Developing Floating Communities

A comparative research to examine flood resilience in cities, considered from an institutional capacity approach

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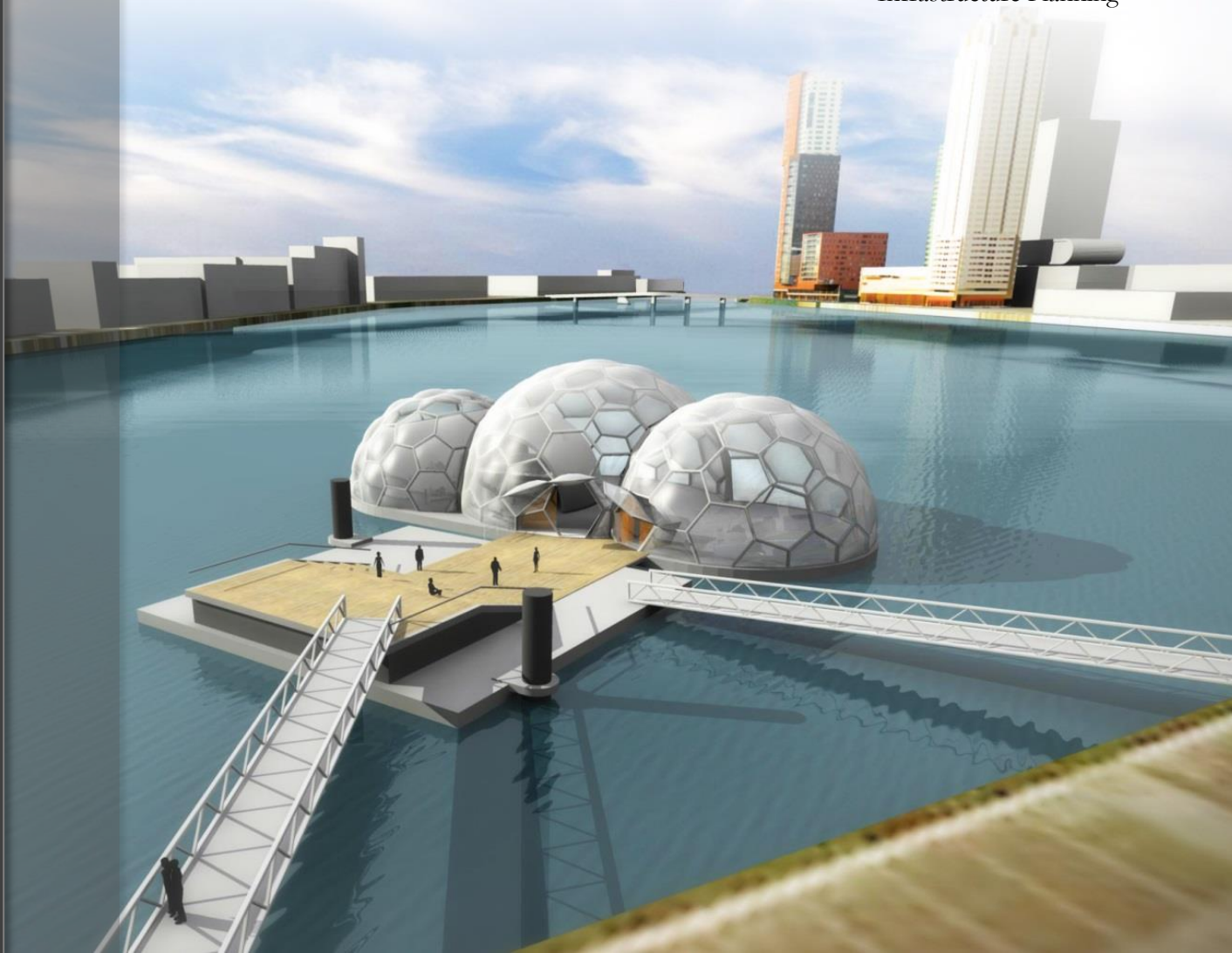
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Abstract

In the face of climate change coastal cities have to rethink their approach towards flood risk management. To enable cities to cope with flood risk, a combination of both technical and social measures is needed to prepare the urban fabric to the event of flooding. These measures are needed to reduce the vulnerability of local communities and making cities more resilient when a flood actually occurs. The capacity of the local community to cope with flooding determines the resilience of a place; this brings forth the role of institutional capital in the scope of flood resilience in urban systems. However, there is a knowledge gap, because for years the focus of flood risk management has been on the resistance of flooding, and there is still a lack of knowledge that enables the shift towards flood resilience. Therefore new government arrangements are needed that emphasise importance of the institutional capital to govern for flood resilience, in the form of intellectual, social and political capital. One of the concrete examples to make coastal cities more resilient to flood is the development of floating communities. These floating communities are, amongst others, being developed in the cities of London and Rotterdam. These two cities provide case studies to assess how institutional capital can contribute to govern for flood resilience in urban areas.

Lessons can be learned about how institutional capital is being used in the development process. The results of both cases show that political capital is the main driver behind development of floating communities. The political capital mobilizes action to start developing the communities. However, there is a discrepancy between the Dutch and the British cases when it comes to social and intellectual capital. In the London case there is a lack of these two capitals, which stands in contrast with the Rotterdam case, where social and intellectual capital are indeed available and being incorporated in the development of the floating communities. Lastly, incorporating the notion of flood resilience is not considered an impetus to develop floating communities; however flood resilience does provide opportunities for economic development, and it should therefore be incorporated in the development process.

Keywords: *Institutional capital, flood resilience, floating communities, flood risk management, harbour regenerations, climate change*

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In front of you lies the product of a yearlong dedication to finish the Master programme Environmental and Infrastructure Planning at the University of Groningen. This thesis is the product of blood, sweat and tears. But above all, it is a product of my journey through university. It was a journey that gave me joy, motivation, sometimes frustration, sleepless nights, new friends, challenges and heaps of inspiration. I have learned to love studying, organising activities and working together with others. This journey expanded my horizons and led me through Mexico, Germany, China and the United Kingdom. Places where I have done my research projects and where I met amazing new people who have taught me so much.

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Myrthe Leystra
Groningen
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List of abbreviations

AOD   - Above Ordnance Datum

C40   - C40 Cities Climate Leader Group

CAQDAS   - Computer-Aided Qualitative Data Analysis Software

CDC   - Connecting Delta Cities

CTD   - Clean Tech Delta programme

ExCeL   - Exhibition Centre London

GLA   - Greater London Authority

HU   - Hermeneutic unit

RDM Campus - Rotterdamsche Droogdok Maatschappij (now part of Hogeschool Rotterdam campus)

RoDMA   - Royal Docks Management Authority

RSoA   - Royal School of Architecture in London

TE2100   - Thames Estuary 2100 Plans

TU Delft   - Technical University Delft

UNESCO-IHE- UNESCO Institute for Water Education

Chapter 1

Introduction

The world is rapidly urbanising in the last couple of centuries, to the extent that nowadays more than half of the world's population lives in urban areas and this will increase up to 60% of the world's population living in cities by 2030 (Grant, 2008; Annez and Buckley, 2009). Cities are often located in low-lying areas directly at the coastline or near mouths of major rivers, and these locations serve the cities trade, economic growth and welfare. However these locations also put the cities to greater risk form natural hazards, such as flooding, storms and storm surges (De Sherbinin, Schiller and Pulsipher, 2007). In particular in the debates around climate change, hazards like flood risk need attention (De Bruijn, 2004; De Sherbinin, Schiller and Pulsipher, 2007). The notion of climate change is a popular contemporary discourse that is concerned with the possible effects of a worldwide change in temperature. There is scientific evidence that the global surface temperature will likely increase with 1.5 °C by the end of the 21st century, relative to the 1850-1900 period (IPCC, 2013). This rise in temperature may have severe consequences such as sea level rise, changing weather patterns and increased precipitation. These consequences of climate change increase the risk of floods in coastal areas and alongside rivers, or in other words; areas where cities are often located. Based on this scientific evidence, it becomes clear that new solutions are needed to enable coastal cities to cope with the changing climate and increased flood risk.

Spatial planning can provide solutions for urban areas that face flood risk, since planning is concerned with the distribution of people and activities in space. Spatial planning can for example provide solutions for land use, transport and urban planning in flood prone cities. Therefore there is a call for spatial measures to transform the urban fabric of cities to cope with increased flood risk, and an approach is needed that governs this transformation of coastal cities. There are several ways to cope with the increased flood risk. To understand this natural hazard however, a definition is needed. In this thesis, flood risk is defined as the chance of a flood times the consequence of a flood, whereby the consequences of a flood are determined by the exposure of property and communities times the vulnerability of property and communities (see figure 1). As can be seen in figure 1, in this equation specific attention is being paid to the exposure and vulnerability of property and communities, which in the event of flooding are most prone to devastation. It therefore becomes a necessity to examine how property and communities can adapt to climate change, both on land and on water, to increase the resilience and adaptivity of flood prone cities.
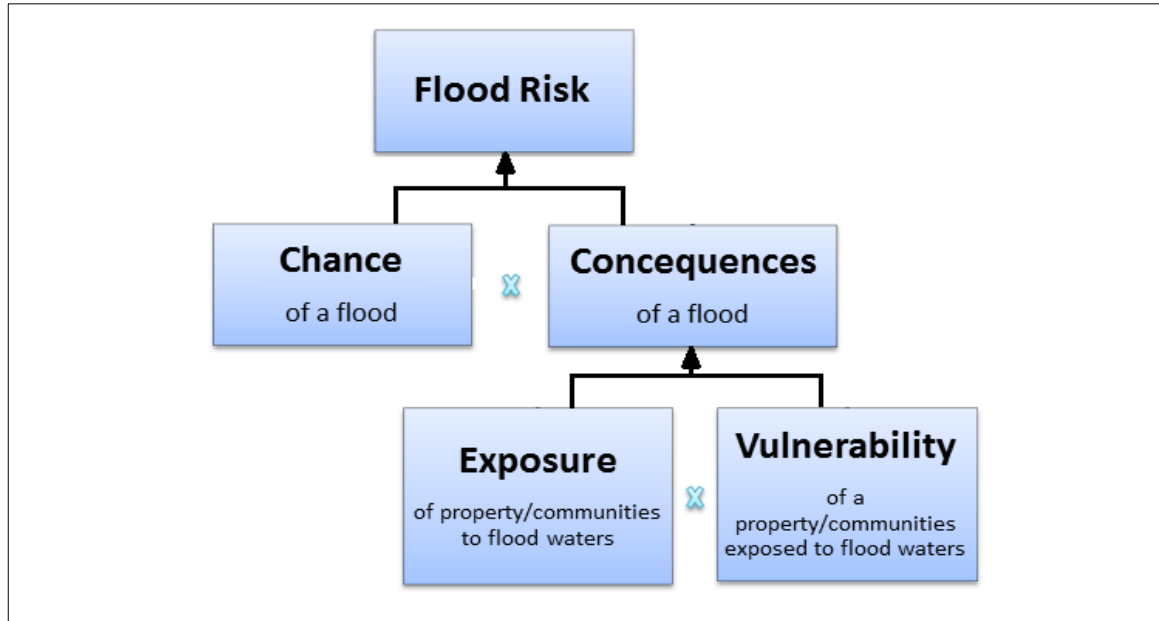
Figure 1: Flood risk equation. Source: chiefscientist.qld.gov.au

The development of property and communities that can withstand the effects of flooding can provide a solution for coping with flood risk (Meijerink and Dicke, 2008; Woltjer and Al, 2007). Examples of this type of development are, amongst others, amphibious property, floating development and even entire floating communities. The development of floating communities in particular illustrates a new approach into water management, namely the shift from resisting flooding towards accepting a degree of flood risk. This relatively different approach in water management emerged from awareness amongst researchers and politicians that it is better to 'live with water' than to 'fight water'; this means there is a shift in water management towards the concept of resilience (Meijerink and Dicke, 2008; Restemeyer et al., 2013). 'Living with water' becomes a more desirable approach, since it reduces the exposure and vulnerability of property and communities (see figure 1), whilst making them more resilient. In this way the consequences of a flood decrease. This thesis draws upon literature of Holling (1973 and 2001) and Davoudi (2012 and 2013) about the view of socio-ecological resilience, because it emphasises the interaction between the physical and human environment. This view of resilience fits most to the worldview of a spatial planner, since spatial planning refers to the methods used by planners to influence the future activities in space, with the aim of balancing demands for development with the need to protect the environment, and to achieve social and economic objectives (European Commission, 1997). The development of floating communities happens in both the physical and human environments, with for example engineering the floating structures on water bodies, as part of the physical environment, and encouraging economic development whilst reducing community vulnerability as part of the human environment. It therefore provides for an interesting case study about how resilience in cities can be improved.

In the planning of more flood resilient cities, the development of floating communities is a concrete example of adapting land-use to deal with increased flood risk. In the process of developing these floating communities, local institutional capacity can be used to increase the resilience of cities and communities, and make them more adaptable to flood risk (Restemeyer et al., 2013). Healey (1998) points out that it is this institutional capacity that plays an important role in governance and the spatial development in cities. In this case the development of floating communities has potential to contribute to flood resilience in cities. She also points out that the tasks of urban development shift from 'building places' to fostering institutional capacity in communities for 'place-making' activities (Healey, 1998, p.1531). This is why the focus of this thesis lies on the development of floating *communities*, consisting of residential property with public space and facilities that together create the living environment and not merely floating structures and property.

In academic literature usually three capitals are being distinguished that all contribute to the institutional capacity of communities, namely; 'intellectual capital', since knowledge about technical development is needed to develop floating communities and it is important to consider how this knowledge can being exchanged; 'social capital' is needed to examine the collaboration and social relations between stakeholders; and third, 'political capital' that emphasises the importance of political decisiveness of local authorities to make a change, or in other words to mobilize action (Healey, 1998; Khakee, 2002; Restemeyer et al., 2013). Because of the specific characteristics of the three capitals, they are useful for governing resilience in coastal cities.

1.1 Problem statement and research questions

As illustrated in the introduction, planners and developers are trying to create solutions for urban planning in the face of climate change. There is an increased awareness of the possible effects climate change can have on the urban environment and therefore governments are developing and redeveloping the coastal zones with a resilience regard. There is however a knowledge gap, because for years the focus of flood risk management has been on the resistance of possible flooding, and there is still a lack of knowledge that enables the shift towards resilience. The former focus mainly lied on taking technical measures to prevent floods from happening, such as heighten dykes and develop more storm surges (De Bruijn, 2004; Meijerink and Dicke, 2008). Though to increase the resilience of cities and communities new government arrangements are needed that emphasise the vital role played by the local community and private stakeholders. These groups are of great importance, as they determine the capacity of a local community to cope with flood risk and they can increase the adaptability and the resilience of a place (Adger, 2003). So to bridge the knowledge gap in the shift from resistance towards resilience, an approach is needed that helps to understand how the community capacity can be governed to increase the flood resilience.

To examine this community capacity, the concept of intuitional capital is being used to assesses how stakeholders are involved and what kind of capacities they possess (Restemeyer et al., 2013). To be able to make this assessment, it is important to examine what the motives for developing these floating communities are, for whom these communities are being built, which stakeholders are involved, and how the local authorities mobilize action. Political decisiveness, knowledge and social relations are important attributes to develop floating communities. The aim of this thesis is thus to create a conceptual framework to assess how institutional capital can be used to govern for flood resilient cities. It furthermore provides lessons that are drawn from the two cases studies, London and Rotterdam, where floating communities are being developed.

By making a comparison between the cities of London and Rotterdam, differences and similarities between both cases are being examined. This provides lessons for future development processes of floating communities. It creates a theoretical framework that adds to the wider scientific debate around creating flood resilient cities. Therefore the main research question that will be answered in order to achieve the aim of the thesis is the following:

"How can institutional capital be acquired to govern for flood resilience, analysing the development of floating communities in the cities of London and Rotterdam?"

Sub questions

- ❖ How can institutional capital be assessed in the development of flood resilient cities?

- ❖ What do the cities of London and Rotterdam do to develop floating communities, who are involved in the planning processes and how does this influence the planning process?

- ❖ What can London and Rotterdam learn from each other's approach towards governing institutional capital for increasing flood resilience in their cities?

1.2 Research approach

As mentioned above, the aim of the thesis is to provide a theoretical and conceptual framework that can be used for future development projects to increase the flood resilience in cities. This is done by making a comparison between the planning processes of floating communities in the coastal cities of London and Rotterdam. To answer the main research question, the theoretical concepts of flood resilience and institutional capital have been explored. On the basis of this existing literature about these concepts a conceptual framework is developed to assess resilience and institutional capital in practice.

By drawing on the literature of Holling (1973 and 2001), Davoudi (2012 and 2013) and others, three views of resilience, the engineering, ecological and social-ecological view, are discussed. The socio-ecological approach to resilience is used in this thesis, as it fits the worldview of the planner, because it shows the interaction between the human system and the physical (ecological) system. The planner tries to address both the human and physical systems, and therefore this view of resilience provides a good framework for assessing flood resilience the development of floating communities.

Following Restemeyer et al. (2013) the concept of flood resilience is discussed in regard to institutional capital. Institutional capital is an important factor to examine how flood resilience in cities can be increased; this has been stressed by several researchers that emphasise the role of institutions, leadership and social capital into the scope of resilience (Olsson et al, 2006 in Davoudi, 2012). The concept of institutional capital is used to examine the way intellectual-, social- and political capital are involved in the planning process and how this can be governed to contribute to the flood resilience of both cities. Therefore an overview of the three capitals is provided, based on Healey (1998) and Khakee (2002) amongst others

The three capitals are put in a conceptual framework, which is developed in this thesis. The framework is grounded in the existing theory about flood resilience and the concept of institutional capital. It is a framework that is heuristic in nature and it helps to explore if the three capitals are available in the development process of floating communities. This is done by addressing several criteria that are included in the framework. The theory and conceptual framework are thus the basis of the research approach in this thesis. With the help of the framework, results of the empirical observations can be interpreted. To be able to use the frameworks, data was collected in order to assess the institutional capital in practice. To be able to do this a research strategy was designed to operationalise the theory and conceptual framework.

1.3 A strategy for analysis

This thesis is of a qualitative nature. It is designed as a comparative research, with two case studies as object of research, to assess how institutional capital can be acquired for the development of flood resilient cities. The focus lies on comparing the planning process of floating communities in London and Rotterdam. Conducting a qualitative comparative research has the distinct advantage of assessing patterns of social interaction and processes of human meaning-making. Furthermore, its strength lies in the fact that multiple observations (two cases) are given more weight than a single observation (Van den Brink, 2009; Peterson, 2005). By comparing the two case studies, important lessons can be learned for future development of floating communities and the use of institutional capital

To make the comparative study, two cases were selected that represent the central problem statement of how institutional capital can contribute to flood resilient cities. To find two representative cases, several coastal cities that are developing floating communities and trying to increase flood resilience in flood prone areas were explored. Furthermore a concise background analysis was done to determine whether a coastal city was researchable. Two cities where floating communities are to be developed and that were researchable are the coastal cities London and Rotterdam. A brief description of both cases will be provided in the next paragraphs, but first the research strategy for the data analysis is discussed.

