative (Public interviewee 2+3, 2018), which is why a coordinated collaborative assessment can be seen as indirectly hinted towards in the conveyed stories and thus supporting a policy recommendation narrative.

Furthermore, testing any new spatial development for different issues arising out of water- or weather-related extremities and considering both sustainability and climate change ought to be done in the beginning of such development, and is thus supporting a policy recommendation narrative.

Finally, as some actors are seen as being important and crucial but at the same time not that well involved in future-proofing Dordrecht, a concretization of involvement appears to be the unspoken missing feature, which is why the partly confidential messages about wishes for further involvement by some partners supporting a policy recommendation narrative too. With the form the main recommendation being the concretization will this be also taken up in the sections on <u>discussion</u> and <u>recommendations</u> below. Considering lastly the entire Delta of South-Holland it is suggested that the whole Delta is crucial in future-proofing Dordrecht. While this policy recommendation narrative based on public narrative accounts aids in answering the research questions is the following section shedding light on the responses by citizens, prior to the main discussion of this research thereafter.

5.3. Ontological narratives

In light of the central quest of this project in eliciting the main narratives of Dordrecht are the present ontological narratives, hold by citizens respectively, adding to the already examined public narratives by authorities. Below, participants are introduced, followed by an analysis of the conveyed accounts.

5.3.1.Selected Participants

As mentioned within the methodology on the selection of the case study area above, the selected interviewees are either related to the municipal project "Vogelnest" and the adjacent café "Nestcafe" (Het Vogelnest, 2018a) or contacts brokered by people related to the "Vogelnest" project. The selected interviewees are 11 in total, of which are 3 from the mentioned project and were connecting the interviewer to the other interviewed people from the neighbourhood. Thus, 8 of the interviewees were chosen opportunistically at the location of the local neighbourhood-café "Nestcafe". All interviewees are living within the Vogelbuurt neighbourhood or the adjacent streets in the Reeland area. In the following are the narratives as conveyed within the interviews presented and reflected upon.

5.3.2.Analytical results of ontological narratives

The following ontological narratives are divided into 7 main narrative themes, which are dealing with aspects of history, experience with water, undertaken actions, identities, socio-economic constraints, future perspectives as well as finally those that aid in solving mentioned problems through governance. Whereas there is a strong similarity to the above described public narratives, which is due to the focus of the study also intended, are there also interesting and partly surprising divergences observed, which are reflected upon below. In the following are all narratives both described and presented.

5.3.2.1. Historical narratives (ontological)

In line with the methodology did historical accounts appear in the interviews, referring to past events around weather and water respectively. These historical occurrences were conveyed in such way that a connection could be made to possible occurrences of such events in the future too, which therefore let a certain motivational aspect to focus on such issues appear, not as profoundly though as within the respective public narratives. Among the most prominent references are those towards the Watersnoodramp in 1953 (Citizen 11, 2018; Citizen 12, 2018; Citizen 2, 2018; Citizen 3, 2018; Citizen 4, 2018; Citizen 5, 2018), and the St.

Elisabeth flood in 1421 (Citizen 1, 2018; Citizen 7, 2018), thus 8 of 12 interviewees made references to significant historical events in their narrative accounts, shown exemplary below.

Table 18: Historical narrative quotes (ontological)

Historical narrative quotes (ontological)
"[...] and the Elisabeth flood, the damage to people itself less. there was, people did suffer from it but there was not , not that bad compared to the economic damage that occurred from it, because they lost lots of income for it, because, yeah, they didn't have to pass Dordrecht anymore [...]" (Citizen 1, 2018)
"[...] in the past (the water was sometimes high and sometimes low but not now) ... my husband used to live on a house on the river, ... he called I can't come home today because of the water ... and that was totally normal, high, low, water in the houses, the people were prepared for that. We had the Watersnoodramp in 1953 and after that the ... waterworks, and then it was over. [...] Voorstraat that's our important street in the city [...] and I lived there as a child and I have seen the water over the dike. [...] in the middle of the night I heard a noise what I never heard, like a waterfall, so I looked out of my window and I saw the water, little streets in the full moon, it was full moon, over the dike (means small streams of water coming over the dike), and [transl.: very fast it became more so I woke up my father and mother and we woke up the neighbors and the whole street was awake and all looked on the water ...]. I saw the worst of the worst, the Watersnoodramp. It was 1953, and I was 9 years old." (Citizen 3, 2018)

With regard to recent events were no specific occurrences mentioned apart of some heavy rain events. The only reference to recent events was made more generally to what is currently happening, e.g. that sometimes there is water in the streets after a strong rain event (Citizen 11, 2018). As no strong differentiation between more distant and more recent historical events could be made based on interviewees' responses are all of them gathered in the present historical narrative, thus referring to both distant and recent history respectively. Nevertheless, some recent instances and their appearances in a story occurred, i.e. happening during the lifetime of the interviewees, with some examples displayed below. Most interviewees were referring to the recent historical event of a big rain or generally much water last year, meaning therefore most likely 2017 (Citizen 2, 2018; Citizen 8, 2018; Citizen 9, 2018). Since no precise definitions of these more recent historical events were made by interviewees, such stories were gathered within the present general historical narrative. Interestingly, in reference to the ontological narrations on recent historical happenings can no events be identified within the elicited historical embeddedness or public narratives dealing with history that would match these mentioned ones. The only events in recent years that may be meant by citizens can be high waters on the rivers around Dordrecht in 2018, or the strong rainfall happening in 2015, which would match any of those accounts that are displayed below. Such divergency in what constitutes as a recent event so significant to be remembered between narrative accounts of authorities and citizens is surprising but due to different exposure to such events might there be also a simple explanation, further studies may explain such in detail respectively. Nevertheless, such recent occurrences shed already some light on the awareness for being exposed to water and experiences with it, discussed in the following section.

Table 19: Recent historical events quotes (ontological)

Recent historical events quotes (ontological)
"[...] yeah last year there was. ... I remember a lot of rain was here. [...] yeah I think last year was. The last few years I think. yeah." (Citizen 9, 2018)

"I remember living ... really at the center, at the Nieuwe Haven, and that was really flooding, with water when there was a lot of rain, you couldn't use the car anymore, they need to put sandbags on it to keep it out." (Citizen 12, 2018)
"I live here since now 12 years ... remember a lot of precipitation and the houses in the center, they are in the water, and the sewers flooded, ... and they had to put sand sacks in front of the doors because the water rose really strong in the city. [...] in less than 2 days, really fast rising! There was continuously bad weather [...] I thought no that doesn't end well. But there was no big problem after all." (Citizen 8, 2018)

5.3.2.2. Experiential narratives (ontological)

The following experiential narratives are displaying those instances that interviewees refer to as being exposed to water-related occurrences. In contrast to the vulnerability narrative as identified within public narrative interviews, are the present ontological narrative accounts not strongly focusing on any specifically mentioned vulnerability but rather just experiences of the city with water and weather, hence the narrative's name. These experiential narratives are focusing on a specific event centered disaster-scenario, the general exposure to water, awareness for changes in weather and water as well as finally some already occurring challenges.

Disaster-scenario narrative

Similar to the extensively mentioned event-centred vulnerability by interviewees for public narratives are some citizens also aware of specific constellations in weather and water systems, posing a potential threat to the city respectively. This threat, as mentioned within the respective public narrative above more in depth and thus only referred to here, is commonly known as a combination of a spring tide and a westerly storm from the sea, posing already a significant challenge to the Western part of the Netherlands, followed by high water discharge on the rivers that might turn then to a disaster for Dordrecht in case the dikes cannot withstand the water-pressure (VRZHZ, 2015). References to such constellation were made in relation to the Watersnoodramp of 1953, or in relation to it as a future challenge that might occur, which is then further elaborated upon below in the future-perspectives narratives.

Table 20: Disaster-scenario narrative quotes (ontological)

Disaster-scenario narrative quotes (ontological)
"Sometimes it can be. 1953 it had also to do with the wind, once or twice a year there is a special way the wind comes from, and if that is together with a lot of rain then it goes wrong. So that's not often so we don't expect that. But sometimes, once in 20 years, it happens [by chance], together, and then you have a problem." (Citizen 5, 2018)
"[...] it s a combination of wind from the west, and [...] spring tide because of the (means shape of the sea) and water from the rivers. with that combination then you get very high water, and because they know it would happen they can then bring sand bags and other things [...] (Citizen 1, 2018)
"Flooding! [...] it could happen. ... that there is a storm and the dikes break. In the center of Dordrecht ... the ... Voorstraat ... it's ... too low, if it get's a real storm and spring tide, it goes [...] in (shows visually with the hands that it's very fast them rising)." (Citizen 10, 2018)

Interviewees described vividly such specific event-centred and disastrous occurrences, as shown above exemplary. These references also refer to historical accounts as shown above, but as they are specific in their description was an own narrative around them identified. To some extend already displaying that

Dordrecht is exposed to water as such events are threatening for the city, is exposure to water more thoroughly elaborated upon in the following.

Exposure to water narrative (ontological)

Exposure to water becomes apparent by the notation that Dordrecht is located under the sea-level and that this fact is mentioned to be of importance for some of the interviewees. While there is awareness for being exposed to water, although limited, occurring issues in the neighbourhood are currently limited, more dealt with further below in the respective narrative. Nevertheless, similar to the public narratives dealing with that topic are also interviewed citizens noticing a certain exposure to water, which is in line with a study showing that approximately eight of ten inhabitants of Dordrecht consider water as important (Soffers, 2016).

The exposure to water while being located under the sea-level and surrounded by water is noticed also in relation to a potential threat since the city can therefore be potentially inundated (Citizen 10, 2018; Citizen 8, 2018; Citizen 9, 2018). Further is water also seen as something that causes due to the permanent presence of it in the Netherlands some concern, especially as water-related issues become *"Always [sic!] worse and heavier. The sea level, the river level, higher, higher, higher! Netherlands is behind a dike (shows concerned expression)"* (Citizen 11, 2018). Thus, water is especially for those interviewees concerning that are mentioning climate change related issues as arising and being noticeable. Exposure to water is also referred to by the need to manage the water level, both for flood protection and to avoid that the wooden foundations under the houses are starting to rot in case of too low groundwater-levels as seen below in the occurring challenges narrative. However, extreme weather-events are not very much noticeable for the interviewees in the Vogelbuurt neighborhood, and only sometimes very local water problems are voiced to occur, showing thus also a certain exposure to water even if rather insignificant for the present narrative.

Table 21: Exposure to water narrative quotes

Exposure to water narrative quotes
"Dordrecht is under the sea level, and then with a few days of rain that a lot of problems are coming … and then we flood." (Citizen 8, 2018)
"I do have one of the higher parts of the outside locations [in the city centre], so I am one of the last people that have to worry about it. And yeah, sometimes it actually comes all the way to the edge of the waterkant (means the cay), so it gets very high, and once every 10, 12 years parts [of the old city centre] get flooded [...]" (Citizen 1, 2018)
"Maybe a bit of rain and then the street is (flooded) … But here directly I don't have no problem with water, no I don't have any problem. I can't see it here now." (Citizen 11, 2018)
"[...] all the problems we have with water right now are just small ones. It's not big catastrophes, it's just a nuisance if your street is flooded with this little bit of water, and you need to pump out your basement and stuff like that, it's just annoying, but it's not like really dangerous." (Citizen 12, 2018)

Finally, even though no major floods are reported as happening in this particular neighbourhood, is there still a certain awareness for exposure to water and the brought about possibility of a flood emerging. This is appearing more in detail in the narratives about awareness for exposure as well as on future challenges.

Awareness for exposure to changes in water, environment and climate narrative

Rising water levels around Dordrecht are noticed and appear to be a worry for some of the interviewees, which is mentioned in relation to climate change and a correlation between these two phenomena. This narrative constitutes the specific awareness for changes in water, environment and climate, partly also

causes for them, and how interviewees are referring to them. Generally, there appears to be quite some awareness for being exposed to changes in water, environment and climate as connections between drivers for such changes as well as specific changes that are noticeable are among the named issues. Interestingly, such awareness can even point towards a certain degree of place-relationship, also appearing to some extend in the identity narrative below, which shapes awareness for change at a place of attachment and also any climate adaptation measure in the following (Fresque-Baxter & Armitage, 2012).

Awareness for a changing climate and environment was apart of the below shown examples also manifested in relation to human induced temperature increases due to activities such as driving cars, flying or eating meat (Citizen 3, 2018; Citizen 8, 2018), as well as generally occurring changes in the environment due to human activities (Citizen 9, 2018). More specifically are interviewees noticing that trees are blossoming earlier in the year, climate change is leading to droughts and increased rain, floods as well as extreme weather events across the globe and in Dordrecht. Mentioned was also that climate change is increasing water levels in both rivers and sea and is thus imposing the need to increase pumping capacity to remove groundwater, and that the earth is losing its temperature-regulating function with the loss of the rainforests, indirectly referring to climate change (Citizen 10, 2018; Citizen 11, 2018; Citizen 12, 2018; Citizen 2, 2018; Citizen 7, 2018). Finally, changing periods and more extreme weather events were emphasized as occurring already now, which makes things such as weather forecasts appear to be less reliable for interviewees. Remarkably, interviewees were mentioning partly even in a detailed way such changes and presenting therefore their awareness for such issues, which is therefore supporting a narrative gathering such accounts.

While being aware of such changes has it been conveyed that there is also a certain degree of inability to act in light of such big changes, in contrast to those people who state clearly that humans need to change their behaviour (Citizen 12, 2018), or even state specific climate mitigation behaviours. The below displayed action narratives are shedding more light on conducted climate action to both mitigate and adapt to a changing climate.

Table 22: Awareness for exposure to changes in water, environment and climate narrative quotes

Awareness for exposure to changes in water, environment and climate narrative quotes
"I see that the water level becomes higher every year. The cay at the Meerwede is flooding once a year, and this is a real problem. [...] The world changes! [...] Temperature! The temperature, it's now 29 degrees, warmer, and warmer and warmer. The North pole, down under, it's melting. The sea level is higher, higher, higher, also the rivers! [...] and we need to do something about it. [...] With the northpole and that it's melting there is more water, also from the rivers. The river is the connection to the sea and water is constantly becoming more." (Citizen 11, 2018)
"[...] the weather changing, I think we are already experiencing that. Like it's really hot, but many [sic!] rain, like the monsoon, in Holland, that's really strange. And I think it's frequently. We didn't have winter, a really winter, and that's a long time that we had a real winter here. So those are signs that the climate is really changing." (Citizen 4, 2018)
"[...] it becomes more ...overall, water and drought. It becomes a bigger difference ... before it was always the same weather, we have a sea-climate here, and now it becomes more a land-climate, more heat, more cold as well, and more water, and also more droughts!" (Citizen 3, 2018)

Within these ontological narrative interviews, many interviewees appear to be aware of changing weather and climate as well as issues around water as seen above. Nevertheless, it is not conclusive whether citizens think that residents in the area are unaware of such happenings, with some stating that, while others also mentioning that more people are becoming aware of changes in environment and climate. Commonly do interviewees refer to the present lack of education in the neighbourhood Vogelbuurt as reason for people

being according to them unaware of such changes. Whereas the common voicing of socio-economic issues as being the reasons for unawareness, which is also mentioned further below in the respective narrative, do the here conveyed stories not point towards a lack of awareness by interviewees themselves, although interviewees mentioning that people are not talking about such things with them either: *"[Water,] It's an item we aren't talking about. When I am asking to one person "What do you think about water problems?", "What the f***" (laughing). (transl.: People are not aware.)"* (Citizen 11, 2018).

Moreover, there appears to be a diverging perception of the severity of problems around water, environment and climate among the interviewees, with most of them seeing things as getting more severe though and mentioned such worsening in reference to climate change: *"The sea level is higher, higher, higher, also the rivers! [...] It gets worse here! [...] it's rising and rising and rising [...] every year it becomes worse!"* (Citizen 11, 2018). On the other hand, awareness for the above-mentioned exposure to such changes seem to not correlate with a state of concern or even any current worries, which would need a further examination though. Such absence of worry is manifested as it was explicitly asked whether interviewees are worried about these changes.

Reasoning for an absence of awareness by others were given by suggesting that residents are not experiencing any problems because *"[...] people with a garden see the problem ... But if you don't have a garden and you pave everything ... it makes real [sic!] easy to ignore it. [...] I am already aware of the situation and I am already busy where I'm gonna live in the future. Not this year or next year but in 5-10 years, and that won't be here."* (Citizen 2, 2018). Another respondent reasoned that *"[...] there is not a lot of education about all the water and how we live with it in the Netherlands. We all assume "oh we got the Rijkswaterstaat, they will take care of it" [...]. But I do think, people do not really educate the Dutch public anymore about all the dangers we have in the Netherlands. It's all about "yeah we live under sea level but we have all these dikes and it will be ok, and all the water we have waterworks and it will be going by the rivers, and we are all safe". But obviously there have been incidents through about history, where dikes break, where water can't get away, ... it's just a Dutch thing. But I think education. ... Where I come from, nobody even told me about the dangers of water because it's not really a big problem from where I come from."* (Citizen 12, 2018). Nevertheless, due to the awareness that there is a risk of flooding for the city, the same interviewee refers to it as something that *"[...] everybody should be worried about [...]"* (Citizen 12, 2018).

Lastly, whereas awareness and ignorance were named as being present in the neighbourhood, the following occurring challenges and issues narrative suggests for the interviewees an overall consciousness for topics such as climate change and its effects.

Occurring challenges and issues narrative

While extensively reflected upon above, an existing awareness for changes in the environment let respondents also notice and name some occurring challenges that are mostly related to recent floods and issues with weather and water. These occurrences are conveyed as being a very serious question and challenge to be dealt with, some examples are displayed below. A more specific and concrete issue that interviewees are referring to is that many residents are mainly putting tiles instead of grass into their gardens, and interviewees are making a connection to surface-water run-off into the sewage system and tiles in the garden.

Finally, similar to the afore mentioned issues being in line with those identified by authorities above, is an occurring challenge land-subsidence that is related to drainage of peaty soils, causing the surface to sink respectively, and with such drainage causing house-foundations to rot as some interviewees refer to (Citizen 11, 2018; Citizen 6, 2018; Delta Programme Commissioner, 2017).

Table 23: Occurring challenges and issues narrative quotes

Occurring challenges and issues narrative quotes
"[…] they have gardens where they put all stones on it … all those gardens which are tiled, and that's pretty much these days, it's bad for the absorbing of the water into the ground level because then it streams off the gardens into the riol, the sewer, and it goes to the … surface water. But if you have just normal gardens with dirt and flowers it goes down. And that's better!" (Citizen 10, 2018)
"the backyards of the gardens, they are really low. Because this is a swamp area and it keeps sinking down, and then when it was really wet … it was like all muddy. […] I remember like my whole house was sinking, […] the walls they went to the left a little bit so there were a lot of small cracks in it. Even my whole heat went out of the windows. So even small problems are like, and that's … because of the water because it keeps sinking. … it's not good for the house." (Citizen 12, 2018)
"(transl.: The showers are getting heavier!) It's more raining every time! In 10 minutes water comes down, and then it's very heavy! […] The streets are flooding … (shows some 20cm with his hands) … sometimes also … [the tunnels are under water] You can see it every year, more and more. […] (transl.: a rain shower of 10-15min, it's so heavy that the sewage cannot cope with it, it's a big problem.)" (Citizen 11, 2018)
"The municipality of Dordrecht, years ago, the groundwater level was lowered, it is now very low, very low! The foundations are from wood and they are rotting. … called the municipality … they said they don't know …(at his house happening) … they say nothing, they say "I don't know" […]" (Citizen 11, 2018)

In relation to the described challenges within the experiential narratives are the following action narratives showing specifically those measures that interviewees named as their contributions towards tackling them.

5.3.2.3. Action narratives (ontological)

The following action narratives are shedding some light on the occurring adaptation as well as mitigation practices conducted by citizens so as to combat climate change and its effects, mentioned by interviewees respectively.

Occurring adaptation practices narrative

Several of the conveyed stories can be labelled as referring to adaptation towards water and climate change, hence an own narrative. Those stories that are labelled as adaptation are such that are mainly referring to actions that are currently undertaken. In line with the interview protocol and to elicit citizens' narratives, occurring measures to adapt to existing weather- or water-related events were mentioned in the narrative interviews, which is in line with the identified public narrative dealing with occurring adaptation measures respectively.

Among the conveyed stories were mainly already occurring practices to adapt to water or to deal with events that are potentially threatening the city, while those referring to future happenings are presented further below. Considering the need for measures to be taken by both citizens and authorities for successfully future-proofing the city, it is important to specifically look at already occurring measures and what they imply. The mentioned measures are mainly dealing with exposure to water as well as preventive actions by both citizens themselves or others (Citizen 1, 2018; Citizen 2, 2018; Citizen 5, 2018; Citizen 7, 2018). Whereas not per-se an adaptive measure towards climate change has the need for houses to withstand high waters in the old city centre of Dordrecht been named as adaptive measure towards floods (Citizen 1, 2018). Moreover, such reference to the city centre, as seen below, is also made towards local residents installing own pumping systems so as to be able to cope with waters affecting their houses. A measure to adapt to a

mentioned increase in heavy rainfall that is suggested for authorities is e.g. installing larger sewage pipes so as to avoid flooding of the streets in the neighbourhood, or even making dikes higher as river-levels are increasing (Citizen 11, 2018). Finally, one interviewee even mentioned that in relation to a project of a housing foundation people located close to the Dutch coast, the Randstad respectively, are already now *"[…] moving towards higher grounds, like 4 or 5 meters above sea-level. So that's really interesting, you see people acting on it [...]"* (Citizen 7, 2018). As seen are the mentioned adaptive measures to deal with occurring issues nevertheless more passive in nature than the following climate mitigative activities as mentioned and conducted by some citizens.

Table 24: Occurring adaptation practices narrative quotes

Occurring adaptation practices narrative quotes
"[…] and most people, that had already one of these floods, the all have their own pump system, so, yeah, worst case scenario is barricade the doors, to pump just behind the doors and most of the times it's enough." (Citizen 1, 2018)
"Sometimes it's a lot of rain, here or in countries around, so the river, all the water comes with the rivers to our country, but I think at every point that are a problem, there go a lot of people to that place and they are going to think about how we gonna stop the water. […] and every place they don't trust, they're going to rebuild the dikes. Sometimes the houses must be broke down because the dike has to be heavier or higher or something. I think there is always someone busy with that and I have trust! I feel pretty safe, unless (means: although) we are here around with rivers, we are some kind of island, Dordrecht, but I am not scared." (Citizen 5, 2018)
"We are actually working on it, to collect rain water with the ... tanks, the 1000 litre. There is a, well it's 1000 litres but what's a 1000 litres? That's not really that much, yeah for the garden it's 200 litres a day and it's a small garden. So I think people could collect water." (Citizen 2, 2018)

Occurring climate mitigation narrative

With several interviewees being very much aware of climate change and its effect, such as shown in the narrative on awareness for exposure to changes in water, environment and climate, some even state concrete actions to combat climate change. Interviewees further state the importance of individual mitigative activities and reducing greenhouse gas emissions. Interestingly, significantly more people are aware of climate change in contrast to those who do also conduct mitigative behaviours, with further research needed to analyse this phenomenon in Dordrecht more in depth as knowledge alone is not sufficient to motivate for action (Wolf & Moser, 2011). Yet, some of those citizens who do mention actions to fight climate change appear to make a clear connection between some of the changes and their causes as well as mitigative options. Moreover, as already shown is awareness for climate change present, including some of the potential threats by it as also shown below in the future perspectives narratives. Such awareness is shaping some of the conducted activities to alleviate climate change and its impacts through mediating between climate change and the relative danger it poses to inhabitants (Daniels & Endfield, 2009). Among the conveyed actions undertaken to mitigate climate change or contribute positively to the environment were e.g. cycling, avoidance of meat-consumption, absence of flying as well as the consumption of organic food (Citizen 10, 2018; Citizen 2, 2018; Citizen 3, 2018; Citizen 4, 2018). In the following, some of those actions are displayed exemplary.

