University of Groningen
Master Thesis

Breaking Down Boundaries for a Wave of Opportunities

The role of boundary spanners in Adaptive Delta Management

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Abstract

Coastal cities are increasingly vulnerable to the impacts of more extreme weather events. As a result, governments are turning to policies that facilitate Adaptive Delta Management, such as the Dutch Delta Approach (DDA). The DDA has become an export product that could aid other regions in managing their vulnerable delta system. However, complex urban water projects can face complications when stakeholders cannot reach an agreement or have contested interpretations. To combat this, boundary spanning is seen as a mechanism to consolidate collaboration and alleviate challenges (Van Meerkerk & Eldenbos, 2018). As a result, this paper tries to answer the question: 'How do stakeholders perceive or experience boundary spanning during Adaptive Delta Management?'. To approach this question, an in-depth case study was chosen, guided by four semi-structured in-depth interviews and a document analysis. The chosen case study was the Rebuild by Design competition with a focus on the Big U and East Side Coastal Resiliency project (ESCR) in New York City. The results produced four themes which included: 1) catalysts for boundary spanning, 2) activities, skills and behaviors, 3) inhibiting and enabling factors and 4) community engagement. The ultimate aim of this paper is to contribute to the growing understanding of boundary spanning during Adaptive Delta Management in vulnerable delta regions.

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1. Introduction

1.1. Background

Over the past few centuries, cities around the world have relied on flood control measures to protect their populations from risks of flooding. However, due to climate change, these measures are becoming ineffective (Bucx et al., 2014). In low lying coastal areas of densely populated river deltas, climate events such as flooding and storm surges are resulting in the loss and damage of infrastructure, buildings, lives, livelihoods and social systems (IPCC, 2014). Additionally, climate processes such as sea level rise are expected to increase, which make extreme climate events more likely to occur in the future.

According to the Sixth Assessment Report by the Intergovernmental Panel on Climate Change (IPCC), these coastal-specific climate hazards affect approximately one billion people (IPCC, 2022). The wicked problem is characterized by deep uncertainties and a large variety of affected stakeholders, which makes the adaptation of delta areas an important governance challenge (Dewulf & Termeer, 2015). As a result, cities around the world are considering alternative policies to mitigate flood risks and turning to expertise from other delta regions.

The Netherlands could be considered the frontrunner to Adaptive Delta Management (Minkman & van Buuren, 2019). The small and densely populated country has a long-standing history of land reclamation and dealing with flood threats from both the sea and rivers (Bouw, 2021). As a result, water management has led to a governance structure of Water Boards, a national Delta Fund, numerous knowledge institutes and a culture of collaboration (Bouw, 2021). Over the years, Dutch experts have created a knowledge base on Adaptive Delta Management that they can export to more vulnerable regions through policy transfer. An example of a policy that has been transferred to other contexts is the Dutch Delta Approach (DDA). The DDA has become a product that could aid other regions in managing their delta system. In turn, this generates business opportunities and foreign trade for the Netherlands (Minkman & van Buuren, 2019).

A bilateral partnership where policy transfer occurred was between the Dutch government and New York City. After Hurricane Sandy struck New York in 2012, Dutch experts helped design resilient plans to rebuild the city in ways that could better withstand storms (Bouw, 2021). During this collaboration, American and Dutch stakeholders had to work together causing the boundaries between stakeholders, disciplines, policy objectives, culture and values to be blurred. However, this was not without its challenges. Complex planning processes can face complications when stakeholders cannot reach an agreement, have contested interpretations, or different preferences in communicative practice. To overcome this, boundary spanning is seen as a coping mechanism to consolidate collaboration among stakeholders and alleviate challenges (Van Meerkerk & Eldenbos, 2018).

Boundary spanners can be defined as people who are skilled at bridging interests, organizations and professionals across various kinds of boundaries (Webb, 1991). Since policy transfer draws attention to the actors who translate and re-shape a policy, the concept of boundary spanners lends itself to investigate specific actions and behaviors that influence the policy transfer process. According to Van Meerkerk and Eldenbos (2018) there is a need to understand how certain types of boundary spanning roles, activities, behavior and competences are related to the realized outcomes. Furthermore, Ruiz et al. (2017), emphasizes the importance of understanding the disciplinary dynamics and interactions, as well as the mechanisms and strategies applied by individuals and organizations to facilitate transdisciplinary practices in urban water projects.

1.2. Research problem

Boundary spanners have the competences to work well in complex and uncertain environments. Therefore, it is important to understand how individuals adapt their behavior to these contexts in order to be meaningful and effective. Hence, the research question is: 'How do actors perceive or experience boundary spanning during Adaptive Delta Management?'. The aim is to ultimately inform future policy-makers working on vulnerable deltas about the boundary spanning roles, skills and behaviors necessary to drive climate adaptation.

The objective of this study is to investigate the role of boundary spanners using the Big U and East Side Coastal Resiliency project as an in-depth case study. The structure of the paper can be outlined as follows. After the introduction, the next chapter conceptualizes 'Adaptive Delta Management', 'Dutch Delta Approach' and 'boundary spanners'. The paper proceeds by briefly introducing Rebuild by Design and their history to contextualize the Big U and East Side Coastal Resiliency (ESCR) project. Then, the methods of this project are outlined with regard to ethical considerations and positionality. The following chapter delves into the results of the interviews and document analysis. Finally, the paper concludes with recommendations for how future urban water projects should incorporate Adaptive Delta Management. The ultimate aim of this paper is to highlight the importance of boundary spanning behavior to understand how this shapes Adaptive Delta Management in the New York City context.

2. Theoretical Framework

2.1. Adaptive Delta Management

In the past, the Netherlands had a technical approach to flood risk management where water management took on the form of dams, dikes, and other civil engineering work (Van den Brink et al., 2019). However, due to two major flood events in the 1900s, the Dutch took a more radical approach to managing the delta system (Bouw, 2021). Using nature-based solutions, space was created for the major rivers to reduce the impact of flooding. The programme that initiated this was called Room for the River, which lasted between 2006 and 2018. The goal of this project was to bring together the national, provincial, municipal governments and regional water authorities to collaborate on long-term solutions to manage flood protection (Willner, 2016). The Room for the River project illustrates a paradigm shift from fighting the water to living with the water. Additionally, the objective of accommodating for higher flood levels was integrated with improving the spatial quality of deltas (Van den Brink et al., 2019). As a result, flood resilience policies in the Netherlands began to transition to a holistic approach, with more focus on an adaptive strategy (Minkman & van Buuren, 2019). This became known as Adaptive Delta Management (ADM).

The Dutch Delta Program adopted ADM to protect the Netherlands against flooding by anticipating the challenge of climate change and socio-economic developments (Van Alphen 2013). A definition for ADM is an approach that considers uncertainties and dependencies in decision-making on delta management while simultaneously minimizing the risk of overspending or underinvestment (Van Alphen 2013). This policy development approach tries to ensure that short to medium term adaptation decisions will not be maladaptive, even if future climatic developments vary from what is currently predicted (Reeder and Ranger 2011).

To do so, ADM considers adaptation tipping points and adaptation pathways (Dewulf & Termeer, 2015). Adaptation tipping points can be defined as points where the magnitude of change due to external pressures, such as sea level rise, results in the current strategy or measures to no longer be effective (Kwadijk et al. 2010). By predicting when adaptation tipping points can occur, adaptation pathways can be developed (Haasnoot et al. 2011). These are sequences of measures and options that allow for flexibility to adapt to a wide range of future climate scenarios (Zevenbergen et al., 2018). Adaptation pathways provide decision makers with options that can be taken under certain conditions and indicate in what time frames these conditions can be expected under what climate scenarios (Kwadijk et al. 2010). With this approach, policymakers can reduce the risk of under and over investing.

ADM has four key objectives as described by (Van Alphen, 2013). The first is having a systematic approach that takes various spatial scales into account. The second is involving

multiple stakeholders in a joint decision-making process to enhance legitimacy and feasibility. The third is adopting a flexible scenario-based approach that allows for switching from strategies, for example by employing adaptation pathways. The fourth objective is linking different investment agendas, such as urban development or nature restoration. These objectives allow ADM to provide greater transparency to decision-makers (Gersonius et al., 2016).

2.2. Dutch Delta Approach

With the accumulation of knowledge on ADM, the Dutch became aware of their comparative advantage over other delta regions. It was recognized that their knowledge could become an export product that could aid other countries in managing their deltas (Minkman & van Buuren, 2019). This became known as the Dutch Delta Approach (DDA), a policy that could be transferred. According to Dolowitz and Marsh (1996), policy transfer is defined as knowledge about policies from one time or place that is used in the development of policies in another time and/or place. The main stakeholders involved in spreading the DDA are essentially all members of the Dutch Water Sector. This includes private companies, government agencies, knowledge institutes, and non-governmental organizations (NGOs) that are engaged in water management. The largest network that acts as a platform for spreading knowledge about the Dutch approach is the Netherlands Water Partnership (NWP).