1.3.1 Research strategy

To conduct the comparative case study and to turn ideas into practice, a research strategy is designed to operationalise the conceptual framework. The research strategy is composed of several steps that enabled the empirical observation on location. The first step in this strategy was the case selection and analysis of the background and context of the selected cases. Consequently, the next four steps are designed to analyse both cases:

Step 1: Analysis of background and regional plans
To make the comparative case study between London and Rotterdam, an understanding is needed about the context in both cases. Therefore the background and context of both cases have been analysed. This was done by assessing policy documents and news items from both cases.

Step 2: Analysis of institutional context
However, to get a full comprehension about the context of both cases a deeper understanding is required. Therefore knowledge is needed about planning approaches and institutional characteristics. This is analysed with literature and the EU Compendium of Spatial Planning Systems and Policies.

Step 3: Analysis of capitals and resilience in practice
To analyse the capitals and resilience in practice, in-depth interviews were conducted with stakeholders that are involved in the development process of floating communities. Furthermore policy documents are analysed.

Step 4: Interpretation of data: similarities and differences
The final step was to interpret the data collected during the empirical part of the research. This was done by placing the data in the conceptual framework. Subsequently the results of both case studies were compared, from which conclusions were drawn.

1.3.2 Brief introduction of the cases

Worldwide a trend can be observed in harbour cities; the seaward movement of harbour activities, due to ever growing sea vessels. Larger sea vessels need deeper and larger harbours to be able to tranship cargo. Due to this trend shallow inland harbour areas and docks are losing their industrial function. To deal with the loss of activities in inland docks, projects are being designed to redevelop former docks, aimed at encouraging economic development and growth. This trend can also be observed in the coastal cities London and Rotterdam. Both cities are regenerating former inland docks to assign new functions and enable economic development. The development of floating communities is one of these strategies to redevelop and regenerate former inland docks in London and Rotterdam.

However, in the face of climate change, coastal cities have to rethink the redevelopment these former docklands, since these docks often are prone to flooding as they are located in low lying areas that are connected to open sea. London and Rotterdam face the same challenges concerning climate change and sea level rise. Both coastal cities are located at the English Channel and North Sea, which means that they face similar climatologic problems. The same storms, tidal surges and mean sea level rise are experienced in both cases; this makes it interesting to compare how both cities cope with the same challenges.

Both London and Rotterdam face the same challenges concerning climate change, sea level rise, and they both experience the seaward movement of industrial activities. Due to the fact that these cities are located relatively close to each other on the English Channel, causes the cities to experience similar problems and both develop floating communities in former docks. This makes the cities pre-eminently suited for this comparative research. By making the comparison between both cities in the development process of floating communities, valuable lessons can be learned and exchanged with each other. To learn more about both case studies, a brief description of London and Rotterdam is provided.

One of the regeneration projects in former docklands is the "Thames Gateway" regeneration project in London, which is part of the larger Thames Estuary 2100 plans. These plans aim to create economic development and growth in the former inland docklands. The plans furthermore advocate the importance of increasing flood resilience and climate adaptivity in the Thames Gateway area, which is a large area that stretches from Canary Wharf to the coast (TE2100 Plan, 2012). One of the ideas in the regeneration project is to create the United Kingdoms' largest 'floating village' (Greater London Authority, 2013). This 'floating village' is a showpiece of the Mayor of London and it is designated to be designed in the Royal Docks, a large former inland dock. The idea behind the development of a floating community is that the communities should improve land- and water use of the docks and increase the quality of life of the area.

In The Netherlands already quite some people live on houseboats and floating homes, but recently living on water has gained more attention of the international community, since it may provide possible solutions for flood resilient planning. Like London, the city of Rotterdam is working on regeneration projects. As part of these projects the municipality has the ambition to create floating communities as well (De Graaf and Van der Brugge, 2010). A pilot project 'floating pavilion' has already started in 2010 and is designed to function as catalyst the development floating[1]. According to policy plans of the Stadshavens the location of the 'Floating City' will be the Rijnhaven-Maashaven, which is an inland dock near the city centre of Rotterdam (Stadshavens Rotterdam, 2009). Ambitions for the Floating City have been described in policy plans that were written in 2009, however until now there are no concrete schemes available since the bidding procedure is still ongoing.

1.4 Relevance for science and society

This year the debate around climate change has increased, with the severe weather conditions in autumn and winter of 2013. According to the website of Risk Management Solutions last winter season has experienced the most severe sequence of storms since 1990, with a total of over 17 low-pressure systems, with some storms containing wind speeds well over 100 kilometres per hour, which is hurricane power[2]. Especially the United Kingdom, but also the Netherlands, northern Germany and France were struck by heavy rains, strong winds and large waves in the coastal regions. This caused tidal surges and floods which resulted in damaging thousands of houses and the loss of life[3]. This year's storms have proven that current technical flood prevention measures no longer suffice, as technical measures, like storm surge barriers, do not prepare people for when flooding does happen.

These recent storm events emphasise the importance of new approaches flood risk management. Spatial planning can help to adapt land-use in the face of disasters and floods (Meijerink and Dicke, 2008; Woltjer and Al, 2007). With the development of floating communities both technical measures and social measures of flood risk management come together for the prevention and mitigation of floods, whilst making cities more climate adaptive and resilient. However, there is still not much literature written about what the role of institutional capital can be in the development of flood resilient cities. In other words, it should be assessed how local stakeholders, citizens and institutions can contribute to make the living environment more resilient to flooding. This makes the conceptual framework relevant in the wider scientific debate around the shift in governance, whereby the community capacity can be used to govern for more flood resilience in coastal cities. It thus adds a heuristic conceptual framework to assess institutional capital to the existing literature about flood resilience.

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[1] www.drijvendpaviljoen.nl
[2] www.rms.com
[3] www.bbc.com

1.4 A guide for the reader

This thesis has developed a conceptual framework to assess how institutional capital can be acquired to increase flood resilience in coastal cities. A comparative qualitative research is conducted with London and Rotteredam as case studies. Furthermore a research strategy is designed to explore institutional capital in practice, to structure the data collection, analysis and interpretation. The thesis is structured on the basis of this research strategy, which means this thesis is structured as following;

Chapter 2 contains the theoretical framework, which is built on existing literature about the resilience and institutional capital. The concept of socio-ecological resilience is being discussed and the distinction between the different views of resilience will be explained. Following this, the link with institutional capital and resilience is discussed and the concept of institutional capital is divided into intellectual capital, social capital and political capital. Furthermore, this chapter elaborates on the conceptual framework for assessing how institutional capital is used for the planning process of floating communities. Subsequently chapter 3 elaborates on the research strategy, methodology and positionality, after which chapter 4 describes the background and context London and Rotterdam. This chapter also provides an overview of the institutional differences between both case studies that are important to take into account, since it explains how legislations and norms can influence decision making. Institutional characteristics of both countries influence the development of the floating communities and therefore the results. In chapter 5 the results of the interviews and document analysis are discussed and placed in the conceptual framework. Finally chapter 6 summarises the thesis and draw conclusions based the results. Furthermore this last chapter provides recommendations for future developments and for further research.

Chapter 2

The role of institutional capital to increase flood

resilience

In this chapter the theoretical framework of this thesis is discussed. The development of floating communities is put into the context of flood resilience and institutional capital. First of all, the development of floating communities has the potential to contribute to the flood resilience of cities, therefore the theoretical concepts of flood risk management and flood resilience are explained and linked to the institutional capital approach. This chapter elaborates on how institutional capital can help to increase flood resilience in cities and it provides a framework for assessing the development of floating communities in London and Rotterdam.

2.1 The shift in flood management strategies: from resistance to resilience

The attention to floating communities and other forms of adaptive urban development can be linked to the debates around climate change, sustainability and vulnerability (Scott, 2013). Moreover, due to the fact that the impact of climate change will likely cause sea level rise, increased precipitation and more extreme weather conditions, flood vulnerability in cities will increase. These events in turn may have severe consequences for the environment and urban areas (EEA, 2008). Scientists know that extreme weather events like the hurricanes Katrina and Sandy will become more common. In the aftermath of these disasters, it became clear that the cities and its communities were destroyed and were not able to recover easily (Crichton, 2007; Davoudi, 2012; Scott, 2013).

These events mark a shift in the management of risks. In many countries the emphasis on the prevention of disasters is moving towards a means of coping with disasters. The initial focus of flood risk management was on the prevention of floods all together, with the Delta Works in the Netherlands as a striking example of how extensive projects can prevent the land from flooding, for example with storm surge barriers, dams and high dikes (Van der Ven, 2004). This persistent focus on prevention has led to a lack of strategies for coping when disasters actually do happen, as could be experienced during hurricanes Katrina and Sandy. That is why the emphasis is shifting away from merely flood prevention towards the combination of prevention and creating resilient environments.

The shift means that an environment becomes able to cope with flood, or in other words there is a shift from 'fighting water' towards 'living with water' (Meijerink and Dicke, 2008; Restemeyer et al. 2013). An example of this shifting approach in water management is the Dutch 'room for the river' programme, which is characterised by both mitigating flood risk and adaptation (Scott, 2013). Consequently this also marks a shift in governance and urban planning to increase the robustness and adaptability of environments (Meijerink and Dicke, 2008; Woltjer and Al, 2007). This shift comes with more decentralisation and increased influence of the private sector in urban planning. Integrating water management and urban planning can be used as a means to create cities that are more flexible and adaptive to change, and it offers opportunities for future development of coastal cities (Meijering and Dicke, 2008; Vis et al., 2003; Woltjer and Al, 2007).

The focus on flexibility and adaptability of cities brings forth the idea of incorporating resilience into flood risk management in the urban environment. To explore how flood resilience can be enhanced in coastal cities, floating communities can provide an opportunity; as can move along with the water levels, they are flexible and adaptable to the environment. Though to use this concept, it is important to understand what resilience is and where it comes from.

2.2 What is resilience?

The concept of resilience has been used by physical scientists to denote the ability of materials to absorb and resist external shocks; it is defined as the maximum energy that can be absorbed without creating a permanent distortion (Davoudi, 2012). But with the rise of systems thinking and the publication of the Canadian ecologist Holling in 1973, the concept entered the field of ecology. With the introduction of resilience in ecology, Holling made a distinction between two views of resilience: engineering and ecological resilience. The difference between these two views of resilience is the 'bouncing back' and 'bouncing forward' ability of systems after disturbance, as can be seen in figure 2.

Figure 2: Schematic illustration of engineering- and ecological resilience.
Davoudi (2012), Davoudi et al. (2013), Holling (1973 & 2001)

Engineering resilience focusses on the efficiency and ability of a system to *bounce back* to its original stable equilibrium after disturbance. The ecological resilience is defined as 'a measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables', whilst *bouncing forward* to an alternative domain (see table 1) (Holling, 1973, p. 14; Davoudi, 2012). Moreover, these views of resilience differ in the way that engineering resilience has an emphasis on 'efficiency, constancy and predictability' with one stable equilibrium to which a system returns, whereas in ecological resilience there are multiple equilibria and it focuses on the ability that groups and ecosystems have 'to persist and adapt' (Adger, 2003). Both views acknowledge the existence of equilibrium in systems, to which a system bounces back or forward, which is illustrated in figure 2 (Davoudi et al., 2013).

After the concept of resilience had been adapted in the ecological sciences, it also appeared in the social sciences. Even governments and other institutions have adapted the concept in their policies towards ecological and social issues. However, Davoudi (2012) warns that resilience is becoming a 'buzzword', and she points out that the concept of resilience is quite vague. Therefore a good understanding is needed before the concept can be incorporated into different fields of study, like for example disaster studies, psychology, economic geography and spatial planning. Furthermore she advocates incorporating uncertainty and nonlinearity within the concept of resilience for the field of spatial planning, rather than using engineering resilience and ecological resilience which focus on linearity and predictability (Davoudi, 2012; Davoudi et al., 2013).

2.2.1 Socio-ecological resilience

Reflecting on the aforementioned, Davoudi (2012) explains that the concept of resilience should include risk and a certain degree of uncertainty, instead of predictability and linearity, only then can it provide a framework for spatial planning and other fields of study (see figure 3). Uncertainty in spatial planning is inherent to the fact that planning occurs in a complex and adaptable system (e.g. a city), and issues are locally specific, hard to define and context related (De Roo and Porter, 2007). De Roo and Porter (2007) argue that uncertainty has to be accepted in planning to deal with complex and adaptive systems, since reality is never completely certain and predictable, and the physical and human environments are continuously transforming.

These ideas step away from the technical rational in the 1950s, where the world was considered predicable. Water management of that time reflects that world view, with the development of extensive storm surge barriers that were based on a predictable world (engineering and ecological resilience). However, the role of humans in these systems is being ignored. It is the action and interaction of humans with systems that makes for example a city a social world, where individuals' perceptions and behaviours increase uncertainty (De Roo and Porter, 2007).
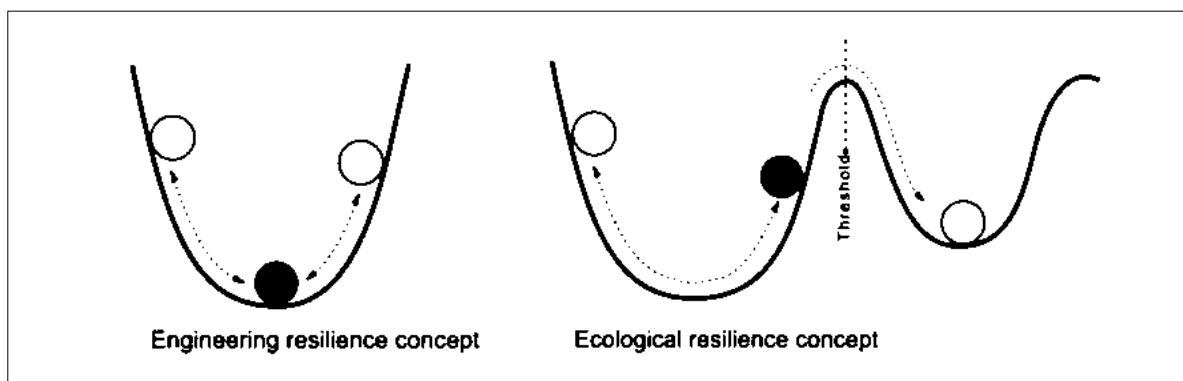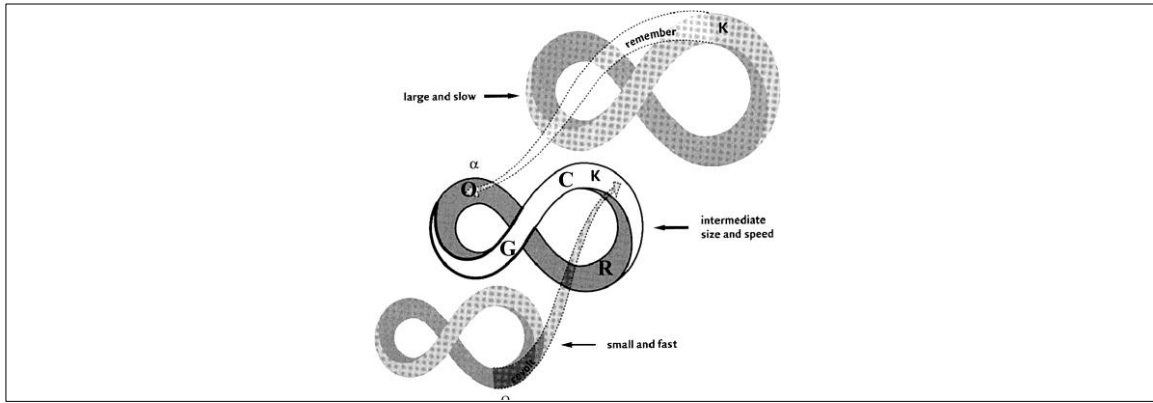
Figure 3: Schematic illustration of socio-ecological resilience.
Davoudi (2012), Davoudi et al. (2013), Holling (1973 & 2001)

Because of the emphasis on uncertainty, the third view resilience can provide an understanding in technical and human systems, and how periods of rapid *and* gradual change influence these systems (Holling, 2001; Folke, 2006; Simmie and Martin, 2010). Where engineering and ecological resilience focus on sudden change and returning to the 'normal' equilibrium, the third view of resilience is rejecting the idea of equilibria and asserts that systems may change over time with or without disturbance. Hence this view of resilience is being described by Holling (2001) as the 'social-ecological' view of resilience, as can be seen in figure 3. In this figure, there is no equilibrium in which a system is located (see also figure 2), but it rather is an evolving system that can transform itself with several phases that include: growth, conservation, creative destruction and reorganisation (Holling, 2001). The growth phase (r) is characterised by accumulation of recourses (capitals), competition and a rising level of diversity, it also is characterised by decreasing resilience. The conservation phase (K) is where growth slows down and this phase is characterised by stability, certainty and low resilience. Subsequently follows the creative destruction phase (Ω), where a chaotic collapse is characterised by uncertainty and low resilience. Then in the reorganisation phase (α) there is room for restructuring and innovation. This phase is characterised by high uncertainty, but also high resilience (Davoudi et al, 2013). Furthermore, these phases occur in different systems at different speeds and sizes, often whilst interacting with each other. This framework thus provides "an understanding of resilience as continually altering, as the system adapts and changes" (Davoudi et al., 2013, p. 310). Therefore these development phases and the uncertainty in systems stand in contrast to the engineering and ecological resilience. To enable this flexibility in systems, there are four characteristics that are specific for socio-ecological resilience, as can be seen in table 1 (Davoudi, 2012).

First of all *persistence*, also called robustness, refers to the ability of a system to withstand a given level of stress or disaster. It is an important part of managing climate-related risks in a city, to increase the strength of for example the utilities and infrastructure (Davoudi et al. 2013).

Engineering resilience	Ecological resilience	Socio-ecological resilience
Bounce back to equilibrium or steady state after disturbance	Bounce forward into another stable domain. The ability of systems to absorb changes and adapt, with the existence of multiple equilibria.	The ability of a social-ecological system to change, adapt and transform in response to stresses, and rejects the existence of equilibria
Emphasis - Efficiency - Constancy - Predictability	*Emphasis* - Persistence - Adaptability - Unpredictability	*Emphasis* - Persistence - Adaptability - Transformability - Preparedness

Table 1: The distinction between the different views of resilience. Adapted from Davoudi (2012) and Davoudi et al. (2013)

Secondly *adaptability* is about making adjustments within a system to make it less vulnerable, through flexibility and the ability to adapt to change. Flexibility in a system refers to the availability of networks and cooperation between stakeholders, which can lead to adaptability of the system and therefore contribute to resilience (Davoudi et al., 2013). Adaptability is also found in the ecological view of resilience.