Table 25: Occurring climate mitigation narrative quotes

Occurring climate mitigation narrative quotes
"You know I am very busy with environmental issues, I don't eat meat, actually I am kind of vegan, I [...] cycle [...]" (Citizen 2, 2018)

> *"[…] we all have to do our part ... as small individuals, to help. Like simple thing, the CO2, we have one car, ... it's really a small thing ... but maybe if everyone thinks .... maybe it becomes a big thing. So I always think start with yourself. I don't eat a lot of meat, because that's really bad for the climate and for the air, so I cut my meat radically, one time a week, two times sometimes. So the small things I think, that's what I can do."* (Citizen 4, 2018)

> *"People need to stop with emitting CO2, we need to go back to before ... not everyone can fly with the plane on holidays every year, that's the reason that I never will fly."* (Citizen 3, 2018)

Some of the mentioned actions can be also seen in relation to a place identity as the latter shapes the former to a certain extend (Fresque-Baxter & Armitage, 2012). Following up on this, an emerging identity narrative is presented below.

5.3.2.4. Identity narrative (ontological)

In line with the captured identity narrative within public narrative stories can such be also identified within the present ontological ones. This identity narrative is mainly referring to Dordrecht being an island and surrounded by water that is often high, as well as that water appears generally to be a defining theme for the city. Moreover, it is even suggested that there exists an island mentality that differs from mentalities of cities not surrounded by water (Citizen 9, 2018). While the mentioned effects of climate change on the local livelihoods are related to among others water, is the emergence of an identity narrative shaped by water interesting as connecting identities and climate impacts also increase the salience of issues such as climate change (Lejano et al., 2013).

Table 26: Identity narrative quotes

Identity narrative quotes
"I think that's the relationship we have with the water in Dordrecht... you are on an island, we call it an island, I think that's the main, that describes the whole feeling the people living in Dordrecht are having with water." (Citizen 2, 2018)
"Dordrecht is not so big of course, it's a small island, as the people say we are living on an island. You are surrounded by water, and yeah, how long does it take until it goes not well anymore, I don't know. ... if people continue living like this and are causing problems with the poles, then it can be max. a few years (until this happens) ... but very fast." (Citizen 8, 2018).

Another emerging topic that is pointing to the specific nature of the location is the below following socio-economic constraints narrative.

5.3.2.5. Socio-economic constraints narrative (ontological)

The conveyed stories that belong to a socio-economic constraints narrative, which is in line with the ones mentioned by authorities, are mainly dealing with constraints to a well-functioning social system in the neighbourhood. Primarily is the neighbourhood marked by low-income groups, an often poorly developed social network by inhabitants and problems arising out of poverty, unemployment, conflict or addictions (Citizen 6, 2018; Kelder, 2018). These constraints are voiced as being important issues to be dealt with and partly the reason why people do not pay so much attention to their environment or are even aware of changes in it. Moreover, these phenomena are mentioned as being different in other neighbourhoods surrounding the Vogelbuurt, and are voiced as something that ought to change (Citizen 6, 2018). While being described as a problematic neighbourhood are its inhabitants also referred to as being rather closed and not helping each other a lot (Citizen 9, 2018), which can be according to the same interviewee even a problem for relief

in case of a major flood affecting the entire area. Apart of such neighbourhood-specific constraints did one interviewee also mention that the municipality lacks the financial capacities to invest in needed changes such as e.g. bigger sewage pipes in order to decrease the chance of local floods as well as higher dikes (Citizen 11, 2018). Similar to that did interviewees for public narratives on the same narrative also mention economic issues that label the municipality of Dordrecht. In addition to the issues mentioned above in the category within the public narrative on socio-economic constraints are the ones here also important as social groups and networks aid in activities like disaster risk reduction, an issue that emerges while looking into narratives about future challenges (EDUCEN, n.d.). Besides, a functioning socio-economic system and good social linkages aid in building resilience towards various challenges such as the ones brought about by climate change (C Folke, Hahn, Olsson, & Norberg, 2005).

Table 27: Socio-economic constraints narrative quotes

Socio-economic constraints narrative quotes
"[...] one of 3 people is on social welfare, one in four people has problematic debt, a lot of divorcees, single mothers, single fathers, stuff like that. They have other problems than their garden or the climate or something like that, I think that's the main issue." (Citizen 7, 2018)
"The most regular people here they don't think that much, they haven't been to school that long because there was no money for it. [...] It hurts to see that a lot of people, they don't see the relationship between the environment and how they behave but it really is like that. If you talk to children over here, you know there is a lot of Drug dealing around the Vogeplein as well, [...] and that's also because they don't think they will climb up the ladder any time. It's not happening for them, and that's how they feel. And everything is connected ... if you invest in a neighborhood and you put rich and poor people together you have more of a social value, people can see another example for them. [...] People have too many problems to care about the flowers around the trees. The rather have food on the table, they rather solve their own debt you know. Able to pay their bills." (Citizen 6, 2018)
"And they try to change it a bit [the social situation here], they tear down the building and they put new homes ... on the other hand, those homes gonna be a bit more expensive, but there are less homes for people ... maybe the problem will be solved here but it's gonna start somewhere else .... it's all temporarily or you just move the problem. And ... I've seen that all happening here before ... [...] some people have to go to another neighborhood, so the trouble will start over there." (Citizen 6, 2018)

The following narratives on future-perspectives are taking the above-mentioned present issues and concerns further and shed light on visions about future challenges and how to deal with them.

5.3.2.6. Future perspectives narratives (ontological)

Future challenges and implications narrative

Several interviewees were referring to the possibility that water- and weather-related events challenging the city might occur in the future and these can be captured in a future-challenges narrative, which is similar but less nuanced than the future challenges narratives in the public narratives and in line with the interview protocol respectively.

To begin with and as already mentioned in the awareness-related narrative are interviewees noticing that climate is changing and with it also sea-level and weather events. Interviewees conveyed that these changes are potentially posing significant challenges for the future in Dordrecht and the Netherlands as such. Moreover, a severe breach of dikes and the consecutive flooding of the city are vividly described by interviewees, making it for them a very real and possible challenge coming ahead that is exacerbated by climate change induced sea-level rise. Whereas the below shown accounts present just a small example of

the conveyed messages are some people referring to big disasters as potentially arising in the near future, especially if no mitigative measures for it are conducted, among which are e.g. another Watersnoodramp that is perceived as possible since it already happened earlier (Citizen 7, 2018; Citizen 8, 2018). Such challenges are also causing worries to appear even if the likelihood is mentioned as being rather in the future that is unfolding for respondents beyond the coming 20 years (Citizen 2, 2018). Several of these mentioned challenges are also conveyed by authorities as seen above in the respective public narrative. Whereas many interviewees refer to the possibility of water in the city, the possibility that this particular neighborhood will be flooding is in contrast less strongly emphasized, although mentioned as a possible scenario to occur in the future. Finally, imagining such possible event seems to be not correlating with actual measures as apart of one interviewee considering to move away from Dordrecht because of the risk of flooding, no others mentioned such concrete activities. Actions that interviewees consider as being a measure for combating future challenges are displayed in the following narrative below.

Table 28: Future challenges and implications narrative quotes

Future challenges and implications narrative quotes
"I […] hope it won't be a very big disaster because Holland is, I think half of Holland is in big trouble if the sea is rising. […] you can't live there anymore then ... if they neglect the Deltaworks then we could get a lot of water in big parts of Holland (laughing), so many people will die then." (Citizen 4, 2018)
"[…] if there is water in the street then there will be consequences. […] the whole social structure will fall apart for a period of time ... and then I mean really water in the streets like a dike breaks through or such heavy rainfall that you have to literally take a boat to get to the supermarket […] and if that happens here I think there will be a lot of, I think it's also a bit too late. […] when there is a disaster in a country like the Netherlands then there is money ... but it's a bit too late by this point […] I don't think we are really that far away from a situation like that. […] " (Citizen 2, 2018)
"You know the Watersnoodramp, […] how whole of Dordrecht was ... flooded. We may have a dike here, but if everything breaks, this one here is gonna be under water too. [And] I think it's a good possibility with the rising sea levels, and we've to keep putting more infrastructure in the whole coastline to keep us safe […] I don't really think it will be durable to protect the whole Netherlands in the future ... It's a worry. […] we have now the Deltaworks of course, but if those fail, all of South Holland, and part of Brabant and Zeeland, they are all at risk, and in my opinion the Deltaworks are […] getting old […] so I think one day […] it might fail. […] maybe all dikes will break loose and then the water is gonna be until Utrecht and then there is no Dordrecht left. I can't predict what the future will bring." (Citizen 12, 2018)
"[…] we expect more and heavier rainfall in Holland, because of climate change. A lot of places in the Earth which contributes the least on CO2 and carbon emissions ... in Africa they hardly did it the carbon emissions but they get the drought, very unfair. But at other places there is going to be more rain (stressed!), that's supposed to be in Holland. We are expecting more rain in the future, heavier rain, longer rain." (Citizen 10, 2018)

Future measures & actions narrative

Most conveyed stories containing future measures and actions to deal with challenges coming ahead are dealing with major disasters such as a dike breach and a consecutive flood affecting the whole city. Preparing for such events is a challenge and suggestions are among others having boats constantly ready and available in the area, relocating the entire city, swimming lessons for all people in the neighborhood, basic-survival packages for citizens, as well as generally knowledge how to deal in such situations (Citizen 2, 2018; Citizen 7, 2018; Citizen 8, 2018). Nevertheless, such actions in case of a major flood appear to let constraints and uncertainty arise whether it is taken serious and people starting to prepare for such major

disaster, which is already referred to in the public narrative around collaborative governance and difficulties in managing a big disaster. Due to concerns about safety out of threats posed by floods are some interviewees even consider moving to other parts of the Netherlands (Citizen 2, 2018; Citizen 8, 2018). Mitigating the most severe impacts of strong rain, which is expected to increase due to climate change, by e.g. having more green to improve water drainage into the soil (Citizen 2, 2018) is among some of the other possible measures that are named by interviewees.

Apart of gaining insights into measures and actions that citizens aim on conducting for future challenges, is such overview over citizens' views on their scope of actions also interesting as in the Netherlands appears to be a lack of knowledge on how residents might act in light of climate-related issues (Hegger et al., 2017).

Table 29: Future measures and actions narrative quotes

Future measures and action narrative quotes
"[A] voluntary fire army, I think you should do something like that ... you have the reddingsbrigade (sea-water-rescue organization is meant and referred to as being something similar as they have already boats; also referring to Israel having bomb-shelters all the time prepared and people knowing all the time what to do and whom to listen to) ... maybe you should do something like this (reference to Israel). If you know really good how to swim and how to rescue people, you should have a boat with a working motor on your roof, and when the dike breaks you jump in your boat and go here and there is the big boat where you can save all the people, and you gather all the people in the neighborhood, and the city comes with a bigger boat, you put people there and we all go to higher grounds ... should prepare for, but making those steps is saying "we really take it serious, and we take climate change serious, and we think we can stop it because we preparing to safe the lives and loose the ground, [...] and then you come onto something really Dutch ... we fought for it, we made the dikes, we made the windmills, we pumped the water out, we are not going let it go, I think it's really deep in the Dutch DNA: we fought the water, we won't go away. ... We not gonna loose again, and not forever" (Citizen 7, 2018)
"Well the only thing you can do is just study the weather, ... when extreme weather is coming just prepare for that. But I don't really think other than taking precautions, like having pumps ... you can't do a lot about it, because you can't have always people ready to just be in every neighborhood to safe everybody. It's just like gonna be a moment thing and then it all snaps and then it's all a big problem." (Citizen 12, 2018)
"I think it should be wise to move to parts in the country where you are not that kwetsbaar (transl.: vulnerable), where you are not that threatened by the water, because you are below NAP (normal amsterdam peil/water level), and the water will rise, it's gonna happen, also from the sea side but also from the land-side, from the rain and rivers. So in the end you can raise the dikes, you can raise them all, but in the end ... you are living in the Netherlands and they will manage a way, but if there is a lot of water there will be a lot of water and you can't change that effect. I think in the end the people should also make steps ... probably in the end you have to return some land to the water to give it some space. That's what I think could be a solution. [...] you [sic!] can tell people what they should stock in their houses, like enough clean drinking water, food, so they can survive for 2-3 days or 2 weeks ... But no solution to just put some boats next to the shops. I think creating in the neighborhood places that are high enough to serve us, an escape route ... where people can ... easily gather ... like a bomb shelter on high ground." (Citizen 2, 2018)

Apart of such rather specific solutions are also suggestions made that refer to houses withstanding flooding as well as the in the public narratives already mentioned regional dikes that aim on preventing more wide-spread flooding are referred to as being an important measure for future challenges (Citizen 12, 2018). In reference to climate change is it mentioned that only a major change of the current way of life, referring to consumption, diet and mobility respectively, is preventing the most severe consequences and is thus needed

(Citizen 12, 2018). Whereas future measures and actions are suggested within the interviews, interviewees also mentioned concerns that *"[…] people will always be a bit too late when it comes to the big problems"* (Citizen 4, 2018), referring thus indirectly to something that is needed to solve issues on another base, which could be governance such as shown in the following governance narratives.

5.3.2.7. Governance narratives (ontological)

The following governance narratives are mainly dealing with existing constraints to collective problem-solving of societal stakeholders as well as recommendations how to improve the current situation and solving emerging problems and issues.

Existing governance constraints narrative

The current existing constraints narrative is while dealing also indirectly with recommendations as shown further down, explicitly displaying those constraints that are conveyed as hindering progress in future-proofing the neighborhood and the city. For solving local problems, occurring and future complications respectively, interviewees were identifying several constraints that counteract a proper problem-solving. As these constraints are considered important by them and were conveyed with such prominence in their stories, they are presented within this own narrative around existing constraints in governing the solution of various problems in Dordrecht. The below presented constraints are mainly of institutional nature and listing them aids in overcoming them if taken up by the respective authorities.

Table 30: Existing governance constraints narrative quotes

Existing governance constraints narrative quotes
"[The] Housing [sic!] cooperation … gives fines to people who are not maintaining their garden, so […] Actually [sic!] it's better if you just pave it … more than 60, 70% of the neighborhood is paved … and that's only a one-time investment. … and then the organization stops complaining about your garden. …. [Otherwise] the organization will come to you and say: "oh you have to maintain that …", and if you don't do it you get a fine. And if you are already in a debt … then you are just like yeah. It's happening right now (stresses "now"!)! … the people on the other side of the Vogelnest, they already got five fines and now they are threatening them with house eviction for not maintaining their garden. … The Gemeente (transl.: municipality) is coming now and says yeah you have to do this and they are like yeah." (Citizen 2, 2018)
"I think it's really important that the local government is taking a stand, "this is the way we gonna do it", and e.g. I'm busy with the Bomspiegels (green around the trees, with stones always around usually), because we gonna adopt them. And then I said to the guy ok let's take the boarders out of it because due to the aanpake klimaat, etc (transl.: tasks on climate, etc), and then he said, yeah we can't do that because all the grounds flows away, and then I said to him but listen and this and this … and he said, yeah we can't do that. And that makes it really hard. Because I understand why he says we can't do that, but on the other hand is the local government [saying] yeah you have to do that (stressing that!). […] What I don't understand from the local government is when you say OK let's make more green. And then you say OK I want that green, … I'm gonna maintain that … And then they say no it's not possible. I understand, they are also locked in some rules. But if you want to change something you have to be flexible. … and the whole flexibility thing is not existent anymore." (Citizen 2, 2018)

Whereas both barriers and stimuli towards climate action can be identified are the here listed constraints requiring both public as well as private actors to conduct changes in order to properly adapt to climate change. Moreover, it appears that the mentioned parties, based on the interviewees' stories, do not perceive the problem as very urgent, with a lack of salience being suggested as a common problem (Runhaar et al.,

2012). Finally, while private corporative actors may not be so aware of climate adaptation, the initially mentioned constraint above is clearly pointing towards their role and thus recommendations can be made based among others on the interviewees' responses. In the following section are the citizens' recommendations presented.

Recommendation narrative

Interestingly, from the public narrative on collaborative governance it appears that there is an ongoing collaboration between authorities and citizens, while the latter themselves noticing room for improvement in this endeavor. Thus, indirectly mentioned were several recommendations to improve the work on both future-proofing the city and the neighborhood, as well as generally the social situation in the Vogelbuurt neighborhood. Whereas the current recommendation narrative is indirectly in line with some of the constraints mentioned above were the present accounts conveyed in such way that a wish for improvement is given, which is why they can be summed in a recommendation narrative.

It seems from some interviews that citizens have the feeling that locally, in the neighborhood respectively, the municipality is not present and not acting on issues of the interviewees' concerns, such as water-related problems or climate change, indirectly referring to a need that this should change. An interviewee even mentioned that he sees changes occurring and water levels rising, but that he believes the municipality is not doing so much about it although the issues are becoming constantly more urgent (Citizen 11, 2018). A suggestion made based on this is that citizens should talk about the afore mentioned issue with the municipality and express their concerns (Citizen 11, 2018; Citizen 12, 2018). Moreover, information from the municipality about both identified issues and their attempt to solve them appears to be absent (Citizen 11, 2018), which might be also referred to by an interviewee recalling the need for the municipality to *"Think long-term! Think really long term, think about what could happen, […] when sea-level is really going to a point when it is dangerous to people, how do you manage that […]"* (Citizen 4, 2018).

Interviewees also suggest to let citizens actively participate in plans to change things in the neighborhood and motivate them for such activities (Citizen 6, 2018; Citizen 9, 2018), which is a recommendation that, as shown further below in the discussion of this research, is crucial for any future adaptation project. While focusing on the local area it is suggested that information sharing should be happening in relation to the Nestcafe, a coffee-bar organized by the city-lead project Vogelnest within the Vogelbuurt neighborhood (Kelder, 2018). These projects are believed to be successful for local citizens and offer possibilities to inform people also about climate- and water-related issues and initiatives, e.g. with an information-board or educational activities with speakers that let people even directly gain from their participation (Citizen 10, 2018; Citizen 12, 2018; Citizen 8, 2018; Citizen 9, 2018). Moreover, informative conversations across the neighborhood like the narrative interviews for the present project are referred to as a good example for them (Citizen 2, 2018). While information from the city is wished for, it is also mentioned that such information should be transparent and especially easily understandable to ordinary people (Citizen 10, 2018; Citizen 4, 2018; Citizen 6, 2018). Finally, with many interviewees stating an absence of knowledge how to respond in case water becomes a big problem for the city and the neighborhood, more information might alleviate such absence and thus supports such recommendation narrative and specifically the dissemination of information and education about water and climate. Apparent from the interviewees' responses become their wish to contribute positively themselves as well as that the municipality is taking matters of their concern seriously, which is why the recommendation narrative is also important for future projects in the neighborhood.

Table 31: Recommendation narrative quotes

Recommendation narrative quotes
"You know that's most important here because they always complain about the housing corporation, about the government, that it goes really slow, ... (interview mentions that it took 1 year to build the Nestcafe, which is for citizens long but for the city hall they were happy that it was just a year). ... you can react to that, what people want ... and do that already ... (referring also that Vogelnest tries to implement things within a week) or at least tell people why it didn't happen yet." (Citizen 7, 2018)
"You can't say to people who are in ... debt guidance "you have to fix your garden because it's not climate proof" and then they say ok we gonna create a more parking space in the street. People are already frustrated and angry. So that's easy to forget that the local government is a big (stresses!) player in policy." (Citizen 2, 2018)
"If there are plans to change things over here that people participate, not just send a letter "this is what we gonna do", "This is what we want to do, what is your opinion, and do you want to think with us", instead of "This is what we are gonna do to you and you cannot do anything about it. It's like, "OK we want to do this, how do you think we should do it, and do you think we do it in a good way, or do you like the colors of the wall ... ". You know, give people something to have an opinion about and listen to them, that really helps." (Citizen 6, 2018)
"So if you would write a contest about it and they could win something, then they will attend, otherwise if they do not get something out of it ... [they wouldn't come]. Because most people don't really have high IQ, and you have to interest them. But how? ... That's difficult here." (Citizen 9, 2018)
"Like I told you it's education! And I do think that what we do here with this project (refers to the Vogelnest project), it's one way of educating the people, with small ways. But just starting conversations, giving them the numbers. I think that's the only way to go. [...] and maybe start like to say we want that change or we want this. [...] I think we need like places like this (the Vogelnest), people coming together, people who don't really know each other, and just educated and compare, and they will tell and tell on (to others)." (Citizen 12, 2018)

In addition to these conveyed recommendations did also specifically mentioned responsibilities appear within the ontological narrative interviews, displayed below respectively.

Responsibilities narrative

Crucial in any governance endeavor for solving complex issues are responsibilities, which also appear in the ontological narrative interviews as conveyed by citizens. Clear responsibilities are suggested to aid in e.g. climate adaptation and other actions (Mees, 2017), and are specifically identified here by citizens, which alone is already an interesting observation to include here a more subjective observation. References to responsibilities are made obvious and as citizens specifically stressed them, an own narrative shows them clearly and pays tribute to such specific declaration. Moreover, a lack of clear responsibilities is also seen as a barrier in adapting to climate change, thus climate action becomes more difficult (Runhaar et al., 2012). Most conveyed accounts refer to responsibilities as some kind of decision that needs to be made, as well as who ought to address various problems mentioned by them. Several interviewees mention that the municipality ought to find a solution for water and climate related issues, with some even mentioning their personal lack of specific knowledge as a reason for that (Citizen 11, 2018; Citizen 2, 2018; Citizen 4, 2018; Citizen 7, 2018). Nevertheless, it has been also pointed out that with more information for citizens, referring thus also to the above identified recommendation narrative, citizens are able to do things such as increasing the green surface in their gardens themselves and the municipality won't have to do such things alone but rather they can then all act together (Citizen 5, 2018). This is also in line with the by Mees (2017) identified stimulation that is needed while otherwise action is more unlikely to be taken, depending though on specific

measures respectively. Finally, the here identified responsibilities by citizens, exemplary displayed below, let also assumptions be made of what ought to be done to successfully address the many issues that are crucial for future-proofing the city of Dordrecht.