Minkman and van Buuren (2019) investigated how the DDA was translated for international transfer using a policy branding perspective. In their research it was found that the tight network of stakeholders in the Dutch water sector created opportunities for Dutch policies to be communicated and branded internationally as the DDA. This allowed Dutch knowledge and policies to become an export product that helps other countries manage their deltas. However, networks engaged in communicating the DDA are extremely fragmented. It was noted that one portion of the network was directly involved in developing Dutch policy, another was engaged in developing the DDA as a brand, and another was actively translating the approach abroad. According to the authors, this fragmentation led to significant differences between the original policy and the transferred policy (Minkman and van Buuren, 2019). Zwarteveen et al. (2017) addresses a similar point that a universal definition of the DDA does not exist due to the constant translation of the DDA by different actors in various contexts. Another finding in literature was that there are limited opportunities to exchange lessons learned between the stakeholders engaged in DDA. Usually ad hoc adjustments are made instead of experiences being used to collectively re-define the core elements of the policy. Minkman and van Buuren (2019) suggest that future research should focus on what capacities and strategies are needed in the policy translation process.

2.3. Boundary spanners as a tool for policy transfer

Due to a push for more cross boundary collaboration in public governance, there is a growing body of research on boundary spanning behavior, activities and challenges. In this research, boundary spanners are defined as individuals who are sensitive and competent at bridging interests, organizations and professionals across various kinds of boundaries (Webb, 1991). These individuals are not necessarily defined by their formal function, but by the behavior and activities that they perform.

According to Van Meerkerk and Eldenbos (2018), boundary spanners can engage in activities that cross organizational or institutional boundaries, generate and mediate information exchange and connect processes and actors together. In literature, this has been summarized into three main activities: connecting different people and processes, selecting relevant information, and translating this information across the boundaries (Leifer & Delbecq, 1978; Tushman & Scanlan, 1981). Various scholars agree that boundary spanners are important for building trust within governance networks, help improve coordination around decision making processes, and facilitate implementations surrounding complex public issues (Steadman 1992; Williams 2002; Van Hulst et al. 2012).

Furthermore, literature emphasizes that trust and leadership are important for realizing integrated water management practices (Klijn et al., 2010; Williams, 2002). Trust stimulates coordination between various actors from different domains and organizations, leading to cross-boundary partnerships. According to Van Meerkerk & Edelenbos (2015), trust develops in informal network structures. Informal networks allow for actors to think and behave outside their formal roles and rules, which creates opportunities to explore possible partnerships and getting to know other partners' ambitions, interests and values (Edelenbos & Klijn, 2007). Leadership skills play a key role in translating and bridging the informal networks with formal decision-making structures and policy processes (Edelenbos & Klijn, 2007).

Literature and empirical research also demonstrate that certain conditions and circumstances facilitate connective capacity. In organizational psychology and business administration literature, four categories of conditions may influence boundary spanning behavior: 1) environmental characteristics, 2) organizational support, 3) role definition and 4) individual determinants (Van Meerkerk & Edelenbos, 2018). Firstly, environmental characteristics may include inter-organisational relationships, environmental uncertainty, dependency and dynamics (Van den Brink et al., 2019). It is assumed that positive encounters stimulate trust, which correlates to the quality of boundary spanning activities (Van den Brink et al., 2019). Secondly, organizational support may refer to management feedback, empowerment, and co-workers' support (Qiu, 2012; Chebat & Kollias, 2000) Thirdly, role definition concerns the definition of the boundary spanner's function. Fourthly, individual determinants can include cognitive capacities, social-emotional competences, motivation, and experience (Au & Fukuda, 2002;

Dollinger, 1984). Certain social-emotional competences may include listening skills, empathy, and conflict management (Van den Brink et al., 2019). Finally, experiences in the past can help foster boundary spanning capacities.

In research conducted by Van den Brink et al. (2019), these four conditions provided a framework for analyzing landscape architects as boundary spanners during the Room for the River projects. According to their findings, specific conditional factors caused landscape architects to conduct different activities and roles. It was found that crucial factors were having a dynamic project environment, organization support, clear role definition, and social-emotional skills. Interestingly, findings showed that landscape architects had difficulty having a more process-oriented instead of content-oriented boundary spanning role. In addition, bringing diverse opinions, values and interests into a new landscape design seemed to be challenging. In their research it was concluded that in flood risk management projects, landscape architects were still hindered by a traditional, content-oriented, and sectoral design image of their discipline (Van den Brink et al., 2019).

In this thesis, the framework proposed by Van Meerkerk & Edelenbos (2018) was applied to a case study whose nature was to be multidisciplinary and process oriented with a more radical approach to design. In doing so, this thesis investigates whether these conditional factors alleviate the challenges experienced by other boundary spanners working in more rigid contexts, as described by Van den Brink et al. (2019).

2.4. Conceptual model

The conceptual model (Figure 1) depicts the interplay between Adaptive Delta Management, policy transfer, the Dutch Delta Approach and boundary spanners. As described in the previous sections, the Netherlands has accumulated a lot of knowledge on Adaptive Delta Management, which they have used to create flood resilient policies known as the Dutch Delta Approach. The Dutch Delta Approach has been transferred from the Netherlands to other vulnerable regions that struggle with Adaptive Delta Management. The conceptual model tries to illustrate the interaction between boundary spanners from the origin and destination region to create a context specific solution. It is hypothesized that boundary spanners have the competence to successfully translate a policy that suits the context of the destination region using certain behaviors and skills.

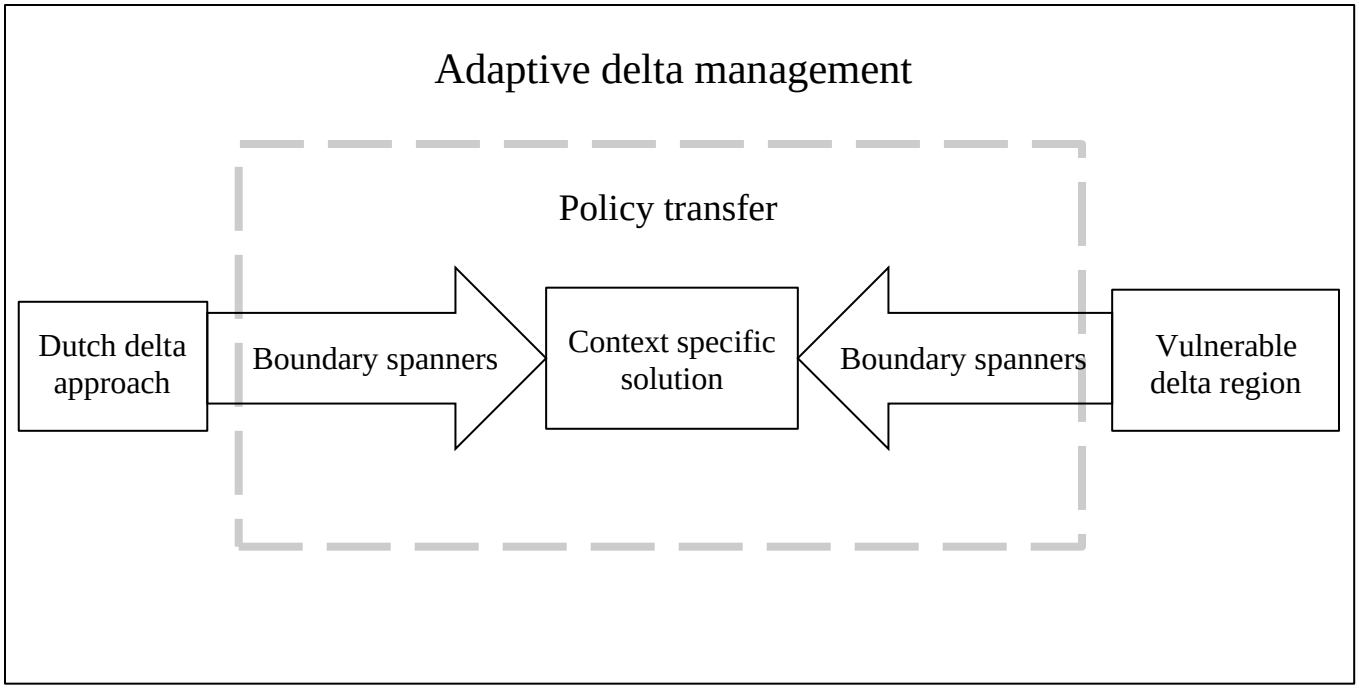

Figure 1: Conceptualization of boundary spanners during policy transfer of adaptive delta management (Author, 2022)

3. Methodology

For this research, the Rebuild by Design competition, and subsequently the Big U and ESCR project, were selected as an in-depth case study to delve into boundary spanning roles, activities and behaviors. According to Flyvbjerg (2006), this is an example of an information-oriented selection. In line with this approach, a case study is selected based on the information content it is expected to hold. The goal of this approach is to maximize the utility of information from a single case, to further inform research or policymakers.