The third characteristic is *transformability* of systems, which makes the socio-ecological approach profoundly different from the other views of resilience. Transformability means that a system can transform (suddenly or gradual) to a new system, when the existing system collapses (Davoudi, 2012; Davoudi et al., 2013; Scott, 2013).

In Davoudi et al. (2013) and Holling (2001) it is argued that a fourth characteristic should be added to the list; namely *preparedness*, which refers to the influence of human action and intervention on the environment. An important characteristic of social systems is the capacity of humans to predict and plan on future scenario's, by anticipating 'surprises' and learning from previous events (Holling, 2001).

2.2.2 Using socio-ecological resilience in flood management

Interlinking socio-ecological resilience with flood risk management provides a way of dealing with flood, in particular in coastal urban zones. Resilience in flood prone cities means taking precautions to prevent flooding like strengthening storm surges and developing early warning systems, but it also means adapting land-use to suffer less in case of a flood (Vale and Campanella, 2005 in Davoudi, 2012; Restemeyer et al., 2013). Making flood prone cities more adaptive and able to transform themselves contributes to the resilience of the system. Furthermore robustness emphasises the strength of a city to withstand the impact of a flood without causing any severe disturbance, and human interaction can contribute to the preparedness and robustness of a city to flooding (Restemeyer et al., 2013).

These characteristic of socio-ecological resilience stand in contrast to the characteristics of ecological and engineering resilience in the way that the socio-ecological approach advocates transformability of a city, which is about renewal and a less flood prone state (Davoudi, 2013; Scott, 2013; Restemeyer et al. 2013). According to Restemeyer et al. (2013) the characteristics of resilience have implications for strategy-making, for it implies that flood risk management shifts towards dealing with flood risk and preparing a city for a disaster and create opportunities out of the flooding. This includes technical measures as well as governance and sharing responsibilities (Meijerink and Dicke, 2008). New government arrangements are thus needed that use bottom up approaches to share these responsibilities, which brings forth the role local communities, private stakeholders and local governments play to increase the adaptivity of systems.

However, one should be cautious when implementing the concept of socio-ecological resilience into spatial planning. Davoudi (2012) points out that although the concept of resilience is relatively vague; it is being implemented in policies by governments. Governments tend to have an emphasis on the self-reliance of systems, and they consider self-reliant cities as being resilient. Although the existence of engaged networks does help foster the adaptive capacity of cities and contributes to the transformability of them, it is not a substitute for accountable governance and neither does it mean that governments can completely retreat (Davoudi, 2012). Furthermore the means and ends of resilience have to be defined, for example questions have to be asked about resilience for whom and for what purpose (Davoudi et al., 2013). Davoudi adds to that with arguing that "resilience for some people or places may lead to the loss of resilience for others" (Davoudi et al., 2013, p.306). The socio-ecological approach can become a useful to enhance the flood resilience in cities, provided that these potential pittfals are taken into account.

Considering the characteristics of socio-ecological resilience, disturbance in a system has the potential to create opportunities for innovation and development (Adger, 2006 in Folke, 2006). Moreover, these disturbances increase the uncertainty and complexity in systems, which brings forth the relation that the local community has with the environment (De Roo and Porter, 2007). This provides a model for understanding social processes, by combining different actors, networks and institutional organisations that in turn can contribute to the robustness, adaptive capacity, transformability and adaptive governance in systems (Folke, 2006). To create opportunities out of crises, a region or city needs to be prepared, to adapt to future scenarios. This brings forth the role of institutions, leadership, social capital and learning into the scope of resilience (Olsson et al., 2006 in Davoudi, 2012). These ideas of incorporating institutional capital, making use of local knowledge and increasing bottom-up governance into planning has already been emphasized by Patsy Healey, who argues that it is the local community, its individual citizens and local relations within, that shape on-going place making. Therefore increasing resilience in flood prone areas can benefit from capacity building in these communities (Healey, 1998; Restemeyer et al, 2013).

2.3 Institutional capital and capacity building

As mentioned before, a way of increasing the adaptability and transformability of a place is by capacity building and making use of institutional capital. The concept of 'institutional capacity' has been developed by several researchers, for example Amin and Thrift. They stress in their research the importance of how local governance can reduce vulnerability of local economies, societies and environments, whilst promoting economic health and quality of life (Healey et al. 1999; Amin and Thrift, 1995). In order to become less vulnerable and at the same time more adaptive and transformable, a city needs its communities, organisations and institutions to develop and manage its processes. These communities can help a city recover and renew itself after change or disturbance (Restemeyer et al., 2013). Moreover Healey et al. (1999) indicate that the ideas about institutional capacity emphasise the benefit of a web of relations that are involved in urban governance, which connect government organisations with private sector organisations.. Khakee (2002) argues that capacity building brings about a community-wide learning process about sustainable development and the power of this learning process can help transform how people think and act in governance situations (Healey et al. 1999). In urban planning this is a shift from a top-down government towards bottom-up governance approaches, or as Healey (1998, p.1531) clearly illustrates; "the tasks of the urban planning shift from 'building places' to fostering the institutional capacity in communities for 'place-making' activities".

Although the ideas of institutional capital and capacity building have been widely adopted into different fields of study, it has experienced a proliferation of different sorts of capitals, for example human capital, financial capital, cultural capital and so forth. This multitude of capitals creates a potential pitfall for researchers, because it might not always be clear which sort of capital would suit a certain issue. Therefore, to get a better understanding about the concept of capacity building, Khakee (2002) provides a clear definition of institutional capital: "institutional capital […] is defined as the overall quality of the collection of resources embodied in social relations and interactions in a place" (Khakee, 2002, p. 54). This means that the idea of institutional capacity incorporates social relations and interactions within a community and these interactions are constantly evolving as a result of a social learning process (Healey, 1998; Healey et al, 1999; Innes and Booher, 2003; Khakee, 2002). This collection of resources is important to understand different kinds of institutional capital.

To connect institutional capital to the concept of flood resilience in flood prone areas, it is important to know who is involved and what kind of capacities stakeholders need to possess (Restemeyer et al., 2013). Stakeholders can for example be local businesses, authorities, citizens and political groups. All these stakeholders together create institutional capital. Though in the institutional capital literature there are usually three capitals that can provide further understanding of the concept

of capacity building, namely; *intellectual capital, social capital* and *political capital*. Several authors emphasize the importance of the contribution these kinds of capital can make to water management and governance. In the literature there is a clear distinction made between these three forms of institutional capital, and the development of the floating communities needs all three. Intellectual capital is needed to provide knowledge and research, about technical innovations, social capital encompasses networks and relations between all stakeholders and political capital includes decision making and mobilising action. These capitals provide a framework for assessing the existing institutional capital in London and Rotterdam. The next paragraphs elaborates on these three capitals.

2.3.1 Knowledge as a precondition

Knowledge and knowledge development are important aspects in the development of floating communities, since innovation requires knowledge. The availability of knowledge development in a place is being described as 'intellectual capital'. Traditionally intellectual capital has been examined by economists, because knowledge is considered a valuable resource for productivity and economic activity, but more recently this capital is considered important for organisations and communities in general (Nahapiet and Ghoshal, 1998). Nahapiet and Ghoshal define intellectual capital as "the knowledge and knowing capability of a social collectivity, such as an organization, intellectual community or professional practices" (p. 245).

Furthermore Restemeyer et al. (2013) denote that in the field of flood risk management intellectual capital is necessary to increase the flood resilience in a city. By interaction between networks and disciplines, knowledge can be exchanged in order to create new solutions. Therefore, intellectual capital is also referred to as 'knowledge resources'. Knowledge to create new solutions acquires skills and capabilities that enable persons to act in new ways. This knowledge is created through learning by previous experiences, research and understanding of people, places and issues (Khakee, 2002; Nahapiet and Ghoshal, 1998).

Furthermore, intellectual capital has the emphasis on openness towards knowledge, transparency of knowledge and exchange of knowledge between disciplines and organisations (Khakee, 2002; Restemeyer et al. 2013). High level of knowledge overlap and exchange between organisations usually stimulates communication and understanding, which in turn can lead to new knowledge. Sharing this knowledge can improve and facilitate decisions that have to be made, for example in the case studies these include decisions about the development of floating communities and how this will be done. This inevitably links intellectual capital to social capital, as learning occurs in complex, collaborative social practices (Nahaphiet and Ghoshal, 1998). Consequently this study will look at what universities, governments and firms do to create knowledge with research and how this knowledge is being exchanged.

2.3.2 Good relationships matter

Secondly there is social capital, which initially appeared in community studies. In community studies social capital highlights the importance of the survival and functioning of city neighbourhoods. One of the key researchers on this topic, Robert Putnam, describes in his research how citizen's participation and organisations can contribute to the success of democracy. Putnam argues that membership in groups creates 'social capital', which consists of "networks, norms and social trust that facilitate coordination and cooperation for mutual benefit" (Putnam, 1995, p. 67). Networks of strong, crosscutting relationships developed over time provide the basis for trust, cooperation and collaboration in such neighbourhoods (Nahapiet and Ghoshal, 1998).

Social capital is therefore to be explained as 'relational resources', and it emphasises the importance of the contribution and awareness of the population and individual stakeholders in relation to each other, organisations and institutions. Adger (2003) describes social capital theory as "an explanation for how individuals use their relationships to other actors in societies for their own and for the collective good" (p. 389). Moreover the term 'social capital' refers to social networks between these stakeholders and the ability to act collectively, therefore social capital can be seen as the aggregate of actual and potential resources linked to the possession of networks and relationships (Adger, 2003; Bourdieu, 1986; Khakee, 2002). It is thus "the product of an endless effort which is essential to produce and reproduce lasting, useful relationships that can secure material or symbolic profits" (Bourdieu, 1986, p.22).

According to Healey (1998) social capital stresses the importance of thinking through these relations, since they identify people and places, but it is also important to examine the range of social relations, power relations and the linkages between networks of these relations (Khakee, 2002). The central proposition of social capital therefore is that networks of relationships constitute a valuable resource for social affairs, because it provides members of a group with "the collectively-owned capital", and much of this capital is embedded within networks of mutual recognition (Nahapiet and Ghoshal, 1998; Bourdieu, 1986). Social capital constitutes to social structures and it facilitates the actions of individuals within that structure (Nahapiet and Goshal, 1998).

In the context of flood resilience Restemeyer et al. (2013, p.6) describe social capital as 'the capacity of the population to deal with flood risk and their willingness to prepare and invest in precautionary measures'. Governance is an important aspect of capacity building for social capital, because a collaborative and bottom-up approach is needed, with broad stakeholder participation (Healey, 1998). In this thesis networks, private party participation and social relationships between stakeholders, such as businesses, developers and authorities are considered social capital. Since social capital is the connection and relations between stakeholders, it is strongly linked to both intellectual capital and political capital.

2.3.3 Politics to seal the deal

And lastly 'political capital' refers to the commitment and willingness amongst different political groups, such as politicians and other institutions, to shape policy agendas and to mobilize action (Khakee, 2002). It is differs from social capital; "while social capital refers to trust-building trough social interaction in society, political capital refers to the individual powers to act politically that are generated through participation in interactive political processes linking civil society to political systems" (Sørensen and Torfing, 2003, p. 610). According to Sørensen and Torfing (2003) the term political capital refers to three factors that are related to a political stakeholders' ability to be involved in political decision making: the level of access that stakeholders have to decision-making processes (endowment); their capability to make a difference (empowerment); and their perception of themselves as political stakeholders (political identity). Sørensen and Torfing (2003) explain endowment as a question of what actors *have*; empowerment as what political stakeholders *can do*, and political identity of *who they are*. In addition political capital consists of norms that support democratic governance and political participation (Booth and Richard, 1998). Therefore political capital can be described as the 'capacity for mobilisation'. This refers to the way national and local politicians and decision-makers are willing to contribute to implementing policy measures, and in this case implementing resilience strategies into water management. Mobilisation in this sense is the fact that politicians have to power to trigger change in policies and they can be the mediator in collaboration between intellectual, social and political capital itself (Healey, 1998; Khakee, 2002; Restemeyer, 2013).

Therefore in this research the level of political capital is assessed by examining who is responsible for decision-making, whether there is clear information about the development process and what the level of the decisiveness of local politicians is. In addition, the motives of local politicians are assessed; is the development of the floating communities actually being done from a resilience perspective or not? Moreover, there is special attention for the role of institutions and how these might institutions influence the development process.

2.4 Framing the capitals and resilience

This thesis examines how institutional capital can increase flood resilience in the coastal cities of London and Rotterdam. In the context of urban planning, resilience focusses how a city takes precautions to prevent flooding, but also adapts land-use to cope with possible floods, with the development of floating communities as a concrete strategy to increase resilience (Restemeyer et al. 2013). For studying how resilience is incorporated in decision making and the planning processes of floating communities an assessment is made on the local institutional capital, whether it is available in both cases and how it is being used. This is done by linking the concepts of resilience and

institutional capital to each other, whereby in this case the three forms of institutional capital (the intellectual, the social and the political capital) become criteria for the development of floating communities and how this development can increase flood resilience. The way to increase resilience is to prepare a community in vulnerable systems, by combining different actors, groups, networks and institutional organisations, whilst dealing with uncertainty and surprise in the future (Folke, 2006; Davoudi, 2012). However, to be able to examine the three aforementioned capitals and resilience in the development of floating communities, a framework is needed that enables one to make the assessment.

Therefore a framework is designed that assesses the available institutional capital the planning process in the London and Rotterdam docks, as can be seen in figure 4. The heuristic framework is based on literature about socio-ecological resilience and institutional capital. In other words this framework provides a way to examine how the planning process has developed, for example by looking at the social relations of stakeholders and institutions, how they are being informed about the developments of floating communities and how this fosters flood resilience in coastal cities. This information can contribute to development of floating communities and flood resilience in the future. The central aim of the framework is to approach the different kinds of capitals in London and Rotterdam, how the different capitals use knowledge, networks and relations to create flood resilient solutions, and whether or not this is a learning process that uses a bottom up approach towards shaping policy agendas and trigger change with a resilience perspective (Healey, 1998; Restemeyer, 2013; Khakee, 2002).

Institutional capital in flood resilience strategies

Intellectual capital	Social capital	Political capital
Knowledge Resources - Gaining knowledge through research - Exchange of knowledge between stakeholders	**Relational Recourses** - Collaboration - Social relations between different stakeholders	**Mobilisation Capacity** - Awareness and willingness to trigger change - Shaping policy agenda's

Figure 4. Conceptual Framework for analysing the different forms of institutional capital in the planning processes of flood resilient cities. Source: author (2014)

The framework is a simplified rendering of reality, as each of the three capitals has two criteria that are based on literature discussed in the previous paragraphs. These criteria are being assessed by analysing documents and interviews with involved stakeholders. More criteria can be distinguished that contribute to flood resilience, however for these specific case studies there are six criteria in total designated to assess the available institutional capital. These six criteria are considered the most important characteristics to assess how institutional capital can be built for governing flood resilience. The next paragraph elaborates on the criteria of the framework, why certain criteria have been used and how these criteria will be assessed.

2.4.1 Intellectual capital as first…

The first criterion of intellectual capital, is '*gaining knowledge through research*'. This criterion refers to knowledge gained through learning of previous experiences, but also to knowledge gained by doing research and the understanding of people and place (Khakee, 2002; Innes and Booher, 2003). Gaining knowledge has an important link with resilience, for it prepares communities and institutions for sudden change, which is necessary to increase flood resilience in a city (Davoudi, 2012; Restemeyer, 2013).

The criterion 'gaining knowledge through research' covers several aspects of institutional capital, and is therefore used as an criterion in this framework. It covers for example scientific research (Khakee, 2002), which is necessary to increase the technical knowledge about flooding and technical measures to prevent flooding or to cope with it. In addition, it covers understanding of people and place, which is needed since places and communities differ from each other and they cope differently with sudden change. Therefore knowledge about a place and its inhabitants is important to increase the flood resilience in cities (De Bruijn, 2004; Healey, 1998; Meijerink and Dicke, 2008; Woltjer and Al, 2007). The criterion 'gaining knowledge through research' will be examined through interviews and document analysis (see chapter 4), by looking at the extent that research is being done by public and private stakeholders, universities and knowledge institutions, and to what extent knowledge is being shared with social and political capital, which brings forth the link to the second criterion 'exchange of knowledge'.

'*Exchange of knowledge*' between stakeholders, institutions and disciplines can improve and facilitate decisions that have to be made and bring about new solutions towards flood risk management (Khakee, 2002; Restemeyer, 2013). The ideas of making use of local knowledge, exchanging knowledge and transparency of knowledge have been emphasised by several researchers, for it shapes place making and therefore it increases the resilience in flood prone areas (Healey, 1998; Restemeyer, 2013). 'Exchange of knowledge' is important, as this criterion has strong links with the two other capitals, since it connects the stakeholders and institutions who are able to gain knowledge

and exchange it, and in this way creates networks between them. 'Exchange of knowledge' has been examined through interviews and document analysis by looking at when, why and how much stakeholders exchange knowledge.

2.4.2 Social capital as second…

According to Khakee (2002) the criteria of the social capital can be explained as 'relational recourses, which emphases the importance of the willingness, preparedness and contribution of populations and individual stakeholders in relation to each other, organisations and institutions. Therefore '*collaboration*' is the first criterion, which refers to the extent that different institutions and organisations work together in the planning process of floating communities. The collaboration between the aforementioned stakeholder groups is necessary for capacity building and collaborative, bottom-up approaches that make communities and cities more adaptable to flood risk (Healey, 1998; Restemeyer, 2013).

To examine 'collaboration', it first is important to find out how organisations, such as universities or port organisations, architects and political groups work together on the development of floating communities. For example coalitions like the 'Clean Tech Delta' are assessed (see paragraph 5.2, which describes the Rotterdam case). In this research one stakeholder group is left out, namely the citizens. This is a deliberate consideration, since there are no residents of floating communities yet and there were no opportunities to interview residents of both London and Rotterdam areas in the vicinity of the designated development areas.

The second criterion is '*social relations between different stakeholders'* that includes networks, covenants and power relations. These social relations can influence the planning process through for example existing relations between large construction companies and small architect bureaus, social relations between political parties and private parties, or even between political parties themselves. 'Power relations' refers to the organisations and politicians that have the power to trigger or to avoid change, which is the direct link to the following capital (Healey, 1998; Khakee, 2002).