Table 32: Responsibilities narrative quotes

Responsibilities narrative quotes
"It's also a job for the local government, "how serious are we taking that problem", because in the end it's you're talking about the lives and the way people are living in Dordrecht .... you can't take it lightly that's what I mean. So if the local government decides to .... That's the whole questions, "how serious is it?", I think it's quite serious, and I think the local government is a bit like "yeah it is serious, but yeah it's also really expensive to do something"." (Citizen 2, 2018)
"[...] we don't think so much about the water and all those things [...] The municipality needs to find a solution for that." (Citizen 11, 2018)
"If you have to make these adaptions [to a disastrous flood], it's on so many levels, you have to put a boat on your roof, and you have to learn to swim, and you have to be prepare that the dikes can break, but that's also, again you have to stop eating meat, stop flying, stop driving a car, stop buying stuff from the other side of the world, all the kind of stuff to stop the global warming to stop the water rising, and that's a part people don't wanna hear. So I think if you start preaching ... like a prophet, people will make you ridiculous because they just don't wanna hear it. So I think it should come, at least from the city council but even better from the government." (Citizen 7, 2018)

Whereas this marks the finalization of the found ontological narratives hold by citizens, is the following section briefly taking up some selected core-visions for achieving a future-proof city of Dordrecht, presented as main narratives for a future-proof city.

5.4. Overview of narratives for future-proofing Dordrecht

Following up on narratives elicited by interviewing both public authorities as well as citizens in the neighbourhood Vogelbuurt, several main narratives for future-proofing the city of Dordrecht can be identified. In addition to the complete overview of narratives that can be found in <u>Annex F</u> is the following list providing an overview of all main narratives and displaying their appearance in public and ontological interview-responses, marked with X in the respective column. Partly in line with the utilized methodology for this research, several shared main narratives appear both in public as well as ontological narratives, while in contrast are others appearing only in public or ontological narratives, thus a divergence between them can be spotted.

Similarity of main narratives can be found in those cases where an underlying reasoning for certain activities is stated and referred to, which is interesting to observe as such similarity offers a fruitful entry-point for discussing measures to be taken to reach a future-proof city. On the other hand, divergence is appearing in those main narratives that are labelling specificities of activities such as adaptation mentioned by public narrative interviewees and more general climate action that is mentioned by citizens. Moreover, divergence is also marking different perceptions of issues, with citizens referring more generally to experiences of issues as seen in the experiential narratives and authorities often symbolising a state of being vulnerable, hence the main public narrative of vulnerability. The below shown overview of narratives is also having meaning in hindsight of to be designed measures to future-proof the city of Dordrecht, which will be followed up in the section on <u>recommendations</u> and is answering sub-question one of the research-aim respectively. Finally, such overview is also providing a good indication of all the elicited narratives within this research that is as such discussed and reflected upon in the following section.

Table 33: Overview of narratives

Narrative themes	Appearing narratives	
	Public narratives	**Ontological narratives**
Historical narratives	X	X
Vulnerability narratives	X	--
Adaptation narratives	X	--
Experiential narratives	--	X
Action narratives	--	X
Identity narrative	X	X
Socio-economic constraints narrative	X	X
Future perspectives narratives	X	X
Governance narratives	X	X

6. Discussion of the research

The following discussion is looking closely at the <u>results</u> in relation to the <u>theory</u> guiding this project, the elicited narratives as well as their implications for future-proofing the city of Dordrecht and finally a reflection about the <u>method</u> of this research and potential limitations.

6.1. Reflection about the results

This research is successfully utilizing a narrative-based focus on eliciting crucial data for situating climate action close to people's narratives around changes in their surrounding at the location of Dordrecht. Therefore, it can be initially stated that even though previous research, as outlined in the beginning, is limited in its extent of which it connects existing narratives with climate action, this project is successfully filling that gap. Focusing on stories that interviewees for this project conveyed is this research in line with its theoretical foundation that people convey stories in a narrative way (Hewitson, 2014; Wiles et al., 2005), which can be only confirmed as the majority of the stories were told in a narrative-way. As such are in the following the conceptual elements of narratives and frames specifically elaborated upon as these constitute the main structure of human talk. The other two emerging theoretical considerations around emplotment and perceptions as already shown in the theory of this research are intrinsically embedded within narratives and their mutual relationship to frames that provide guidance and mark salience of elements. Thus, narratives and frames constitute the most important theoretical concepts as being relevant for the meaning of the results and are therefore subsequently discussed in their relation to the elicited results. Moreover, emerging visions since crucial for future-proofing Dordrecht in practice are elaborated upon thereafter.

6.1.1. Narratives and climate action

6.1.1.1. Narrations in stories

Considering the mentioned importance of narratives in human lives the elicited data confirms such in principle as implications for future-proofing Dordrecht through various climate actions were mostly well narrated upon by interviewees. Such narrations that focus on events, actors and complications are found in most of the results as they refer to e.g. historical happenings and their complicating effects, connect to measures that are implemented in the following by certain actors and convey outlooks to the future, to give just a brief overview of how narratives are located in the results. While it is argued that narratives are organizing human experience and construct reality (Bruner, 1991) is this basically in line with the observations made while analysing conveyed stories. E.g., the common reference to historical events and utilization of it as a motivator and reason for action, attention or even worry shows that narrated stories about them are in a way structuring the experiences of the interviewees and even provide a frame of reference (Viken & Nyseth, 2012). Another appearing motivator as narrated in the stories is climate change and the effects brought about by it that are affecting the city, which is also marked by a specific framing in use that is defining mentioned problems within a narrative. Historical references were mainly made to the two very significant events having an impact on Dordrecht, the St. Elisabeth Flood in 1421 and the "Watersnoodramp" in 1953 respectively. Such references to already happened events are presenting also how conveyed narratives are embedded within a chronology of narratives, thus answering sub-question two of the research aim and also making a certain plot visible through such references. On the other hand, while narratives are providing guidance and people convey information through them as seen in the data, can the theoretical notion that they are fundamental to social life based on this research not be confirmed, although further research might be needed for examining that divergence between data and theory more in depth.

6.1.1.2. Guidance by narratives

Guidance and structure brought about by narratives as conveyed in the <u>theory</u> is becoming specifically visible within data showing various experiences with climate change and its effects and the stories about it. Public interviewees referring to a vulnerability and ontological ones to an experience can be seen as such type of guidance by narratives around these phenomena, which is in line with theoretical aspects of narratives that are guiding humans (Somers, 1994). As narratives allow to make sense of an experience (Bremer et al., 2017) is such divergence between public and ontological narratives in line with the theory, thus institutions referring to vulnerability, affecting them as it let them reason through it their actions, as well as citizens' referral to actual experiences with climate change and its effects. Common references towards vulnerability by public interviewees can be also seen as a binding element between them as narratives provide a sort of connection between narrators and structure their exchange (Ingram et al., 2015), and showcase their perceptions in line with the institutions' conveyed stories (CARE Nederland, Groupe URD, & Wageningen University, 2018). Such common storyline and emphasis also appear to make sense as authorities are working together on future-proofing Dordrecht and need to politically convey a message for safeguarding its inhabitants from a specific vulnerability or threat and are thus in need for among others funding and support. Collaboration between them is as already mentioned institutionalized within several action plans, which is why a common aspect that glues them together and feeds interaction in a certain way backs up the theoretical foundations of narratives as shared realities fostering interaction and providing guidance (Bremer et al., 2017; Delta Programme Commissioner, 2014; Ingram et al., 2015; Ministerie van Infrastructuur en Milieu, 2016; Provincie Zuid-Holland, 2009). In that way can also the mutual relationship between narratives and frames be seen as conveyed in the theory. From interview-date emerging is that both frames and narratives constitute a binding function due to the voiced commonality of them between narrators. Interestingly, such common reference to vulnerability also has potentially fruitful implications for future-proofing the city since it appears as both motivating and guiding element. Nevertheless, such reference to vulnerability may also convey a feeling of a lack of control in light of such exposure to potential risks (Moser & Boykoff, 2013), with ambiguity how the future may unfold as shown below, feeding such considerations.

In line with vulnerability as a common and shared reference among authorities is also such arising out of the specific constellation around high tides, Westerly storms as well as a flood from the river that is threatening the city and is prominently conveyed and framed as a threat within the narratives. Such reference states in many cases also implications for future-proofing Dordrecht and preparing for future events arising out of that conveyed threat, thus guiding activities in tackling such. Interestingly, such specific reference to an event-centred constellation has been also made by ontological narrative interviewees, referring to it as happening both in the past and potentially also in the future. This shared occurrence and thus similarity in the narrations around event-centred occurrences between citizens and authorities holds fruitful implications for future-proofing the city, discussed further below. Nevertheless, while both authorities and citizens share some common narrative features that can be even stated as being needed for coordinated action is there also discrepancy on some of the narrated details and being thus in line with other research investigating such phenomena (Brown, Stacey, & Nandhakumar, 2008).

Guidance by shared narratives can also lead to collaboration in decision making of multiple parties and societal actors at different levels of society, allowing to conduct decisions interactively, which is also termed as governance (D. A. Loorbach, 2010; Newig & Fritsch, 2009). Further can collaboration as e.g. fostered by shared narratives lead to the forming of coalitions that have a shared understanding and language in use of particular issues that are dealt with (M. Weber, Driessen, Schueler, & Runhaar, 2013). Thus, the here identified shared nature of narratives is also aiding in governing the needed steps to future-proof the

city, considering the importance for cities in addressing both climate mitigative as well as adaptive measures that need governance arrangements for implementing them is this a crucial finding in itself (Betsill & Bulkeley, 2006). In addition to guidance provide narratives also more fundamental meanings to their conveyors as seen in the following.

6.1.1.3. Narratives as identity

The specificities of Dordrecht as appearing in the data let a certain identity within the narratives be identified. Interestingly, such appearance of an identity in narratives is also backed by research that states that narratives basically constitute our social identities and thus locate them within emplotted stories, i.e. narratives (Somers, 1994). A defining feature emerging from the data seems to be the fact that Dordrecht is foremost an island and has therefore an island identity according to both public and ontological narratives respectively. Interviewees are referring both to the fact that Dordrecht is an island and stress the fact that it is surrounded by water, hinting towards the complicating nature of water in light of the challenges and opportunities out of it, thus using a very specific framing within such narratives. The identity of Dordrecht is for public narrative interviewees further defined by being a city that was once very rich and is now vulnerable because it is an island, yet again showing a specific emplotment and framing in such stories. Whereas this is prominently referred to and also in line with theory stating that narratives are told with a purpose (Bremer et al., 2017), which is making obvious a state of vulnerability, is this identity not necessarily different from other locations but rather structuring the stories of the interviewees and aiding in conveying their respective messages. It can only be assumed that such occurrence would also appear in other cases, for this though a comparative study on another city would be needed and public narratives elicited. Such more differentiated view into why vulnerability is such a constituting factor for Dordrecht's identity can be also supported while looking into climate adaptation in the entire Dutch Delta that has many islands and such description as island is in other contexts used rather "normal" without any specific reference to the state of an island (Ligtvoet et al., 2011). Nevertheless, citizens conveying ontological narratives also pointed very specifically towards Dordrecht being an island and thus at least a certain degree of identity-forming character can be assumed that is backed by the framing used in their narrations. Finally, narratives as identity are providing a certain identifying character as seen above and backed by theory, but the elicited data does not support the fundamental constitution of those narratives to the social identities of the interviewees. Nevertheless, identity as appearing from the data and in line with theory is still an important factor to be acknowledged regardless of its fundamentality.

6.1.1.4. Narrated perceptions and futures

In line with the above elaborated issues does from theory emerge that narratives within language are shaped by specific perceptions about phenomena that profile the frames in use and mark therefore an important base for narratives. In line with both theory and research aim did interviewees narrate in a rich way about their perceptions of happenings as well as expected and desirable futures. Thus, apart of the afore mentioned mainly past- or present-related occurrences and implications was it also crucial to elicit future-related aspects so as to be able to future-proof the city based on some of the insights of this project. One of the foci of this research was therefore on assumptions and desires for the future, which according to the theory are conveyed by narratives as they are explaining happenings in a back-ward fashion but contain intentions and assumption about the future in a forward-looking way (Hewitson, 2014). Such theoretical foundation can be most certainly backed up when looking at the motivational narratives conveyed by public interviewees as they refer to vulnerabilities for the city that are motivators for acting upon mitigating or even avoiding certain risks as already outlined above too. Moreover, references to history are generally well fitting such theoretical foundations of what constitutes a narrative as public interviewees referred often to them when

marking points that are future-orientated, providing also insights for future-proofing Dordrecht. In that way does this research back up notations of Hewitson (2014), who states that the way how a story is told is important, considering the way historical references were made as reasoning for action by public interviewees, i.e. motivators. Rich narrations about perceptions and worries being relevant for the future are specifically stressed within the public narrative on future challenges, which refers to the known threat and occurrence of a major flood that is increasingly causing concern due to climate change. Citizens referring to experiences of e.g. climate effects and that Dordrecht is located next to water are also feeding theoretical foundations as their stories are conveyed in such way that worries become obvious, thus also using a specific framing and being in line with theory on it. In light of this can be also seen that awareness for certain issues is present when there is also experience in one or the other way, such as conveyed e.g. within the public narrative on perceptions of exposure to water or the ontological narrative on awareness for changes in water, environment and climate. Finally, activities relating to awareness of certain issues only occur to happen at the level of citizens when there is at least a certain exposure to a risk or event, supporting worldviews or even knowledge present as such are shaping perceptions. In case these conditions are present, action may occur, which is in line with research that shows the prominence of e.g. worldviews and existing engagement in action about climate change (Capstick & Pidgeon, 2014). Whereas perceptions are as seen vividly narrated about are they intrinsically connected to the frames in use that are basically created by stories about perceptions. Thus, in the following are frames specifically focused upon since they comprise the second main structural element besides narratives that are important in human conversations.

6.1.2. Observed frames within elicited narratives

As already mentioned above and being central to narrative research is framing, i.e. in principal stressing the importance of certain issues and choosing a specific interpretation so as to cause a certain understanding (Entman, 1993). Looking at the theory while interpreting the results it can be stated that on the one hand are authorities mostly encouraging the use of a specific interpretation of a phenomenon as well as convey particular parts of reality with more prominence. Citizens on the other hand specifically stress a perceived issue so as to stress the importance of it to the interviewer, which is therefore in principal in line with the theoretical background on framing. The salience of elements becomes throughout many interviews obvious, and the stressing of e.g. observed and occurring changes in weather and water offers the chance that other frames such as those stressing in particular climate change become activated. In light of the theory is this study, and potential future studies looking more in depth at the data, giving significant insights on how framing is central within conveyed stories and narratives, thus theory on such can be both backed up and even refined. Having said this, centrality of frames within narratives as outlined in the theory, is backed up by this research and certainly confirms the importance of frames within narratives, both having therefore utmost importance in human conversations. Such centrality of frames and the importance of narratives allow together with the shared character of the identified narratives the formation of winning coalitions, which may reframe certain elements so as to be able to successfully work together on them (Driessen et al., 2012). Analysing elicited narratives upon the frames in use, i.e. looking in principal for salient elements and storylines within the narratives, is providing crucial insights into what interviewees may think about narrated phenomena (Fletcher, 2009), with some main frames found in the narratives elaborated upon subsequently. In the following are both shared frames as well as those that diverge between ontological and public narratives described as insights into designing and implementing concrete measures can be gained by them.

6.1.2.1. Shared frames in ontological and public narratives

Climate threat frame

Framing becomes particularly obvious while e.g. looking at the awareness for exposure to changes in water, environment and climate narratives, since these stories contain frames that attribute phenomena with climate change and in some instances even the causes and its effects, which is thus directly in line with theory (J. De Boer et al., 2010; Entman, 1993). Within such frame around climate threats were mentions about the exacerbating vulnerability for Dordrecht that is arising out of climate change, and that it seems across all the interviewees very likely and certain that things are expected to become worse. As such was there a stressed ambiguity and insecurity about the future, which is expected to be influenced by the threat of climate change that is noticed as worsening over time. Some interviewees name climate threats as being beyond their control, with some stating concrete actions as shown and framed below also marking at least some discrepancy on that end.

Vulnerability frame

Another shared framing emerges from the narratives is such that stresses the specific vulnerability of Dordrecht since it is facing specifically due to its location and being an island a specific risk. Framing around possible events that did already occur in the past is here very prominent, with the voiced combination of threatening elements causing such vulnerability being at the centre of this frame. Worries are here commonly conveyed together with a stressed specificity of phenomena threatening the city. Moreover, awareness and detailed knowledge of phenomena are conveyed and stress the vulnerable state of the city, manifested to some extend even within a certain identity of the city as already elaborated upon.

Problem frame

In line with the afore mentioned frames is a common frame also such that stresses the occurrence of problems around extreme rain events and to some extend water. Whereas such problems are expected and also framed in hindsight of a future worsening is their current occurrence also commonly voiced as something that is happening at the present moment. Within such problem frame can be also stated that a commonly voiced awareness for water that can become even a threat under certain circumstances is also named by both public and ontological narrative interviewees.

While the above described frames are commonly appearing are the following frames apart of some very limited overlapping utilization mostly diverging between ontological and public narrative interviewees.

6.1.2.2. Diverging frames in ontological and public narratives

The following frames are used in diverging ways among the interviewees, and that divergences are specified within each of the frames.

Constraints frame

While constraints are generally voiced by both clusters of narrative interviewees are public narratives specifically stressing the meta-constraints around financial limits present in the municipality as well as problems arising out of the built environment that is shaped by such monetary constraints.

Citizens on the other hand refer to social issues such as the structure of the community, the poor network and low education and poverty as main issues. Specifically stressed and framed is here the constraint that individual social problems are for citizens of the Vogelbuurt neighbourhood more pressing than climate change or other changes in the environment.

Severity frame

The severe nature of voiced issues being common, the specific framing about such severity is diverging in nature. Public narrative interviewees are strongly pointing to the limited possibility of e.g. preventing problems arising out of extreme rain and rather stressing the need to adapt to it when it is occurring and even voice an importance of integral planning for adapting to severe events.

By contrast do citizens see the already worsening general character of climate change and the effects of it such as higher water levels but they do not yet see extreme situations arise, indirectly though hinting towards a possibility for extremities in the future.

Action frame

Various activities around climate change and its effects being commonly named, with e.g. causes and effects voiced by public narrative interviewees focusing on extreme water and weather-related occurrences and the imposed need for treatments as seen within some adaptation narratives. Frames become particularly obvious when looking into the exposure to water and specifically adaptation was stressed and framed as being something that is normal and obvious by public narrative interviewees. In that regard are the voiced risks framed as something that is manageable, even though the need for governance and collaboration with citizens is stressed too. Within such action frame on adaptation were also framed elements marking difficulties around the short warning time and the need for evacuation present, often in reference to the respective severity of an occurring event. Nevertheless, occurring events were framed as specifically supporting the discussion around actions undertaken to adapt to extremes.

Inhabitants were not so much stressing any adapting measures but moreover vividly framing their stories and climate mitigating behaviour due to their strong notions of climate change and the need for actions on it.

In addition to observed frames can several visions that emerge from the data be elaborated upon as shown in the following.

6.1.3. Emerging visions for the future

Following up the afore discussed foundations and implications of both narratives and framing shall the following shed more light on future-related aspects in the data, which as such embody in specific theoretical aspects of both narratives and frames as well as crucially add towards enabling a resilient and future-proof city based on emerging visions for the future. The here in this research elicited main narratives and their displayed overlap are in line with theory stating the shared nature of narratives, which allows therefore to construct measures for future-proofing the city that are in line with collective aspirations for a desirable future (Gidley et al., 2009). In the following are those collective aspirations or visions as emerging from the data singled out and elaborated upon.

6.1.3.1. Vision of climate resilience and a safe future

As pointed out is reference and reasoning for future actions in light of possible events given in hindsight to historical events and known possibilities that motivate for acting upon them, exemplary seen in motivational and future-orientated narratives respectively. Public narrative interviewees referring in a detailed manner to possible challenges arising in the future and how to deal with them, although mentioning a certain level of ambiguity arising specifically out of climate change as well. An appearing underlying motivator for action is apart of the afore referred historical component climate change, which is also reason for certain institutions to even look beyond their respective jurisdictions and include climate change in their field of

action. Notions on both present and future climate change are important triggers to work on creating climate resilience, something that is fundamental from both the point of view of the city as well as the current project and can be thus seen as one of the main visions emerging from the data. Thus, the current project is by following a people centred approach in creating resilience also in line with suggestions from literature as it is seen as utmost important to include people's own desires for a resilient and liveable future (CARE Nederland et al., 2018).

Examining what desires interviewees have in light of a future under climate change is thus in line with existing research showing that successful adaptation is focusing on desirable futures that can then be aimed at (Moser & Boykoff, 2013). As from the public narratives emerging is a strong desire for the future to keep Dordrecht liveable, which was conveyed as being ultimately challenged by the mentioned implications climate change is bringing about. Similarly, ontological narratives pointing towards a rather close future that will be even severely affected by climate change as the same point towards the changes that are already happening. On that note appears through a discrepancy between negative effects for the city as a whole but not so soon occurring negative effects in the Vogelbuurt neighbourhood. Putting those notions of expected challenges as mentioned by ontological and public narrative interviewees together, much support for the outlined recommendations around both climate mitigation and adaptation can be assumed that is also in line with the following vision on climate action below.

Conveyed visions aid on a meta-level in fostering resilience as strategies based on the narratives can follow up on notions what ought to be achieved, which is basically to keep the city liveable in the long run. Interestingly, citizens referred to possible disastrous floods affecting the entire city and their desire for safety in addition to authorities too. Based on the elicited narratives can be stated that generally is support for measures preparing for a devastating flood present in the city, thus partly answering sub-question 3 of the research aim, which will be followed up in the recommendations for implementation respectively. Being in line with theoretical aspects stating that narratives are displaying desires that are partly even collectively shared is the underlying conveyed message of a desire for safety in line of such foundations in theory. Future-orientated elements within narratives are also appearing in responses by citizens for example within the action narratives as they refer to observed or known effects of climate change and interviewees referring to the need of people to act upon climate change. Further are ontological narratives showing that in reference to future perspectives, historical occurrences exemplary reminding them of the possibility of similar happenings in the future, backing therefore a vision of a climate resilient future.