In terms of this study, the Rebuild by Design competition was chosen due to the innovative and radical approach to Adaptive Delta Management. Instead of experts designing flood resilient plans from the shelf, the competition stressed multi-stakeholder engagement, community engagement, and embracing ambiguity. Therefore, it was inferred that this novel approach to building a resilient city would increase boundary spanning behavior. Since the competition included numerous projects, and the scope of this research favors depth instead of breadth, one project was chosen as a focal point. This project was called the Big U, which is designed to be a flood protection system that encircles Lower Manhattan. Currently, the first compartment of the Big U is being implemented in the Lower East Side, which became known as the ESCR Project. The Lower East Side is a neighborhood that has affordable housing concentrated in low-lying areas near the waterfront. As a result, thousands of residents living within these residential buildings are vulnerable to coastal storms, making this a prominent case study to investigate.

3.1. Case study: Rebuild by Design competition

In 2012 Hurricane Sandy struck New York City and caused unprecedented damage. The City Subway system, many suburban communities, and road tunnels entering Manhattan were flooded. At least 43 people lost their lives and thousands of people were displaced (NYC, 2013). There was an estimated economic loss of roughly $19 billion (NYC, 2013). The shocking climate event revealed the vulnerabilities of the city, from weak infrastructure, low-income communities and elderly populations (Ingels et al., 2017).

A month after Hurricane Sandy, former President Obama signed an executive order to create the Hurricane Sandy Rebuilding Task Force (The Rockefeller Foundation, 2014). The Task Force was chaired by the Housing and Urban Development (HUD), and included the support of Henk Ovink, a Dutch government official with the title: Dutch Special Envoy for International Water Affairs (Dutch Water Sector, 2014).

On June 20, 2013, a design competition called Rebuild by Design was launched (The Rockefeller Foundation, 2014). The aim of the Rebuild by Design competition was to redesign New York City in ways that would enhance resilience and protect the city from future extreme weather events (The Rockefeller Foundation, 2014). The core of the competition was not to simply rebuild New York City from the bottom up, but to prepare for future Superstorm Sandies. Since climate change is rooted in uncertainty, the approach of the competition was to steer away from typical post-disaster responses. It has been recognized that simply rebuilding takes away the opportunities to imagine what a more resilient city would look like (The Rockefeller Foundation, 2014). Therefore, the vision of Rebuild by Design was to move resilience to the foreground in a purposefully ambiguous way to enable flexibility and creativity.

During the competition, teams were given vague descriptions of what the requirements of the design should be. In HUD's competition Brief, it only specified that the project had to focus on four areas: 1) coastal communities, 2) high-density urban environments, 3) ecological and water body networks, and 4) category for unidentified or unexpected focus (HUD, 2013). On the other hand, the process of how the design proposals should be formulated was elaborated in detail. Teams had to include stakeholders from at least three areas: engineering, landscape design, urban planners, architecture, industrial design and community engagement, among others (HUD, 2013). Additionally, The Brief stated the need for public engagement, with specific attention on underserved populations (HUD, 2013).

The outcome of Rebuild by Design were six winning design proposals and were allocated approximately $920 million for implementation (Dutch Water Sector, 2014). According to Secretary Donovan, the proposals are blueprints for how cities can become more environmentally and economically resilient (Dutch Water Sector, 2014). It is hoped that the

Rebuild by Design will be an inspiration for other public-private partnerships that generate innovation and resilience around the world (Dutch Water Sector, 2014).

3.2. Big U and East Side Coastal Resiliency project

One of the winning designs was the 'Big U'. This design was intended to be a protective coastal system that encircles Lower Manhattan to protect it from flooding (Bouw, 2021). The design proposes a structural approach by using deployable flood walls and berms, as well as nature-based solutions for reducing flood and storm surge risks (Grannis, 2016). The system is expected to stretch 16 km long from West Fifty-Seventh Street up to East Forty-Second Street (Figure 2). The team members involved included Bjarke Ingels Group, One Architecture, Starr Whitehouse, James Lima Planning + Development, Green Shield Ecology, AEA Consulting, Level Agency for Infrastructure, ARCADIS and Buro Happold (Bouw, 2021).

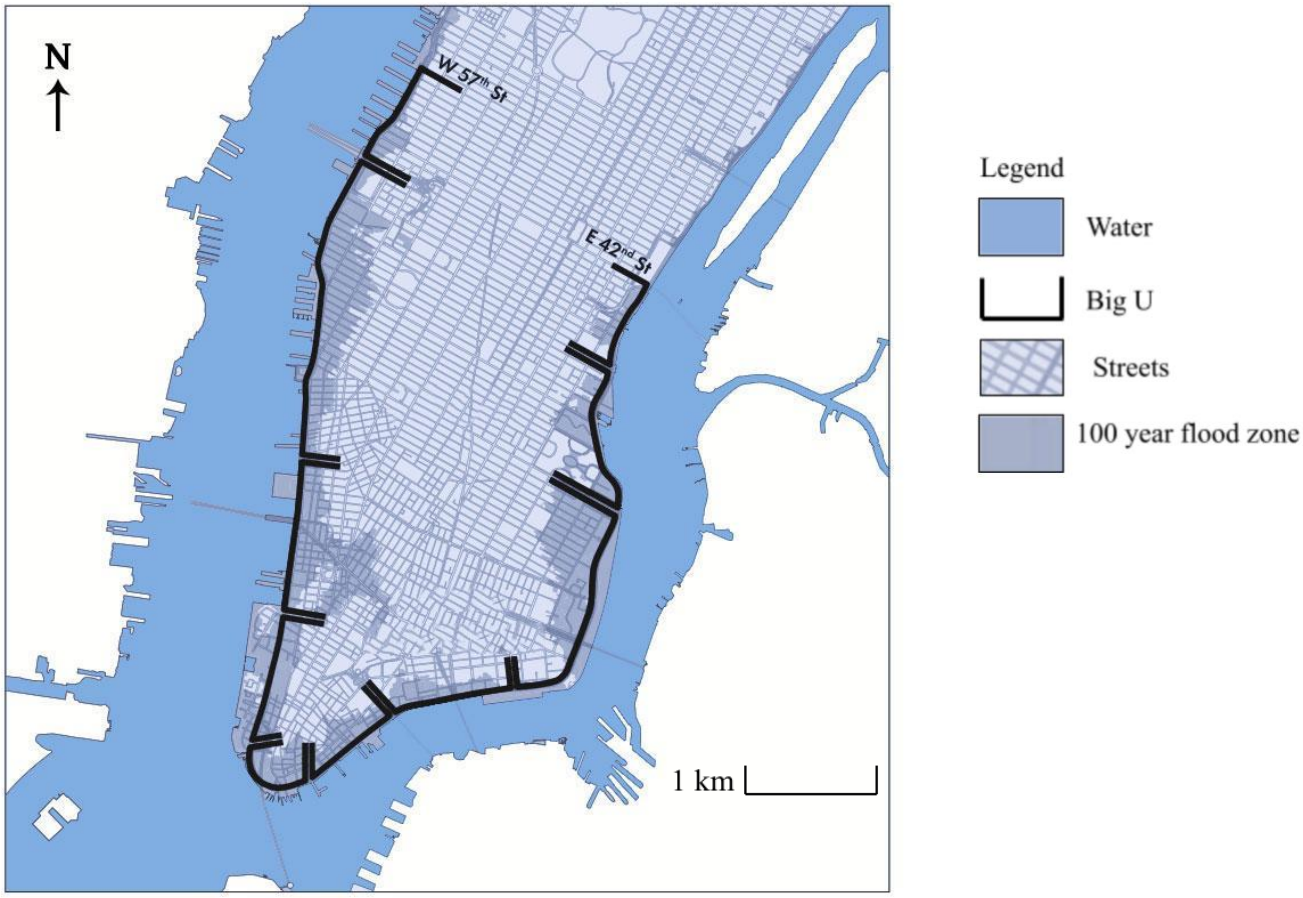

Figure 2: Map depicting the Big U and 100-year flood zone, adapted from Bouw (2021) by author (2022)

After winning the competition, the New York City Department of Design and Construction introduced the Eastside Coastal Resilience Project (ESCR), which began construction in 2020 (East Side Coastal Resiliency Staff, 2022). The ESCR is the first implementation plan of the BIG

U. The project is located in New York's Lower East Side, specifically Montgomery Street to East 23rd Street (figure 3).

The neighborhood ESCR will be trying to protect is home to a large vulnerable community (Bouw, 2021). During Hurricane Sandy, the electrical systems of many buildings were flooded, causing damage, financial loss and disruption for thousands of residents (De Blasio & Weisbrod, 2016). Additionally, a significant number of households have a low-income status and live in affordable housing (De Blasio & Weisbrod, 2016). Most of the affordable housing was built before current floodplain construction standards were established in 1983 (De Blasio & Weisbrod, 2016). As a result, the buildings are extremely vulnerable to future damages from flooding. The neighborhood is also characterized by low vacancy rates, suggesting few opportunities for resettlement if households are displaced (De Blasio & Weisbrod, 2016). Most of the affordable housing is located in a five-block floodplain. This floodplain is separated by Franklin D. Roosevelt East River Drive (FDR Drive) and East River Park (Figure 3). The plan of ESCR is to elevate East River Park by 3 to 5 meters above sea level (Bouw, 2021). In doing so, it is hoped that 30,000 residential units and 110,000 residents are protected.