2.4.3 And political capital as third requisite.

Political capital refers to the 'capacity for mobilisation', which means the power to trigger change in politics and shaping policy agendas (Healey, 1998; Khakee, 2002; Restemeyer, 2013). The role of institutions and politicians is important as they can provide incentives for more capacity building and learning processes for problem solving (Innes and Booher, 2003; Davoudi, 2012). However, the decision of politicians to address or not to address certain issues might differ; this is why one of the criteria is '*awareness and willingness to trigger change*'. It brings about the role of institutions, local and national political groups that are involved in the planning process. The awareness and willingness

of political stakeholders might be difficult to examine, but as an example in paragraph 5.1 illustrates, it is the Mayor of London who has the power and the willingness to trigger change by making the decision to start the development of floating houses in the Royal Docks. This links to the last criterion 'shaping policy agendas'. The criterion "awareness and willingness to trigger change" has been examined by document analysis of policy measures like for example the Thames Estuary 2100 Plans, but also by interviews with politicians and institutions that help making shape of these plans.

The last criterion '*shaping policy agenda's*' refers to how the plans of the floating communities are being incorporated in larger policies in both case studies. For example the Thames Estuary 2100 Plans gives guidance to the development of flood risk management policies in London. This criterion is therefore assessed by document analysis and interviews.

2.5 Conclusion: turning ideas into strategies

This chapter has provided an illustration about the shift in water management: the shift from resistance to resilience. This shift provides the basis for the central question in this thesis, since it explains why several trends occur in water management. With the shift towards resilience, cities need to reconsider their urban planning, as 'living with water' demands for a different planning approach. One of the concrete examples of 'living with water' is the development of floating communities. However, to be able to succeed in developing these new communities, local institutional capital is essential, since a city needs its communities, organisations and institutions to develop and manage its processes in order to become less vulnerable and at the same time more adaptive, transformable and robust.

This brings forth the relation that stakeholders have with the environment, which provides understanding about the motives for developing floating communities. Knowledge, political decisiveness and social networks, or in other words intellectual-, political-, and social capital, are important criteria to develop these communities. However, to be able to assess the three capitals in the development of flood resilient cities, a framework is needed to do so. Therefore the capitals have been placed in the heuristic model to provide for an assessment framework to examine how institutional capital is being used in the development of flood resilient cities.

However, to be able to use the framework and assess the availability of institutional capital, a strategy is needed to turn ideas into practice. This strategy is used to collect and analyse the data, after which the information is put in the conceptual framework to interpret and make sense of the data. The next chapter elaborates on the research strategy and methods used for data collection.

Chapter 3

Exploring institutional capital in practice

The literature on flood resilience and institutional capital provides a good basis for the conceptual framework, however to turn ideas into practice a research strategy is needed. To explore institutional capital and to examine the role of institutional capital in the planning process of floating communities in practice, the ideas and conceptual framework are turned into a research strategy. This has resulted in a comparative research with a research strategy that is of qualitative nature. It aims at making a comparison between both case studies, to provide an insight in the different approaches in water management and urban renewal in the face of climate change. Parts of the research strategy are for example selection of representative cases, the empirical study had to be conducted and data had to be analysed. This chapter explains the steps taken in the research strategy and it elaborates on the comparative nature of the study, methodology and analytical strategy. Furthermore it discusses the positionality of the researcher.

3.1 Research strategy

The research strategy follows several steps that form the basis of the structure of the thesis (see table 2). The first step is the case selection and analysis of the context of both cases. To determine which cases are representative, several criteria have been formulated to assess which cases meet the criteria. The next paragraph elaborates on this first step in the research strategy.

After the cases were selected two steps were taken to comprehend case specific contextual characteristics. First the 'background analysis of the cases' provided an insight in the policy plans concerning the regeneration of the former docks in both case studies, London and Rotterdam. It furthermore provided information about the development of floating communities in designated former docks. However, a deeper understanding of both cases is required, since both cases are located in different countries. The fact that the research is dealing with different countries has implications for the data collection, since both countries have different institutional characteristics, planning regimes and approaches towards spatial development. Therefore an analysis of case specific institutional characteristics is of importance to provide an essential basis for understanding the development of floating communities in both case studies. The next paragraphs discusses the analytical strategy for analysing of the context of both cases.

Step	What		Analytical strategy		Chapter
1	Case selection and context				4
	1	Background analysis of cases	1	Analysing policy documents and news items of both cases	
	2	Analysis of institutional characteristics that determine local planning approaches	2	Analysing the local institutions and planning practises with the help of existing literature	
2	Analysis of the capitals				5
	1	Examination of policy plans concerning the development of floating communities	1	Analysis of policy documents concerning floating communities with ATLAS.ti	
	2	Analysis of intellectual-, social-, and political capital in practice by interviewing stakeholders	2	Analysis of interview transcripts with ATLAS.ti	
3	Interpreting and comparing the results of both case studies		Analysis by placing the results in the conceptual framework		5
4	Drawing conclusions on the use of intellectual-, social-, and political capital in the development of floating communities				6

Table 2: Structure of the research strategy

After the context analysis of both case studies, the nest step in the research strategy is the analysis of intellectual capital in practice. This empirical step consists of two parts; namely policy document analysis and conducting interviews in the field. Paragraph 3.3 of this chapter discusses this step and the analytical strategy which is used to assess the information retrieved from the collected data. Part of this analytical strategy is the use of ATLAS.ti as analysis tool. After the analysis of the data, the results of both case studies have been interpreted and compared with each other. This is done by placing the data into the conceptual framework (see chapter 2). From the comparison conclusions are drawn about the use of intellectual-, social- and political capital in practice.

3.2 A comparative case study

This thesis is of a qualitative and interpretive nature, with two case studies as object of research. As aforementioned, it aims at making a comparison between both case studies to provide an insight in approaches in water management, the role of institutional capital and whether or not resilience is being incorporated in the development process of floating communities. Conducting a case study has the advantage that patterns of social interaction and processes of human meaning-making can be distinguished (Van den Brink, 2009). Furthermore the strength of a *comparative* case study lies in the fact that an observation made repeatedly is given more weight than a single observation (Peterson, 2005). Lijphart adds that a comparative study "extends the investigators experience, to make him aware of more possibilities and social capacities" of the case study (Lijphart, 1975, p. 158).

3.2.1 Case selection and background analysis of the cases

To make the comparative case study, two cases had to be selected that represent the central problem statement of how institutional capital can be built to govern for flood resilient cities. To find two representative cases, coastal cities that are redeveloping harbour areas were examined and a concise background analysis was done to determine whether the cases were researchable. This background analysis showed if there were plans to develop floating communities. As mentioned in the previous chapter, a trend can be identified towards increasing flood resilience of cities rather than using technical measures to resist flooding altogether. Furthermore another trend can be observed in coastal cities around the world; the seaward movement of harbour activities and expansion of coastal cities towards the shore.

Two of these cities where the aforementioned trends can be observed, are London and Rotterdam. In both cities the seaward movement of harbour activities is visible and therefore former inland docklands are being regenerated. Moreover, both cities are located at the English channel and North Sea, which means that they face exactly the same problems, like mean sea level rise and extreme weather conditions. Another similarity between both cities is the fact that they both plan to design floating communities. This makes both cities representative for assessing the available institutional capital in the development of floating communities.

The background analysis of both cases is done by analysing documents and news items that are related to the harbour regenerations and development of floating communities (see table 2). Especially news items provide a first and useful impression on the progress of development of floating communities. Though caution has to be paid with using these news items, since they contain the author's bias, news items are very useful for the first background analysis.

3.2.2 Analysis of case specific institutional characteristics

However, the basic background analysis is not sufficient to provide a full comprehension about the context of both cases. An insight is needed in the planning approaches and institutional characteristics of both countries, since differences in planning approaches might influences the information retrieved from the data analysis. In the analysis of institutional characteristics in the case studies, attention is paid to the institutions (rules and laws), culture (values and norms) and planning regime. All three characteristics influence the development process of floating communities and therefore are important to identify.

The local institutions and planning approaches are analysed with the help of existing literature like, among others, the EU Compendium of Spatial Planning Systems and Policies (see table 2). Chapter 4 elaborates on both the institutional characteristics and the background analysis of both cases.

3.3 Analytical strategy

To examine the capitals in practice, an analytical strategy is needed in order to do so. This is the second step in the research strategy and it is related to the empirical part of the thesis (see table 2). The empirical analysis of the capitals in London and Rotterdam consists of two parts, namely document analysis and analysis of intellectual-, social-, and political capital in practice through in-depth interviews. Document analysis and in-depth interviews form the qualitative data collection methods for this comparative research.

Qualitative research focusses on the question of 'why'? and seeks to decipher experiences within broader webs of meanings and within sets of social structures and processes (Aitken and Valentine, 2006, p. 291). It is useful for exploring new topics or understanding complex issues, such as the explanation of people's beliefs and behaviour, and identifying social structures and cultural norms in a society (Hennink et al., 2011). Qualitative methods are often described as 'soft methods' and hence described as humanist orientation (Aitken and Valentine, 2006, p. 341). Qualitative methods consist of, among other things, participant observation, in-depth interviews and textual analysis, which provide rich, detailed and multi-layered material. Furthermore, qualitative methods enable the researcher to produce 'a deeper picture' than for example a questionnaire (Flowerdew and Martin, 2005; Aitken and Valentine, 2006).

To gain as much knowledge as possible, different research methods are mixed. According to Hennink et al. (2011, p. 52) the term mixing research methods is being used to refer to the fieldwork approach whereby researchers combine several research methods. One can mix methods across paradigms (qualitative and quantitative), but one can also mix strategies within the interpretive paradigm. This means combining different qualitative research methods with each other, which is done by combining document analysis with in-depth interviews. The combination of these two qualitative methods provides a good overview of what is written in policy documents and what is actually being done by the interviewees. In this case a mixed method approach was between two methods was used; document analysis and in-depth interviews.

3.3.1 Analysis of policy documents

The first method of data collection is policy document analysis. The analysis of policy documents provides an insight in the plans and processes for the development of floating communities. These documents include policy plan s about the comprehensive regenerations in both harbours, the competition briefs of the floating communities and climate adaptation strategies (see table 3). The documents are relevant for assessing the development of the floating communities, for they show what is documented about the use of institutional capital and how the cities try to increase flood resilience. They thus provide a good overview about what is being planned in both case studies.

	Analysed policy documents	
	London	**Rotterdam**
1	Royal Docks Competition Brief	Bidboek Tender Rijnhaven Rotterdam
2	London Plan	PlanMER Stadshavens: Deelstudie Water
3	Royal Docks Vision	Gebiedsplan Rijnhaven-Maashaven
4	The London Climate Change Adaptation Strategy	Rotterdamse Adaptatiestrategie
5	Thames Estuary Plan 2100	Stadshavens Uitvoeringsprogramma 2007-2015
6	Royal Docks Development Parameters	Stadshavens Rotterdam Structuurvisie
7		Verkenning Drijvend bouwen

Table 3: list of analysed documents

It is important to note however, that every document that has been analysed is a product of local authorities. These local authorities include the municipality of Rotterdam, Stadshavens, Greater London Authority (GLA), the Environment Agency and the Borough of Newham. Since the authors' bias influence the content of such documents, care has to be taken when analysing the documents to extract information out of the data. To deal with this issue of bias and to deal with the vast amount of data, ALTAS.ti has been used as a tool for data analysis.

3.3.2 Analysing institutional capital in the field

Furthermore interviews with both public and private stakeholders have been conducted in both cities (see table 4). As aforementioned, interviews enable the researcher to get a detailed and multi-layered pictured of an issue (Flowerdew and Martin, 2005). It is for this reason that interviews have been used as a method for data collection. In-depth interviews help to understand the way different stakeholders are involved in the development of floating communities, and what their motives are to be involved. The interview guide was made prior to the interviews (see appendix 1). Afterwards, the interviews have been transcribed, coded and analysed. Accordingly with the document analysis, the in-depth interviews have been analysed with the data analysis tool ATLAS.ti. Stakeholders from different backgrounds have been interviewed, for example local authorities (GLA and municipality of Rotterdam) and private stakeholders (Dura Vermeer and DeltaSync). Table 4 shows the interviewed stakeholders and the number of interviewees.

Positivists criticize in-depth interviews, claiming that interviewers bias the respondents' answers or that interviewers are not or cannot be objective or detached (Flowerdew and Martin, 2005). However, humanist or post-structuralist approaches to research argue that objectivity does not exist in the social sciences, as the social sciences deal with norms and values which are important in understanding the world. Rather than losing objectivity, researchers can use interviews to explore subjective values, beliefs and thoughts of individual respondents. (Aitken and Valentine, 2006; Flowerdew and Martin, 2005). This makes in-depth interviewing an ideal data collection method to obtain a deeper picture of the people and processes behind the development of floating communities.

	Interviewed stakeholders and number of interviewees			
	London		**Rotterdam**	
1	Greater London Authority	2	Municipality of Rotterdam	1
2	London Borough of Newham - Regeneration department	1	Dura Vermeer Technical University Delft UNESCO-IHE	1
3	London Borough of Newham - Planning department	1	Delta Sync	1
4	The London Climate Change Adaptation Strategy	1		
5	Royal Docks Management Authority	1		

Table 4: list of analysed documents

3.3.3 *ATLAS.ti as an analysis tool*

To deal with the vast amount of data generated by the policy documents and interview transcripts, an analytical strategy and analysis tool was needed to turn the data into information. ATLAS.ti is such an analysis tool and it belongs to the Computer-Aided Qualitative Analysis Software (CAQDAS). Like other CAQDAS programmes, ATLAS.ti does not actually analyse the data, but it rather is a tool for supporting the process of qualitative data analysis (Friese, 2012). Although computers are helpful in finding characters or coded data segments, the researcher needs to create these data segments by means of coding. In addition Friese explains that "a carefully conducted, computer-assisted qualitative data analysis also increases the validity of research results, especially at the conceptual state of an analysis" (Friese, 2012, p.1). CAQDAS programmes thus become helpful tools to analyse the data systematically, which otherwise would be too time consuming when done manually.

To structure large amounts of data, ATLAS.ti works with 'hermeneutic units' (HU) or 'idea containers' (Van den Brink, 2009). The HU is a file that stores everything that has been done to the data like coding or quoting and it thus contains the analysis one carries out in ATLAS.ti (Friese, 2012). In the HU primary documents are saved, which can be then analysed by coding, quoting and other actions that are available in ATLAS.ti. For the actual analysis, there are two main phases of analysis that are used: the textual-level analysis and the conceptual-level analysis.

The textual-level analysis explores the data. It includes editing the primary documents into quotations, adding memos to passages and coding selected passages to facilitate the analysis (Van den Brink, 2009; Friese, 2012). The term 'code' is used to refer to an issue, topic, opinion or ideas that is evident in the data. They are essentially topics discussed in the documents and identified through reading the data (Hennink et al., 2011). Van den Brink explains that coding is the most important phase of the textual-level analysis, since the codes "capture the meaning in the data and they can be used as classification devices at different levels of abstraction to create related information units for comparison" (Van den Brink, 2009, p. 59). These codes can be created inductive and deductive.

Deductive codes are codes that are derived from the conceptual framework of the study. Deductive codes thus originate from the researcher, for example from topics in the interview guide that were derived from the research literature. Inductive codes on the other hand, come directly from the data and are developed from reading the data, whilst noting issues raised by participants (Hennink et al, 2011). Therefore the deductive codes are developed first and then inductive codes are added on the basis of reading the data.

The conceptual-level analysis refers to the conceptualisation phase of data analysis. Conceptualising data is a task that moves the analysis to a more abstract level and it involves interpretive work. ATLAS.ti provides for several conceptual tools, such as the graphical Network Editor (Van den Brink, 2009; Hennink et al., 2011). The Network Editor can be used to build networks from codes that were created during the previous textual-level analysis. It enables the researcher to create networks that consist of nodes (objects like codes or quotes) and links (relations between objects). Through the creation of networks, it is possible to visually connect selected codes, memos and quotes to display relations between the objects (Van den Brink, 2009). It makes conceptualising essential to understand how individual components of the data are linked together that can begin to explain the phenomenon under study (Hennink et al., 2011).

However, although ATLAS.ti provides a handy tool for analysing documents, there are some potential pitfalls related to this programme. First of all, it is very labour intensive due to transcribing interviews, creating codes and reflectively analysing the data. Furthermore, Yanow and Schwartz-Shea (2006) argue that although CAQDAS programmes facilitate textual analysis, it never replaces the analytical thinking itself and therefore reflexivity on the analysis is paramount.

Nevertheless, because of distinct features that facilitate textual analysis and bearing the potential pitfalls in mind, ATLAS.ti provides a convenient tool for analysing the policy documents and interview transcripts of the empirical data collection. To analyse all the documents, four HU's have been created to analyse the primary documents. These four HU's were created to differentiate between data from the Netherlands and the UK, but also between policy documents and interview transcripts. This was done to unveil differences in the data, for example issues that might be addressed in policy documents, but that are not addressed in the interviews or vice versa. It then becomes interesting to examine why this is the case. The four HU's are the following:

- Document analysis UK   - Document analysis NL

- Interview analysis UK   - Interview analysis NL

After assigning the primary documents to the HU's, a code list was created to analyse the documents on the textual-level analysis. Several codes have been created deductive by reading the literature, the conceptual framework and designing the interview guide. The literature and conceptual model

provided the questions for the interview guide (appendix 1). All deductive codes are thus created prior to the analysis and they are related to the three capitals and resilience. In the code list multiple codes can be related to an overarching code, for example 'procurement', 'decision making' and 'role of institutions' are all related to the overarching code 'political capital' (see table 5). Besides the deductive codes, inductive codes have been created whilst reading the data. These codes are addressed in the policy documents or issues are raised by interviewees. These inductive codes provide even a more detailed insight in the development of floating communities, which was previously not been thought of, as can be seen in table 5.

After the textual-level analysis, the conceptual-level analysis step was made to actually analyse the data. This was done by visualising relations between codes in the primary documents with the Network Editor. The Network Editor was used to reveal relations between codes in the data. Furthermore relevant quotes are displayed. In each HU networks were made for each capital and for resilience, which makes a total of sixteen network views (four HU's times four networks per HU equals sixteen networks). These networks can be seen in the appendices II – XV, where they are displayed with a brief description of each network view.

Code list	
Deductive	**Inductive**
Intellectual capital - Universities - Knowledge institutions - Research - Sharing knowledge	
Social capital - Private stakeholders - Partnership - Relations - Collaboration between stakeholders	
Political capital - Procurement - Decision making - Role of institutions - Involved authorities	
Reason for development - Climate change - Flood defence - Resilience	Reason for development - Land shortage - Population growth - Uniqueness - Economic regeneration - Economic growth
Development process - Procurement process - Decision - Development process in the future - Target group (i.e. inhabitants)	Development process - Development issues

Table 5: list of mainly used codes

In figure 5 one network is displayed, the other network views can be found in the appendices. This network is made for political capital in the HU 'interview analysis NL'. This network shows the links that tell more about the relations between the nodes. The nodes are the codes and quotes that are related to the code 'political capital'. It shows that the code 'role of institutions' is part of the code 'political capital', which means that when the code 'role of institutions' occurs in a document, it tells something about political capital. The arrow between both codes in the network view explains the direction of relationships and interaction between both nodes. Another code in this network view is code 'partnership', which placed amidst intellectual-, social-, and political capital. This is the case since partnerships emerge between private stakeholders, authorities and knowledge institutions. Besides codes, also relevant quotes are placed in the networks view. These quotes come directly from the documents and they explain certain relations between the codes.