Interesting to notice is that those citizens that are interviewed are very much aware of environmental changes happening and leading to effects such as rising temperatures and sea-levels. Whereas not all interviewees agree on the level of changes, apart of one interviewee who voiced scepticism towards the amount of human influence on climate change, were they all knowledgeable on climate change and that it is happening and influenced by humans, as well as affecting the city of Dordrecht. Those accounts that mentioned climate change and observable effects of it were very much in line with the defining features of narratives as they connected different aspects in their stories, e.g. carbon emissions, rising temperatures and rising water-levels, and their stories rendered their understanding through this emplotment. Moreover, certain elements of their stories were specifically stressed and framed as being important, which thus adds to the theory of framing that states the relative importance of issues is e.g. appearing in the way how such are told. Such framing becomes also visible by looking more closely to those elements that are coded as moral judgement and is in general one central aspect to narratives.

Having said this, a further vision of concrete activities that aid in enabling a safe and resilient future as outlined above can be defined.

6.1.3.2. Vision of climate action

Whereas not an end in itself but rather a mean is climate action nevertheless being voiced as crucial and in addition to the need of a current occurrence also referred to as being important in the future, which is why it can be also seen as a vision of climate action. With climate change being most prominently mentioned within ontological narratives and institutions referring to the need of further action to limit sea-level rise that is threatening the city it can be pointed towards the further below recommended mitigative strategy as having support by the conveyed narratives. Moreover, observed changes affecting the city now and being expected to be further increasing in their severity in the future, it can be stated that based on both ontological and public narratives are adaptive measures supported, concretized further below. Expressed narratives are aiding also in designing e.g. adaptation measures that are termed as successful as explicit foci on futures were made in the results, which is considered as an important step for such designs (Moser & Boykoff, 2013). Whereas the mentioned experiences of climate change may only point towards concern since negative effects were reported, which in turn could change if those effects are absent, is this still hinting towards awareness that if combined with emotionally catching information can result in significant climate action (E. U. Weber, 2010). Experience with climate change affecting a place of attachment such as inhabitants of their city further stimulates concern about climate change (Moser, 2014), and can lead to a situation that people become more willing to act and mitigate their influence on climate change (McDonald et al., 2015). These mentioned experiences with climate change by interviewees suggest that there is already a certain closing distance of climate change, which can be further stimulated so that climate change becomes closer by communication strategies that reduce the psychological distance of it (Spence et al., 2012). That said, a mentioned lack of information about challenges and actions to tackle them is referring nevertheless to the below recommended dissemination of information, which might then further stimulate action. Such communication of climate change, accompanied with the needed risk communication needs to be in any case also joined by structural policies that enable such communication efforts to be fruitful in stimulating real action on the ground (Moser, 2010). Mentioning climate change and their effects suggest in any case the rather reduced psychological distance of it among the interviewees, thus awareness about living with the effects of climate change now and in the future can be said as being present, especially considering the voiced occurring climate actions.

Mentioned occurring adaptation strategies as well as those that are likely to be implemented in the future are also aiding theoretical foundations that call for the need for collaborative leadership in order to deal with challenges ahead by implementing both major and minor solutions, as already now happening across Europe (Gurzu, 2017; Anna Taylor, 2018). Collaborative leadership in that regard includes various societal stakeholders and knowledge brokers in decisions and fosters collaboration among them (Anna Taylor, 2018). Implementing such mixture of both smaller and larger solutions to various problems in Dordrecht may be also needed as in the current Anthropocene, many actions by humans bring a long very different consequences on various scales of society, which is why such mix might be a good bet for success to solve some of the issues. Finally though and thus being in line with the quest of this present project are humans deciding and acting to achieve a safe and desirable future together, which in the best case lead to something that can be termed as a better Anthropocene (Ellis, 2018a, 2018b), supporting thus the vision of climate action as well as a climate resilient and safe future.

6.1.4.Voiced constraints and their remedies

This project was eliciting desires about what constitutes a desirable future, but for action were there also several constraints voiced as hampering such. Specifically, local socio-economic constraints that may hamper the quest of future-proofing the city are present within the city and neighbourhood, among which were social problems such as monetary issues, a lack of education and conflict most prominently conveyed.

Municipal economic constraints might generally not be easy to overcome, although a needed transformation of the socio-economic system towards being situated both within planetary and socio-economic boundaries may offer chances, noting though the current ambiguity of what such a transformation look like in practice. Such transformation is at least hinted towards by one of the interviewees, which is in line with theory about transformations that states the principally social construct of it and various understandings as become obvious in narratives (Patterson et al., 2016). Narratives that contain transformative elements are also forming one of the cornerstones that interprets how society can live within planetary boundaries and what ought to change in our current unsustainable socio-economic system with negative effects such as climate change (Hackmann & St. Clair, 2012).

Nevertheless, with such local socio-economic constraints being voiced, not much work appears to be conducted on a level of transforming local society systematically, both to become more socio-economically strong so as to consist of a functioning social fabric, but also not in terms of even considering a transformation towards a more sustainable society as outlined above. Socio-economic constraints as being present in the neighbourhood are among others related to a poor social network, which is considered among others as important for social resilience (Eraydin & Taşan-Kok, 2013; ISSC - UNESCO, 2013; Wardekker, 2016), poverty and criminality (MC2 & Kristal, 2006). Interestingly, a report on various lifestyles in that neighbourhood reveals that two groups are broadly present, which are those always living there and having with their respective social groups rather strong ties, as well as those coming back to the neighbourhood and are more passive and focused on privacy, being thus in line with the reports of one of the interviewees also moving back to the Vogelbuurt neighbourhood after living for a while somewhere else (Citizen 9, 2018; MC2 & Kristal, 2006). With such issues being continuously present, a serious limitation in successfully future-proofing the city and neighbourhood continues to be present too, which is why further steps to remedy such big constraints are needed in order to achieve the afore mentioned visions.

While a broad transformative action cannot be seen at the moment based on the material and data available, several initiatives across Dordrecht as well as related to the Reeland area and the Vogelbuurt neighbourhood in particular are still aiming on improving living conditions and informing citizens about various issues and how to conduct action on them. Generally, some local citizen initiatives are aiming at transforming Dordrecht towards becoming more sustainable (Dordt Duurzaam, 2017, 2018; Weizigt Natuurlijk duurzaam, n.d.), and aspirations in renewable energy are starting to materialize too (Dordrecht, 2018g). Whereas a broad transformative action base seems to be absent, thus in line with the interviewees' responses stating the absence of broad-scale climate mitigation as mostly authorities are focusing on adaptation even though climate change being the underlying reasoning and motivator for much of the conducted action, is such action at least embedded in some of the officially named programs on the municipal homepage (Dordrecht, 2018c, 2018f, 2018g). Such work can be seen as very positively and an important first step but the absence of a broad mitigative strategy in the city, supporting the already occurring quest of climate adaptation, is something that ought to be improved if future-proofing the city is consequently followed up across all spheres.

Based on this research, it can be further reflected about several implications for future-proofing the city, which is conducted in the following and thus in principal dealing with question three of the research aim.

6.2. Implications for future-proofing Dordrecht

Looking at the elicited narratives and conveyed messages, several implications for future-proofing the city of Dordrecht are arising, which will be elaborated upon in the following and starting with implications of mentioned threats.

6.2.1. Climate threats as stimuli for action

Future-proofing the city is motivated very prominently by well-known historical events, generating awareness across the city, which further translate to an exposure to water and risks arising out of it that many interviewees vividly name as important triggers for action. Most interestingly though is that both implicitly and explicitly named was climate change as among the main reasons why issues for the city of Dordrecht arise and work on threats by climate change is conducted. Climate change as extensively mentioned is posing many challenges to humans, with impacts occurring already now and increasing annually in severity as also noticed in Dordrecht (IPCC, 2014c; Levin et al., 2012). As the city of Dordrecht is specifically paying attention to extreme rain related floods as well as storms approaching by sea and threatening the city, climate change is likely to be exacerbating those events already now as weather systems are slowing down in their velocity and thus increasing the potential local impact (Haug, 2018; Kossin, 2018). Specifically, for Dordrecht is such slowing down of weather systems potentially disastrous since a worst-case scenario, e.g. framed within the event-centered vulnerability narrative utilizing a vulnerability frame, developing out of a storm by sea and a flood from the river in this emerging situation that weather systems persist longer at a given point also magnifies the risks for the city.

In case such extreme constellation arises and a storm from the sea is occurring over a prolonged period of time, as well as a low-pressure system bringing rain over Europe also moving slower (Haug, 2018), Dordrecht that will be certainly affected by a rising sea-level is also threatened increasingly by such constellation that has been to date mainly named as worst-case scenario occurring in the future. Thus, more extreme climate impacts threatening the city already now and are further believed to increase in the future, lead to an increasing vulnerability and to ambiguity how the future may unfold and how to safeguard the population of Dordrecht, which is in various forms named by interviewees directly and indirectly. In light of this was it observed that awareness and attention for climate change and its increasingly threatening effects is generally present in Dordrecht across the interviewed institutions for public narratives as well as many of the citizens interviewed within this project. Whereas such threats are present and increase in their potential severity are visions how to deal with such also specifically arising out of this threat as lined out in emerging visions above. In the following, the implications of those mentioned threats and arising visions for actually future-proofing the city in practice are shortly discussed.

6.2.2. Positive future visions supporting climate action

Having lined out both emerging visions as well as the motivating component of climate threats, several positive visions that support action can be singled out. An interesting implication arises out of the common reference by authorities towards a general vulnerability of the city, which arises out of water in specific and more generally due to the effects of climate change manifesting themselves among others through issues around water and extreme weather increasingly threatening any urban area (Revi et al., 2014). Such common reference may offer the chance to re-frame vulnerability towards something like "living with water and climate change", which includes both risks and positive aspects arising out of Dordrecht's location and being surrounded by water. Such implication becomes obvious while looking into Rotterdam's new narrative around water that is basically evolving around a long-term positive vision for the city's relation with water, basically a new narrative how water is seen (Dunn et al., 2017). Based on this it can be suggested

that also Dordrecht takes up such lessons and designs a truly visionary outline how Dordrecht can live with water in the future and is addressing climate change in relation to it, further taken up within the recommendations below. Such vision can be based on the existing vision for the city covering the time up to 2040 and includes mentioning of climate change and water safety (Gemeente Dordrecht, 2013b), substantially adding though lessons learned from among others the current project and placing climate change and water much higher on the agenda in light of the expected challenges. In that way is such positive vision also taking up the elicited vision around climate resilience and a safe future as pointed out above and incorporates such in a long-term strategic vision for climate resilience and safety.

Creating a positive vision for the future while engaging various societal stakeholders and actively incorporating them is also potentially leading to more success and empowers actors as it may aid in overcoming any feeling of helplessness in light of the anticipated challenges created by climate change (Moser & Boykoff, 2013). Actively incorporating various actors is also in line with the second identified vision of climate action that is obviously closely connected to that of a resilient and safe future. Additionally, this research, while eliciting shared narratives with some shared frames in use, can be also seen as successfully opening up possibilities for collaboration and a discourse around future-proofing the city of Dordrecht as shared aspirations and stories also aid in overcoming any strict opposition towards action (CARE Nederland et al., 2018).

Such vision becomes meaningful as it was conveyed that a major disaster may happen rather sooner than later, citizens expecting it rather soon, which is further complicated by the limited amounts of exits from the island, the short warning time in case of an unfolding disaster and thus many people being stuck on the island. A vision that may acknowledge that fact can open up possibilities how to engage positively in preparing for such event as much as this is possible. Common knowledge of experienced high water, extreme rainfalls, rising water-levels and the generally limited possibilities for adapting to worsening climate impacts offer while such outlook sounds dire, fruitful options for collaboratively developing measures to address such issues. While such common knowledge could also lead to a short-term vision around a safe Dordrecht is such contrasting a here anticipated long-term strategic vision for a climate resilient and safe future. This commonality of some of the narratives and their practical implications contribute also towards answering part three of the research aim. Common awareness and knowledge, both of citizens and authorities, make communication and action potentially much easier since some above identified shared framing was utilized by interviewees in addition to some general shared narratives around certain issues and visions. Nevertheless, such communication may critically take up the lessons from the observed frames above since shared frames appear to be more of a dire and negative nature whereas the
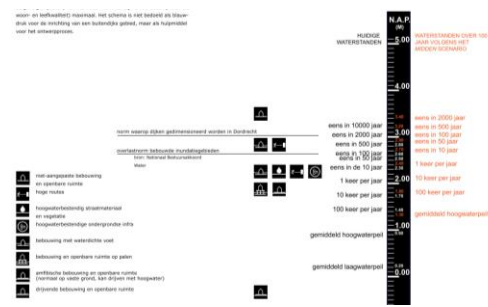
diverging frames also contain such that stress a positive future, with both negative and positive frames supporting action from a different reasoning. For example, citizens themselves referring to an observed worsening and voicing therefore the need to act on climate change and the effects brought about by it, such as increasing water levels and increasing frequencies of high water as seen in Figure 30.

Figure 30: Increasing flood-frequency and water-levels (Bax et al., 2008)

The shared nature of narratives and knowledge about issues at hand make the development of visions easier, and as such also concrete action supported by those visions. Developed visions may be then further differentiated and framed as either active future-vision, thus include preventive elements, versus re-active future visions that are only acted upon based on occurring challenges without much outlook into the future. In any case, such sharing and already occurring activities make a follow-up of them easier, and therefore

also aiding in realizing the second identified vision of climate action, which is more thoroughly discussed in its practical aspects in benefiting the reaching of climate resilience in the following.

6.2.3.Governance arrangements for realizing climate resilience

Actions such as the voiced multi-level safety strategy and development of shelters for citizens, together with emergency pumping capacities and increased sewage design-loads are all in the process of development and are expected to continue in order to foster climate resilience. These measures foster climate resilience and aid in adapting to occurring climate change, with climate adaptation prominently voiced by institutions as being occurring and happening. Additionally, adaptation is involving among others the preparation for major risks, but also concrete measures to adapt to already occurring extremes and challenges. These concrete measures as found within the elicited narratives are having support and can be seen as part of the conveyed desires. Developing further measures ought to be in line with narratives about desired futures as much can be learned from them. Specifically, those actions that are involving both authorities and citizens and needing some kind of governance arrangement are focused upon in the following as this research adds significantly to their successful and collaborative realization.

The focus on the known multi-level safety strategy appears as very important from the interview accounts, and ultimately requires extensive risk governance involving a variety of stakeholders and especially citizens as voiced by interviewees. In case of the worst-case flooding for Dordrecht, a risk for the entire South-Western Delta exists, thus risk governance is becoming paramount. Therefore, not just dike-ring 22 that is surrounding Dordrecht as well as the specific risks in relation to the location of a dike breach as shown in Figure 31, but the whole dike system in the region are crucial to be kept in mind.

Figure 31: Water depths due to a dike breach at Kop van 't Land (de Bruijn et al., 2016)
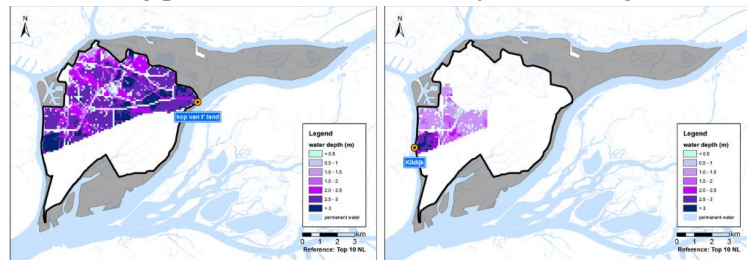
Effectively addressing that risk evolving specifically out of a breach at Kop van 't Land needs to involve citizens as their actions are paramount and to be designed shelters need to fit their needs and live-realities. The mentioned living lab that is focusing on among others multi-level safety needs to expand its activities and become both more visible to inhabitants and ultimately include them in a holistic way. Taking into account the elicited citizens' wish to participate in endeavours for future-proofing Dordrecht, several suggestions for incorporating them in governing such can be made as seen below. Moreover, as this research elicited a lack of concrete involvement by some authorities a further concretization of such can be suggested too.

In addition to such meta-challenge requiring risk governance and a multi-level safety strategy is this research also eliciting that the already conducted actions such as removing tiles, extra pumping capacities as well as finally climate mitigation that addresses the causes of the mentioned issues ought to be further increased and strategically supported. Extending means of involving citizens and also motivating them for action, which was named as important as authorities cannot solve all issues themselves, also becomes more important since it appears that residents are though facing increasingly problems around water but do not wish to pay more for measures that ought to prevent issues from occurring (NOS, 2018). Considering that is this research also meaningful as it shows that citizens are concerned and wish to act themselves at least in parts while narratives offer a chance to connect authorities' and citizens' aspirations in fruitful collaborative governance arrangements. Collaboration ought to occur both on concrete climate actions as

well as through risk governance for rescue operations, including though also the mentioned need for visionary leadership by especially the municipality as well as other governmental organizations.

An elicited and occurring shared understanding of the issues at hand as e.g. evolving from the stories around such issues is important and are motivating for further action and fostering collaborative governance. Therefore, this research is by eliciting narratives ultimately adding towards shared stories that let people identify with measures that are in line with their own stories about issues and foster the creation of winning-coalitions for action. For such winning-coalitions to bring about real change, knowledge that is locally understandable is needed, hinting towards a need for co-production of knowledge so to realize governance measures and foster positive change as shown in the following.

6.2.4. Co-production of knowledge and governance

Generally, it can be assumed that occurring adaptation measures as well as those planned to be occurring in the future offer positive perspectives for citizens. Nevertheless, this notation appears not to be present for the interviewed inhabitants as there seems to be a lack of knowledge and perspective about future challenges and potential measures to be undertaken. Thus, narratives are yet again important as they can activate people's concerns and motivation to act. Knowledge co-production that is seen as important requisite for achieving a sustainable development, is as seen from the narrative responses practically non-existent in the case of Dordrecht, which is why this study is an important first step in co-producing knowledge and eliciting needs to conduct such. Although it is an important first step it is also not more than a mean since implementation of measures requires a collaborative effort of authorities and citizens around concrete activities. Narratives may aid in co-production and the realization of desirable and sustainable futures by e.g. connecting actors and bridging any gaps that let them so far not work together but rather in parallel (Frantzeskaki & Rok, 2018) and include various aspects of an issue that may be otherwise left out (Frantzeskaki & Kabisch, 2016). In light of solving mentioned issues can thus be stated that a co-productive governance approach is needed that sees the embedded nature of the various actors and their relationship affecting the design of governance measures, and paying attention to context, knowledge, governance process and any emerging vision in dealing with the challenges at hand (Wyborn, 2015). Dealing with challenges at hand by e.g. adapting to them in a collaborative manner can be also seen as co-production of adaptive measures since in addition to formal authority-based adaptation are also citizens conducting some adaptive measures and therefore exists a mutual relationship between these two actor groups and activities (Wamsler, 2016).

While a co-productive governance approach is principally focusing on the aspect of co-production is in addition to that a collaborative or participatory governance scheme needed that allows in the meaning of true co-production many societal stakeholders to participate in future-proofing Dordrecht and even create ownership of measures (D. Loorbach, 2010; Shaw et al., 2009). Such participatory governance or decision-making process is evolving around dialogues that as extensively mentioned are shaped by some common narratives and becomes through this shared nature meaningful and allows to achieve consensus on at least a minimum issue (Trindade, 2000). In line with the selected stakeholders in this research are the chosen institutions important to be included and need to open up the space for citizens to participate both in decision-making, something that was elicited in the narrative interviews, as well as in developing and co-producing solutions as such together. Such solutions and the development of them can be seen as being nested, i.e. solutions at the level of individual houses are embedded within the system of both the neighbourhood and the city as well as in structures beyond the scope of the city-level, with the latter being important for the mentioned regional risk governance as seen in Figure 32. Having said this are narratives

offering a unique chance to co-produce both knowledge and concrete activities and implement them in a collaborative effort as they bring people together and gather them around certain main issues.

Figure 32: Involved scale in governance of urban adaptation measures (Ligtvoet et al., 2011)
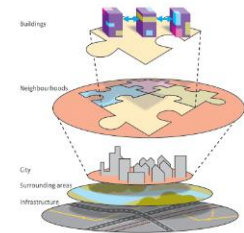
Interesting to notice is that it seems that some organizations are very much interested in participating more actively in the quest of future-proofing Dordrecht, but the topic is not yet systematically addressed in all of the involved organizations. Furthermore, a discrepancy between citizens and institutions was noticed in the results since ontological narrative interviewees referred to mainly municipal activities around climate adaptation but not much adaptive action at all is currently conducted by themselves. This is interesting to notice since in light of true co-production and collaboration as well as numerously pointed out in public narrative interviews should adaptation also be conducted by citizens themselves. On the other hand, recognition of the issues at hand and the importance of collaborative governance in solving mentioned issues is a very important first step, which is why apart of a beneficial future improvement that ought to occur, much positive action is already happening in several fields. Nevertheless, such concrete implications for governance arrangements also hint towards the need for motivators to bring citizens and stakeholders on board, which are explained below.

6.2.5. Motivation to foster climate action

In order to gather support for concrete climate action and motivate stakeholders to participate in the endeavour of a future-proof city, motivators ought to be made explicit and visible. Such need for motivators was also mentioned by interviewees and is elaborated upon here. Increasing motivation for action through e.g. openly addressing and communicating health impacts of climate change and extreme events might be a fruitful point of departure as climate change is significantly threatening human health of everyone (Health Care Without Harm, 2018; University College London, 2009). Health impacts of climate change underline crucially the need for climate-proofing a city through adaptation and act on climate mitigation, and making such interlinkages obvious may motivate further parts of society to act on various issues arising out of climate change, which is as mentioned above appearing as the underlying reasoning for action in Dordrecht (Haines et al., 2009; Ligtvoet et al., 2011; Sauerborn, Kjellstrom, & Nilsson, 2009; K. Smith et al., 2014; WHO, 2016). Accompanying such mentions of health with the elicited risks for Dordrecht may significantly motivate citizens to act and support measures to be taken to address both causes and effects of climate change since worries about climate change were voiced together with the need for action. Preparing Dordrecht for a future under climate change ought to be addressed holistically by linking also other sustainable development goals to such endeavor (White, 2010), including the addressing of social issues that have been directly mentioned as being present and elaborated upon afore.

While the afore was not directly mentioned in the interviews is the voiced need for climate action and motivation implying such meta-motivators, which could as shown arise out of climate threats as well as more specifically human health. Motivating for action is definitely a precondition but in addition to making exposure to climate change obvious and considering various worldviews that may hinder or support climate action is a shared understanding of the issues important, i.e. the story evolving around them is crucial as already seen. Nevertheless, with voiced limits to adaptation and the extensively described existent support for climate action being present it becomes paramount to acknowledge in addition to the afore shown stimuli for action imposed by the threat of climate change also much wider and grand challenges of climate change as seen in the following.