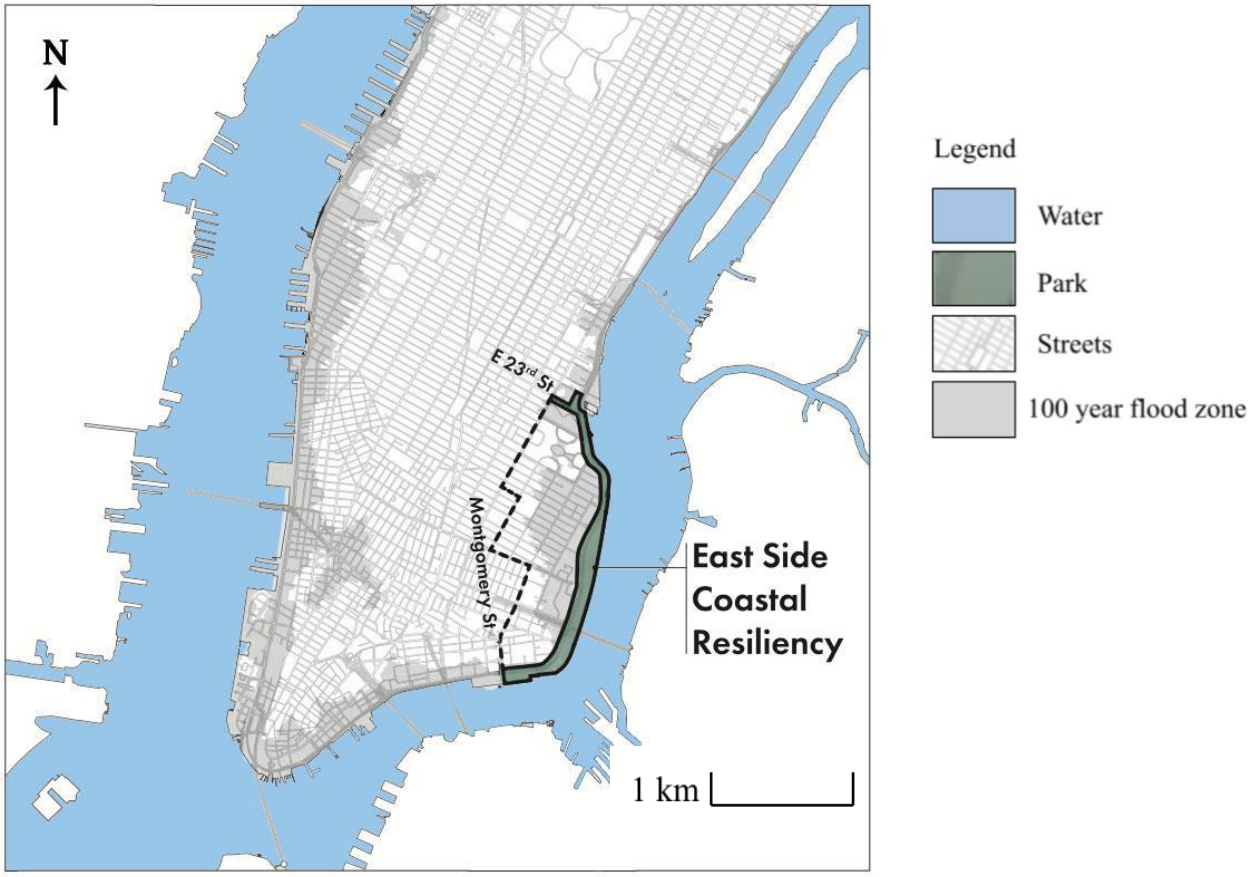

Figure 3: Map depicting the ESCR, adapted from Bouw (2021) by author (2022)

3.3. Sub-questions and methods

To answer the question, 'How do actors perceive or experience boundary spanning during Adaptive Delta Management?', three sub questions were identified, based on the theoretical framework in chapter 2. The first sub question was, *'How have policies about Adaptive Delta Management been transferred from the Netherlands to New York City?'*. This sub-question investigated how policy transfer occurred between the Netherlands and New York City to illustrate the context that enabled boundary spanning work. The second sub question was, *'How do boundary spanners mediate between different cultures, expertise and actors during the Big U and ESCR project?'*. During the Rebuild by Design competition, one team worked on the Big U. The team was composed of numerous Dutch, American and international firms with different cultures and areas of expertise. As a result, investigating how individuals were able to mediate between different cultures, expertise and stakeholders was relevant to understanding the skills, behaviors and roles needed. The third sub question was, *'What are the conditional factors for boundary spanning during the Big U and ESCR project?'*. By researching the enabling and constraining factors, it was possible to recognize the conditional factors that allow boundary spanners to do their work efficiently. Additionally, it provided a contextual understanding of the necessary elements that foster or preclude boundary spanning.

The research approach of this study is qualitative. Since qualitative research is part of the interpretive paradigm, the aim is to understand the thoughts, feelings, and experiences that actors associated with the Big U and ESCR have. Due to the inherent nature of case studies, there is often a substantial element of narrative (Flyvbjerg, 2006). Therefore, the main method for this research is a narrative analysis. The approach of a narrative analysis is to reflect on the nature of the stories told to understand how people make sense of their lives and experiences (Hennink et al., 2020). The benefit of this method according to Mattingly (1991) is that not only does it give meaningful form to experiences that have already been lived through, but it also provides a forward outlook, which helps to anticipate future situations and to envision alternative futures.

While narratives make it possible to investigate the complexities and contradictions of real life, it is criticized for being difficult to summarize into general propositions and theories (Benhabib, 1990; Mitchell & Charmaz, 1996; Rouse, 1990). However, more recent literature warns against summarizing dense narratives. Peattie (2001) states, "It is simply that the very value of the case study, the contextual and interpenetrating nature of forces, is lost when one tries to sum up in large and mutually exclusive concepts" (p. 260). Therefore, this method is the most suitable for this research, despite not being generalizable into general propositions and theories.

3.4. Data collection and selection

To answer the research question, a semi-structured interview guide was created based on the conceptual model and theoretical framework (Appendix I). The aim of the interview guide was to allow participants to reflect on their own skills, behaviors and role within their work and create opportunities to explain their experience with the Big U and ESCR. This fits within the interpretive ontology and epistemology of qualitative research. The same interview guide was used for all participants to ensure dependability; however, the semi-structured nature of the interview guide created the flexibility to deviate to topics that were important to the participant. This prevented the researcher from steering the interview to predetermined topics, enhancing the credibility of this research.

The main method for recruiting participants was purposive sampling. Participants were deliberately contacted through email based on their likelihood to act as boundary spanners or have worked with actors who may identify as such. It was acknowledged that confirmation bias could have played a role in selecting participants. The implication of this is that some participants were preferentially chosen to support the researcher's belief that they are boundary spanners, while in reality they did not have to be. However, this was accounted for by asking participants about other stakeholders they have worked with or talking about the process in general, resulting in certain individuals and skills being mentioned, which was further triangulated by conducting a document analysis.

Interviews were held between the 14th of April and 17th of May in 2022. Between the 18th of April and 29th of May, 2022, the researcher was in New York City to conduct field research on-site. According to Flyvbjerg (2006), the most advanced form of understanding a phenomenon is when researchers place themselves within the context being studied. In doing so, researchers can better understand the viewpoints and the behavior of social actors. Therefore, fieldwork was conducted to better understand the social, physical and political environment of the city.

During this period, a total of five in-depth semi-structured interviews were conducted. Two interviews were in person, two interviews were held on google meet and a walking interview took place along the waterfront in the Lower East Side. It was expected that more interviews would be conducted, however several prominent actors, firms and community groups involved with the Big U and ESCR projects refused or were unable to participate in this research. This could be explained by public animosity towards ESCR, recent lawsuits, research fatigue, or general busyness. The interviews that did take place lasted approximately 45-90 minutes and the walking interview took 150 minutes long. During the interview, a recording device was used to make transcriptions.

Additional to the interviews, a document analysis was conducted to achieve triangulation, and enhance the credibility of this research. The advantage of doing a document analysis is that it reduces potential biases by verifying findings and corroborate evidence from other

sources (Bowen, 2009). When information from different sources show convergence, there is greater confidence in the trustworthiness of the findings (Bowen, 2009). Furthermore, since interviews fell short and there was limited time to find more participants, the document analysis helped bridge the gap that was formed.

For this research, the document analysis consisted of reports and an interview that were publicly available (Appendix II). Reports about the Rebuild by Design competition and ESCR project were found on the Rebuild by Design website and governmental websites, such as the New York City Department of Design and Construction.

3.5. Data analysis

The interviews were transcribed verbatim using the software Otter.ai. By producing a word-for-word replica of the interview, the content and meaning of what has been said was able to be analyzed. The analysis was done using ATLAS.ti to ultimately generate themes. When developing codes for the analysis, a deductive and inductive approach was taken. The deductive codes were based on the literature and theoretical framework. As can be seen in the deductive code tree, the topical interview questions were connected to a specific code, which was used to answer one or more of the sub-questions defined (Appendix III). Inductive codes were made apparent during the close reading of the transcript (Appendix IV). Inductive codes are crucial to uncover themes and topics that did not appear in academic literature.