Another feature in the network view is the display of 'groundedness' and 'frequency' of codes, which are shown between the brackets behind each node. For example the node 'political capital' has the numbers 41 and 8 between the brackets. The first shows the frequency of occurrence of that particular code, which in this case the frequency is forty-one. Furthermore the brackets show the groundedness of that particular code. The groundedness shows the number of relations with that particular node, which is helpful to understand how many relations with that particular code exist. In this case the code 'political capital' has eight relations with other codes. By making use of these features of ATLAS.ti, the policy documents and interview transcripts have been analysed.
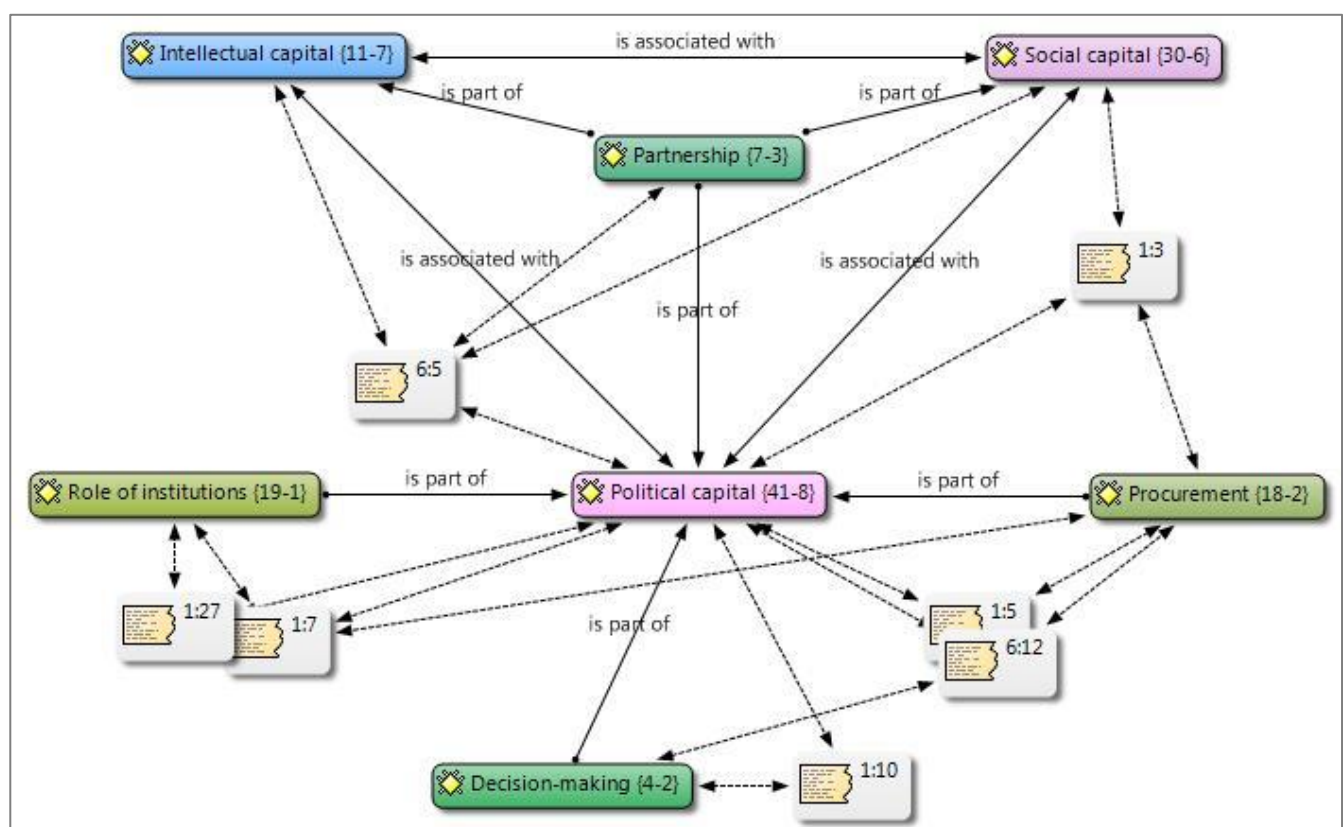

Figure 5: Code network of the code 'political capital' in the HU 'Interview analysis NL'

3.4 Dealing with positionality

Multiple stakeholders are involved the planning process of the floating communities, which makes it for a researcher key to know their own position and situated knowledge. According to Aitken and Valentine (2006), situated knowledge is "a challenge to objectivity, […] one where theorization and empirical research are framed within the context in which they are formulated". Research is not neutral or an objective activity, but it rather is shaped by a host of influences ranging from personal beliefs to culture and individual relationships between researcher and researched (Aitken and Valentine, 2006). That is why Flowerdew and Martin (2005) encourage researchers to recognize ones positionality and being reflexive. Through reflexivity, qualitative researchers reflect on their subjectivity, on their social backgrounds, beliefs and behaviour impact (Hennink et al., 2011). As mentioned above, biases can influence the information extracted from the data: the bias of the author and the bias of the researcher, therefore it is important to be reflexive on the gained information (O'Leary, 2010).

Hence as a Dutch student there is limited knowledge on British norms and approaches, this can influence the bias and attitude towards the traditions, values, habits, ethics and local planning procedures. It is for example important to reflect on the different planning regimes in both countries, since the Netherlands has a comprehensive integrated approach, whereas the United Kingdom has a land use management approach towards planning (European Commission, 1997). To understand these cultural differences, an overview of differences in planning regimes is provided in the next chapter. This makes it possible to determine the origin of differences between both case studies, whether they are either related to cultural differences or that they are related to differences in the approach towards the development of floating communities.

Besides the matter of cultural differences, the language barrier can also influence the material derived from the interviews, since language is cultural information that might be misinterpreted or misunderstood. To avoid ambiguities, all interviews have been recorded and transcribed, which made it easier to process the data. Furthermore, ATLAS.ti also helps to reduce the issues related to positionality by providing an analysis tool for processing the data more easily.

3.5 Conclusion: turning strategies into practice

With the research strategy and analytical strategy it becomes possible to actually turn the conceptual framework into practice. The research strategy for the qualitative comparative research consists of several steps to develop an understanding about both case studies, after which the capitals were actually explored in practice. This is done by conducting in-depth interviews and analysing policy documents. These policy documents consist of documents that describe the regenerations in the Royal Docks and Stadshavens, environmental plans and they include competition briefs for the

development of the floating communities. From the interviews respondents come from the local authorities, knowledge institutions and developers. With the help of ATLAS.ti the data is read, coded and analysed. The computer-aided analysis tool provided a helpful tool for the analysis, as it enabled the assessment of vast amounts of textual data and visualisation the relationships between codes in the datasets. After the empirical data collection and analysis, the results were placed into the conceptual framework for interpretation and comparison of the results of both cases. With the conceptual framework, conclusions are drawn on the use of intellectual-, social-, and political capital in the development of floating communities.

However, the research strategy starts with the first step of the research strategy, which is to explore the background and institutional characteristics of both case studies. This is done to get a deeper understanding about the context of the development of floating communities in London and Rotterdam. The next chapter therefore elaborates on the context of both cases.

Chapter 4

Setting the stage

To understand more about the context in both case studies, an overview in needed about the background and institutional characteristics of London and Rotterdam. Therefore, this chapter provides a description of the regeneration projects in both cities. It elaborates on the background and context of the cities themselves, the regeneration projects in the former docks and it provides a description of the development sites. The development site located in London is the Royal Docks, a former harbour area in the east of London alongside the river Thames. In the Rotterdam case the floating village will be developed in the Stadshavens, which are former docks near the centre of the city. Besides knowledge about the background and location of the case studies, knowledge about institutional characteristics of both cases is needed to understand the local planning approaches.

Institutional differences between the Netherlands and the UK are being discussed, for it is important to take country specific characteristics into account when making a comparison between two different countries with different legislation and traditions. This chapter provides an insight in the planning approaches in the United Kingdom and the Netherlands, whereby attention is paid to the institutions (rules and laws) and culture (values and norms) of both countries.

To understand the planning approaches in both cases and institutional characteristics, one needs to know how planning approaches are developed and how this translates in planning practices nowadays. In the Netherlands the Dutch term 'ruimtelijke ordening' is closely tied to the important traditions of managing a scarce land resource, and it has connotation of major public sector activity in development processes that has been the norm in the Netherlands. In the UK the term 'town and country planning' refers to the system of regulating land use and development activities of both public and private developers (European Commission, 1997, p. 23). These Dutch and British planning regimes have been described in the EU Compendium of Spatial Planning Systems and Policies (1997). In this compendium a comparison has been made between the different planning styles in the European Union. Furthermore a number of emerging trends have been identified that are also evident in the Netherlands and the UK, which are likely to have a significant implication for the organisation and implementation of the spatial planning system. For example central-local government relations are changing and the impact of the EU on planning systems will affect spatial planning (European Commission, 1997; Needham, 2005). The institutional differences are discussed prior to the results; otherwise it is difficult to understand the results and conclusions of the thesis.

4.1 Down the river Thames in London

In port cities all over the world docklands are rapidly changing due to extensive regeneration projects, which is also true for the city of London. The river Thames runs through London, which connects the city to open sea, enabling harbour activities near the city centre. But like in other port cities in the world, harbour activities are moving seaward, leaving former city docks in deserted. Therefore, to regenerate these areas, extensive plans are developed to bring back economic activities to the docks. A striking example of this phenomenon is the regeneration of Canary Wharf. But to regenerate the entire Thames estuary, the Thames Estuary 2100 plans have been developed. Part of the Thames Estuary 2100 Plans, is the regeneration of the Thames Gateway, an area that stretches 60 km on either side of the Thames from Canary Wharf to the coast and plays an important role as 'gateway' to the centre of London (Brownill and Carpenter, 2009; TE2100, 2012).

4.1.1 Extensive ambitions for London's Royal Docks

Started in the 1980s, the Thames Gateway is the largest waterfront regeneration project in Europe, situated between the city centre of London and the river towards Europe[4]. The regeneration project has become a necessity after the port industry has moved out of the city and towards the mouth of the river Thames, leaving the docklands in London deserted and in disrepair (Malone, 1996). The regeneration project of the Thames is so extensive that it has large effects on the spatial, economic and social structure of the urban fabric. Parts of the regeneration in the Gateway are the extensive projects in the London's Royal Docks (see figure 6), which according to the Thames Estuary 2100 Plans, have a specific policy for flood risk management to 'keep up with climate change and land use change so that flood risk does not increase' (TE2100, 2012, p.124). According to the Thames Estuary 2100 Plan the Royal Docks are very prone to flooding;

> "The ground level is much of the Royal Docks policy unit is low (at 1m AOD[5] or less), whereas the levels at the docks and the Thames frontage is higher (3m to 5m AOD). Thus there would be great difficulty evacuating floodwater should flooding occur, this also means that this area is vulnerable to pluvial flooding" (TE2100, 2012, p. 124).

The Royal Docks policy includes extensive and established residential and industrial areas (TE2100, 2012). First the docks closest to the city centre were redeveloped, like Canary Wharf, and nowadays the focus has shifted towards the more remote Royal Docks. The Royal Docks comprise three docks; the Royal Albert Dock, the Royal Victoria Dock and the King George V Dock, which have different

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[4] www.21stcenturychallenges.org
[5] AOD = Above Ordnance Datum; measurement on the British islands for the height of the sea level. Usually mean sea level is used for the datum

functions in the development plans (Thames Gateway Partnership, 2008). The city government, the Mayor of London and developers target to attract the wealthier and highly educated people and high end businesses. They aim to create a modern and sustainable society in the former docks (Enterprise Zones, 2013). To attract these businesses and entrepreneurs the government invests in modern transportation systems to connect the docks with the centre of London. One of the latest attractions for the Royal Docks is the Emirates Cable Car, which runs between the Royal Docks and North Greenwich[6].

One of the new ideas for sustainable development is the plan to create the UKs largest floating village in the Royal Victoria Dock[7]. The mayor of London announced in 2013 that the city government has made the official decision to create and plan this floating community, which will be developed with homes, jobs and commercial places such as a hotel and shops (BBC, 2013). This official decision fits within the Thames Strategy East, which has a vision for the Royal Docks as 'Water City' (Thames Strategy Partnership, 2008, p. 111). Developments in HafenCity Hamburg, IJburg Amsterdam and Stadshavens Rotterdam are being used as inspiration for the development of this floating community. The idea behind the development of a sustainable floating community is that it should improve land- and water use and increase the quality of life.
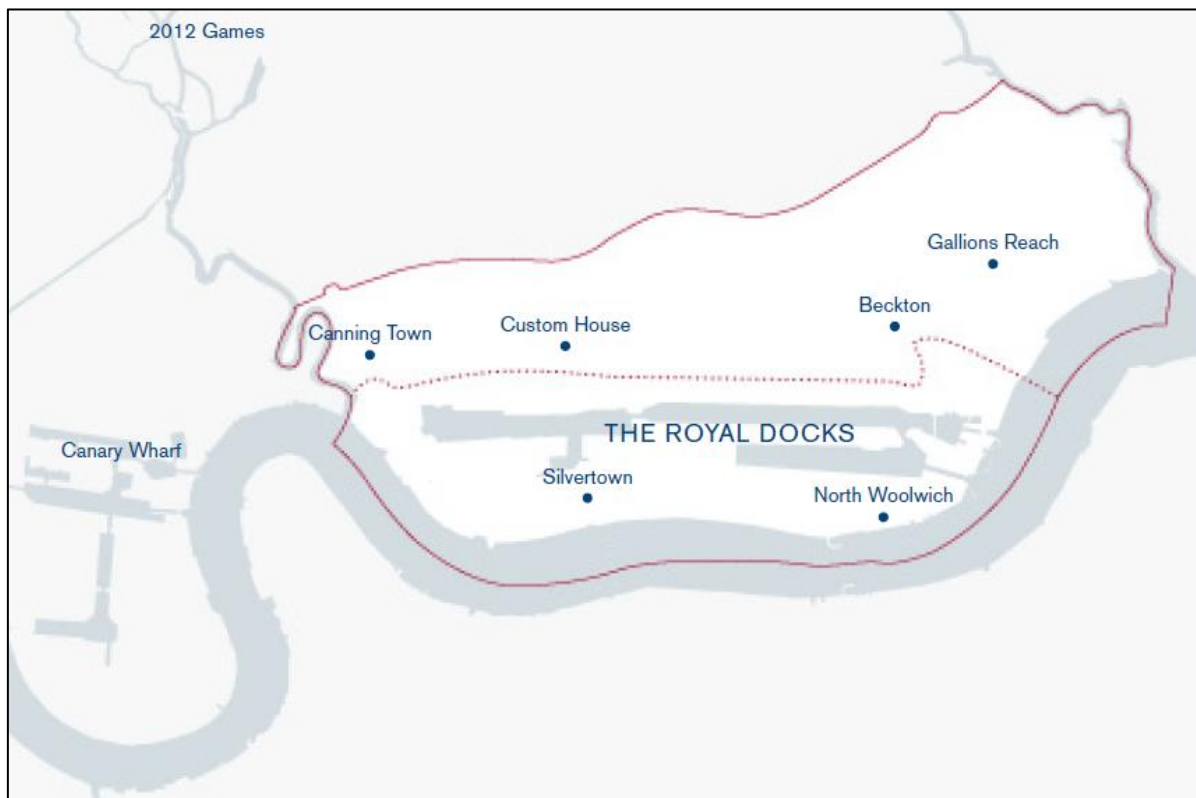

Figure 6: The location of the Royal Docks. Source: Royal Docks Vision Plan

[6] www.royaldocks.net

[7] www.royaldockslondon.com

Whilst writing, the winner of the ideas competition for the Royal Docks Floating Village has been announced, namely the Carillion Igloo Genesis consortium has won with their design and schemes. The winner has been announced by the Greater London Authority (GLA) and the Mayor of London. The fact that a winner of the bid has been announced gives London the lead in the development of floating communities in both case studies[8]. However, it will not be until April in 2015 before the London Borough of Newham will decide over giving planning permission for the scheme. It already becomes clear that the Borough of Newham will decide whether or not to grant planning permission, because they are the local planning authority. But to fully understand the decision-making process for the London Borough of Newham, an understanding is needed in the planning approaches in the United Kingdom. The next paragraph therefore provides a description of the British planning regime of Land Use Management.

4.1.2 British Land Use Management

The British planning system regime has its roots in the Town and Country Planning Act of 1990 and the Planning and Compensation Act of 1991. The British system is a planning system with the tradition of *Land Use Management*, and its primary goal is regulating development and land use for the public interest (European Commission, 1997; Janssen-Jansen and Woltjer, 2010). It is not, like the Dutch system, oriented toward protection of private interests, instead the system considers the notion of separate ownership rights and development rights. The Land Use Management approach defines itself by seeing planning as a narrower task of *controlling the change of land use*, where local authorities do most of the planning, and central government supervises, sets regulations and provides for guidance on numerous policy topics (Sanyal, 2005; European Commission, 1997; Janssen-Jansen and Woltjer, 2010). In essence, this is a development-led type of approach where the local authority regulates development, since they have the authority to grant planning permission. Local districts are responsible for spatial planning documents and local development framework, covering issues such as housing, recreation and general spatial planning. These frameworks are primarily leading for planning permission (European Commission, 1997; Janssen-Jansen and Woltjer, 2010).

This brings forth the general process for development in the British planning system. An important concept in the system is that of the 'planning obligation', which refers to the additional commitments taken on by a private actor to get planning permission. Therefore planning obligation is also referred to as 'planning gain'. These planning obligations contain constraints on implementation and the requirement to carry out certain obligations for the developer (Janssen-Jansen and Woltjer, 2010). Establishing planning obligations is a process of locally negotiated public private agreements

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[8] https://www.london.gov.uk/media/mayor-press-releases/2014/07/mayor-announces-developer-to-build-royal-docks-floating-village

that takes place prior to the application to obtain a permit. These negotiations end in a legally binding written agreement stating the planning obligations for the developer (Janssen-Jansen and Woltjer, 2010). The obligations offer the local authorities to recoup betterment by, for example, providing adequate access, car parking, replacing facilities or social housing (Janssen-Jansen and Woltjer, 2010).