6.2.6. Implications of wider challenges arising out of climate change

Taking into consideration the elicited underlying motivator and stimuli of climate change, several implications for Dordrecht arise out of wider climate change in addition to the above-mentioned specific threats of it. Climate change continues to accelerate for the time being, and so does the melting of ice-masses such as the Antarctic ice sheet, recognizing that it holds enough water to let the global sea level rise by 58 metres (IMBIE Team, 2018) and approximate up to one metre until 2100 if emissions continue as previously (DeConto & Pollard, 2016). Therefore, Dordrecht and the Netherlands are fundamentally threatened, which has been also voiced by interviewees and as a reason to mitigate human greenhouse gas emissions leading to climate change. This is a very significant potential contribution as Antarctica alone holds such vast amounts of water frozen that it poses an unprecedented challenge to large areas in the world located close to the sea-level, which is why in relation to the mentioned melting of ice by interviewees is here prominently elaborated upon this phenomenon. Since approximate 30-50% of the occurred sea-level rise happened yet alone due to heat expansion of the water (IPCC, 2013), the coupling of the Southern Ocean that stores large amounts of heat and the Antarctic ice sheet can lead to a potential disastrous meltdown of the ice and resulting in a large sea-level rise in the nearer future up to the year 2300 (Rintoul et al., 2018) of 0.6-3 metres by only a part of the Antarctic (Golledge et al., 2015). Furthermore, as anthropogenic emissions are the single main driver for climate change at this magnitude, much depends on the development of emissions that contribute to radiative forcing and resulting in long-term ice-melt of among others the Antarctic ice-sheet, which influences the global sea level for a very long time to come (Delta Programme Commissioner, 2018; Golledge et al., 2015; IPCC, 2013). Finally, this coupling of emissions, melting of ice, and sea-level rise, has also very severe implications for the Netherlands as whether the Netherlands can cope with such issues depends very much on the rate and speed of these changes (Beintema, 2018), which was also prominently voiced by the Delta Programme commissioner Wim Kuijken during his remarks at the annual NKWK conference in 2018 and generally at the conference itself (Delta Programme Commissioner, 2016, 2018; Pluis, 2018). Lastly, Dordrecht as also many other areas are threatened by many climate change related happenings as seen already, which only will increase in strength with rising temperatures and thus, mitigation is paramount and also called for by interviewees but as already stated in the beginning of this study is adaptation becoming at least as paramount and need to happen simultaneously. Being in line with some of the elicited stories of citizens, climate action in form of emission reduction ought to be conducted, specifically since many issues arise for Dordrecht, significantly threatening the future of the city with uncurbed climate change that currently continues to worsen. Thus, climate action in form of climate mitigation is specifically focused upon next.

6.2.7. Paramountcy of climate mitigation

Given the shown effects and threats of climate change, climate mitigation as already pointed out is becoming paramount for safeguarding humanity. Such climate mitigating activities are having strong support based on the elicited narratives, which is why here is shortly elaborated upon climate mitigation. Authorities are currently less prominently voicing climate mitigation as it is partly out of their scope of action but based on this study and further below concretized can be stated that this ought to change as from interviewed citizens appears a clear desire for that. Citizens themselves are as mentioned already conducting climate mitigative behaviours that are important in reducing greenhouse gas emissions and are a critical component in future-proofing the city of Dordrecht (Semenza et al., 2008). Furthermore, while authorities referencing as stated above towards climate change as reason for action, is climate mitigation seen as second side of the same coin on climate action, including also climate adaptation respectively. Concrete mitigative action programmes together with climate adaptation appear to make most sense as both activities were pointed out by various narrative interviewees. Climate mitigative actions are also crucial since critical

pathways of climate change starting to emerge, which involve the transgression of planetary boundaries and new systematic states of the planet that are likely to unfold when warming reaches around two degrees on average and thus resulting in a cascade of events that threatens the very suitability of the planet for humans to thrive in the long run (Steffen et al., 2018). In front of such looming crisis and the fast progressing climate change that suggest the very limit of adaptation is a major transformation towards systemic sustainability paramount and many steps committed towards in the coming decades are possibly having effects on our very survival, which is yet again why in addition to climate adaptation and building resilience towards already occurring changes a systemic transformation is needed and thus effective planetary stewardship implementing such (Steffen et al., 2011, 2018). The need for transforming societal practices that are causing climate change are becoming also obvious as incremental changes in e.g. climate adaptation are reaching its limits in light of the cascade of expected events that are likely to happen and fundamentally altering the Earth if climate change is not seriously addressed and halted (Steffen et al., 2018). Such transformative approach could be implemented in practice as a transformation programme as shown subsequently.

6.2.8. Implementing a transformative programme

With many issues being present that point towards the need for a sustainability transformation to remedy some of these issues may a transformative programme for Dordrecht become a possibility to be explored and implemented. One way to achieve a safe and climate resilience future could be transformative adaptation, referring to both a needed sustainability transformation that has climate mitigation prominently on the agenda, as well as adaptation to occurring changes as already happening. Such social action for a deliberate transformation has at its core human agency, among others centred around values, and aims to fundamentally change systemic structures and thus the relations between the natural ecosystem and the socio-economic system within (Patterson et al., 2016). Moreover, a deliberate transformation towards an ethical and sustainable relationship of humans with nature is at the forefront of what is needed to successfully address the many environmental challenges brought about by humanity in the Anthropocene and to avoid negative consequences putting into jeopardy our very survival in the long run (O'Brien, 2012). In that sense does transformative adaptation mean something bigger than changing the way adaptation is conducted and has at its core a more fundamental change in how climate action is conducted, which could be in the case of Dordrecht a shift from mostly adaptation towards holistic climate action that also empowers citizens to deliberately shape their future and their relation with their environment (Few, Morchain, Spear, Mensah, & Bendapudi, 2017). Finally, transformative adaptation implies in that sense that the process of adaptation leads to a transformation that changes some more fundamental practices of the human endeavour (Few et al., 2017). To some extend may this be hinted towards by those interviewees that state as problems how society emits greenhouse gases that are causing climate change and how humans alter the environment, which they see as fundamental reason for emerging issues. Following up on such mentions may a transformative programme for Dordrecht aid in alleviating some of the biggest threats. Thus, measures to start putting in motion such transformation may be a good start, for Dordrecht initially around mitigative efforts that are implemented across the city. Achieving such measures to unfold requires that citizens, as pointed out above, participate in the decision-making and are able to voice their concerns and contribute to the finding and reaching of solutions (Proops, Faber, Manstetten, & Jöst, 2000). In that way are the here elicited shared narratives and utilized frames contributing positively to that endeavor as numerously shown. Finally, all of the discussed implications of this research for future-proofing Dordrecht point towards some overall moral responsibilities to conduct climate action.

6.2.9. Moral responsibilities for action

Having stated the effects of climate change and its trajectory, it becomes increasingly obvious how paramount action on climate mitigation is, also since adaptation alone is not sufficient to cope with the most severe impacts of climate change. Action for combating climate change is therefore seen as a moral responsibility for us towards future generations (Qiu, 2011) and its effects on our livelihoods make such morally imperative and utmost important (ISSC - UNESCO, 2013). In light of that, acknowledging that the discussion on specific moral aspects of climate change and responsibilities towards it is ongoing, there appear at least such moral obligations so as to inherit future generations a liveable world with as less environmental disruptions as possible (Moss et al., 2011). This research can therefore not remain neutral in light of the ongoing challenges arising out of climate change and thus refers to the below stated recommendations, among which are climate mitigating activities inhabiting a prominent spot. In light of Dante Alighieri's poetic quote that *"The [sic!] darkest places in hell are reserved for those who maintain their neutrality in times of moral crisis"* (Smit & Coullie, 2014, p. 123), with climate change and the quest for action about it seen as moral crisis of humanity, is this research strongly encouraging the follow-up of the below stated recommendations for future-proofing, specifically climate mitigation and is thus not neutral in this recommendation or even strictly objective in a scientific sense.

Finally, humanity's quest for a liveable future will be ongoing in the future and mitigative action is so paramount that also research around adaptive and preparatory strategies for climate change cannot be conducted without pointing towards the paramount need of a grand transformation towards systemic sustainability. This present study can provide a first step to collectively achieve such a transformation as people become empowered by voicing their ideas and current social-inertia can be overcome by empowering citizens, which together with further below recommended first actions may give them also a certain ability to act and thus realizing their capacities for positive change (Marselis, 2018). As such implications for future-proofing Dordrecht are based on the method this research has been utilizing in order to arrive at the former are in the following the methodological implications of it discussed.

6.3. Methodological implications and limitations

Initially it can be stated based on the conducted research that the followed methodology of desk research, preparation and conducting of data analysis as well as the final analysis of the elicited material fit well the goal of this project. The upfront decided strategy of qualitative research is fitting well to the aim of the overall project CoCliServ and the current research and is thus sufficient in its scope. Such qualitative research is especially more fitting than a quantitative data analysis because for answering the research questions and fulfilling the goals of this project the language in use and the voicing of certain issues is more important than the quantitative appearance of certain words or common phrases. Additionally, a quantitative analysis of the gathered material would not aid in the quest for future-proofing the city of Dordrecht and only focusing on qualitative analysis is thus of no limitation to the results and outcomes of this study. Moreover, a qualitative approach is fitting well for the number of interviewees since their accounts are backed up with data from various other sources, whereas a quantitative approach would have not been able to aid the quality of the results.

Gathering data as outlined in Figure 2 was a well-suited approach to gain all the needed data to fulfil the aims of this research. The firstly conducted desk research prepared sufficiently for conducting some initial interviews to gain insights into both the history of the city in relation to water as well as the landscape of stakeholders involved in future-proofing Dordrecht. Although the chosen stakeholder analysis was limited in scope and included an iterative process of identifying through snow-balling potential new stakeholders,

which could be therefore in principal conducted in a larger setting too, was the selection of the stakeholders well-grounded and backed up by both documents and references to them as being important. Thus, those public interviewees identified via stakeholder analysis and interviewed in the following are well chosen since a triangulation of sources was conducted and supported the choices made (Verschuren & Doorewaard, 2010).

In light of the methodologically chosen technique of narrative interviews, one arising challenge while conducting them was the needed guidance. With a semi-structured interview-approach followed, a minimum of guidance was trailed but since interviewees were telling their stories rather freely it was chosen not to interrupt them even in cases when the stories deviated incrementally from the core-topic. Guidance as prescribed by the methodology was given only by the asked follow-up question that aimed on guiding the interviewees in a least-interruptive manner back to the core topics around weather and water as well as when mentioned by interviewees themselves also climate change. Looking at the elicited narratives that are mostly rich in narrations and thus fulfilling the aim of this research, such challenge and potential limitation appears to be of no hindering to the results since meaningful narratives were elicited. Thus, the rather limited experience in conducting narrative interviews that were of limitations in other studies appear not to matter in the present case considering the richness of the elicited narratives (Bremer et al., 2017). On the other hand, and unrelated to the utilized methodology but rather related to the research structure, a potential limitation of the research due to the conducted narrative interviews may still be present since the author of this thesis also acted as interviewer and thus any power-bias may have been imposed by that fact. The possibility of such limitation exists and may manifest itself through the used language as e.g. official stakeholders may talked in a different way since beside the larger CoCliServ project this thesis is situated within, it continues to be a part of a study program and may be thus seen as less important than other projects. Moreover, social stratification is a reality in any city, which includes Dordrecht, and those strata that are interviewed and belong to a lower educated and less wealthy one may find it difficult to talk to someone with an academic background and may thus shy away from talking openly. These potential limitations are subject to the strategy this project is following and its meta-conditions such as primary investigators and interviewers, but it can from the current point of view not be stated that a different methodology would have changed such circumstances tremendously.

Further did the selection of participants within the neighbourhood evolve from some key-informants towards opportunistically chosen and by former interviewees suggested residents, which as such can be also seen as a scientific sampling bias (Babbie, 2007). Such sampling bias can be de facto scientifically relevant and must be acknowledged while analysing ontological narratives upon their meaning for the whole of the population of Dordrecht. On the other hand, being a by the municipality chosen neighbourhood for climate action are the responses still relevant for the Vogelbuurt neighbourhood as the sample of interviewees can be seen as at least being similar to the social realities with regard to education and other settings elaborated upon in an report about the neighbourhood (MC2 & Kristal, 2006). Moreover, the chosen interviewees have a varying background and are as from what appears in the data well aware of the issues present within their neighbourhood, which makes any scientific sampling bias be less significant since as already pointed out results showing rich and useful narrations.

Some interviewees, specifically citizens that were interviewed to elicit ontological narratives, may have conveyed partly different stories if the interviewer would have talked to them fluently in Dutch language in contrast to the occurred mix in Dutch and English language. On the other hand, interviewees conveyed full and often lengthy stories in both Dutch and English language, regardless of the language a particular question was asked by the interviewer, which is why language cannot be seen as a real issue affecting the results. All of these potential biases can be just acknowledged but by no means fully eradicated, especially

within the setting and structural limitations of the present project. While such potential biases might be present and to some extend also scientifically relevant, no obvious limitation was recognized during the interviews or the analysis and it is not expected that there was any significant influence of any of these potential biases on the results of this study and thus the outcomes of the project.

One issue that arose while eliciting narratives is the split between public, i.e. organizational narratives, as well as individual narratives. While an individual may also represent an organization comprised of citizens, such as e.g. a citizen group, the respective narrative would be rather accounted for the public narratives if the stakeholder chose to answer on behalf of the organization. This becomes also apparent while interviewing members of public authorities, which though may answer on behalf of the organization and thus eliciting insight into the public narrative of the organization but may also simultaneously represent to some extend their individual narratives, with the latter happened in some instances and notes on private observations. Nevertheless, such division does in principal still make sense even under the mentioned difficulties in eliciting narratives as the research ultimately looks at the level of policy-makers, i.e. authorities, and what is currently in practice more the receiving side of policies though this is changing as citizens inhabit more and more active roles in policy making and voicing their interests.

Regarding the chosen analytical method of a narrative analysis of the elicited stories can be upfront stated that in line with the aim of this research is there an obvious subjectivity present in the interpretation of the results, which though can be seen as present in any similar study on narratives (Wiles et al., 2005). While this subjectivity can be a bias, which is in a research project that is conducted by one researcher not to be totally avoided, is the methodology as such paying attention to limit such biases as much as possible and incorporating a wide array of data sources used for interpretation from various angles. Subjectivity is obviously also present in the selection of the examples given in this project report though these still provide insights into the way interviewees conveyed their stories. The chosen strategy of avoiding to "scientizing" the results and leaving conveyed stories as coherent as possible aided in gathering the main narratives of both authorities and citizens, which can be also seen in the examples presented as these exemplary insights are limiting any potential subjectivity bias in the analysis to some extend (Bremer et al., 2017).

Analysing the narratives and coding them as an individual researcher is a scientific limitation that was tried to be limited by internally validating code-book and exemplary code-applications, but how consecutive coding is conducted can be still a limitation (Campbell et al., 2013). While in a case that several researchers are coding data can they cross-validate their choices is such cross-validation not possible for an individual researcher. This particular issue was tried to be eliminated as much as possible by giving good insights into the actual data by providing a rich set of examples that underpin the selected choice of narratives and also relatively aid in limiting the afore mentioned subjectivity bias. Nevertheless, analysis conducted individually is still subject to individual interpretation, which is why the data might be further examined more in depth to gain further insights into the narratives and improve scientific validity.

A potential impact on the results that is not related to the methodology of the study made the particular timing of the interviews within the environmental realities at this point in time since citizens appeared to be aware of changes in environment, climate and water as the awareness-related narrative shows. Timing of interviews during a very hot and dry period and in particular prior to an officially declared national drought and heatwave in the Netherlands might have affected the answers (KNMI, 2018). Hence, if conducted again, interviewees in the neighbourhood might now have a different view on the observed impacts of climate change in Dordrecht and it can only be hypothesized whether they would frame different issues as important. Nevertheless, many of the voiced observed changes were apart of some lack of rain, not connected to drought but rather to the increasing extremity of e.g. rain-events, which is why this potential effect is seen as not significantly affecting the study.

Lastly and as a final verdict it can be stated that as with many similar studies, potential biases and limitations in how widely the results are valid are present and at least of some scientific significance. While acknowledging this fact is this study still highly valuable in light of the meta-goal of creating resilience towards future-issues by future-proofing the city of Dordrecht. The value of this study becomes particularly obvious since it aids the current endeavour in eliciting crucial insights into stakeholders' own narratives and what a resilient future ought to look like in order to design measures based on their responses that are then marked by support since they are in line with their stories and visions. Moreover, this study provides rich insights in how the endeavour of future-proofing a human settlement and creating resilience can become successful in the long-run and a lack of knowledge by some stakeholders be overcome. Studies that elicit people's own knowledge about climate change and its impacts and what any programme fostering resilience towards them ought to look like are particularly valuable considering the foremost social challenge of tackling climate change. Aiding the core of developing climate services for the overall CoCliServ project is this study and the used methodology also giving valuable insights on that account. Therefore, based on this study are several well-grounded recommendations to various involved societal stakeholders presented below and the call for their implementation repeated since such is based on the elicited stories within this research project.

7. Recommendations

7.1. Recommendations for implementation

Initially can be stated that since this research shows the support for measures to be taken for future-proofing the city, following up on this research and collectively developing various adaptive and mitigative solutions is crucially important. This research can lead to successful winning-coalitions, assuming that the presently involved stakeholders will continuously be involved in the future, which will allow the reframing of the issues at stake so as to successfully work on future-proofing the city of Dordrecht. Since both institutional as well as individual respondents marked concern for a future under climate change that ought to still provide a liveable future for them, collaboratively discussing them and designing measures appears to be crucial from this research. Specific adaptive and mitigative measures can be recommended in the following, initially though can be stated that a comprehensive communication strategy by involved institutions is needed as pointed also out by interviewees. The below shown four main recommendations, i.e. communication, vision-building, concrete actions as well as supporting policies, are supporting each other and it is suggested to implement them in a joint effort together since each of them promotes the other recommendations. Finally, while those institutions participating in this research are already working on climate adaptation it is highly advised to utilize the crucial window of opportunity that this research and the existing work opens and include climate mitigation within a comprehensive quest for future-proofing Dordrecht through climate action that starts immediately. Climate action is paramount as it is the defining issue of our time (UN, 2018a), which is why increasing action towards happening on all levels of society and at all places, including Dordrecht, is of utmost importance for safeguarding humanity's future (Falk et al., 2018). As there is no more time left to postpone action due to the occurring severity of climate change (UN, 2018b), it is further paramount that Dordrecht and all involved institutions are committing towards real climate leadership and incorporate lessons from the present project and other research in the field, and rigorously implement climate activities on both climate adaptation and especially climate mitigation in order to foster a safe future for Dordrecht and for all of us.

7.1.1. Communication strategy on climate action

A communication strategy that openly disseminates information about the risks that Dordrecht is facing, aids in overcoming the commonly voiced lack of knowledge by citizens about threats and makes climate change as shared underlying motivator for conveyed actions obvious. Such communication strategy ought to be designed in a language that comprehensively and easily conveys the main messages to citizens across the city and should be particularly attention-catching and contain emotional elements so as action is triggered by it. Important to consider is that apart of mentioning the negative effects of climate change that ought to be avoided, a positive picture for a desirable future such as elicited in this research shall be drawn and communicated because it will be much more supported than one that contains just negative outlooks for the future.

Communicating the risks around water and specifically stressing the effects of climate change on human lives is in line with elicited stories in this research. Based on such risk communication that prominently includes water and climate change, the specifics ought to be elaborated upon such as a first part on the ultimate risk of a major flood and how citizens can respond to it, thus referring to a more desirable state of the future that contains a certain degree of safety from negative climate impacts. Moreover, communicating how the various involved authorities are tackling that risk, focusing on rescuing and safety respectively, also alleviates the lack of knowledge by citizens in how a potential major disaster is currently dealt with.

Such information can be aided by informing citizens how they themselves can prepare, which as such creates further awareness for the issues at hand and thus climate change as an ultimate driver that many citizens are already aware of.

In the following can the by citizens referred to wish for climate action be followed up upon and an outline of the needed meta-activities around climate adaptation and mitigation be given within a targeted communication program. Such targeted communication provides the base for working collaboratively on solutions to the various challenges ahead and reach a desirable future that is free of the most severe climate impacts by disseminating the most important information in reference to the need for action. In addition to the mentioned risk mitigation through climate adaptation is climate mitigation as numerously pointed out of paramount importance and action around it also aiding in reducing ambiguity about future trends affecting the city such as voiced by authorities, which underlyingly referred to a need for mitigation. Therefore, support for mitigative measures can come by actively communicating the climate change related drivers for the faced risks, and measures that aim on reducing e.g. greenhouse gases ought to be taken in the following. A strategy that communicates living with water as a climate neutral city might further aid in gathering support and motivating for action. Moreover, since Dordrecht is already now considered as a frontrunner in climate adaptation, the known limits to adaptation and open communication about such limits further supports the recommendation to intrinsically connect both adaptation and mitigation and strategically follow it up in the form of climate action as seen further below. The presently outlined communication strategy can lay the groundwork for such climate action and be a strong cornerstone in the endeavour of realizing a climate-resilient and future-proof city of Dordrecht.

A focus on rescuing and safety in light of a possible major disaster and not so much on evacuation since not possible for everyone in Dordrecht can be recommended to both prepare actively for as well as communicate in a coherent and complete way. Thus, disseminating information on possible risks and effects, possible actions to be undertaken individually and what the involved authorities are currently doing is important and also wished for in hindsight of the ontological narratives. Information about how possible disasters may unfold and what can be done could be supported by gamified augmented reality applications for smartphones and let citizens see both effects and possible measures in their immediate surrounding, something that has been already applied in flood risk management in other places within the Scent-Application for smartphones (Scent, 2018). Finally, disseminating information to citizens ought to occur through various channels, including existing local newspapers (Wijken Dordrecht, 2018), online channels and communication means such as the ones from the as successful perceived Vogelnest (Het Vogelnest, 2018a, 2018b), leaflets and even such as informative talks in the city and neighbourhood respectively. An application for smartphones such as the "Rotterdam Sustainability app" developed by the Rotterdam Climate Initiative may also support the endeavour for future-proofing Dordrecht through various climate mitigative and adaptive activities (Rotterdam Climate Initiative, 2018). This communication strategy can then be followed up by the most relevant stakeholders and the most interested and eager citizens to jointly develop a comprehensive vision for Dordrecht, adding to the by policy makers developed vision.

7.1.2. Vision for Dordrecht on climate change and water

In addition to such communication strategy, the design of a truly innovative and creative vision for Dordrecht, containing both climate change and water on top of the agenda can be developed by authorities and citizens together. This research shows that in light of expected challenges ahead, arising out of climate change and water, a vision that is openly communicated is needed in order to increase knowledge and collaborative action across various stakeholders and citizens related to Dordrecht. Furthermore, such vision for Dordrecht should connect apart of the crucial topics of climate change and water also various

stakeholders with each other, which is why the language used for that vision is important and should be understandable by all participants. The development of such vision may therefore take up the elicited narratives and craft visionary scenarios taking up the conveyed messages as they are seen as important by the involved stakeholders. Vision-building as suggested by much research ought to be supported by research in the field and underlined with facts about climate change, the existing climate atlas for South-Holland might be a good point of departure (CAS & KNMI, 2017). The existing vision for Dordrecht in 2040 that has been developed by policy makers can be included as it contains elements around the socio-economic realities of the city that are interesting to consider but has shortcomings in reference to meta-challenges such as climate change (Gemeente Dordrecht, 2013b). Moreover, since citizens were from what is known not actively involved in the development of this existing vision and no attention was given to shared storylines that motivate the follow-up of such vision make its application for future-proofing Dordrecht not fitting from the current research's point of view. Hence, the suggested development of a new and innovative vision on Dordrecht's future with climate change and water.