For the document analysis, a thematic analysis was also applied. The inductive and deductive codes used for the interview transcripts were also used to evaluate the documents. In this way, it was possible to compare and contrast findings from the interviews and documents using a similar scheme. After assigning and grouping the codes, the core narratives of the participants were compared to construct themes that give an overarching perspective on boundary spanning.

3.6. Ethics and positionality

Before interviews were conducted, all participants received an information letter and consent form (Appendix V). This was sent through email stating how the data will be handled, what the aim of the research is and the rights of the participant. Before the interview began, the consent form was brought up to make sure all parties understood how the data was being used. During the interview, a voice recorder was used for transcriptions. To ensure this is ethically justifiable, permission was asked before the interview took place. After the interviews, the recordings were stored on a device under a passcode only accessible by the researcher. During the transcribing phase, all names and sensitive data were taken out to ensure anonymity. When referring to the participants in text, pseudonyms are used. After the interviews were transcribed and analyzed, the recordings were deleted immediately.

The positionality of the researcher can directly influence how the research is conducted and how results are interpreted (Hay, 2016). Differences in gender, sexuality, ethnicity, and class can impact the particular lens in which people view and interpret the world. In relation to case study research, Flyvbjerg (2006) stated that it is important to tell stories in its diversity by giving a multi-sided, complex, and sometimes conflicting account. By doing so, readers from different backgrounds can make their own interpretations and draw diverse conclusions. This research tries to imitate that by allowing the results to generate different meanings for someone with a different identity.

When reflecting on positionality, the researcher is a 22-year-old white female with both Dutch and American citizenship. During her adolescence, she grew up in the United States, Philippines, Qatar, Dubai and the Netherlands. The strength of having an international upbringing, as well as a Dutch and American background, allows the researcher to have an open-minded perspective and an understanding for how different cultures operate. In regards to this research, the researcher did not have any personal involvements with the Big U or ESCR project, which makes the researcher an outsider. The advantage of being an outsider in this research is that participants may make more of an effort to clearly articulate events, circumstances and feelings. However, the potential disadvantages include not sharing the same outlook of the world, thus having interpretations that may be less reliable. In addition, it may be more difficult to establish rapport with the participants. Therefore, a document analysis will try to minimize the disadvantage of being an outsider by providing information written by actors and stakeholders who were part of the competition and projects.

4. Results

In this chapter the results of the thematic analysis are displayed. As mentioned previously, four key informants were interviewed who had varying levels of involvement with the projects. The participants also had different roles, national affiliation, and were part of different organizations. To illustrate this, table 1 shows an overview of the characteristics of the participants.

Table 1: Overview of research participants (Author, 2022)

Participant number	Role or function	Organization	National affiliation	Associated project
Participant 1	Chair	Community board	American	ESCR
Participant 2	Big U design team member and landscape architect	Rebuild by Design and One Architecture & Urbanism	Dutch	Big U and ESCR
Participant 3	Urban designer	One Architecture & Urbanism	American	ESCR
Participant 4	Big U design team member and civil engineer	Rebuild by Design and ARCADIS	Dutch	Big U and ESCR

From the thematic analysis, the four most prominent themes identified were: 1) catalysts for boundary spanning, 2) activities, skills and behaviors, 3) inhibiting and enabling factors and 4) community engagement. Under the main themes, sub categories were identified to create a holistic narrative of the interviewees' experiences. To illustrate the themes and form a narrative, quotes from the interviews were used, as well as information provided from the document analysis.

4.1. Catalysts for boundary spanning

From the analysis three main catalysts for boundary spanning were identified: a natural hazard, leading figures and design as an instrument to stimulate resilience. During the interviews it was explained that Hurricane Sandy was imperative for “galvanizing support” and “prioritizing funding”. According to participant 4,

> "We need disasters, as unfortunate as it is, and we need a response. Because the one in the US can't do without the other."

Hurricane Sandy was explained to have created a "window of opportunity" and a mindset that this will never happen again. In the period after the storm, Obama created the Hurricane Sandy Rebuilding Task Force, headed by Secretary of Housing and Urban Development (HUD) Shaun Donovan. At the same time, the government in New York City expressed their interest in the Dutch Delta Approach. This resulted in a bilateral partnership being initiated by former HUD secretary Shaun Donavan and Henk Ovink. The partnership between Henk Ovink and Shaun Donovan developed when Donovan was in Germany and Ovink invited him to the Netherlands to see the Dutch flood management systems (Willner, 2016). During this meeting, Ovink expressed his desire to work for Donovan to help bring a Dutch perspective into the recovery process (Willner, 2016). As a result, Donovan contacted the Minister of Environment and Infrastructure and received the approval to loan Ovink to HUD (Willner, 2016). Then on June 20, 2013, the Rebuild by Design competition was launched, spearheaded by Shaun Donovan and Henk Ovink (The Rockefeller Foundation, 2014). When the interviewees looked back on how the Rebuild by Design competition began, one interviewee said,

> "Post Sandy, when Mr. Shawn Donovan, was brought to the Netherlands, and shown all the water management highlights by Henk Ovink, that triggered a sense of, you know, we have success in our own hands (...) And so if people see how others have taken that destiny in their own hands, and crafted a strong response, that is exactly what Henk did in the Netherlands, and it shows that you need to bring people to the Netherlands and people from the Netherlands to the US to really make that click." (Participant 4)

Similar to the response of Hurricane Sandy, in 1953 the Netherlands experienced devastating floods which resulted in a commitment being made that the Netherlands would be safe. In the decades that followed, an institution has been developed with the formation of the Delta Commission. This percolated into other sectors of Dutch society, to the point where "everyone has an uncle or a brother, or whoever, that is doing something with keeping our system up and running." (Participant 4). Water management became rooted in the institutional context of the Netherlands, which has been solidified by funding. As a result, the paradigm shift from fighting to living with the water allowed flood resilience policies to become more adaptive. This shift in thinking was explained to be a useful component of the Dutch Delta Approach, which has been transferred to other regions.

As mentioned previously, the Rebuild by Design competition was heavily focused on the role of design during disaster recovery. In an interview with a design team lead, he explained that before his involvement with Rebuild by Design, he already saw the huge potential design could have,

> "I was hanging out at an Amsterdam bar with a Danish architect, and we were looking at the TV, at what Sandy had caused, and we were thinking, design has a role here. (...) I think designers are pretty good at connecting and creating more collective stories and understandings. And so, from that perspective, he said, well, if the opportunity arises, we should maybe collaborate on this. A couple weeks later I was traveling with Henk Ovink (...) I was sitting next to him on the plane and I spoke about this conversation and he said, that's interesting, I just had the HUD secretary visit, wouldn't it be cool if, indeed, we could, in some way, all get involved. And then I think a couple months later, February or March, there was an official Dutch mission." (Participant 2)

In an interview with Ovink, it was reflected that leadership alone does not provide a framework for how to set up a collaborative process and how to link policy-makers and the community together (Bakema & Restemeyer, 2017). According to him, design creates opportunities for a collaborative and inclusive process that helps build alliances needed to realize change (Bakema & Restemeyer, 2017). As a result, Rebuild by Design acted as a catalyst for creating the opportunity to test, explore and exploit the value of design in resilience building processes. According to most interviewees, Rebuild by Design achieved in creating an iterative design process that allowed for multi-level stakeholder engagement and innovation.

> "I think these competitions are really fostering processes. And I think Rebuild by Design did a great job. I think our team did a great job and made the competition process as interactive as possible with all the different stakeholders." (Participant 2)

On the other hand, Ovink made clear that Rebuild by Design is not an approach that can simply be copied to a different context (Bakema & Restemeyer, 2017). Instead, a tailor-made approach, together with the support of strong leaders, is needed. Additionally, in an interview with participant 4, it was stated that natural hazards or extreme weather events should not be the main catalyst for a response. According to him,

> "We need to get beyond that. And in front of that, otherwise, you know, it's like a self-fulfilling prophecy. We are constantly behind the ball."

4.2. Activities, skills and behaviors

During the interviews it was found that connecting different people and translating information were key activities performed. To participate in the Rebuild by Design competition, teams had to be formed. When describing this process, most participants mentioned the value of working with people's strengths. It was explained that, "you form your team with different mindsets" and "you need to work with all voices and qualities" (Participant 4). According to Ovink,

> "When do things go wrong in the world? When everyone sticks to their own ivory tower. When do good things start to evolve? At the moment, you bring different parties together" (Bakema & Restemeyer, 2017, p.254).