Furthermore, the British planning system distinguishes itself form other systems by its discretionary approach to planning. This important characteristic of the system enables local districts to always have the option to take into consideration some case-specific circumstances and make decisions on the political acceptability of a specific project (Bregman, 1999). This discretion makes it possible to examine each application individually and thus it is possible that decisions can be made which are not in accordance with plans and policies (Nadin and Stead, 2013). Moreover, citizens and developers have the right of appeal against decisions of the authority.

Because of this discretionary system, the provided frameworks contain few written rules about planning, as the central government does not provide a complete set of legislation. Law is built up case by case (Nadin and Stead, 2013). Plans are indicative and not legally binding, therefore there is less certainty in this system (Sanyal, 2005). Yet the British government tries to increase certainty in its planning by introducing a more plan-led system of development control, as each local planning authority is now required to produce an area-wide land use plan (European Commission, 1997). Examples of this new approach to planning are the Planning Act 2008 and the Localism Act 2011. The Planning Act 2008 is an Act of the Parliament, and it is intended to speed up the process for approving major new infrastructure projects, such as airports and harbours. Furthermore, the Localism Act empowers local governments. The measures affected by the Act include more elected mayors, referendums and the "local authorities' general power of competence."[9]

Another problem to this lack of certainty at lower level and supervisor attitude of central government level is the lack of a regional government. Allmendinger and Tewdwr-Jones (2002) refer to these problems as a regional gap, since there is a lack of territorial focus in plans and policy integrations (Woltjer and Al, 2007). There is however an exception to this rule, namely the Greater London Authority and the Mayor of London do function as a regional authority that stands between the British national government and the local boroughs in London. This fact is important when one considers the planning process of the floating community in London, since the GLA is leading authority in the city and it owns the majority of land.

Though the local boroughs have the power to grant planning permission to developers, they have to do this in conformity with the London Plan. The London Plan (Greater London Authority, 2011a) is a wide-ranging strategic plan for London's development that puts planning issues into context with other areas of responsibility for the Mayor, for example transport, economic development, social development and the environment. It basically sets the guidelines for how

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[9] www.legislation.gov.uk/ukpga/2011/20/section/1/enacted

London should grow and change, while it takes European, national and regional planning policies into account[10]. The broader scope of spatial planning involves bringing together strategic perspectives on land development, environmental concerns, resource use, transport, economic development, social infrastructure and similar concerns (Allmendinger and Haughton, 2006).

In short, the main features of planning legislation in the UK are:

❖ The duty on local planning authorities to prepare a development plan

❖ A requirement to obtain planning permission for the development

❖ Planning obligations for the planning application to obtain planning permission

❖ The right of appeal against refusal of planning permission by the local planning authority

4.2 Along the Meuse river in Rotterdam

On the other side of the British Channel lies the city of Rotterdam. Rotterdam is one of the largest municipalities in the Netherlands. The city has its foundations in trade, because it is strategically positioned at the delta of the river Meuse and it therefore is an important hub to the Dutch, Belgian and German hinterland. With cargo traffic of about 450 million ton in 2012, the Port of Rotterdam is by far the largest seaport of Europe (Port of Rotterdam, 2012). Equal to the developments in London, harbour activities in Rotterdam are moving outward towards the sea, leaving docks near the city centre without function. Therefore these former docks are being regenerated to bring back economic activities to the docks.

4.2.1 Incrementalism in the Stadshavens Rotterdam

Part of the Port of Rotterdam are the Stadshavens (city harbours), which is an area of approximately 1600 ha and is located close to the city centre. Due to the completion of Maasvlakte 2 (a large expansion project of the Rotterdam port to attract the largest sea vessels in the world), port related industries are moving out of the city centre and towards new parts of the port (Randstad Urgent, 2010). Because the industry is moving westwards and away from the city centre, the old harbour area is losing its former function (see figure 7). That is why several governmental institutions, including the municipality of Rotterdam and the central government, have decided that the Stadshavens are to be redeveloped, but with a sustainable regard (Randstad Urgent, 2010). This urban regeneration project fits within a larger governmental programme called 'Randstad Urgent', which is designed to stimulate administrative decisiveness. Because the city is situated in a river delta and in close proximity of the North Sea, the urban development of the Stadshavens has to deal with the likely sea level rise and increased water levels in the river Meuse (Olsthoorn and Tol, 2001).

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[10] www.london.gov.uk/priorities/planning

The regeneration of the Stadshavens is, after London, the largest comprehensive area development in Europe, with its 1600 ha. In the comprehensive 'Havenplan2020' the redevelopment of the Stadshavens is only a smaller part of development, though because of its location close to the city centre a very important one (Havenplan2020, 2004). Furthermore the area is designated to become a place of innovation and knowledge development in the field of water, climate and energy (Randstad Urgent, 2010; Clean Tech Delta, 2011; Havenplan2020, 2004). These objectives are joined in the 'Clean Tech Delta' (CTD) programme where public and private partners (such as municipalities, two universities, an energy company, knowledge institutions, water boards and developers) cooperate on urban development in the Rotterdam Stadshavens area. The objectives of the CTD programme are to provide for a living and working environment which is 'future-proof' and adaptive to climate change, to ensure profitable growth for both the port and the urban environment and to develop sustainably (Clean Tech Delta, 2011). This cooperation project is only one of several projects and collaborations between public and private stakeholders in redeveloping the Stadshavens.

One of the already developed projects in the Rotterdam Stadshavens is the Floating Pavilion, situated in the Rijnhaven. This pavilion is a floating structure, made of three connected floating hemispheres, and it is designed to be climate adaptive, sustainable, innovative and flexible. Because the pavilion is floating, it can move with the rising of water levels and it can be moved from place to place. It therefore can be considered a flood resilient the structure, for it is able to cope with the impact of sudden water level rise. The pavilion serves as a pilot and catalyst for the development of future floating communities[11]. Although this is the first actual constructed floating structure, the Stadshavens programme has the ambition to build climate proof houses, which fits the "Rotterdam Climate Proof" slogan (Rotterdam Climate Initiative; 2013).
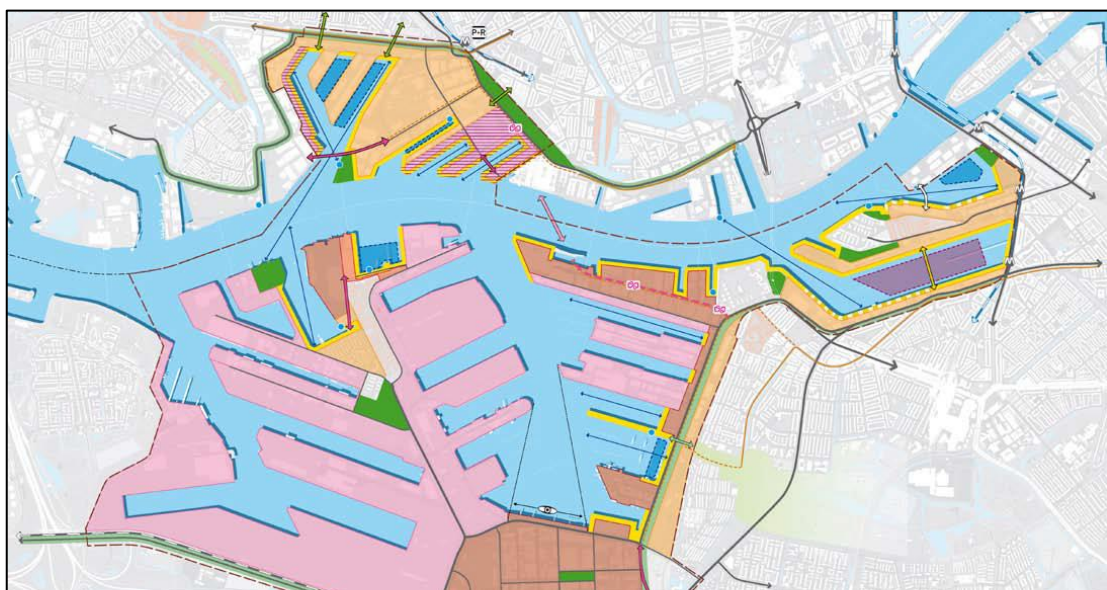

Figure 7: The location of the Stadshavens. Source: Structuur Visie Stadshavens

[11] www.rotterdamclimateinitiative.nl

Furthermore, the city government is planning to build an entire floating community, called the "Floating City", which will feature homes, offices, a school and a park. Building this community will need highly innovative solutions, because the Floating City will be built on a very large scale in tidal waters (Stadshavens Rotterdam, 2009). To enable the development of floating communities in the Rijnhaven, the municipality of Rotterdam has placed the dock in the market and has written an ideas competition that provides the future winner of the bid a thirty year concession to exploit the dock and future floating community (Stadshavens, 2013). Certain conditions have been established prior to the ideas competition and these have to be incorporated in the future plans. But contrary to the approach followed in London, the municipality of Rotterdam establishes a more incremental approach towards the development of floating communities. This is already evident with the stepwise approach to first enable pilot projects for floating development, which should later grow towards more extensive floating communities.

And like in the British case, an understanding of the Dutch planning regime is needed to understand the role of involved authorities, stakeholders and institutions that are involved in the development of the Floating City.

4.2.2 The Dutch Planning doctrine

The Dutch spatial planning 'doctrine' has deep historical roots, since land use planning dates back to the beginning of the twentieth century and the legal system of spatial planning is based on the Spatial Planning Act that came into effect in 1965 (Hajer and Zonneveld, 2000; Van der Valk, 2002; Faludi and Van der Valk, 1994). Quite opposite to the British system, the Dutch system is characterised by a *Comprehensive Integrated Approach*, which is an approach of a plan-led system that consists of a systematic and legal hierarchy of plans aimed at spatial coordination and protection. It distinguishes itself from other systems by large public sector investment and political commitment to planning (European Commission, 1997; Sanyal, 2005; Faludi and Van der Valk, 2002). In the EU Compendium the Comprehensive Integrated Approach to planning is described as 'framework management', and with large public sector investments it is possible to bring about realisation of development that requires responsive and sophisticated planning institutions, mechanisms and political commitment to the planning process (European Commission, 1997, p.36). It will not come as a surprise that the country is very central led, with a 'decentralised unitary state' that has a three-tier system of government: the Dutch national government, provincial governments and municipalities (Van der Valk, 2002). Basically these three levels of government are autonomous and there are statutory powers reserved for all layers of government. In the Netherlands they are codified in the constitution, which has implications for spatial planning. Other than in the UK where no codified constitution exists, the Netherlands has the constitution in which basic rights of citizens are written

down (European Commission, 1997). Because the constitution establishes basic rights for citizens, it influences decision-making in the spatial planning realm. Take for example housing; because the Dutch constitution establishes the basic right for all citizens to a decent home, hence a certain percentage of new residential development often has to be social housing. In this case the responsibilities of tiers of administration below central government are decided in national legislation and may be changed through the enactment of new laws (European Commission, 1997). This system of rights and legally binding acts make the system less flexible, but it provides for a high degree of certainty in planning.

In the Dutch system each level of government has the authority to lay down strategic plans, which result in a complex system of interrelated plans (Hajer and Zonneveld, 2000). Although these plans are indicative, the municipal structure plan does have judicial consequences, since the municipal land-use plan (bestemmingsplan) is legally binding and provides the highest level of legal security (Hajer and Zonneveld, 200). This certainty in planning reflects the primary goal of Dutch spatial planning: ensuring the quality of life for its inhabitants. Quality of life is linked to sustainability, liveability and the quality of the spatial environment (Van der Valk, 2002). This spatial environment in the Netherlands has to deal with physical constraints, for example scarcity of land and the thread of overcrowding. By specifying and balancing the impacts of proposed actions, the quality of life can be improved. An example of this focus on quality of life is the 'compact city' policy that was initiated by the central government and which became very successful (Faludi and Van der Valk, 1994; Van der Valk, 2002). The interacting national, provincial and municipal plans make sure that security can be provided, however many developments deviate from the legally binding land-use plans (Buitelaar and Sorel, 2010). To keep providing for legal security the new Dutch Spatial Planning Act (Wet Ruimtelijke Ordening) came into effect in 2008, replacing the old Act from 1965. One of the most important objectives is placing the land-use plan as central decision framework. It furthermore determines the tasks of the government and the rights and obligations of citizens, institutions and companies. Central to this act is the idea of "*decentraal wat kan, centraal wat moet*" (decentralisation), which puts more responsibilities at the lower governments. The steering and safeguarding functions, legal certainty, are to be strengthened by this Act (Buitelaar and Sorel, 2010; Needham, 2005).

The planning process itself basically follows a process of constant negotiation. However Dutch planning is always based on the local allocation plan of a municipality. Everyone who aspires to construct a building or change the use of land is obliged to acquire a building permit or a planning permit. The building or planning application is being reviewed with the land-use plan for the area. When the application is in conformation with the land-use plan, then the municipality is not allowed to refuse the application or to state any conditions (Van der Valk, 2002). In some cases it is possible to adjust the land-use plans to make development possible, though this can be problematic and time consuming.

In the case of the floating community in Rotterdam, it is the responsibility of the Rotterdam municipal government to adjust its local land-use plan to make development in the former docks possible. This has to be done so that the municipality is able to grant planning permission once there is a preferred contractor to develop the Floating City.

Another important part of a development process is gaining support of local stakeholders, this happens in consultation meetings during the development process. It is key to understanding the Dutch planning as it is rooted in the so-called 'Polder model', which is the belief that power flows from consensus and participation. Political institutions are assisted by advisory and participatory agencies consisting of stakeholders and experts (Van der Horst, 1996). This network of agencies is paralleled by numerous consultancy firms, which together form a highly dense institutional network that is needed in this system of consensus (Hajer and Zonneveld, 2000). Because of the emphasis on consensus, Dutch planning has focusses on negotiation, mediation and the development of planning strategies. Therefore the instruments of planners are mainly communicative to gain support of involved stakeholders, for this support is a necessity to go forth with developments.

Moreover the relationships between government, citizens and the private companies are changing, as the government is withdrawing from certain activities (privatisation) and leaving the private sector with more responsibilities (Needham, 2005). This puts even more emphasis on participation in planning processes, hence in the Netherlands participation in planning processes is a legal right and individuals have the right to appeal against decisions in courts of law. This participation however, is one of the main reasons for delays in planning processes that sometimes may take years before execution of plans, since conflicting land use claims and adoption of plans can experience resistance (Van der Valk, 2002).

Therefore, the main features of planning legislation in the Netherlands are:

❖ A plan-led system in which a three-tier government makes frameworks and land-use plans

❖ Focus on legal security and certainty

❖ A system that is based on consensus, the so-called Polder model

❖ High institutional density

4.3 Differences between both case studies

Concluding the previous paragraphs it becomes evident that there are some important differences between the British and Dutch planning systems, which are necessary to understand both planning processes of the floating communities. This paragraph places the differences and some similarities next to each other to provide a clear and convenient overview. Table 6 shows this overview the institutional characteristics in a table, where the UK and Netherlands are directly placed next to each other.

These differences in planning approach are reflected in the planning process of the floating communities. Table 6 shows in a nutshell the most important differences, which may affect planning processes and decision making. Where for example the municipality of Rotterdam has to incorporate the floating communities in its land-use plans and other strategic plans, it is possible to develop floating communities in London without these legally binding plans, because there is more freedom of action at the local level. Although there is more 'planning freedom' than in the Dutch case, the London Plan does provide for a strategic framework, which guides developments in London and checks developments against the ambitions of the Mayor of London. In this case political decisiveness becomes important for the development of the communities.

Furthermore, systems such as the English put more emphasis on flexibility and it is very development oriented, whereas in the Netherlands planning practice is more based on legal security and provides for a more plan-led approach (Janssen-Jansen and Woltjer, 2010; Buitelaar and Sorel, 2010). Discretion and flexibility are the key motors behind British development, and it gives room for political judgement on local and central levels. Planning permissions are not checked against plans and frameworks, but they are judged on their planning gain where private parties take on extra obligations with their projects (Buitelaar and Sorel, 2010; Hajer and Zonneveld, 2000).

	United Kingdom	Netherlands
Project coordination	❖ Strong role of the national state, national influence and interventions ❖ Strong tie between local and national level, but: regional gap ❖ Judging projects on the basis of argumentation	❖ Strong municipalities ❖ Three government levels, explicit role of provinces as regions ❖ Judging projects on the basis of prescriptive norms and regulations
Planning gain and packaging interests	❖ Large freedom of action at local level (negotiations) ❖ Planning proposals composed and testing particularly in local politics	❖ Compulsory instructions by local land-use plan (no negotiations) ❖ Plans structured and tested by bureaucrats and, eventually, a judge, not as much by politicians
Development-oriented planning and discretion	❖ Planning as an arbiter of development proposals (and an agent of development) ❖ Security about political decisions (security as derivative of the permit procedures) ❖ Government does not have an active role as property developer	❖ Planning as an agent of protection and integration ❖ Legal security (establishing rights of usage) ❖ Government often is an active property developer

Table 6: differences between Dutch and British planning and institutions
Source: Janssen-Jansen and Woltjer (2010)

Certainty in British planning is a derived from permit procedures, which makes it a matter of political decisions (Janssen-Jansen and Woltjer, 2010; Bregman, 1999). This is in contrast to the Netherlands, where land-use plans are leading for new developments. One of the problems that are associated with this system is that spatial dynamism may be hindered (Janssen-Jansen and Woltjer, 2010).

Except for the significant differences, there are also some similarities. Both countries are reforming their approaches towards spatial planning. In the Netherlands, the strictly regulated central government policy is reduced in favour of more decentralised planning policies. In the UK on the other hand, the planning system is reforming towards a more plan-led system. Both countries can learn a lot from each other's approach in planning and how this influences planning processes.

4.4 Conclusion: differences matter

Differences in planning regime and context do matter. The differences matter when trying to understand the results from the empirical research and comparing the results with each other. Most differences are rooted in historically developed planning approaches. In the UK this is the Land Use Management approach, with emphasis on regulating land use and a discretionary approach towards planning applications. Local authorities are responsible for granting planning permits, which in the London case is the London Borough of Newham. In the London case however, the regional authority in the form of the Greater London Authority owns most of the land in the Royal Docks, which makes them responsible for development of these areas. This creates complex relationships between these authorities. In contrast to this approach stands the Dutch approach, which is a plan-led comprehensive approach. Planning is done on three levels of government, but in this case the responsible authority is municipality of Rotterdam. Planning is done by checking planning applications against local land allocation plans, and when the applications fit within the allocation plans the planning authority has to grant planning permission.

With this knowledge about the context of London and Rotterdam the empirical study on location was conducted. The next chapter elaborates on the results from the data collection and the analysis of the policy documents and interview transcripts.

Chapter 5

Institutional capital in practice

This chapter describes second and third step in the research strategy; analysis of the capitals in practice, interpretation of the data and comparison of the results. For the second step, data has been collected on location in London and Rotterdam by means of in-depth interviewing. Besides interviewing, policy documents have been analysed to learn more about the development of floating communities and how institutional capital can contribute to increase flood resilience in coastal cities. Analysis of the data has been done with the help of ATLAS.ti, which provided a convenient tool for analysing the textual documents.