An innovative visioning for future-proofing the city requires long-term commitment by stakeholders, which is highly recommended to be followed up in any case, thus longitudinal cooperation between authorities and institutions should occur for success in vision-building and the follow-up of it being more likely. Such vision can be also seen as the core of a sustainability transformation, dealing with various aspects of un-sustainability which manifests itself among others in climate change and extremes brought about by it. A vision aiming on future-proofing Dordrecht by focusing on climate action is supporting therefore visions about a sustainable and resilient society, which in the case of Dordrecht implies both adaptive measures towards climate change induced extremes around weather and water, as well as climate mitigation. A vision for a future-proof Dordrecht is taking up such visions for a sustainable society and lines out policy measures and concrete actions in the following, and involves at its core broad and long-term engagement with the issue in order to be successful (Moser, 2010).

Thus, such vision is directly in line with this project as narratives allow to design measures that stakeholders can identify with and potentially supporting them in the long run. Visioning together with societal stakeholders and citizens can create engagement, more support for such exercise and measures in the following, and allow back-casting for reaching that vision in the latter and also refine what that vision entails (Robinson, 2003). Moreover, visioning based on the here elicited narratives provides in itself further emerging narratives that allow a movement through time, and may aid in solving a disconnect between official visions and those based on citizens own aspirations for a desirable future (Milojević & Inayatullah, 2015). Collaboration with citizens on such visioning and communicating that endeavour is also aiding to overcome the voiced ambiguity whether the municipality and other actors are taking the matters at hand, i.e. the effects of climate change, really serious. An innovative vision can also let the mentioned winning-coalitions of actors as defined by e.g. shared narratives implement some of the in the following shown concrete activities.

Based on such visions for a future-proof Dordrecht that is dealing with climate change and living with water, awareness for emerging issues can be increased and thus a first step for further action is taken. Referring back to the afore mentioned communication strategy should such vision, once developed, be also extensively communicated and disseminated so as to mainstream it across societal stakeholders active in Dordrecht as well as citizens across the city. Incorporating the ideas of many societal stakeholders into the development of such vision, something that has been also happening throughout the present project, is letting a more fine-grained narrative landscape appear, which is thus also potentially gathering support for any measure from more stakeholders. Finally, such vision supports measures that can be suggested to be implemented rather sooner than later, as seen in the following.

7.1.3.Concrete climate action

Climate action as pointed out is referring here to both adaptation to and mitigation of climate change. In that regard is it important to make obvious that measures are conducted to adapt to extremes brought about specifically by climate change since such framing opens up the chance to follow up on mitigative activities as discussed further down. With concrete climate action, the city may consider opening a local branch of something like the living-lab "Spuilab" also within the neighbourhood, or at least expand the activities to e.g. the neighbourhood centre "Vogelnest" so as to include climate action in the activities happening at the latter. Involving citizens also locally was an explicit wish voiced by some of the interviewees and can be seen in light of this research as a good idea to expand concrete activities to other places in the city. Interviewees also stated exemplary that the involvement via interviews as within the present project is for them something that ought to happen also in relation to climate action and activities brokered by the municipality. With the afore mentioned vision is such concrete action also a sign for citizens that they are taken seriously, which was a voiced complaint of being absent during the interviews. Thus, community-based approaches in collaboratively developing and implementing measures to future-proof various neighbourhoods and the city as such ought to be taken in order to be in line with the specific local circumstances and life-realities (Ayers & Forsyth, 2009).

Initially and since already occurring should adaptation be expanded and take place together with citizens, hence in addition to the above shown communication strategy around the risks of a major flood can measures be collaboratively developed and citizens can learn to adapt to the potential risk of a major flood. Such measures to prepare for a major flood can link opportunities for such and have benefits for other aspects too, exemplary seen within the linking opportunity narrative as well as governance narratives in general. In addition to the above discussed general communication strategy can dissemination of information aid in preparing and adapting to risks arising out of climate change. Such information aids to overcome the by citizens mentioned lack of knowledge about the risks for Dordrecht and gives them insights in what they can do themselves. The above-mentioned suggestions for the way of sharing that information can be used and e.g. neighbourhood-managers, i.e. "Wijk-managers", could facilitate and spread information even further and more precisely in addition to existing information on the municipal homepage (Dordrecht, 2018f).

A wish for basic survival packages may also be fulfilled here as such could be either handed out or at least exemplary be prepared together at an information evening, which further fulfils the elicited aim of citizens to also conduct measures themselves to prepare them for risks. Since there exists a national centre that aids in dealing with and preparing for major crises, including information on how a survival package ought to look like, local activities should be coordinated with that and are in line with such national preparatory measures (Nationaal Coördinator Terrorismebestrijding en Veiligheid, 2018). Training on how such major disaster might unfold could be conducted in the neighbourhood, similar to the annual testing of the flood-gates in the old city centre. Among the by interviewees suggested measures were e.g. also swimming lessons for all children, which aids both in potential risk preparation as well as the social wellbeing in the neighbourhood, and finally does such aid in showing the seriousness of the issue at hand. Children may be also a catalyst for change since they are often very much active in such activities as well as other environmental and climate mitigative projects, and communicate activities to peers and family, which is why specific attention in both climate mitigation and adaptation projects should be given to them as also in line with the national water plan (Delta Programme Commissioner, 2017; Moser & Boykoff, 2013; Rijksoverheid, 2009). Thus, children can turn abstract climate knowledge into the life-realities as they are sharing information in a personalised way (Lejano et al., 2013).

While such activities are conducted, the current activities around multi-level safety can be further developed and adapted to local circumstances together with the citizens as they expressed a wish to participate in developing various activities and measures. Another concrete suggestion was the development of something like a voluntary safety brigade that is trained to locally aid in potentially rescuing people during a disaster, which may also aid the social coherence in the neighbourhood as such activities are often community events that bring people together. In addition to such adapting and preparatory tasks for a major disaster can also smaller climate adaptation measures be realized that have multiple benefits, which may include more green areas arranged by citizens or the storage of rainwater that further creates awareness about the issue. For such measures to unfold though, several of the above voiced constraints need policy measures such as shown below in order to create the space for them to unfold.

Climate action as critically voiced by citizens should also contain climate mitigation and is thus the second main concrete activity-bundle that is suggested based on this research. Whereas the city is conducting already some activities as shown above is a more systemic approach towards climate mitigation needed and measures to be implemented and actively communicated about. Especially with the upcoming national climate-law "Klimaatbeleid" are many more activities needed to be implemented, which is why the municipality can critically stimulate through their own activities transitions away from fossil fuels in the field of heating, mobility and energy generation as well as purchasing renewable energy or even divest their funds from fossil fuels (de Blasio & Khan, 2018; Hofs, 2018; Klimaatakkoord, 2018; Rijksoverheid, 2018a). Incorporating the strive to become climate neutral in all municipal activities can build on vastly existing recommendations to do such, e.g. including an analytical inventory of all greenhouse gas emissions followed by actions to reduce them (Kirby, 2008). Furthermore, the existing "Green City Tool" can show policy makers how well the city performs in overall sustainable development as well as in a detailed manner on climate mitigation and adaptation and suggests measures for improvement (European Commission, 2018b).

A climate action plan may also include e.g. promoting organic food and meat-free menus in municipal restaurants, electric cars, and climate-mitigating actions in all official projects, and even following the EMAS eco-management scheme and green public procurement scheme "Maatschappelijk Verantwoord Inkopen" (European Commission, 2018a, 2018c; Pianoo, 2018). These measures can be seen as leading by example and critically support those measures that were named by citizens as important and that they themselves are already conducting many of them. Many of these measures have also an important social dividend and co-benefits such as positive health impacts by reduced meat-consumption on both humans and the environment, which should be also openly communicated about as this contributes towards motivation for further action. Exemplary named can be also organic urban agriculture producing in a small-scale healthy produce for the city, which in turn can lead to enhanced awareness for the environment (Seyfang & Haxeltine, 2012). Such schemes have several positive co-benefits for the community and its structure, aid in climate resilience through adapting to extremes by an increased green surface area as well as climate mitigation through uptake of carbon into the soil (IPCC, 2014c, 2014a; Revi et al., 2014; Stead, 2014). Moreover, urban agriculture involving citizens also accounts for various direct and indirect health benefits through working in and with nature as well as consuming organic and pesticide-free food, reduced transport distances that lead to a reduction of noise pollution by transport and spares greenhouse gas emissions so as to just name a few of the benefits. Involving citizens in activities that let them reconnect to the biosphere has generally many positive impacts on human wellbeing and can make the interconnected nature of our socio-ecological system visible as humans are intrinsically connected to nature (Carl Folke et al., 2011).

Additionally, climate mitigative measures ought to be further developed and disseminated together with citizens, e.g. climate mitigation projects linked to occurring projects such as the mentioned neighbourhood centre "Vogelnest", something that was also mentioned by interviewees. Finally, climate mitigation needs to be followed up by internal policies and codes of conduct to display the municipality openly as a frontrunner in climate action, which it currently portraits itself around adaptation but as extensively shown here and mentioned by interviewees needs to include climate mitigation too. Thus, the branding and displaying that occurs together with concrete action could happen e.g. as climate-action-municipality. Motivation for climate action can be further backed up by highlighting also climate impacts on human health, i.e. basically connecting environment and health effects as shown above that can critically stimulate action across many spheres of society.

All of these concrete activities around climate adaptation and mitigation support the strive for future-proofing Dordrecht and thus empowering all societal stakeholders to act on safeguarding their own desired futures. Dordrecht can, if measures are systemically followed up upon, become itself a seed for a good Anthropocene (Bennett et al., 2016). Those measures allow citizens, if properly motivated to do so, to conduct measures themselves and motivate others to do so too as some interviewees mentioned that desire, which can be supported by already existing means that aim on facilitating citizen participation (Dordrecht, 2018a, 2018e, 2018d). Such citizen-lead action can be also seen as fostering social ties in the neighbourhood since people are collaborating with each other on a common goal. Moreover, fruitful utensils to create a roadmap for citizen participation such as the "Public Engagement Roadmap" tool can also aid in achieving goals for a future-proof city as set out in the vision for it (The Engagement Lab, 2018).

Climate action is clearly supported by individual responses since interviewees are aware of climate change and conducting already actions, as well as authorities that name climate change as underlying cause why actions on future-proofing the city is conducted. Implementation of measures is wished for in a rather fast way by citizens, thus communication about the progress on implementing measures in the neighbourhood and city is one important component of climate action as it can motivate for further activities. Crucial in any case is to implement both adaptation and mitigation measures in a combined package (Stead, 2014) and show the interconnected nature of measures, addressing both causes and effects of climate change. Finally, it is important that such climate action is followed up by policies such as the ones suggested in the following that make a systemic realization of climate actions easier to be achieved and scaled up.

7.1.4. Policies on climate-proofing Dordrecht

Policies supporting climate action are crucial as they can foster the wished-for long-term commitment by various actors and institutions as well as concretize their involvement. To start with, such involvement of various societal actors is to be followed up in the new integrated spatial policy "Omgevingswet" as it combines strategic themes for future-proofing the Netherlands and fosters participation of societal stakeholders including citizens and businesses (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2018; Rijksoverheid, 2018b; VNG, IPO, UvW, & Rijk, 2018), which needs to be implemented in Dordrecht as well. Moreover, the already mentioned new climate law "Klimaatwet" is further pushing for incorporating the set out meta-goals in locally achievable goals (Hofs, 2018; Klimaatakkoord, 2018; Rijksoverheid, 2018a). As such can be stated that climate action needs to be mainstreamed across all sectors aiming on future-proofing Dordrecht, and it may also help to re-frame the nature of the current challenges as quintessential social challenges, which aids in the discourse around them and the attraction of stakeholders (Hackmann et al., 2014).

Regarding the policy recommendations, as captured above in an own narrative can be stated that it might be beneficial to aim for a concretization of authorities' involvements and implement their tasks in future-

proofing Dordrecht also in some internal policies fostering such endeavours. Policies that aim on defining concrete problem owners even if such might be ambiguous can aid in overcoming inaction. E.g., conducting assessments whether any development is future-proof, i.e. climate proof and neutral, as suggested by some institutions, can make climate change visible and work on it concretely followed up upon, which is something the above-mentioned new bills are also fostering after all.

Enabling collaboration with citizens on climate action through a code of conduct or memorandum of understanding by the main parties involved in future-proofing Dordrecht, i.e. an internal policy, may also further strengthen such, and thus let measures be collaboratively implemented, which is something that is wished for by citizens as well as voiced as important by some of the public authorities. Moreover, it may help to further disseminate information on what citizens can do themselves, especially considering that these four main recommendations here are building on each other and supporting each other further.

Streamlining climate action entails also that policies that are working in contrast to each other are eliminated, e.g. citizens voicing that they try to work on the officially supported work on bringing green into the city by removing the pavement around trees (Dordrecht, 2018e) but are hindered by official municipal workers. Furthermore, as voiced are housing companies fining residents that do not maintain their gardens in the way the company intends them to do, which is incentivising residents to pave their gardens instead of having grass or other things in them, thus a negative contribution is made through covering potentially penetrable soil and intensifying heat stress. It may help to collectively address such issues and incorporate also private businesses and housing companies in climate action for future-proofing Dordrecht, and potentially legislate the follow up of certain measures. Finally, a strategic implementation plan that comprehensively addresses both causes and effects of climate change can be suggested to be developed, something that can be seen as the localized version of the mentioned climate policy "Klimaatwet".

While absolute safety cannot be guaranteed it is at least becoming more likely that Dordrecht and its population are much more aware of the risks of climate change related extremes, better prepared for them, and lastly, also commit fully to climate mitigation, if suggested policies and suggested measures are rigorously implemented. Thus, following up on the results of this research in developing measures to conduct climate action for future-proofing the city in line with aspirations for the future of both authorities and citizens is highly recommended as it offers the chance to significantly improve living realities of the local society and should happen as soon as possible. If all involved stakeholders are committedly following up on these recommendations and the outcomes of this research, the impossible can become possible, which is safeguarding a future in Dordrecht and contribute positively towards mitigating climate change.

7.2. Recommendations for future research

Since this research project was focusing on narratives for future-proofing the city of Dordrecht, data analysis focused mainly on narrative analysis and implications for implementation. Having said this, more in depth analysis on the elicited narratives that goes beyond key issues can be recommended as the conveyed stories are very deep in meaning and e.g. the fact that also people from a socially more challenged neighbourhood are very much aware of environmental and climatic changes is an observation that ought to be studied more in depth. Thus, future research on local awareness and concern for water and climate change may offer insights into how to better address climate change related issues in a collaborative manner.

An interesting observation was an appearing divergence of how severe climate change and its effects are perceived between authorities and citizens, with further research perhaps being able to study the reasoning

for this phenomenon. Practical research on the influence of frames on conveyed narratives might in that regard also aid theoretical literature stating the relationship between frames and narratives. Furthermore, the conducted analytical focus on frames within elicited narratives ought to be further explored as a frame analysis conducted on those narratives may lead to fruitful practical implications for implementing measures in Dordrecht and communicate effectively about them.

Future research may also compare the elicited prominence of a local identity in relation to the specific vulnerabilities of the city of Dordrecht with another city facing also specific threats by climate change and analyse how identity is manifested in the latter by comparison, and whether such is related to climate threats as well. In depth research on the links between identity, place-attachment, awareness and concern for environmental and climate changes affecting that place and what this implies for action can also offer a chance to learn more about the specific case of Dordrecht and its location in a flood-prone Delta. In the following does it become interesting why some citizens state awareness for climate change but do not name any action about it, and whether a narrative approach may be able to motivate those citizens that are already aware of it to also act on mitigating climate change. Enabling change by employing a narrative approach involving key-citizens and children might be investigated and whether the intended effects in promoting climate action can be realized in such way. The current research elicited many concrete suggestions for both improvement and implementation made by both citizens and authorities, which if singled out and analysed can provide fruitful insight in how to make the governance approach utilized for future-proofing the city more effective and potentially efficient, as well as gather more support in the long run. The present lack of knowledge of how citizens might behave while adapting to climate impacts (Hegger et al., 2017) might become less if the data presented in e.g. the future measures and actions narrative is studied more in depth and followed up upon by involved stakeholders.

Finally, future projects in general may develop participatory means for realizing transformative action in Dordrecht so as to safeguard its future in the long run by enabling both climate mitigation and adaptation, based on e.g. narratives as this has been providing a well-suited starting point as can be concluded. To achieve a desirable future, the suggested vision-building and back casting on what steps ought to be taken may be researched in the light of narratives' influence on that process, which is also taken up by the CoCliServ project in the following stages of this project.

8. Conclusion

Summarizing this project ought to provide a short overview of the research process, the elicited narratives from authorities, i.e. public narratives, and citizens, i.e. ontological narratives, as well as conclude with some implications and recommendations for safeguarding and future-proofing in that regard the Dutch city of Dordrecht. Evolving from extensive data gathering based on desk research, helicopter interviews and such that provide historical insights into Dordrecht's relation with weather and water, a series of in total 20 narrative interviews with 24 participants from both authorities and citizens was conducted. Following a narrative-based methodology, both narrative interviews and narrative analysis resulted in a rich array of public and ontological narratives as presented within some concluding remarks on them forthcoming.

8.1. Concluding remarks on the results

This research formed around the quest for future-proofing the city of Dordrecht and gaining insights on how to achieve this so as to be in line with local desires and wishes for a future that will be certainly influenced by climate change. To achieve climate resilience that is fitting local circumstances since dependent on many behavioural changes, narratives provide critical insights into what matters and ought to be a desired and anticipated future. Dordrecht, located at an island respectively, faces increasingly climate threats in form of e.g. extremes and potentially disastrous floods and this research looked at content and implications of narratives conveyed by citizens and authorities on future-proofing the city, their embeddedness in history as well as resulting concrete recommendations.

8.1.1. Elicited narratives

Within this research, nine main narrative themes have been identified based on responses from the mentioned interviewees and some of them appeared in accounts by both ontological and public narrative interviewees while others were not shared by them. First, these nine main narratives as displayed below answer the initial aim of this research due to their meaning for developing a resilient future under climate change and unearth the interesting observation of some of them being shared while others are diverging between public and ontological narrative interviewees. Authorities and their public narratives are focusing in a more strategic and detailed manner on the vulnerability of Dordrecht and how to manage especially water that is affecting the city. Ontological narrations by citizens are in contrast focusing more on their experience with already happening climate change and extremes brought about by it as well as narrate holistically about weather, water, climate change and even social issues as well as in parts how to address such issues. Among the shared narratives were mostly those referring to the history of the city with water, the identity forming around city and its relation to water as well as outlooks for the future and how to collaboratively tackle expected issues. Those elicited narratives are important for climate-proofing the city as they convey knowledge, worries and outlooks of issues that are perceived as important and how they potentially unfold in the future and affecting mentioned desired futures. Narrations as conveyed by interviewees become therefore important in light of to be designed and implemented measures to achieve a climate-resilient future that fit the aspirations of interviewees. The following table provides a quick overview of all the elicited narratives from both ontological and public narrative interviewees.

These shown narratives elicit among others the centrality of water in people's lives as well as institutional stakeholders' endeavour around it, and also that due to ongoing climate change a worsening of certain extremes brought about by it is expected. In line with the first research aim can be stated that narratives display both things to be avoided as well as desires of what a future should look like and how to deal with

climate change affecting the city. Thus, living with water and climate change as already happening is also something that becomes obvious in the narrations due to the historical embeddedness of them and link further towards future aspirations of living with water and climate change under the premises of resilience and safety.

Table 34: Description of main narratives

Main narrative	Short description
Historical narratives	Past and ongoing struggles of the city with weather and water: *The disasters of 1421 and 1953 brought suffer and damage to Dordrecht.*
Vulnerability narratives	Location and burdening constellation of threatening events: *The city faces specific risks due to sea and rivers and might drown again.*
Adaptation narratives	Reason for and substance of adaptive measures by authorities: *History and climate change as reminders to avoid a new tragedy by acting on water.*
Experiential narratives	Experiences with weather, water and climate change: *Sometimes it floods minorly but soon expected to be serious due to climate change.*
Action narratives	Occurring adaptive and mitigative activities by citizens: *Some have pumps or collect water, others try to stop emitting CO2 and are vegan.*
Identity narrative	Specificities of the city as being an island i.e. shaped by water: *Dordrecht was wealthy and important but is now a small island surrounded by water.*
Socio-economic constraints narrative	Restraints towards effectively achieving climate resilience: *Old houses and poor inhabitants that are having problems in all spheres of lives while financial and social problems appear more important than the noticed threats.*
Future perspectives narratives	Stances for a future with climate change and remedies to threats: *Ambiguity to keep the island safe in the long run and limits of dikes are approaching, which is why alternative measures and preparation for disasters are needed.*
Governance narratives	Possibilities and constraints towards collectively tackling issues: *Achieving resilience together by thinking long-term and truly collaborate.*

8.1.2.Narrated chronology

For understanding future aspirations as displayed in narratives is it important to examine the historical embeddedness of narratives as the past is shaping the understanding of the present as well as to some extend that of the future. In that regard is there an overall storyline appearing throughout the narratives as such chronology of narratives is unfolding around past, present and future-related narrations that elicit the struggle around living with water in Dordrecht.

Answering the second aim of this research, a set of shared historical narratives provides a well-grounded embeddedness in history that is in line with identified written data on the history of Dordrecht. As a city within the Dutch delta, Dordrecht has a very rich and long history with weather and water since it was founded due to its strategic location adjacent to a big river and was in its surroundings basically wiped out due to the long-lasting effects of the St. Elisabeth flood in 1421. This particular flood made Dordrecht an island that it remains as such until today, which is related to its relative economic decline due to the loss of its strategic location as being able to control one particular stretch of the river and the trade on it. Well-known to both authorities and citizens narrated many of them very richly about this particular event that has meaning to the city until today, manifested both within historical narratives as well as vulnerability and identity-related narratives. The specific meaning of this event for the city of Dordrecht is also given due to the nature of that flood, which is a combination of a westerly storm approaching by the sea and leading to a storm-flood, as well as high water levels on the river and those two waters merging at the location of

Dordrecht. Such event happened in addition to 1421 again during the famous storm-flood of 1953 causing over one thousand people to die across the South-Western Netherlands.