Connecting with people came hand in hand with translating information across the boundaries. In an interview with participant 4, it was noted that one of the biggest challenges is communicating plans to a versatile audience. Since projects concerning Adaptive Delta Management take time to implement, he said,

> "There's a general understanding that we need to do x, that has not changed, but the way it takes shape continues to see new voices and new faces. Which is challenging for the industry (...) But that doesn't keep us from continuing to educate. So, we constantly need to bring these perspectives forward and connect with people. So, this year, it's 10 years post Sandy. We need to continue to be out there and talk to the people and listen to them." (Participant 4)

Listening was a skill that all participants mentioned as being the most valuable. Since the Big U and ESCR is rooted in multi-stakeholder engagement, listening to the different viewpoints of the various disciplines, the different ways of thinking and understanding where each constituency is coming from was very important. In doing so, participants said that it enabled the building of trust, legitimacy, understanding and common ground. In an interview with participant 4, it was explained that building common ground allowed for opportunities to advance a conversation forward. It also created space for people to be open to being redirected in their thoughts and opinions. Participant 1 mentioned that,

> "A lot of the strongest voices are people from the public who are upset about something. And I think (...) it's also important as a leader (...) to also steer the public in the right direction, when they may be wrong. So, it's not just about following orders from the public, but about hearing them, considering their thoughts and then directing them in the right way if they happen to be off course."

Additionally, appearing vulnerable by being transparent, asking questions and being honest allowed for boundaries to be broken. Participants explained that in doing so, it stimulated better communication and decision making. This was described by participant 4 who said,

> "You should ask for feedback. (...) And it's tricky. It's not easy. So, it's holding a mirror to yourself and exposing your uncertainty and asking questions. That's really key. That's like, if you don't show that uncertainty and pretend that you know it all, then you know, you are in your own trap. That's bad and will lead to bad decisions."

In another interview, a participant described the hardships he went through being a first generation American with parents who immigrated from India. Growing up, he experienced poverty and homelessness. This experience allowed him to have an affiliation to issues associated with education or affordable housing. As a result, when working on these issues within the community board he said,

> "I have a personal connection to it. And I have a story behind it. And when I'm coming in and working with other parties, I share that with them. I guess its vulnerability, right. (...) So it gives a sense of legitimacy, but also understanding." (Participant 1)

To summarize, creating a sense of understanding is a common goal for all interviewees. When connecting with people and translating information, listening was a very valuable skill. Furthermore, it seems that being vulnerable can help break down the barriers between stakeholders to foster an open conversation and collaboration. Being vulnerable also allows for transparency. By showing uncertainty and being open to feedback, it creates an environment for better decision making.

4.3. Inhibiting and enabling factors

The Rebuild by Design competition was heavily focused on an iterative process that differed heavily from a traditional approach to disaster recovery. In an evaluation report, it was noted that the traditional approach is to "act like there's no time to design," however Rebuild by Design was "piloting how thoughtful design can be used efficiently." (The Rockefeller Foundation, 2014, p.9). This model created opportunities for innovation, community awareness, multi-stakeholder engagement, and inspired new ideas for building resilience (Grannis, 2016).

Unfortunately, when the design became reality, it seemed that there were obstacles that the process did not account for. In an evaluation report, it was mentioned that the model did not establish a clear administrative plan prior to execution (The Rockefeller Foundation, 2014). This could have been attributed to the fact that the vision for Rebuild by Design was more aspirational than operational. According to participant 2, "There were all kinds of contractual issues, obstacles, hiccups, that prevented the RBD outcome from being implemented". Along the same lines, participant 4 mentioned there were procurement rules that needed to be considered, but were not.

After the competition and the winning design proposals were known, funds to implement the projects were allocated by HUD to state and local grantees (Grannis, 2016). These grantees are currently turning the conceptual designs (developed by the multidisciplinary design teams) into capital projects (Grannis, 2016). However, the institutional and governmental processes (e.g. cost benefit analysis, permitting, and procurement) are not well equipped to deliver such big and ambitious projects (Grannis, 2016). One challenge that grantees are currently facing is a funding

gap. The funding allocated by HUD to the grantees was just a fraction of the total budget stipulated in the proposal. As a result, difficult choices are being made in regards to how to scale and scope the ideas envisioned by the proposal into a feasible project (Grannis, 2016).

Additionally, the evaluation found that the intensity of the compressed timeframe of the competition was taxing. In ten months, several activities had to be completed, which included research, design development, media outreach and community engagement (The Rockefeller Foundation, 2014). Typically, this process takes a minimum of two years, however this was compressed in a time frame of 10 months (The Rockefeller Foundation, 2014). Furthermore, there was a lack of a clear project "prize" (The Rockefeller Foundation, 2014). The scope of the final project budget and the competition award were unknown. Therefore, an interviewee said, "In retrospect, this is not how it could happen again. We would simply not volunteer." (Participant 4)

Although the Rebuild by Design competition created a better approach to disaster recovery, it was found that the model needed to take the local context into more consideration. The lack of institutional support for increasing Adaptive Water Management in America was noted to be a strong inhibitor. According to participant 4, "We (Americans) don't have policy, we have intentions". The American mindset was described as being very atomized. According to participant 2,

> "Everyone just takes care of their own territory, of their own budgets… and in the city or agencies of the city, they have no interest or instinct for collaboration. (...) instinctively, they don't have it. It's just not in their system."

When asked how the DDA could help alleviate these challenges, participant 2 described certain aspects of the DDA that could be useful:

> "An ability to build consensus, the ability to collaborate, ability to think through systems, those can be physical systems, or social systems or the interplay between those."

On the other hand, policy transfer was met with skepticism and contention from both American and Dutch interviewees. In an interview with participant 3, it was explained that the Dutch fly all around the world to explain how to manage water related problems, however in regards to the New York context he said,

> "We are beyond the platitudes that someone flying in from the Netherlands can offer. There are certain parts of the country that are only now starting to wrestle with these ideas, and I think I see that's where, the kind of like Dutch dialogues programmes or so forth are focusing. Because I think the expertise is most appropriate in that early stage of

> just like, hey, there's a different way that we can think about this stuff, a different paradigm. It's about changing the paradigm. It's less about execution. Because when it comes to execution, the context of the situation is highly unique. And not all that transferable."

When reflecting upon the people who translate the DDA, participant 2 said,

> "I think many of our Dutch colleagues, because they have been in the Dutch knowledge management service for a long time, have (...) colonialistic thinking in the sense that they sort of want to sort of tell the others what to do, without having enough reflection on the culture. That doesn't work."

The interviewee explained that the Dutch are maybe experts of only 3% of the puzzle. Therefore, there was an emphasis that more reflection is needed in regards to how stakeholders can adapt themselves to the specific context that they work in. According to an interview with Henk Ovink, being sensitive to contextual and cultural factors is very important (Bakema & Restemeyer, 2017). Consequently, it was suggested that the DDA should only be used as an inspiration, and used in a case specific way that considers the cultural and contextual characteristics of a region (Bakema & Restemeyer, 2017). To end this subchapter on a quote by participant 4,

> "It's a signal that we do need that institutional context to lead these kinds of efforts. It cannot be that a Dutch man, with all his fantastic energy and good intentions, and network and charisma should lead these kinds of efforts."

4.4. Community engagement

The ESCR was the most "extensively engaged, sensitively planned community engagement of any New York City project" (Participant 3). In the interviews, it was explained that the approach taken to engage the public was by networking in the public housing and appointing at least one person as a spokesperson of the community in that building. That person was given flyers to help tell all the residents about the developments of the project and incentivize neighbors to come to the public sessions. What came out of this process was five years of continuous engagement. In the evaluation reports, it was found that the involvement of the community in the iterative design process has led to better projects with stronger public support (Grannis, 2016).

In the interviews and during the walking interview, it was mentioned that a large part of ESCR will involve the temporary closure and reconstruction of East River Park (Appendix VI). According to the website of the New York City Department of Design and Construction, it is expected that the project will create a system of raised parkland, floodwalls, berms and movable floodgates (Michaels, 2021). However, a particular group in the community is strongly against

these plans. During the walking interview, numerous posters were seen around East River Park showing great dissatisfaction with ESCR (Appendix VII).

When delving deeper into the root causes for dissatisfaction it was found that in 2018, the City announced that the ESCR Plan would involve the demolition, elevation, and reconstruction of East River Park (Bruce et al, 2021). Previously the Big U design advised for a system of berms and deployable floodgates. However, the sudden change in plans caused an uproar in the community. Community residents felt that the five years of community engagement was essentially thrown away without explanation (Bruce et al, 2021). In a reaction to this, a group called East River Park Action was formed in opposition to ESCR in 2019 (Bruce et al, 2021).

When reflecting upon the community that is opposing the plans for ESCR, one participant mentioned that communities are not homogeneous entities, and should never be considered as such. Instead, "A community is always many different communities" (Participant 2). Therefore, a project like the ESCR can cause contesting thoughts and opinions from different people within a community. When describing the communities that have and have not been involved in the Big U and ESCR projects, participant 2 explained,

> "One is the community that we have been working with all along, who need this protective system, because their lives depend on it, and they don't have the resources to survive disasters. And then there's another community that are sort of White, older, richer, living a bit further away, but do use the park, who are very much against this project, because they like the park as it is now. During storms, they go to their country houses. They want to live to experience the worst of the climate crisis. So they'd rather keep the park intact. (...) But that's so heartbreaking that there's a schism in the community. But that's one of the things that we learn to adapt to." (Participant 2)

Learning to adapt to contesting thoughts and opinions by the public was also brought up by participant 4 who said,

> "I've attended many, many meetings, and we thought we had it figured out and now there's a new group of stakeholders popping up requesting and demanding that we go back to the drawing board because they don't agree with the solution. (...) it triggers our awareness that adaptation is not a done deal when the designs are done."