For the third step in the research strategy, the results from the data analysis have been placed in the conceptual model. The conceptual framework helps to asses which capitals are available in the planning process of the floating communities and helps to interpret and compare the results of both case studies. Furthermore the concept flood resilience is discussed in both cases, to examine what both case studies do to increase resilience in the cities.

First this chapter discusses to what extent flood resilience is a driving force behind the development of floating communities. Then the results from both case studies are discussed separately, after which the results of the cases are compared with each other.

5.1 The role of flood resilience

Floating communities have the particular feature that they can adapt themselves to changing water levels. The communities can rise and fall with the water levels, they can be moved between places and they are robust, yet flexible at the same time. These features of floating communities prepare thee communities for the possibility of a flood, which makes the communities pre-eminently flood resilient. But what role does flood resilience actually play as an incentive for the development of these communities?

There seems to be a discrepancy in both the UK and the Netherlands between what is written down in policy documents and what people actually claim about increasing flood resilience in their cities. The prominent discourse in the policy documents does not match the actual discourse in practice. In several policy documents the concept of flood resilience is being addressed as very important, which stands in contrast to the results from the interviews, where flood resilient is not addressed as a main driver behind development. The Thames Estuary Plan 2100 for example states:

"Designing and constructing a building or infrastructure in such a way that flood water may enter and cause minimal impact. This aids swift recovery after a flood by ensuring that no permanent damage is caused, structural integrity is maintained, and drying and cleaning are made easier." (TE2100, 2012, p. 223).

Furthermore the Climate Adaptation Strategy of Rotterdam (Rotterdamse Klimaat Adaptatiestrategie) emphasises the importance of adaptation and resilience to prepare Rotterdam for climate change. The policy document states:

"Adaptatie betekent het zoeken naar oplossingen in de hele stedelijke ruimte die het system ontlasten of meer flexibel maken. Adaptatie betekent ook het inzetten op aanpassingen van de stad die meebewegen met de dynamiek van de delta, het stijgende en dalende water" (Gemeente Rotterdam, 2013, p. 24).

"Tevens is drijvend bouwen een van de vormen van adaptief, klimaatbestendig bouwen" (Gemeente Rotterdam, 2011, p. 22).

These quotes clearly stress the importance of adapting the city for making it more flood resilient, as the first of the statements from the previous quotes is the following: "adaptation means aiming for adapting the city, so that it moves along with the dynamic of the delta, and the rising and falling water levels. In addition the technique in the system, opportunities that nature offers will be used to adapt Rotterdam to the changing climate" (Gemeente Rotterdam, 2013, p.24). Furthermore the second quote stresses that "floating development is one a way of adaptive and climate proof construction".

In the policy document of the municipality of Rotterdam, a conceptual framework is provided to emphasise both resistance and adaptation, in cooperation with the society, economy, environment and ecology. As can be seen in figure 10, the focus on both a robust system and adaptation with different stakeholders can be seen as socio-ecological resilience, as socio-ecological resilience emphasises 'persistence' (robustness), 'adaptability' and 'transformability' of systems (Davoudi, 2012). Furthermore the fourth characteristic of socio-ecological resilience, as defined in chapter 2, is 'preparedness'. This characteristic is underlined in the "working together" phrase in the framework. So in both cities, resilience is underlined as an important factor to take into consideration with the regeneration of the former harbour areas. In fact, there is specifically indicated that flood risk measures should be taken into account with for example the (re)development of property. The Thames Estuary 2100 Plans for example states that "flood resistance and resilience measures should be incorporated for property", as "property resilience could offset the increased [flood] risk" (TE2100, 2012, p. 136).
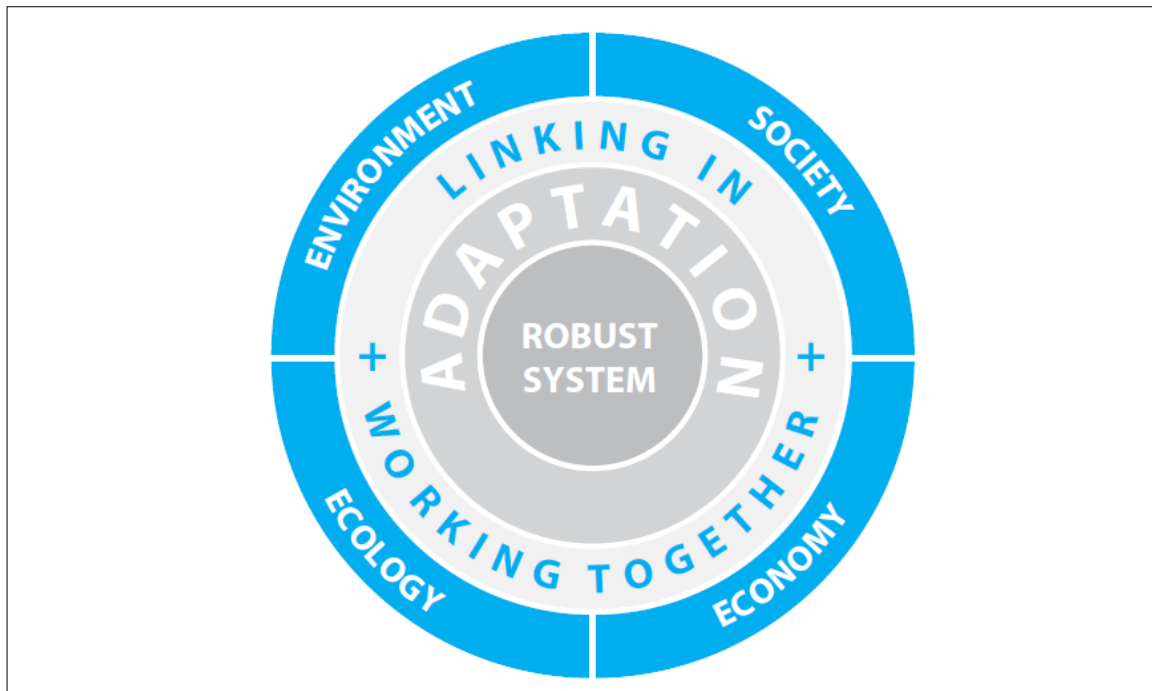
Figure 10: Conceptual framework for climate change strategy in Rotterdam. Source: Gemeente Rotterdam, 2013, p. 7

This aim to increase flood resistance and resilience of property is specified in the Ecobuild 2014 competition brief for the floating village in London. It is designated as a development that can highlight design ideas that could promote water sensitive urban design.

> *"Water sensitive urban design is a land planning and design approach which integrates the urban water cycle, including storm water, groundwater and wastewater management into urban design, […] it can provide benefits such as flood management, improved air quality and green walking"* (Ecobuild, 2014, p. 5).

Policy documents in both cities thus stress the importance of increasing the flood resilience to adapt the cities. However the interviews stand in contrast to the policy documents, since it becomes apparent that flood resilience as such is not a main driver behind the development of the floating communities. This is especially true for the London case, where above all the development of the floating communities is seen as an opportunity to be 'unique', although the Royal Docks is a region exposed to high flood risk. During the interview with the Royal Docks Management Authority (RoDMA), the reason for development is being explained:

> *"So it wasn't done from a background of flood protection, it was done purely from a point of view of trying to create something in the Royal Docks that would be completely different for London, that would be completely unique"* (RoDMA).

The RoDMA furthermore explains that the floating community should become a main attraction for the area, with shops, bars and restaurants, as well as residential property, to increase the income of the Royal Docks area. The London Borough of Newham agrees with this proposition, arguing that the floating community, along with several other developments in the area, is designated to start a visitor economy. An interviewee at the Borough of Newham explains that it does not contribute to flood resilience yet; however, it might be something they would like to see in it in the future:

> "*Not at the moment. That [flood resilience] is something we would like to see in it, but it doesn't at the moment*" (Borough of Newham).

In the Rotterdam case a similar line of reasoning is being adopted; as harbour activities move outward towards the sea, the former harbour areas can be used for new economic impulses and urban densification. It enables the planner to expand the city, but this time inward instead of outward, which is in line with the 'compact city policy' in the Netherlands. According to the interviewee from Dura Vermeer, floating development is an answer to land shortage, as floating development enables seaward growth of cities and is hence a solution to delta cities that face population growth. He argues that floating development mainly can accommodate the growth of cities, but when done properly it does contribute to the flood resilience of cities, since is moves along with the tide:

> "*Steden groeien dicht en ruimte wordt steeds schaarser en in heel veel steden, zeker langs de kustgebieden, is nog veel ruimte op het water. Dus zeewaartse groei is iets wat veel steden dan ook doen, […] en één manier om dat natuurlijk efficiënt te doen is drijvend bouwen. Het idee van drijvend bouwen is een oplossing om de toekomstige groei van steden te accommoderen. En als je het goed doet, dan kan je ook overstromingsbestendig bouwen. Het kan meebewegen*" (Dura Vermeer)

Other interviewees from both DeltaSync and the municipality of Rotterdam do acknowledge that climate change is another reason for the development of floating communities in Rotterdam, though they also stress that the economic incentive behind the development is evident. DeltaSync agrees that land shortage is one reason for the development; the other reason is climate adaptation, with the idea that climate change can trigger innovation and new businesses. They furthermore highlight the ambition of the city of Rotterdam to be a frontrunner in the field of climate change and climate adaptation:

> "*Dat is één reden, de tweede reden is dat Rotterdam euhm… ja, zeer te maken heeft met natuurlijk klimaatsverandering […], dus ook de klimaat adaptatie kant speelt een hele belangrijke rol en daar wil Rotterdam graag in internationaal in kop lopen*" (DeltaSync).

As aforementioned, the municipality of Rotterdam does not regard resilience as a main driver behind the development of floating communities in the city itself; however they do acknowledge that the development in the Rijnhaven actually can contribute to flood resilience in other cities, being an experiment that will teach valuable lessons for future developments worldwide. The municipality argues how the floating community in the Rijnhaven can be a showcase and that best practices from this showcase can contribute to floating development around the world. They see floating development as a sustainable means for accommodating the population growth in the world and in this way contributing to resilience of cities:

> "E*r zijn duizenden, honderduizenden Rijnhavens over de wereld en die kunnen dus een bijdrage leveren in het opvangen van de groei van de bevolking op een manier die de planeet niet meer dan strikt noodzakelijk belast. Dat is de waarde*" (Gemeente Rotterdam).

When summarizing the aforementioned, it is evident that there is a discrepancy about what is written down in policy documents and what is being stressed by the interviewees. To conclude whether or not flood resilience is a main driver behind development, the answer is no.

However, a difference between both case studies can be observed. Climate change does indeed play an important role in the city of Rotterdam, but it is mainly considered an economic incentive, since climate change provides opportunities for economic and urban growth. Stakeholders in Rotterdam see the development of floating communities as a testing ground for development on water, which can contribute to their ambition to become a world front runner in field of climate adaptation. This stands in contrast to the development in London, where the floating community is considered a way to regenerate the Royal Docks and start a visitor economy in the docks.

With this knowledge it becomes interesting to actually assess how institutional capital is being used in the development process of the floating communities. Results of both London and Rotterdam are discussed, after which the results of both cases were compared with each other.

5.2 London's Floating Village

The first case study that is discussed is London. The three capitals, intellectual-, social-, and political capital, are assessed by means of policy document analysis and in-depth interviews. The documents and interview transcripts have been analysed with ATLAS.ti, to reveal how the three capitals are being used in the planning process of the Floating Village in the Royal Docks. The data of the empirical observations have been coded, quoted and analysed to examine what the most important social relations, role of authorities and knowledge development is. All the distinct features of the development process in London are placed in the conceptual framework, as can be seen in figure 11.

5.2.1 Intellectual capital

The first column in the theoretical framework is 'intellectual capital'. On the basis of the policy documents and interviews, this column has been filled with information that describes the two criteria of intellectual capital in the framework; 'research' and 'exchange of knowledge'.

Overall there is little evidence that active knowledge development and exchange is available in London (appendix IV and V; intellectual capital). From the policy documents, little attention is being paid to the role knowledge, knowledge institutions and organisations can play in the development of floating communities. The only evidence of some research being done comes from an interview with the Royal Docks Management Authority, where it was explained that a London based Dutch architect at dRMM architects in fact has done a study on floating development in the Royal Docks. This architect also the dean of the Royal School of Architecture in London, but other than this there is no evidence specific involvement of knowledge institutions with the development of the floating village:

> "*I've done a fair bit of research with things like IJburg in Holland and also looking at places like Hamburg, Seattle… to look at floating communities in those places, to see how you can apply that technology to the Royal Docks. And there is an architect based in London and […] the lead architect has done a whole study on floating development in London. He [the architect] is dean of the Royal School of Architecture in London (RSoA), and I know he has done a lot of work in the RSoA on floating communities. But in terms of specific involvement in the project, no there aren't, you know, the universities aren't involved*" (RoDMA).

Besides the architect, a local visitor centre The Crystal, does research on sustainable urban development. The Crystal of Siemens functions as a visitor and tourist attraction, which provides a place for 'dialogue, discovery and learning' in the field of a sustainable future for cities[12]. It is furthermore home to the world's largest exhibition focused on urban sustainability.

Though there are no clear indicators that there is an active exchange of knowledge between stakeholders in the city itself, London is in fact a member of the C40[13] and Connecting Delta Cities[14] (CDC) groups. These groups are networks of world cities that collaborate and exchange knowledge about climate change and delta management.

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[12] www.thecrystal.org

[13] The Connecting Delta Cities (CDC) is a network that links delta cities that are active in the field of climate change, related spatial development, water management and adaption, in order to exchange knowledge on climate change adaptation. The CDC is part of the C40, and has been established on the initiative of Rotterdam. Source: www.deltacities.com; www.rotterdam.nl

[14] The Climate Leadership Group (C40) is a network that consists of 69 member megacities across the globe. Their aim is to reduce the emission of greenhouse gasses, to address climate change, and to share knowledge about climate change adaptation. Source: www.c40.org

Case	Intellectual capital	Social capital	Political capital
London	**Research:** - There is no clear indication that research is being done or encouraged - However, the research that is being done on floating development, is mostly done by architects - The Crystal a visitors and exhibition centre, owned and operated by Siemens, does research on sustainable urban development	**Collaboration:** - Between the GLA, RoDMA and London Borough of Newham is direct collaboration in the procurement process - Carillion Igloo Genesis, a consortium of different private parties that have won the bid for the floating village - Floating communities are uncharted territory, or a "terra incognita", which makes development and collaboration difficult - Royal Docks Management Authority (RoDMA) collaborates with Greater London Authority (GLA) and London Borough of Newham	**Awareness and willingness to trigger change** - The Mayor of London aims at making London a competitive city - Relatively top down managed by the GLA, Borough of Newham and RoDMA - Several involved authorities, each with different responsibilities - Conflicting ideas between authorities about the development of the floating village, which slow decision making down - Floating village as a unique visitor attraction - Resilience as such is not being seen as a reason for developing floating communities - Reasons for development is mostly of an economic nature - Environmental constraints make the development complex (e.g. development site underneath the flight path of the airport)
	Exchange of knowledge: - No clear indicators are apparent that knowledge is actively being exchanged between universities, developers or other organisations - Both London and Rotterdam are members of the C40 and CDC groups	**Social relations** - There is a particular hierarchy and complex social relation between the involved authorities - Developers are hesitate to invest in this project - Stakeholders in the direct surroundings of the developments sites have an interest (e.g. London City Airport, ExCel etc.) - Bidders in the procurement produced a concept to pitch at the assessment committee	**Shaping policy agenda's** - Development of floating village fits within the Mayors ambition with the city of London - Making use of the water as a policy strategy - Adapting to climate change is considered a responsibility for authorities, in this case the Environmental Agency - Governmental bodies, such as the GLA and Borough of Newham, clearly set the policy agenda's for the regeneration of the Royal Docks

Figure 11: Results from London placed into the conceptual framework

5.2.2 Social capital

Social capital in London is mainly a product of collaboration between involved authorities, as can be seen in the conceptual framework. This is true for both the criteria 'collaboration' and 'social relations'. There is a particular hierarchy between the involved authorities, which makes the development of the Floating Village in the Royal Docks even more complex.

Having multiple authorities involved in the process has implications for the social relations between the authorities and private stakeholders, and between authorities themselves. It thus both covers social capital and political capital, since the authorities are the main players in the planning process. The collaboration and the social relations between the London Borough of Newham and the Greater London Authority (GLA) are complex, which in turn affects the planning process of the floating village. From an interview with the Borough of Newham it becomes clear that both authorities work together on several projects and collaborate in the scoring process of the floating village.

> *"The GLA and the Borough of Newham work together on some of the projects. And we try to work on the same goal […], and that's working with the developers and trying to ensure that schemes come forward that work"* (Borough of Newham).

The social relations however, are complex, since the GLA owns the land in the Royal Docks, the RoDMA maintains the water bodies, but the docks lie within the borders of the Borough of Newham, which makes the borough the responsible planning authority (see table 7). The complex relations between the involved authorities are rooted in the Town and Country Planning Act of 1990 and the Localism Act of 2011, where local governments are more empowered and responsible for local planning and providing planning permits (see paragraph 4.1.2 about British Land Use Management). The Act includes elected Mayors and referendums, which influences the politics in local governments. Allmendinger and Tewdwr-Jones (2002) explain that this causes a regional gap, since the focus of decision making lies on the national and local level. However in London a regional government does exist in the form of the GLA and the Mayor of London, who are concerned with the welfare of the entire city, whereas local boroughs are concerned with local development. This complex hierarchy of social relations between authorities makes the development of the floating village a political game of ideas and interests.

Authority	Responsibility
Greater London Authority	Freehold over the Royal Docks
London Borough of Newham	Local planning authority
Royal Docks Management Authority	Maintenance and development of the water bodies

Table 7: Overview of responsibilities of involved authorities

In the case of the floating village, the GLA and the RoDMA are responsible for the procurement process, with the GLA as leading authority in the procurement process. The Borough of Newham is involved in terms of having a stake in the scoring process. From the interview with the RoDMA it becomes clear what these social relations are:

> "*So it's kind of being procured jointly by the GLA and RoDMA, and Newham is being involved as part of that team*" (RoDMA).

However, some issues concerning collaboration and social relations between stakeholders can be identified. These issues are mainly related to the fact that the development of a floating community is completely new, which makes investors hesitative to be involved and invest in this development. It is the fact that floating development in the UK is still uncharted territory, because floating development is a rather unknown form of development in the country. The London Borough of Newham addresses this issue by stating that this development does not yet have investors, since this type of development is so completely new, therefore organisations are reluctant to come forward with ideas and investments:

> "*I think hinder would probably be getting the developers to take it forward and getting the funding forward. It is kind of the chicken and the egg, you've got to have someone that put their money in, but they are only willing to put their money in if they know that there is someone to pick it up*" (Borough of Newham).