Since Dordrecht cannot prevent effects of such flood on its population are many stakeholders vividly narrating about the meaning of a constellation of events causing such specific vulnerability. For authorities it appears that history is together with climate change the underlying main reason why they conduct work on future-proofing the city, considering sea-level rise and being located under the sea-level, this underlying reason becomes even more significant. Citizens are also well aware of such historical happenings and narrate about them in reference to climate change and that they expect that something similar is going to occur rather sooner than later. Interestingly, both authorities and citizens are very much aware of such future risks that are exacerbated by anthropogenic climate change and both the extremities this brings about as well as the sea-level rise that man-made climate change is causing. Knowledge about big events in the past are strong reminders that Dordrecht is continuously being shaped by water and further are the recent events around heavy precipitation together with the persistent risk of a major flood making threats exacerbated by climate change a lively narrated part of interviewee's life-realities. References to history appeared to shape the understanding of the city of Dordrecht, which manifests itself even within an own identity. Regarding Dordrecht being an island that has both island character as well as is therefore more vulnerable to threats from extremities around water and weather, exacerbated by climate change, an own identity could be even defined. Such narrative that captures the identity of Dordrecht as an island defined by water is shared by both authorities and citizens to a certain extend and has several arising implications for future-proofing the city against extremities brought about by a worsening climate change.

8.1.3. Consequences of narratives

In line with both the main <u>research aim</u> and specifically the third goal of this project, narratives have consequence on measures to future-proof the island of Dordrecht against identified extremities around weather and water. An implication can be e.g. found in the positive visioning narrated by authorities in reference to adaptive measures that aims on giving perspective for the island despite some threatening extremes by climate change. Such positive visioning by authorities can be also seen as "forced optimism" when considering the common knowledge about the vulnerability of the city. As already seen, vulnerability and experience with threatening events appear generally high on the narrated agenda, and although authorities refer to being vulnerable and citizens to experience and thus diverging narratives, underlying frames around being vulnerable and experiencing problems are still shared by both of them. Thus, a consequence of authorities framing their stories so as to motivate the use of a specific interpretation of an event and citizens stressing their particular experience is that both parties appear to be focussing strongly on climate change as well as the vulnerability and problems it is bringing about.

Activity-related narratives giving insights into both authorities and citizens conducting various measures to both adapt to happening climate effects such as extreme rain events and floods, as well as citizens also stressing their focus on climate mitigation. Such narrations are significant for future-proofing Dordrecht since it makes an ongoing quest of dealing with mentioned issues obvious, even though such narratives are not shared when looking into the specific contexts of them. Nevertheless, a shared underlying reason for conducted activities, i.e. climate change, utilizes within the narrated stories a common climate threat frame to motivate for them. Specifics on the nature of conducted activities are though divergently framed by interviewees. Those narratives and the fact that measures are already conducted and are richly narrated about result in the possibility of further actions being in line with them, an implication for future-proofing the city that is also adding towards answering the third aim of this research.

Commonly voiced constraints to implementing activities in practice are nevertheless present and appear within a shared narrative mainly around the socio-economic realities present within the city of Dordrecht, which are among others the lack of financial means as well as within the selected neighbourhood poverty, lack of education, unemployment and poor social connections respectively. Apart of direct limits to implementing measures brought about by such constraints is also indirectly the need for tackling socio-economic issues arising as it was mentioned by e.g. ontological narrative interviewees that those problems undermine the very base of local society. Considering this in light of the identified vision for a climate-resilient future it appears of significance to pay attention to such issues and dealing with them in a collaborative and systemic manner so as to improve life-realities for locals.

The shared nature of future-orientated narratives mentioning stressors and threats arising out of climate change as well as measures to combat them allows to state the identified common underlying wish for a safe and liveable future despite some of the expected challenges for Dordrecht. Narrations on expected future challenges and issues as well as remedies to them make obvious a vision of climate resilience and safety in the future as an ultimate wish, which is why future-orientated narratives are of specific importance in light of the aims of this project. Interestingly, uncertainty about the nature of future issues is shared, whereas the framing about their severity is diverging between ontological and public narrative interviewees. This is on the one hand supporting the implementation of measures to reduce ambiguity, but communication need to carefully pay attention to such diverging frames.

Generally, narratives are providing guidance to interviewees as e.g. seen within experience and perceptions of climate change and its effects on Dordrecht. Guidance and reasoning through narratives, especially the shared understanding and language in use is important to mention and can lead to collaboration in dealing with issues at hand. Moreover, such guidance let become visible the undesired state of insecurity and threats as well as in contrast a future that is safe and liveable and is therefore implying the significance of both adaptive and mitigative activities dealing with climate change and its impacts. Thus, identified visions within narrations and the given guidance by them makes achieving them collectively easier, which is why narratives are significant for the endeavour of future-proofing Dordrecht.

Achieving such identified visions as based on elicited narratives requires a collaborative effort in addressing challenges around climate change, i.e. governance as conveyed by narrations around it. Those governance narratives are shared among interviewees and shed light on possibilities to collaborate as well as hint towards overcoming some of the negative incentives for climate action brought about by current governing arrangements, which includes among others the mentioned inflexible municipal policies constraining citizens to act. As such are governance narratives mainly dealing with the quest of collectively achieving a resilient and safe city, committed involvement and actively involving the various stakeholders. Due to the nature of the current and increasing challenges is governance of paramount importance, and a shared understanding as emerging from the narratives significantly supports the implementation of governance arrangements and follow up the narrated need for them. Nevertheless, implications for future-proofing the city of Dordrecht due to the narrated stories and embedded guiding features to their conveyors also arise out of explored differences between public and ontological narratives.

8.1.4. Differences in narratives

Differentiating understandings of narratives are beside the content of the narratives also found within the varying frames utilized by public and ontological narrative interviewees. Whereas such substance of narratives is interesting and important to be paid attention towards, a more fundamental difference in narrated stories between public and ontological interviewees was found. From narrative accounts does it appear that citizens and their ontological narratives mark a more general understanding of the issues at

hand, including some details respectively, and a rather holistic view on what are problems and how to deal with them. Their narratives show in a broader spectrum the various issues and that both adaptation and mitigation of climate change and its effects is needed while stressing also the social component of future-proofing their livelihood. Public narrative interviewees on the other hand narrate in a rather specific and detailed way about the issues that are for them important, which are in principal water and extreme weather as well as the underlying complicating factor of climate change leading to an increasing severity of them. In line with their work is there a particular focus on the strategic level in reference to how to solve some of the challenges and arising threats. Such observed difference in narrative accounts has important implications for developing and implementing measures in a collaborative manner as mentioned earlier, specifically since without looking at narratives such differences may appear as major hindrances towards successfully future-proofing Dordrecht. Narratives as made visible within this study make it possible to overcome such differences and bridge arising gaps between ontological and public narrative interviewees since shared narrated features provide fruitful entry points for collaboration.

8.2. Closing notes on implications for future-proofing Dordrecht

Based on the results of this research and in particular narratives around vulnerability, experience, activities as well as those orientated towards the future, an underlying motivation for action that is apart of the manifestations in extreme weather and water-related events grounded in climate change was elicited as seen above. Such underlying and common motivator of climate change implies the potentially strong support for various climate actions aimed at safeguarding Dordrecht from negative effects brought about by it. As vividly narrated about are climate threats strong motivators for action, manifested within stories about extreme precipitation and sea-level rise as well as worst-case inundations covering the entirety of the city within a short time. Knowledge about such extremities brings about the ongoing strive of authorities to develop rescuing and safety measures for the population. Since the population knows about such climate threats and voiced similarly to authorities the wish and need for collaboratively developing safety measures, realizing such development together becomes potentially easier if in line with the here elicited narratives and lessons learned. Considering that due to a worst-case flood about 100,000 people are expected to be trapped within the city, shelters that fit the needs and life-realities of citizens are to be collaboratively developed in order to avoid the historically-known devastation a major flood can bring about and thus making collaboration even more important as also mentioned by interviewees.

Apart of directly narrated visions for the future could the two main visions for a safe and resilient future as well as climate action leading towards it be identified in reference to such major threats. Together with commonly voiced narratives may these narrated visions support the design of measures and thus the achievement of such visions. Moreover, vision-building in line with elicited narratives may significantly add in future-proofing Dordrecht as a new meta-vision around climate change and water can gather the needed long-term support for implementing measures as can be suggested based on the current research. Such vision may prominently contain both climate change and living with water and imply the realization of collaborative governance arrangements to translate identified visions for desirable futures into reality. Collaboration was commonly named as something that should occur on climate action in Dordrecht, can be stimulated by both shared narratives and frames within them, and common narratives allow to design needed measures that overcome any potential opposition towards them. Whereas shared narratives aid in setting up collaboration between authorities and citizens is it important to pay attention to the partially diverging frames in use. Specifically, those frames stressing threats and what constitutes the problems at hand are shared whereas activity-describing frames and such relating to a perceived severity of issues are diverging. An implication of this is that whereas the commonly perceived threat as emerging from

narratives is also shared in the utilized frames, activities need to be communicated and framed so as to be in line with the elicited frames already in use in order to be fruitfully taken up. Further examinations on the importance of frames within the narratives is seen as needed and recommended.

Nevertheless, measures as elicited from the results should be developed by means of co-production and in order to foster motivation to continuously acting on them are stimuli for action as based on the narratives to be made explicit. Framing is further supporting such identified stimuli for action and is therefore significant in implementing measures to future-proof Dordrecht. Finally, the threats brought about by already occurring climate change are without committed action to stop it expected to increase as elicited from both narrative accounts as well as research in the field. Therefore, specifically climate mitigation has been elicited as important and that it ought to join the already happening adaptive efforts of authorities involved in Dordrecht so as to avoid disastrous future effects of climate change. Thus, a transformative action programme containing both climate adaptation and climate mitigation is suggested and such should be in line with the here elicited narratives and communicated while utilizing the elicited frames within them.

8.3. Finishing recommendations for implementation

Based on this research, four main recommendations can be made, taking up the elicited narratives and elements within. Initially, openly communicating the risks and what is done in reference to them appears to be of importance as it conveys the main story around meta-challenges and means to tackle them. The narrated worries about climate change can be further supported by such communication strategy and be followed up by positively disseminating what is and further can be done to translate those risks into positive connotations for the future by committedly acting upon them. Second, the already mentioned meta-vision ought to be collaboratively and openly developed and communicated about, including references to responsibilities of actors as narrated stories marked ambiguity on that. Such meta-vision should be openly shared within the city and incorporated into the work of authorities. Based on that and as a third recommendation, concrete climate action can be developed and conducted, as well as framed so as to fit the respective actors that ought to implement it thereafter. Whereas climate adaptation is already happening its implementation should be expanded towards actively incorporating citizens and in addition, climate mitigation ought to be tremendously expanded and activities by citizens on them followed up by authorities. Lastly, streamlining already occurring climate action and mainstreaming activities across authorities and citizens entails a certain need for policies that as lastly suggested in this research follow up the needs as elicited in this research and systematically address both climate adaptation and climate mitigation in a collaborative manner.

Having said this, it can be concluded that in line with the main research aim are detailed insights gained by employing a narrative approach in how to effectively address the needs for future-proofing the city of Dordrecht. Narratives aided in defining crucial issues, key-actions that are both perceived as important and wished for, as well as the eliciting of frames that let both motivation for action as well as communication about it effectively disseminated. Eliciting through narratives the underlying motivator for action, i.e. climate change and to avoid the recurrence of historically experienced disasters, prominently conveyed together with future-aspects the desire for a safe and future-proof city that is achieved by actively involving both authorities and citizens together. Commonly voiced knowledge about major disasters affecting potentially the entire city implies that authorities ought to develop rescuing measures together with inhabitants, something that is wished for by both parties. Furthermore, while authorities vividly name climate adaptive measures and citizens the already noticeable impacts of climate change together with the need for mitigation, their narratives imply in line with research in the field that climate mitigation ought to

be conducted together with adaptation. This becomes even more strongly backed up since the richly narrated experiences with climate change and conducted adaptive and mitigative action clearly marks an existing wish for an increase of activities and support for to be implemented measures.

By focusing on narratives, this study let both shared and diverging stories and understandings of the issues at hand appear, which are critical for climate-proofing a city. With authorities focusing more strategically on water management and citizens narrating holistically about their views on weather, water, climate change and social issues in the neighbourhood, identified narratives and the <u>recommendations</u> based on them might be able to bridge a gap between authorities and inhabitants in future-proofing Dordrecht. An observed shared understanding of important issues would have not become obvious without a focus on stakeholders' narratives. Narratives are making obvious that both shared and diverging underlying reasonings as manifested within the stories exist, which is a crucially important observation for actually implementing measures to future-proof Dordrecht as elaborated upon earlier. Finally, narratives elicit that existing climate action in Dordrecht ought to be expanded towards active collaboration between citizens and authorities upon it and contain at its core both climate adaptation and climate mitigation in order to safeguard our common future in Dordrecht and around the globe.

9. Tables

10. Figures

11.   References

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12.   Annex A: Identified and interviewed stakeholders

The here presented stakeholders are all those stakeholders that were gathered within this project and are considered as important for the quest of a future-proof Dordrecht. This table contains the most important organizations, i.e. the stakeholders, and does not represent and ranking of importance or influence but merely a list of gathered stakeholders currently and/or potentially in the future to be involved. The table has been anonymized and is therefore only displaying the organizations and the interview-format that has been applied to them in the following of this research. A short overview of the selected organizations for narrative interviews is for the sake of clarity also presented below.

Table 35: Selected stakeholders and respective interview-format

Selected stakeholders – organizations	Interview-format	
Gemeente Dordrecht	Helicopter interview	Narrative interview
Waterschap Hollandse Delta	Helicopter interview	Narrative interview
UNESCO IHE	Helicopter interview	
TU Delft	Helicopter interview	
Delta Program		Narrative interview
Veiligheidsregio Zuid-Holland Zuid		Narrative interview
Province of South Holland (provincie)		Narrative interview
WWF		Narrative interview
NKWK Klimaatbestendige Stad		
Duurzaamheidscentrum Weizigt		
Platform Duurzam Dordrecht		
Stichting CAS		
BAX Company		
Rijkswaterstaat		
Deltares		
Gemeente Sliedrecht		
Municipalities in Drechtsteden		
STOWA		
Progrez, woningstichting		
Dura Vermeer		
Hoogheemraadschap		
Hollands Noorderkwartier		
RIONED		
Stadsbosbeheer		
Nature organizations		
Housing organizations		
Private shops		
AtelierX		
Urbanisten		
Arcadis		

List of interviewed organizations for eliciting public narratives

The following six organizations participated in this project, resulting in a total of 9 narrative interviews for eliciting public narratives involving 12 people.

1. Delta Program
2. Gemeente Dordrecht
3. Province of South Holland (provincie)
4. Veiligheidsregio Zuid-Holland Zuid
5. Waterschap Hollandse Delta
6. WWF

List of interviewed citizens for eliciting ontological narratives

In total were 11 narrative interviews conducted for eliciting ontological narratives, which involved in total 12 citizens.

Table 36: Overview of ontological narrative interviewees

Citizen	Living location / Interview location
Citizen 1	Binnenstad, Dordrecht
Citizen 2	Stadspolders (adjacent to Vogelbuurt), Dordrecht
Citizen 3	Vogelbuurt, Dordrecht
Citizen 4	Reeland area (adjacent to Vogelbuurt), Dordrecht
Citizen 5	Vogelbuurt, Dordrecht
Citizen 6	Vogelbuurt, Dordrecht
Citizen 7	Vogelbuurt, Dordrecht
Citizen 8	Vogelbuurt, Dordrecht
Citizen 9	Vogelbuurt, Dordrecht
Citizen 10	Vogelbuurt, Dordrecht
Citizen 11	Vogelbuurt, Dordrecht
Citizen 12	Vogelbuurt, Dordrecht

13.   Annex B: Interview questions for helicopter interviews

These here presented questions for helicopter interviews were designed with the goal in mind to gain through their answers an overview of the situation in Dordrecht, future-proofing the city respectively, and can be seen below in Table 37. The four main questions were disseminated to the interviewees a-priori whereas the sub-questions were asked within the interviews opportunistically when relevance for them was given. The final closing question number five was asked when suggestions for stakeholders were not obvious at this stage.

Table 37: Questions for helicopter interviews

Question number		Question / Sub-question
1		How are you/your organization involved in future-proofing Dordrecht (even if rather obvious but to confirm desk research)?
	1A	*What functions do you/your organization perform?*
2		For gaining an overview of the involved institutions: Who is according to your opinion and knowledge involved in future-proofing Dordrecht?
	2A	*Whom of those should I especially consider?*
	2B	*Whom should I also interview now for an overview, and/or later for the narrative interviews?*
	2C	*How significant are these stakeholders in future-proofing Dordrecht?*
3		How does adaptation to extremes around weather and water as well as climate change, thus future-proofing, in Dordrecht look like in practice, and how do stakeholders approach the issue?
	3A	*Which locations are relevant?*
	3B	*Which timescales are used for adaptation and water-management projects?*
4		What extreme events did the city according to your knowledge experience that need to be considered for adaptation?
	4A	*What decisions regarding adaptation can you/your organization make?*
	4B	*Whom are relevant stakeholders in that context that I could talk to?*
5		*Do you have any further suggestions regarding choosing whom to conduct narrative interviews with?*

14.   Annex C: Codebook

Within this Annex, the development of the codebook is displayed, the preliminary as well as extensive final schemes respectively.

Table 38: Preliminary coding scheme for narrative-identification

Main category	Sub category	Examples / Explanations	Sources
Plot	Relationality / Connectivity / Sequence	*"I felt out of breath last week, I really should [...] think [sic!] about life insurance"* (Somers, 1994, p. 616)	(Bremer et al., 2017; De Fina & Georgakopolou, 2015; Fløttum & Gjerstad, 2017; Lejano et al., 2013; Mattingly & Lawlor, 2000; Milojević & Inayatullah, 2015; Somers, 1994; Wiles et al., 2005)
	Problem / Complication		
	Actors		
	Action / Re-action	*"Just the other day, I was sitting down to watch TV and I noticed little Jamal [...]"* (Mattingly & Lawlor, 2000, p. 6)	
	Structure (beginning, middle, end)		
	Assumed causality		
Framing	Storytelling / Phrasing (linguistic choices)	*"So, if a history is emplotted as a tragedy it is "explained" as a tragedy [...]"* (Hewitson, 2014, p. 119)	(Bremer et al., 2017; De Fina & Georgakopolou, 2015; Entman, 1993; Hewitson, 2014; Mattingly & Lawlor, 2000; Milojević & Inayatullah, 2015; Wiles et al., 2005)
	Highlighting (salience)		
	Exclusion		
	Focus (problem, cause, moral, solution)	*"The cold war frame highlighted certain foreign events-say, civil wars-as problems, identified their source (communist rebels), offered moral judgments (atheistic aggression), and commended particular solutions (U.S. support for the other side)."* (Entman, 1993, p. 52)	
Context	History (past)	*"[...] 'It all started with . . .' [...]"* (Fraser, 2004, p. 189)	(Bremer et al., 2017; Fraser, 2004; Mattingly & Lawlor, 2000; Wiles et al., 2005)
	Space in time (specification)		
	Life-situation		
	Surrounding happening		
	Social life-context / role		
	Place / Location		
Visions	Temporal continuum (possible futures)	*"[...] on a busy city street we see a young man carrying a large potted plant that almost obscures his view, running so fast that he risks colliding with other*	(Bremer et al., 2017; Hewitson, 2014)
	Assumptions about outcomes		

		Intentions on outcomes	*pedestrians [...]"* (Hewitson, 2014, p. 139)	

Following, the final coding-scheme with extensive descriptions of all codes is presented.

Table 39: Coding scheme for narrative-identification

Main category	Sub category	Code	Description
Actors		Citizens, incl. citizens collectives or organizations	Refers to a particular actor in the respective sphere as conducting an action, being responsible for something and/or is involved in something that is crucial and part of a story, i.e. connected to both action and location; which is in this case a citizen or a collective of citizens
		Businesses, for profit and not-for profit businesses	Refers to a business or also educational institutions such as universities that are at least in part privately funded, which are an actor conducting an action, being responsible for something and/or are involved in something that is crucial and part of a story, i.e. connected to both action and location.
		Local government	Refers to municipal governmental bodies as well as waterboards, with the later conducting mainly local work in detail, and the actor conducting an action, being responsible for something and/or is involved in something that is crucial and part of a story, i.e. connected to both action and location.
		Regional/national government	Refers to any governmental structure that acts beyond the scope of a local area such as city or village, i.e. province, ministry, etc. and any related governmental bodies that cover larger parts of the Netherlands such as e.g. the Deltaprogram. That actor is conducting an action, being responsible for something and/or is involved in something that is crucial and part of a story, i.e. connected to both action and location.
Context	Temporal focus	Recent history (since 1750 until 2015)	Relates to any notion of time, i.e. in history, present or future, and is communicated in a specific manner and has thus meaning to the story and is part of it. The codes apply to a rather concrete reference to time, incl. such as e.g. "50 years ahead", etc.
		Distant history (prior to 1750)	
		Present (2015-2020)	
		Future	
		Temporal reference	Relates to a general mentioning of a temporal occurrence of an event or issue, e.g. "once in a while", without a reference to a specific point in time, "in the future", "in the long term", "in the coming years", "in recent years", etc., while having importance to the meaning of the story that this reference is part of.
	Place / Location	Street	Conveys where the issue in the story is happening, i.e. the location or place, which is part of the story and relevant for
		Neighborhood	

		City	the storyline to be included. The code neighborhood refers to anything that is larger than a single location such as house or a specific street but is still part of a city. The code regional is applied to any regional reference, which can be also river regions, e.g. "Rhine-Meuse area", "Delta-region", "Drechtstede", etc. Super-regional refers to anything that is a country or any structure beyond that.
		Regional	
		Super-regional	
	Conceptual focus	Surrounding happenings and developments	Refers to surrounding happenings, e.g. social and economic developments or legal implications and policies that are important for the story and have an influence on what is happening, i.e. what the actor is referring to as being important. Generally, wider happenings that do not happen directly at the level of the organization/person experiencing a certain problem/issue, or if they are to a wider but not story-related amount affected but cannot interfere, thus e.g. happenings or references to happenings the actor can just observe. E.g. "the rivers from Germany bring higher water". This code also applies to policy developments and legal developments that are not conducted at the level of the actor/organization; as well as concrete activities such as e.g. "dike-building activities", references to flood protection schemes, etc. that are neither directly linked to a problem or actor in the story but occurring on a wider scale in the surrounding.
		Specific life-situation and developments	This code refers to the specific life-situation of the actor in the story, incl. the social situation such as e.g. being a member of a group or support-network, whether an actor is old, educated, etc., but also the situation of the place or location in the story, which include life-realities at a place, as well as the situation of an organization and its development and endeavor that is important for the story and the conveyed message. The application of the code may also include happenings that are directly involving the actor such as generating or gathering knowledge about issues, referrals to happenings, e.g. general dike-building activities in a region that are neither problem nor solution that are applied directly to a particular problem that is mentioned in the story, the closing of storm-flood barriers across the Netherlands, a reference to a flood barrier or structure directly linked to that actor without mentioning a specific problem or actions simply listed as involving that actor without further specification. Moreover, that code can also refer to a new policy, norm or law that is not targeting a specifically mentioned problem in the story but e.g. general dike norms, agenda-setting involving the actor, etc. *Note*: if a norm or anything alike is mentioned in relation to an area or specific issue or any other concrete reference it is coded as a solution.
Content	Framing	Subjective description of an experienced	Refers to a description of general happenings that occur to others and are a problem or issue in the story. These general occurrences mark a turning-point in the story while an actor

		problem/issue: overview of events	is not directly mentioned, and/or the general issue has not been directly experienced by someone mentioned in the story, thus it is e.g. not clear for whom it is a problem, while that problem/issue is still crucial for the story. The code can be also applied when there is the possibility of a problem mentioned and the possible effects of this issue as well as when an issue is just generally discussed, but the actor is not explicitly focusing on this issue. *Note*: if the actor is focusing explicitly on that issue or even preparing for it, even if it is not yet occurring but just mentioned as a hypothetical issue, it is coded as experiential description due to the explicit focus on it.
		Experiential description of an experienced problem/issue: specific event that is a problem/issue	Refers to a description of occurrences that happen to the in the story mentioned people/organizations themselves and are a problem or issue in the story, hence both problem and actor have been mentioned in the story and are linked. The problem/issue marks a turning point in the story for a particular actor that has been mentioned in that story. The code can be also applied on a problem that an organization/actor is explicitly focusing upon and/or actively preparing for, even if the issue is not yet occurring but is just a hypothetical issue.
		Causality	This code refers to the causal chain within the story, which links to an issue that becomes through complications a problem/issue to someone. In the same way it can be also referring to a causal chain framed around solutions and things that lead to other things. E.g. words like "because", "then", etc. are part of such data and the code is applied on the causal links in a whole section.
		Cause for that problem / issue	Refers to the specific cause of the above described problem/issue and is part of the story. This code shall highlight specifically mentioned causes for actual problems/issues in the story.
		Solution for that problem / issue	Refers to a suggested or conveyed notion of a concrete solution to the particular problem/issue that is central in the story. Can also refer to something that is undertaken or happening in relation to a specifically mentioned problem/issue such as e.g. a norm or policy. This code is only applied where a specific reference is made. A concrete solution can be also a dike, flood barrier, etc., while it is referring to a specific problem/issue mentioned in the story. Even a communication strategy that refers to a particular problem that an actor is explicitly focusing upon can be coded as a solution.
		Moral judgements	Refers to any moral judgements regarding how things should be or whether something is according to the story-conveying person good or bad, or if something would be better in a different situation. This code can be detected by references such as "it has to/we have to do that", "should do that", "not good for", "better as", etc.