In a report about ESCR and during the interviews, it was explained that once the Big U design proposals were handed over to the City agencies for implementation, it exposed communication breakdowns. As mentioned previously, Rebuild by Design was a novel framework for community engagement. However, City agencies have been accustomed to a different process framework, with varying technical, financial, and political needs (Bruce et al, 2021). As a result,

the plan was adjusted, and the publication of a new ESCR plan created a "huge schism within the community and generated a lot of sense of betrayal" (Participant 3). According to an interviewee,

> "They feel like, you know, we've been working with you guys for several years, you know, we thought we had an agreement, and then the city all of a sudden, turns their back around and is deciding certain things had to be different." (Participant 3)

The sudden change in plans revealed that there is a barrier between stakeholders from Rebuild by Design and City agencies, creating a rift in the communities. As a result, the role boundary spanners can have in this scenario is highlighted, providing evidence for the need of people skilled at bridging this gap and alleviating challenges.

5. Discussion

Boundary spanners perform three key activities: connecting different people and processes, selecting relevant information, and translating information across the boundaries (Leifer & Delbecq, 1978; Tushman & Scanlan, 1981; Van Meerkerk & Edelenbos, 2018). When analyzing the four semi-structured in-depth interviews, it was found that the main boundary spanning activities performed were connecting people and translating information across the boundaries. Connecting with people happened both during the initial stages of the design competition when teams were formed, but also during the project development stage when stakeholders had to be engaged, especially local communities.

Additionally, literature stresses that trust stimulates cross-boundary partnerships (Klijn et al., 2010; Williams, 2002). According to Van Meerkerk & Edelenbos (2015), trust develops in informal network structures. When applying this to the Rebuild by Design competition, the partnership between Henk Ovink and Shuan Donovan occurred through a spontaneous meeting, outside of their formal network structure. This became a catalyst for the Rebuild by Design competition, where leadership played a key role in translating and bridging the informal networks with formal decision-making structures and policy processes, as described by Edelenbos and Klijn (2007).

In research conducted by Van Meerkerk and Edelenbos (2018), bringing diverse opinions, values and interests into a new landscape design is challenging. On the one hand, the Rebuild by Design competition showed a successful framework for engaging the community in an iterative design process. According to the interviewees and document analysis, the Big U and ESCR project experienced five years of continuous engagement with the local residents in order to translate the plans effectively. On the other hand, similar challenges, as outlined by Van Meerkerk and Edelenbos (2018), were experienced during the implementation of ESCR. While community engagement was an integral component to the projects, a particular population still felt strongly

opposed to the rebuilding of East River Park. The root cause for this opposition could be attributed to the broken communication and lack of transparency when the design proposals were taken up by the City agencies. As a result, boundary spanning does not stop when an event, like Rebuild by Design, has been concluded. It should be a continuous activity that is performed at the planning and implementing stage of a complex urban water project.

6. Conclusion

The purpose of this research was to gain an understanding of the experience's stakeholders associated with the Big U and ESCR project have to understand the role of boundary spanning. Thus, the research question was, 'How do actors perceive or experience boundary spanning during Adaptive Delta Management?'. To investigate this, the DDA was chosen as an example of a policy that stems from Adaptive Delta Management. The DDA originated from the long-standing history of dealing with flood threats from the sea and rivers. The paradigm shift from fighting to living with the water, by integrating water management with spatial planning, allowed flood resilience policies to become more holistic and adaptive. Over time, the Dutch created a knowledge base on Adaptive Delta Management that they could transfer to more vulnerable deltas through policy transfer. An example of this was when Henk Ovink brought in the Dutch perspective and kickstarted the Rebuild by Design competition in New York City after Hurricane Sandy. The outcome of the competition was the Big U design proposal, and consecutively the ESCR project.

From the four in-depth interviews and document analysis it was found that the catalysts for boundary spanning were a natural hazard, leading figures and design. When comparing this to the conceptual framework, it can be suggested that instead of boundary spanners being the link that connects the two contexts together, they are instead the catalysts for stimulating change and policy transfer. Therefore, the model should be adapted in light of these findings to produce a more accurate representation of boundary spanning.

In terms of the skills and behaviors necessary to perform boundary spanning activities, listening and being vulnerable were very important. Listening enabled the building of trust, legitimacy, understanding and common ground. As a result, opportunities arose to advance a conversation forward. It also created space for people to be open to being redirected in their thoughts and opinions. Furthermore, appearing vulnerable by being transparent, asking questions and being honest allowed for boundaries to be broken, stimulating better communication and decision making.

The barriers that were mentioned to be inhibiting included procurement and contractual regulations, strict timeframes and funding. Since the emphasis of the Rebuild by Design competition was on the process of creating resilient designs instead of the specific requirements, many institutional elements were not considered. As a result, the translation of vision to reality

became a difficult task. It was found that once the designs were handed over to the City agencies, a few discrepancies were made between the original design and the ESCR plan. As a result, communities felt that their participation was being neglected, resulting in feelings of betrayal and distrust.

In regards to policy transfer of the DDA, it was found that most interviewees were skeptical of the approach. During the interviews it was explained that the DDA was not well met in New York City. The lack of institutional structures in New York City inhibits the implementation of the DDA. While Dutch emissaries advertise themselves as experts of water management, the interviewees described it as colonialist thinking and untransferable. Furthermore, the limited contextual knowledge that the Dutch have of other vulnerable deltas reduces the DDA from being useful in other contexts. As a result, interviewees explained that the DDA is most effective in the initial phase of changing the paradigm of living with and anticipating future climatic hazards.

To conclude, Rebuild by Design can be seen as a framework that was facilitated and led by boundary spanners. The competition was characterized by ambiguity, multi-stakeholder engagement, and community participation to create an institutional space to imagine a more resilient city. The success of the competition was shown by the six winning proposals that have begun to be implemented, such as the ESCR. The lessons learned from New York City can inspire other regions to create a platform for co-creation of a resilient city. However, it is stressed that policies that a city employs to manage their deltas must align with the local context, which is influenced by physical conditions, institutional frameworks and social conditions.

Several broad policy recommendations can therefore be advised. Firstly, urban water projects should involve different perspectives, actors and solutions. Secondly, there is a need to embrace uncertainty in order to remain flexible and innovative. Thirdly, social actors should have opportunities to continuously learn and improve their institutions. Finally, flood resilient policies should support principles of good governance, specifically by having public engagement that allows for co-creation.

In terms of future research, it is suggested that boundary spanning be investigated through participant observation. Unfortunately, Rebuild by Design was an event that had already occurred in the past. Therefore, this research relied on the memories and experiences of participants, as well as documents that were not written with the sole purpose of investigating boundary spanning. By conducting a study on boundary spanners using participant observation it increases researchers' proximity to the studied reality. In doing so, researchers can investigate first-hand what boundary spanning looks like in practice. Furthermore, all participants that were interviewed were male. It could be insightful to investigate the role gender might play when performing boundary spanning activities.

7. References

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7. Appendix

Appendix I: Interview Guide

Introduction

- Could you please introduce yourself?
- How do you define your role within _____?
- For how long have you been part of _____?
- How did you get involved with the Rebuild by Design competition?
- What were your responsibilities and tasks?

Topical questions

- Could you tell me about your experience working on the ESCR?
- How did you perceive the collaboration between the various stakeholders? (what makes it a smooth process?)
- How do you perceive the decision-making process?
- How do you perceive the collaboration between the Dutch vs American culture?
- What kind of skills are needed when working with different stakeholders from various backgrounds?
- What kind of behaviors are needed when working with different stakeholders from various backgrounds?
    - Are there certain conditional factors that are needed? If so, what are they?
- Could you tell me about your personal skills or behavior that enabled you to work efficiently?
    - How did you develop these skills?
- What are the barriers that hinder collaboration?
- What are the enabling factors that allow for effective collaboration?
- What other projects or experiences have you been involved in that could have prepared you for this project?