		Identity	This refers to the particular identity of an actor, a location or inhabitants, and the identity is central in the story. It can also refer to the being of a location in the story, e.g. "being vulnerable", "being more at risk", "being an island", etc.
	Perceptions	Perceptions of happenings / events	Any direct referrals to perceptions of specific happenings, events, or issues that occur in the environment and are related to weather, water, climate change, etc. and are conveyed as part of the story. E.g. how an event is perceived by a particular actor in the story. This includes also perceptions of events that may hypothetically occur, but have not yet occurred. This may also include a perception of an event that will occur statistically e.g. just once in a person's life-time.
		Perceptions of strategies / actions	Refers to perceptions the mentioned actor has of any strategy or action taken in reference to the problem or complicating issue that is central in the story. It can also refer indirectly to an action or strategy where the perception of it is relevant to the story, e.g. the awareness of some mentioned actor for a specific strategy or action, as well as references to general awareness. E.g. awareness of citizens due to flood defense exercises, as well as a certain discourse around strategies or actions such as "Dutch dike-building discourse", etc.
		Perceptions of elements of value	Refers to perceptions of things the actor values and that matter to it, whereas actor and element of value are mentioned in the story. E.g. things such as physical artefacts, nature areas, monuments, etc. and references to the importance of them. This code can be also applied on realizations of e.g. living under the sea-level, general discussions about current developments and how they are perceived, which are neither specifically mentioned problems or solutions. It can be also applied on perceptions of e.g. collaboration, which is not happening in reference to a specific problem or solution. *Note*: no direct strategy or action is mentioned here but just the importance of something.
		Other content	Refers to those parts of the story that point towards being important but cannot be categorized into one of the above codes and are thus saved for later in-depth analysis.
Visions		Assumptions about futures, including the process that happens in the future	Refers to any assumptions about futures, including assumptions about a process that happens in the future, and is central to the story. This can refer e.g. to future triggers for some processes and developments as well as assumptions and visions that refer to solutions for mentioned issues but are just general and not concrete actions as it would be otherwise coded as solution. That code applies further to assumptions about general happenings and processes, suggestions for solutions that can be implemented in the future, etc. This code is

			generally referring to more hypothetical situations about what might happen.
		Assumptions about outcomes	Refers to any assumptions about outcomes while outcome and actor are mentioned in the story and are crucial to it. It also refers to e.g. an end that is stated, something that will occur due to happenings, etc. ***Note***: this overlaps with the code future but applies here on the assumption about a particular future outcome.
		Intentions about actions and outcomes	Refers to intentions by actors in the story on both actions towards, and outcomes in the future. Therefore, the code refers to mentioned visions for what is about to happen and what actors aim to achieve so a certain outcome occurs in the future. The code applies also to more concrete intentions what is to be done, or also should/could be done, but is not happening at the moment but might be on the agenda for the future since it currently is not decided and thus not concrete and set. ***Note***: if it is a concrete action that the actor is intended to do in order to achieve an outcome it is coded as solution, and while there is an overlap also with "moral judgements" is this code referring to mentioned actions for achieving outcomes, even if not decided yet.

15. Annex D: Research summary

Summary of the research aim

NARRATIVES FOR A FUTURE-PROOF CITY: The case of Dordrecht, the Netherlands

Author: Benedikt Marschuetz
Supervisor: Dr. Arjan Wardekker
Research & Institution: Master Thesis, Utrecht University

Climate change and extreme events brought about by it, increasingly threaten cities and thus imposes the need for adapting to them at the city level. Adaptation measures, with many depending on behavioural changes, should be centred around people's lives and aspirations for a desirable future to let people identify with these measures and thus let them become part of desired futures, which will be certainly shaped by climate change.

One way to elicit such aspirations is a focus on narratives as they embed envisioned futures and aspirations for those futures. In Dordrecht, posing as a case study, are specifically narratives around water, weather and climate change of interest, and thus eliciting insights into local visions for futures that will be influenced by climate change. Narratives are basically stories and shared realities that bind people together and foster interaction among them. A narrative usually unfolds around events that include key actors, relationships to these actors as well as time and space, and let people make sense of the world they live in and organize their experiences. Finally, individual narratives are shaped by historical events, relate to other narratives including those of institutions, display aspirations for the future, as well as become meaningful through frames that shape understanding and salience of elements.

As this research is focusing on narratives for a future-proof city, which includes adaptation to climate change induced extremes, is a specific aim to elicit existing narratives and desirable futures to design in the latter fitting adaptation measures that let people identify with and commit to them. To achieve this, an in depth focus on individual narratives and aspirations for a future under climate change will be on two neighbourhoods in Dordrecht. Considering the importance of individuals as well as institutions and authorities for adaptation in practice, and the relationality of narratives hold by institutions as well as individuals, is this research conducting interviews on both institutional and individual levels in Dordrecht. Ultimately, eliciting local narratives aids in developing resilient and desirable futures, and thus are narratives of utmost importance for realizing measures that foster climate resilience.

Source:

Marschuetz. (2017). *Master Thesis Proposal: Narratives for a future proof city: The case of Dordrecht, the Netherlands.* Utrecht: Utrecht University.

16.   Annex E: Interview packages

Interview-protocol: public narratives

A. <u>Historical events regarding weather and water in Dordrecht and their implications</u>

1. Can you describe what more **distant events** around weather (e.g. rain), and water (e.g. floods), are **significant** in Dordrecht?

   a. **Major** events that shaped the city's history?

   b. **Why** do these events have **meaning** for the city?

   c. **What** was the **problem,** and **who** was **affected**?

   d. Specific **locations** with relevance?

2. What **recent** experiences with weather and water related events did you have in Dordrecht and **how** did it **affect** the city and your organization?

   a. **How** did they **come** about and **who** else was **affected**?

   b. **Why** do those events have **meaning** to you?

   c. **What impacts** did occur?

   d. **What factors** enabled these impacts? E.g.: maybe there were some social, legal, economic, or political **factors that contributed** to the impact?

3. **How** did you **respond** to these recent events?

   a. **Why** did you respond in such ways?

   b. What **lessons** might your organization or affected people have **learned** from these events?

   c. Did **anything change** after these events and **how** the organization **responds**, e.g. policy responses?

   d. **How** did **people perceive** such **policy interventions**? **Why** did they perceive it that way?

   e. Any related **personal responses** you can **imagine or** did **experience**?

4. **How** do you **know** generally **about** such **events**?

   a. What are the **sources** of information?

   b. How are you **communicating** such events?

B. <u>Potential future changes regarding weather and water in Dordrecht and their implications</u>

5. **What future changes** in weather and water will and might affect Dordrecht?

    a. **How** can you or cannot **foresee** potential changes?

    b. **How** are you **communicating** such potential changes?

6. **How** will your organization **respond** to such events?

    a. **What** will be **triggers** for such responses?

7. **How** do you think **will people respond** to such events?

    a. **What** will be **triggers for** such **responses?**

    b. **What** do you think **should change for effective responses,** individually and by your organization?

C. <u>Perceptions of weather and water related events in Dordrecht</u>

8. **How** has the organization's **perception of** such **events changed** over time?

    a. **Why** did it change?

    b. Have there been any significant **triggers for** this **change**?

    c. **How** has this been **incorporated into** the **responses**?

9. **How** do you think have **people changed** their **perception** of water and weather-related events in Dordrecht over time?

    a. Have there been any significant **triggers for** this **change**?

D. <u>Visions for a future-proof city of Dordrecht</u>

10. **What** would be **ideal to future-proof** Dordrecht**?**

11. **How** could you **contribute** to such future-proof Dordrecht?

12. **What else** would be needed to future-proof Dordrecht?

13. How are perceptions relevant for future-proofing Dordrecht?

    a. **What** do you think **should change in perceptions** to enable effective responses by your organization?

    b. **How** can you **contribute to** this **change**?

14. **Who else should be involved in future-proofing Dordrecht?**

    a. Is there anyone **you suggest to** explicitly **interview** in the current project whose stance and work is crucial to be considered?

Topical summary of the interview-questions

- Distant and more recent historical events regarding weather and water in Dordrecht and their implications.

- How your organisation reacted and responded to these events, and why your organisation reacted in that way.

- Future changes around weather and water and their implications for Dordrecht.

- Possible responses to these future changes by both your organization and citizens.

- Perceptions of weather and water-related events in Dordrecht and their changes over time.

- Visions for a future-proof city of Dordrecht and relevant actors.

- Belangrijke historische en recente gebeurtenissen met betrekking tot weer en water in Dordrecht en de implicaties daarvan.

- Hoe uw organisatie reageerde op deze gebeurtenissen en waarom de organisatie op die manier reageerde.

- Toekomstige veranderingen rond weer en water en hun implicaties voor Dordrecht.

- Mogelijke reacties op deze toekomstige veranderingen door zowel uw organisatie en burgers.

- Percepties van weer- en water gerelateerde gebeurtenissen in Dordrecht en hun veranderingen in de loop der tijd.

- Visies voor een toekomstbestendige stad Dordrecht en relevante actoren.
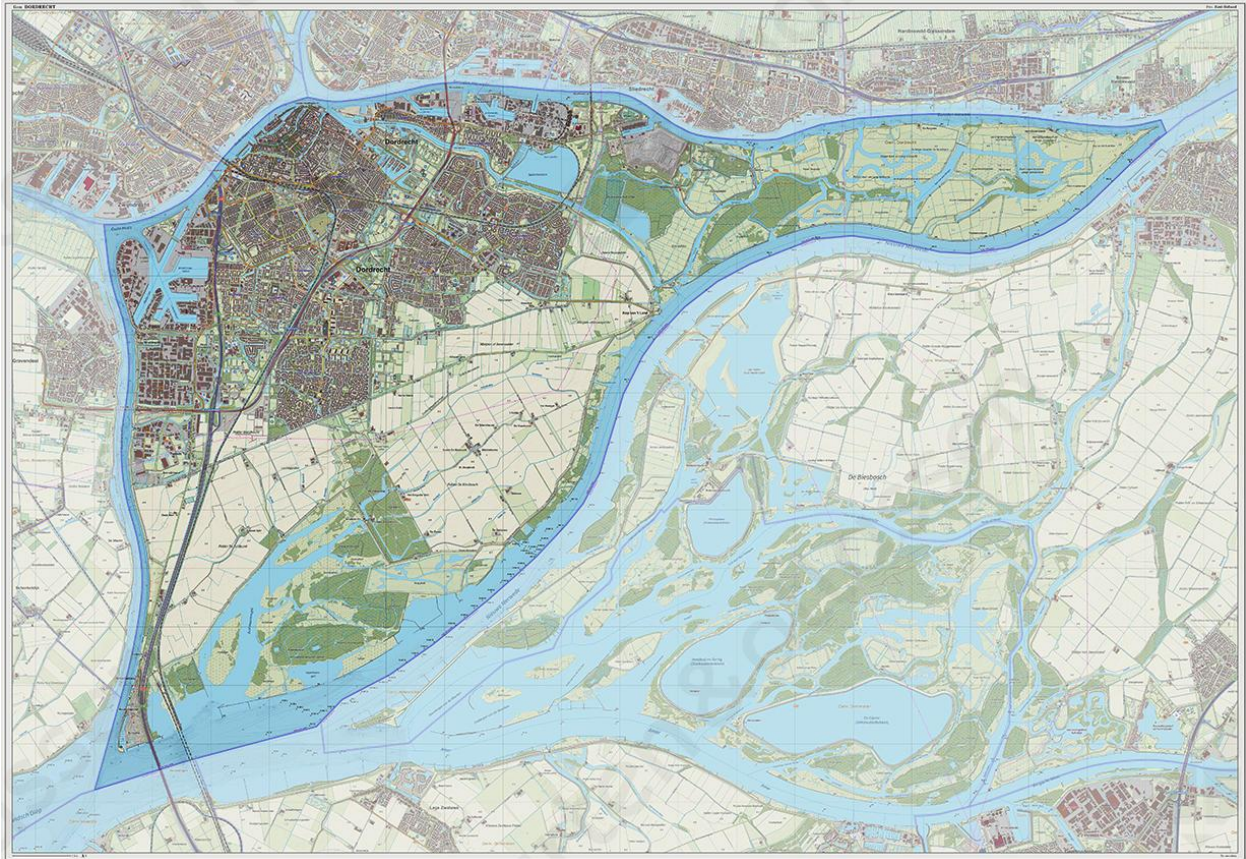
Map of Dordrecht

Figure 33: Map of Dordrecht (Kaarten en Atlassen, n.d.)

Interview-protocol: ontological narratives

    A.   Experiences of weather and water-related events in your neighbourhood

        1. **Did you live here** for a **longer** time and perhaps can think of some weather or water-related **events a bit longer back,** perhaps **also** from your **relatives?**

              a. **What happened**?

        2. What **experiences** with weather and water related events did you have in your neighbourhood and **how** did it **affect** you personally?

              a. **What impacts** did occur?

              b. **How** did they **come** about?

              c. Was there **anybody else** who was **affected and how?**

              d. **What factors** can you think of that **enabled** these impacts or **contributed** to them? E.g.: maybe there were some social, economic, or political **factors that contributed** to these impacts apart of the physical factors?

        3. **How** did you **respond** to these events?

               a. **Why** did you respond in such ways?

              b. Did **anything change** in how you **respond or act** after these events?

              c. Did **anybody else respond** to them and how?

        4. **How** do you **know** generally **about** such **events**?

              a. What are the **sources** of information?

              b. Are you **somehow communicating** such events here, if so, **how**?

    B. Perceptions of weather and water related events in your neighbourhood

        5. **What do you think about** these weather and water-related events?

              a. **Why** do those events have **meaning** to you?

              b. Has your **perception of** such **events changed** somehow?

              c. **Why** did it change?

              d. Have there been any **triggers for** this **change**?

        6. **How** do you think **people in your neighbourhood perceive** these events?

              a. **How** might these **people** have **changed** their **perception**?

              b. Have there been any **triggers for** this **change**?

C. Potential future changes regarding weather and water in your neighbourhood

    7. **What future changes in the context** of weather and water might affect you here?

        a. **What factors** might **contribute** to these future changes?

        b. **How** could you **foresee** potential changes?

    8. **How** could you **respond** to such future events?

        a. **What** might **trigger** your response to them?

    9. **How** do you think other **people might respond** to such events?

        a. **What** might **trigger them** to respond?

D. Visions for a future-proof neighbourhood

    10. **What** would be **ideal to future-proof** this area?

    11. **How** could you **contribute** to this or **what would you like** to do?

    12. **What** else do you think **should change for effective responses,** also by others?

    13. **What else** would be needed to future-proof this area or Dordrecht as a whole?

    14. **Do you think** it matters **how** you or others **think about these** events and any changes?

        a. **Why** do you think so?

        b. Do you think something **should change** in this **thinking**?

        c. **Why** do you think this should **change?**

    15. **Who else should be involved** in future-proofing this area according to you?

        a. Is there anyone **you suggest to** explicitly talk to?

E. *(if time): Follow up*: Information needed by you

    16. Is there any **information** you would **need for responding** adequately to any events that affect you here?

    17. What **sources of information** do you or would you trust more than others?

        a. Any source or channel of information you would take more seriously than others?

        b. **Who should provide** this information to you?

17. Annex F: Elicited narratives

Table 40: Narratives for future-proofing Dordrecht

| Narratives for future-proofing Dordrecht		
Public narratives	Historical narratives	Historical narrative
		More recent historical happenings narrative
	Vulnerability narratives	General vulnerability narrative
		Event-centered vulnerability narrative
		Exposure to water narrative
		Perceptions of exposure to water narrative
	Adaptation narratives	Motivational narrative
		Occurring adaptation narrative
	Identity narrative	
	Socio-economic constraints narrative	
	Future perspectives narratives	Future challenges narrative
		Future adaptation & solution narrative
	Governance narratives	Collaborative governance narrative
		Linking opportunity narrative
		Policy recommendation narrative
Ontological narratives	Historical narratives	
	Experiential narratives	Event-centered occurrence narrative
		Exposure to water narrative
		Awareness for exposure to changes in water, environment and climate narrative
		Occurring challenges and issues narrative
	Action narratives	Occurring adaptation practices narrative
		Occurring climate mitigation narrative
	Identity narrative	
	Socio-economic constraints narrative	
	Future perspectives narratives	Future challenges and implications narrative
		Future measures and actions narrative
	Governance narratives	Existing constraints narrative
		Recommendation narrative
		Responsibilities narrative

18. Annex G: Historical development of Dordrecht
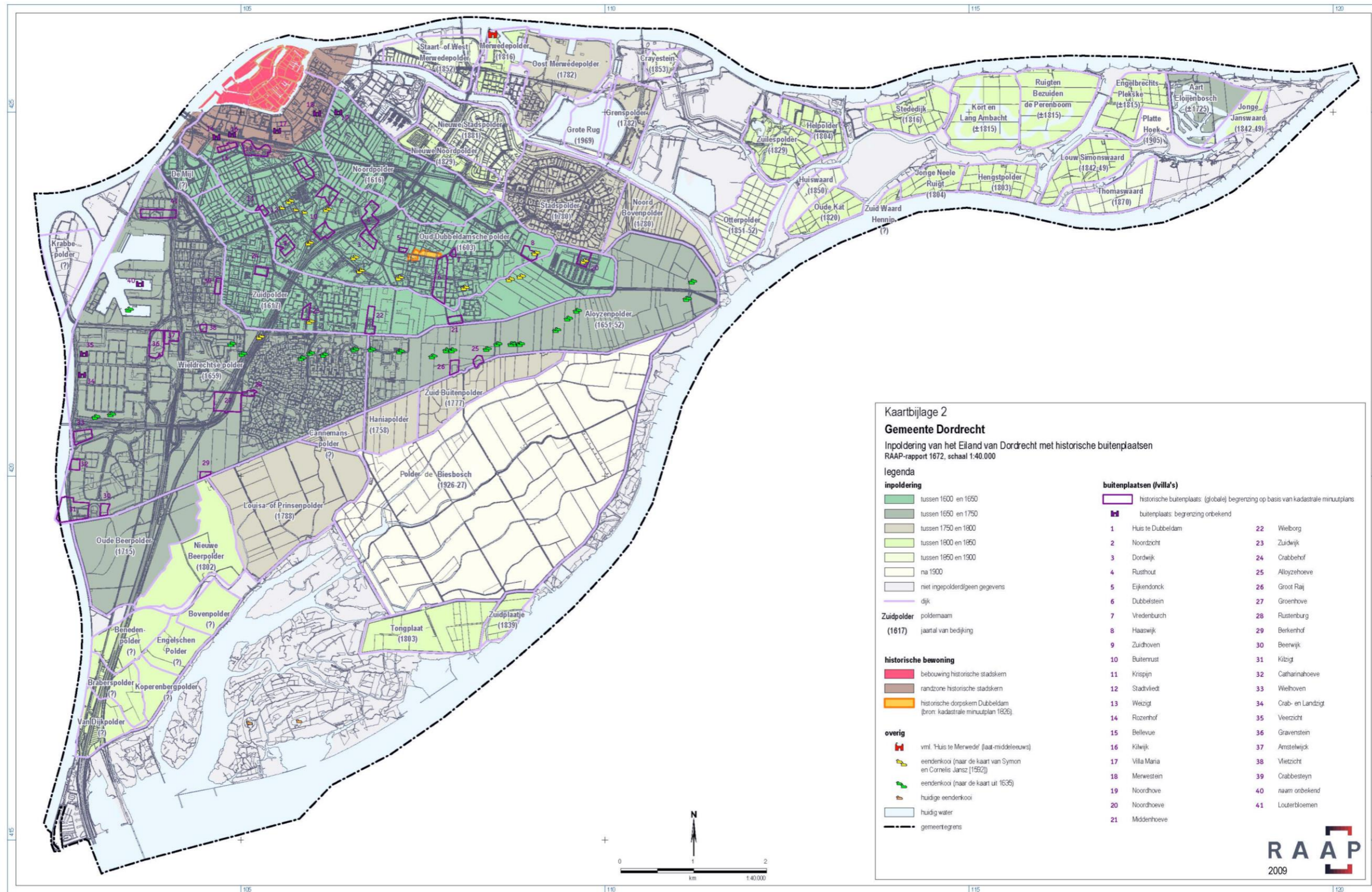
Figure 34: Historical development of the polders in Dordrecht (G. de Boer, Rietkerk, Schenk, & Jansen, 2009)