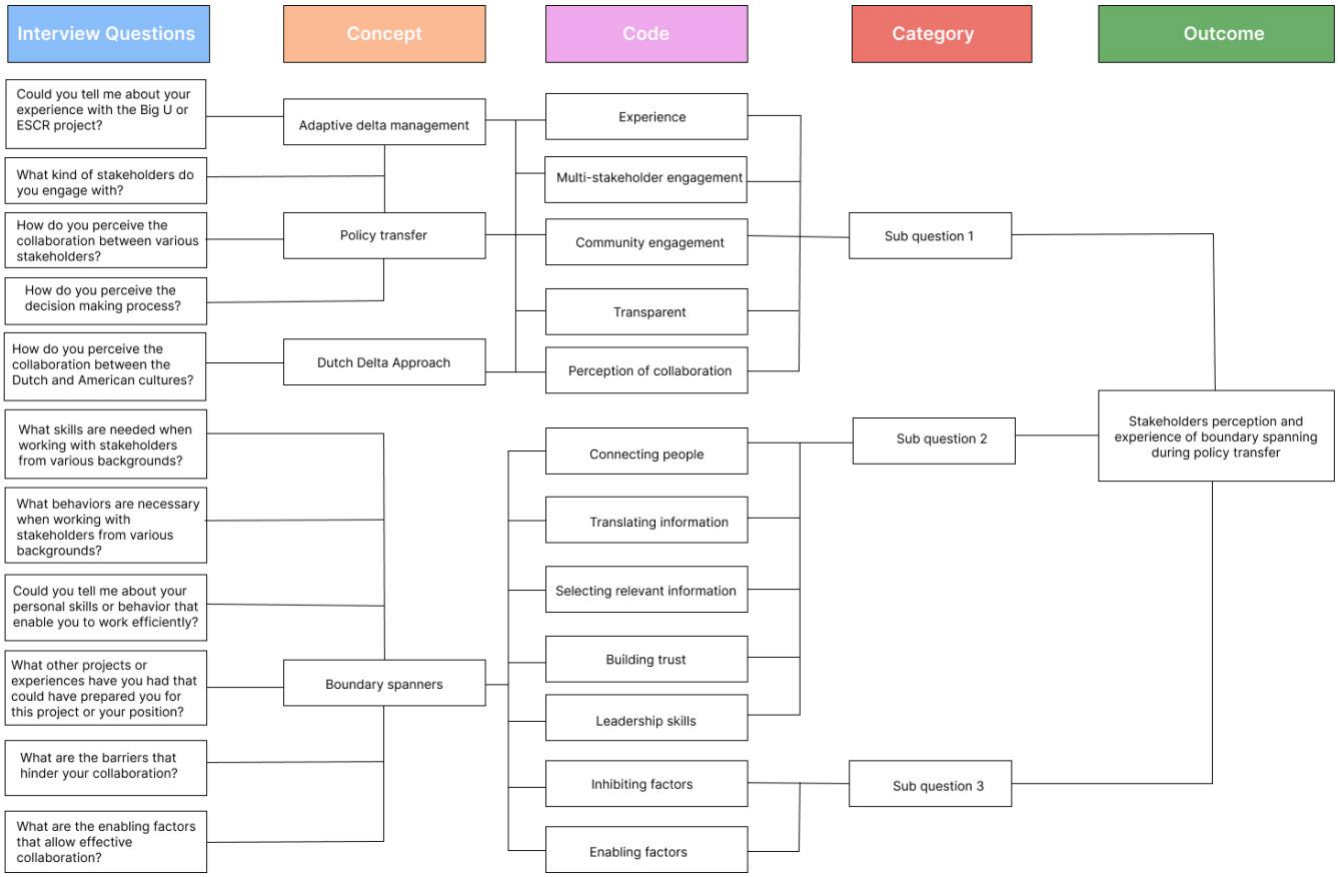
Closing questions

- What are some key lessons that you have learnt while being part of complex climate related projects?
- Would you like to add or mention anything else in the interview that we have not covered?

Appendix II: Document analysis

Document selected	Document type	Data analyzed
The Rockefeller Foundation (2014). *The Evaluation of the Design Competition of Rebuild by Design: an Initiative of President Obama's Hurricane Sandy Rebuilding Task Force and the U.S. Department of Housing and Development*. New York City: Urban Institute, pp.1–80.	Evaluation report	Document provides background information about the Rebuild by Design competition and the evaluation of the process.
Grannis, J. (2016). *Rebuilding with Resilience Lessons from the Rebuild by Design Competition after Hurricane Sandy*. New Jersey: Georgetown Climate Center, pp.1–107.	Evaluation report	Document provides the lessons learnt in regards to the Rebuild by Design competition.
Bakema, M. M., & Restemeyer, B. (2017). Resilience in practice - A transformative approach? A conversation with Henk Ovink, first Dutch special envoy for international water affairs. In E-M. Trell, B. Restemeyer, M. M. Bakema, & B. van Hoven (Eds.), *Governing for Resilience in Vulnerable Places* (1st ed., pp. 244-255). Taylor and Francis Ltd.	Interview	Document provides insights into Henk Ovinks role, experience and ambitions within water management as Dutch Special Envoy for International Water Affairs
Willner, M. S. (2016). *Exporting Resilience: Evaluating US-Netherlands Collaborations Aimed At Enhancing Flooding Resilience in New York City and New Orleans*. Master Thesis, Massachusetts Institute of Technology, Massachusetts.	Report	Document is a study on the policy transfer between New York City and the Dutch government
Bruce, F., Freire, C., Guttieres, T., Izarra, T., Mulgaonkar, P., Ryan, C., Saunders, E., Siringo, L., Sonnemann, S. and Wasserman, A. (2021). *East Side Coastal Resiliency Studio*. New York: Hunter Urban Policy and Planning, pp.1–54.	Research report	Document provides a study on the ESCR case with viewpoints from East River Park Action

Appendix III: Deductive code tree



Appendix IV: Inductive code book

Code	Example quote	Comment (if not clear)	Category
Activism	“People don't like trees to be cut for water safety.”	Referring to East River Park Action	Sub question 3
Vulnerability	“If you don't show that uncertainty and pretend that you know it all then you know, you are in your own trap.”	Referring to being vulnerable	Sub question 2
Institutional context	“It was a close call, you know, and it's, again, a signal that we do need that institutional context to lead these kinds of efforts.”	Referring to the Rebuild by Design competition	Sub question 1 and 3

Appendix V: Information letter and consent form

INFORMATION LETTER

Boundary Spanning during Policy Transfer of Adaptive Delta Management

Purpose of this study

Thank you for your interest in participating in this research. This letter explains what the research entails and how the research will be conducted. Please take your time to read the following information carefully.

The purpose of this research is to study the experiences of individuals who work in or are associated with the field of adaptive delta management. Using the Big U and East Side Coastal Resiliency as a case study, the aim is to identify specific roles, skills and behaviors that enable collaboration amongst various stakeholders to achieve a certain outcome. Additionally, the study tries to understand how integrated flood policies are co-created through the lens of policy transfer. Since you have experience in this field, you are being asked to take part in this study. If you have any questions or need more information, do not hesitate in contacting me.

What does participation involve?

You are being asked to participate in an interview that will last between 40-60 minutes. During the interview, you could be asked questions about your work experience, your role in the Rebuild by Design competition or your experience with implementing the East Side Coastal Resiliency. Furthermore, the goal of the interview is to reflect on what skills and behaviors are important in this field, as well as the enabling and constraining factors.

Do you have to participate?

Your participation in this study is voluntary. This means that it is completely up to you to decide whether or not you want to take part in this research. Once you have decided to take part in this study, you are still free to withdraw at any time, without having to give a reason. If you withdraw from the study, your data will be destroyed, no questions asked.

Are there any benefits to participating?

There are no direct benefits in participating in this research. However, the results of the interview may contribute to further knowledge on how to navigate through complex planning processes of urban water projects. This could potentially benefit policymakers about resilient flood management in vulnerable deltas.

How will information you provide be recorded, stored and protected?

During the interview, a voice recorder will be used in order for transcriptions to be made. The recorded interview will be protected on a device under lock and code, which is only accessible by the researcher. Once the interview has been transcribed, all raw data will be deleted immediately.

Your responses to the interview will be kept confidential. During the transcription of the interview, your name and any other sensitive information will be removed. When mentioned in the thesis, you will be given a pseudonym to ensure that you are not traceable.

What will happen to the results of this study?
The results of this study will be used to write a thesis. It is still up for discussion whether the thesis will ultimately be published, however you will be informed in advance in case you want to withhold your contribution from being published.

Informed consent form
If you decide to participate, you will be asked to sign a consent form. This consent form is to make sure that all parties understand how the data will be used and that the research is done ethically. Once you have signed the consent form, you are still free to withdraw from the research at any time, without having to give a reason.

INFORMED CONSENT FORM

Assessment

- I have read the information sheet and was able to ask any additional question to the researcher.
- I understand I may ask questions about the study at any time.
- I understand I have the right to withdraw from the study at any time without giving a reason.
- I understand that at any time I can refuse to answer any question without any consequences.
- I understand that I will not benefit directly from participating in this research.

Confidentiality and Data Use

- I understand that none of my individual information will be disclosed to anyone outside the study team and my name will not be published.
- I understand that the information provided will be used only for this research and publications directly related to this research project.

Future involvement

- I wish to receive a copy of the scientific output of the project.

Having read and understood all the above, I agree to participate in the research study

Date

Signature

To be filled in by the researcher

- I declare that I have thoroughly informed the research participant about the research study and answered any remaining questions to the best of my knowledge.
- I agree that this person participates in the research study.

Date
Signature

Appendix VI: Community advisory about closure of East River Park

Appendix VII: Picture taken of posters demonstrating against ESCR