Though developers are hesitative to invest, a consortium of private parties has in fact won the bid for the development of the Floating Village. It is unknown which other consortia where involved in the procurement process, since that information is confidential. In this case the winning consortium is made up of several private parties, such as a constructor and housing association. Furthermore architect dRMM is involved in the design of the floating village and this architect that already has done research on the development of the floating village in the Royal Docks, which therefore both covers intellectual and social capital.

> "*The Carillion Igloo Genesis consortium, made up of constructor Carillion, Igloo Regenerations Fund and Genesis Housing Association, has won the competition to design and build the UK's first floating village, at London's Royal Docks. They are working with architects dRMM and engineers Buro Happold.*" (GLA)[15]

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[15] https://www.london.gov.uk/media/mayor-press-releases/2014/07/mayor-announces-developer-to-build-royal-docks-floating-village

Besides collaborating with the managers of the water and the winning consortium, the users of the water in the Royal Docks are also involved in the planning process. This is an important aspect of developing the floating communities since support of local stakeholders could improve schemes. Around the Royal Docks, large players like the London City Airport, the Siemens Crystal and the ExCel are important, but also smaller players like the local sailing school and rowing club are users of the water.

As mentioned at the beginning of this paragraph, a lot of the social relations and collaboration between stakeholders is between the local involved authorities. The complex relations between the GLA, Borough of Newham and RoDMA illustrate the next capital in the conceptual framework, namely political capital.

5.2.3 Political capital

Complex social relations exist between the involved authorities in the development process of floating communities in London. These complex social relations are political in nature, and are thus also put in the conceptual framework underneath political capital.

During the interviews with the involve authorities, the RoDMA and the GLA described that the idea of the floating village originated at the RoDMA, and therefore the organisation is leading the development process. However the Mayor of London owns the freehold over the land, whereas the Borough of Newham is the involved planning authority:

> *"The Mayor of London owns the freehold of this land. Nonetheless, what we tried to formulate in the master plan, working with the RoDMA, RoDMA take a leading lead on this, was to establish a whole series of options as I described, and one of the key options was for a floating village. And the scale of that was part of coconscious discussion with Newham as being the eventual planning authority"* (GLA).

> *"So the GLA have a freehold and that's why they have an interest in the Royal Docks and for Boris Johnson, the Mayor of London, he sees the regeneration of the Royal Docks as one of his top priorities whilst he is still Mayor. And then the London Borough of Newham's role is they are the planning authority, the docks sit in their area of London and therefore they have a role in terms of determining what we do, from a planning point of view"* (RoDMA).

This hierarchy of involved authorities could work on paper, as described in the Ten Point Vision plan of the Royal Docks, where the regeneration of the Royal Docks is addressed as the absolute priority of both the Mayor of London and the Mayor of Newham (Greater London Authority, 2011a). However, conflicting interests affect the development process of the floating communities in the Royal Docks. These conflicting interests emerge from several factors, such as the reason for the

development of the floating communities, political background of both mayors and the hierarchy between the involved authorities (see appendix IV, political capital). Although the GLA and the Borough of Newham both took seats in the scoring committee for the Floating Village ideas competition, the Mayor of Newham expressed his discontent in the media after the preferred bidder was announced, lashing out towards the Mayor of London and criticising the scheme produced by the Carillion Igloo Genesis consortium:

> "*But the scheme has been blasted today as a 'yuppie ghetto' by the Mayor of the Borough of Newham, which will decide whether to grant planning permission next spring. Sir Robin Wales said: 'we have always been clear that any new development must provide affordable housing and an acceptable mix of uses along with much needed long-term jobs for local people. Newham Council cannot, and will not, accept a development consisting purely of luxury apartments which will be out of reach of the majority of our residents'*"[16]

This resistance is remarkable, since the borough has a place in the scoring committee for the ideas competition; however the RoDMA explains that these conflicts emerge from the politics involved. According to the Mayor of Newham, the Floating Village in the Royal Docks should become a visitor attraction that attracts tourists to the area; it should generate jobs and an income for the region, rather than being a high end destination. This is where the Mayor of London and Mayor of Newham have conflicting interests.

The Mayor of London has great ambitions with London and he wants to increase the competitiveness of the city, so that the city can compete with other world cities. The Royal Docks fit within these ambitions, for the Mayor of London sees the Royal Docks as the doorstep to Canary Wharf, and with the London City Airport and the ExCel nearby it is considered a high end destination. According to the Mayor of London, the floating village should become a leisure designation with bars, restaurants and commercial space, as well as homes and apartments (Ecobuild, 2014, p.2). This is also the main driver behind the development of the floating community; it should become a unique attraction in the city and a steppingstone to Canary Wharf. During the interview the RoDMA stated that main attention for the floating village would be on residential development:

> "*With any developments we do, residential development is always more profitable. Because the turnover… well, let's say these floating homes go through for a million pounds, […] it will be high quality living. And where we are situated, that part of the Royal Docks is quite close to Canary Wharf, the financial centre of London, so we expect people from there to want to live on the docks*" (RoDMA).

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[16] http://www.dailymail.co.uk/news/article-2702773/Luxury-floating-village-set-built-Londons-Docklands-featuring-high-end-homes-restaurants-ice-rink.html

This ambition stands in contrast to that of the Mayor of Newham. Planners at the Borough of Newham argue that new developments in the docks should be beneficial for the local community, which is a necessity since the borough is one of the most deprived boroughs in London (Regeneration Planning and Property Directorate, 2010). Hence the borough states that the development of the floating village should increase the economic and social welfare of the borough, so that local residents can profit from the developments in the docks.

> *"The development should be publicly accessible, and have aspirations to increase the visitor economy, to have benefits to local residents, to create local jobs. And like in our planning policy and our core strategy, part of that is jobs and job creation"* (Borough of Newham).

From the aforementioned quote it becomes evident that the floating village in anyway should contribute to the economy of both the entire city and the borough itself. However, the disagreement between both authorities could endanger the development of the floating village in its entirety. Since the GLA owns the land it has the responsibility to provide a scheme, though if the borough does not agree with the scheme, it will not give planning permission.

These main motives for redeveloping the former docks are thus to reinforce the docks economy, to bring back economic growth and create living environments in former industrial areas. It is interesting to see what the main drivers behind developing the floating community in Rotterdam are. The next paragraph elaborates on the availability of institutional capital in the Rotterdam case.

5.3 Rotterdam's Floating City

Accordingly with the London case study, the data collection in Rotterdam was done by means of policy document analysis and in-depth interviews. After analysis with ATLAS.ti, the data has been put in the conceptual framework, to identify the availability of institutional capital in Rotterdam. The result can be seen in figure 12 on the next page.

5.3.1 Intellectual capital

In the Rotterdam case, knowledge is considered one of the most important assets of the development of floating communities. Both policy documents and in-depth interviews emphasise the value of knowledge and actively involved knowledge institutions. Knowledge is considered a product of experimenting with floating development, a product that can be exported abroad, which in turn can beneficial to the local economy of Rotterdam and the ambitions of the city to become a world leader in climate adaptation. This distinct way of valuing knowledge in Rotterdam fits in the conceptual model with the criteria 'research' and 'exchange of knowledge'.

Case	Intellectual capital	Social capital	Political capital
Rotterdam	**Research:** - TU Delft, UNESCO-IHE, Hogeschool Rotterdam and the RDM Campus are directly involved in research about floating communities - Emphasis is put on the importance of research about climate change and climate adaptation - Knowledge as output from the development process of floating communities - The Floating Pavilion is a pilot for floating development, that serves as an conference, exhibition and visitor centre	**Collaboration** - There is a dense network of developers and universities that cooperate with each other - Due to the new form of contracting, the municipality explicitly leaves plan making at the private stakeholders. They collaborate with the municipality to design these schemes - Floating communities are uncharted territory, or a "terra incognita", which makes development and collaboration difficult - Havenbedrijf Rotterdam collaborates with the municipality of Rotterdam	**Awareness and willingness to trigger change** - Relatively bottom up approach with direct incentives from the municipality - The municipality shifts from a top-down to a more bottom-up approach, adapting a facilitating role for other stakeholders - The municipality of Rotterdam provides a new form of contracting, which makes development difficult - Both municipality and private stakeholders struggle with this new form of contracting - Besides the climate adaptation, the reason for development is also of an economic nature, therefore resilience is not a main reason to develop floating communities - Incentives to develop are provided by the authorities - Environmental constraints make the development complex (e.g. development site active docks that are being used by shipping traffic)
	Exchange of knowledge: - Universities, knowledge institutions and developers work together to design floating communities - Knowledge about floating development and climate adaptation as export product for Rotterdam - Both London and Rotterdam are members of the C40 and CDC groups	**Social relations** - Different stakeholders working together in covenants and consortia like Clean Tech Delta and Platform Drijvend Bouwen - There is a greater responsibility for private stakeholders, as the public sector places more responsibilities at the private sector - Developers are hesitative to invest in this project - Stakeholders in the direct surroundings of the developments sites have an interest (e.g. Nieuwe Luxor Theater, Codrico etc.) - Bidders in the procurement have to produce a concept to pitch at the assessment committee	**Shaping policy agenda's** - Rotterdam aims at being leader and frontrunner in climate adaptation and the development of floating communities fits within this ambition - Climate change is considered a responsibility for local governments, but with the help of residents, knowledge institutions and companies - Governmental bodies, such as the municipality, clearly set policy agenda's to regenerate the Stadshavens and to encourage climate adaptation - The municipality of Rotterdam sets policy agenda's to become leading in climate adaptivity

Figure 12: Results from Rotterdam placed into the conceptual framework

During the interview with the municipality of Rotterdam, the interviewee explained that knowledge plays a specific role in the regeneration of the harbour area and the floating communities. The municipality tries to create value out of the development of floating communities, and knowledge is seen as a valuable catalyst to come to production, knowledge creation and the exchange of knowledge;

> [Kennis is iets] *"wat wij zien als één van de dingen die meerwaarde geven, als je dus daarmee tot productie komt of tot kennisdeling en vermeerdering komt"* (Gemeente Rotterdam).

Furthermore, the Stadshavens policy document describes the value of climate change and knowledge as following:

> *"De klimaatverandering is niet zozeer een bedreiging, maar biedt vooral kansen voor innovatie en kennisontwikkeling. Een sterke thuismarkt op het gebied van innovaties is een van de succesfactoren voor een sterke positie op de wereldmarkt. Drijvend bouwen levert zo een bijdrage aan het versterken van de Rotterdamse delta-economie, […] de internationale nummer 1 op het gebied van watermanagement en deltadesign"* (Stadshavens, 2008, p. 6).

The policy document explains that climate change is not seen as merely a thread, but it is also considered an opportunity for innovation and knowledge development. The municipality regards a strong and innovative home market a key factor to gain a strong position on the world market, which in turn contributes to the delta-economy in Rotterdam.

The development of floating communities is thus considered a strategy to become the international front runner in the area of water management and delta design. Because these ambitions are formulated by the local authorities, it both covers intellectual capital and political capital in the conceptual framework, which makes it possible to put a lot of attention to the role that knowledge institutions play in the harbour regenerations. It is the municipality's ambition to become the world's testing ground in the area of delta technology, which is mainly of political nature (Stadshavens, 2009, p. 11).

Investing in floating development can therefore be considered a tool that contributes to the local economy of Rotterdam. However, the current development of floating communities in the Stadshavens does function as a pilot for larger scale floating communities or cities in the future. Therefore the municipality developed a reconnaissance policy document that describes several goals and preconditions for the development of floating communities, with one of the goals specifically aimed at 'floating development being a living lab, to encourage learning for future large scale application of the technology' (Stadshavens, 2011; Gemeente Rotterdam, 2011). Again, knowledge is considered a main outcome of the development of floating communities.

"Kan drijvend bouwen op deze plek dienen als proeftuin om leerervaring op te doen ten behoeve van mogelijk grootschaliger toepassingen in de toekomst?" (Gemeente Rotterdam, 2011, p. 39).

A lot of knowledge is gained through research, which is being done by knowledge institutions, like for example the Technical University Delft, the Hogeschool Rotterdam, UNESCO-IHE and the RDM campus, but also architects and developers are active contributors in the realm of research and development. These stakeholders are often united in partnerships like the Clean Tech Delta[17] and the Platform Floating Construction (Platform Drijvend Bouwen). These forms of collaboration also cover social capital in the conceptual framework, for these networks and partnerships are developed to strengthen stakeholders' own position in this field of research both locally and internationally. It in turn strengthens the position Rotterdam holds within the field. The municipality is very aware of this fact and uses its power to exploit and export this gained 'knowhow':

"Meerwaarde ontstaat bovendien in het exporteren van in Rotterdam opgebouwde 'knowhow' door bedrijven, kennisinstellingen en overheid. Rotterdam wil deze kennis rondom klimaatadaptatie delen met onder andere deltasteden via netwerken als C40 en Connecting Delta Cities" (Gemeente Rotterdam, 2013, p. 30)

One of the ways to create and share this 'knowhow' is by creating pilot projects in the docks of the Stadshavens. One of these pilot projects in Rotterdam is the 'Floating Pavilion', one of the first floating 'show cases' in the city. It is a visitor center that has been has been developed in the Rijnhaven, and it is an innovative example of climate-proof and energy neutral development. The pilot project furthermore functions as catalyst that should stimulate more floating development in the Stadshavens. In addition, the Floating Pavilion acts as a visitor and tourist attraction, and as a conference and exhibition centre.

Besides the local partnerships and forms of collaboration between public and private parties to gain and exchange knowlegde, the municipality of Rotterdam is a member of the C40 and the Connecting Delta Cities (CDC) groups, which are networks of world cities that collaborate and exchange knowledge about climate change and delta management. In these networks the municipality of Rotterdam exchanges its knowledge created by the pilots in the Stadshavens, and the municipality learns from best practices of other cities. These social relations form the link to the next capital; social capital.

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[17] The Clean Tech Delta Mission is to invest in clean tech in order to reinforce the economic competitive edge with a cluster of innovative, future-proof companies and knowledge institutes and a quality stimulus for sustainable area development in the Rotterdam-Delft corridor. Source: www.cleantechdelta.nl

5.3.2 Social capital

As mentioned above, there is a dense network of private stakeholders, developers and universities that cooperate with each other on the development of floating communities. Some of these private stakeholders are local users of the Rijnhaven in the Stadshavens. In the Rotterdam case users of the water are important, since the Rijnhaven dock is still being used for shipping, which has implications for possible schemes. The municipality of Rotterdam explains that these users set non-negotiable preconditions for development of the Rijnahven, like for example the shipping route and movable bridge that provide access to the company of Codrico have to kept clear, and enough room is needed for water taxi's to reach the Nieuwe Luxor Theatre. These preconditions can only be determined in a dialogue with local stakeholders, and is thus placed in the framework as social capital.

Although there are private stakeholders actively involved, the initiative to develop the floating community lies at the municipality of Rotterdam. The municipality of Rotterdam is the manager of the project; it owns the land and it is the responsible planning authority. Other involved authorities include the port Authority (Havenbedrijf), several water boards, Rijkswaterstaat and the central government; however decision making happens mainly on the municipal level. In addition to the involved authorities, a vital role is played by a network of architects, developers and knowledge institutions that contribute to the development of floating communities in the Stadshavens. The municipality is very aware of the role these private stakeholders can play, as can be read in the climate adaptation strategy:

> *"Naast de gemeente spelen waterschappen en het rijk een rol, […] maar klimaatadaptatie vereist ook een samenwerking met andere partijen. Omdat adaptatie zich afspeelt in de stedelijke ruimte, kunnen naast de gemeente ook bewoners, bedrijven, kennisinstellingen en belangenorganisaties participeren en positief bijdragen aan de klimaatbestendigheid in Rotterdam"* (Gemeente Rotterdam, 2013, p. 7).

There is a close cooperation between the municipality and local companies to increase the climate adaptivity of the city. Several networks have emerged that encompass universities, municipalities, knowledge institutions, water boards and developers. Network organisations like the Clean Tech Delta[18], Rotterdam Climate Initiative[19] and Platform Floating Construction[20] enable stakeholders to form networks and exchange knowledge; it therefore covers both social- and intellectual capital.

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[18] Members of the Clean Tech Delta: Ballast Nedam, Hoogheemraadschap Delfland, Gemeente Delft, Deltalinqs, Dura Vermeer, E.on, Erasmus University, Evides Waterbedrijf, Grontmij, Hogeschool Rotterdam, Gemeente Rotterdam, Royal HaskoningDHV, TNO and TU Delft. Source: www.cleantechdelta.nl

[19] The Rotterdam Climate Initiative aims at making Rotterdam a sustainable world port city, in the face of climate change. Members of the Rotterdam Climate Initiative: Gemeente Rotterdam, Port of Rotterdam, Deltalinqs, DCMR Milieudienst Rijnmond. Source: www.rotterdamclimateinitiative.nl

The municipality recognizes these networks and the municipality provides opportunities for pilot projects from private companies, as can be learned from an interview with DeltaSync. They explained that the initiative to develop the Floating Pavilion came from their hand, and with the help of the municipality it was possible to develop and construct the pavilion:

> *"Bij het Drijvend Paviljoen hebben wij het initiatief genomen samen met de gemeente Rotterdam, om het hele Drijvend Paviljoen te ontwikkelen, als eerste stap op weg naar de ontwikkeling van drijvende wijken"* (DeltaSync).

However, the collaboration between stakeholders is not easy. This is due to the fact that there is a hesitant attitude of private parties towards investing in the development of floating communities. In both cases floating development is uncharted territory, which implies that there are uncertainties about construction, financing the project and legal certainty (see appendix III, political capital). This increases the risk to invest in floating communities. Issues related to financial or legal uncertainties prove to be a bottleneck, which has been aptly described as 'terra incognita' by Dura Vermeer:

> *"Je kunt zeggen; drijvend bouwen is nieuw, wij noemen dat een soort 'terra incognita'. 'Terra incognita' heeft dus een groot voordeel dat er heel veel regels niet zijn die je misschien belemmeren, bijvoorbeeld als het gaat om regels in de ruimtelijke ordening. Aan de andere kant kan het ook weer belemmerend werken, omdat niemand dat durft"* (Dura Vermeer).

The interviewee argues that floating development as 'terra incognita' creates opportunities, for rules that restrict floating development do not yet exist. On the other hand there are also potential pitfalls, due to this lack of rules, which hinders development as it cannot provide certainty about legislation and finance. DeltaSync agrees with this proposition, adding that people are accustomed to conventional development and that they are not yet prepared for these new floating developments.

> *"Kijk, wat natuurlijk altijd een knelpunt is dat als je gaat innoveren dan moeten mensen ook iets anders gaan doen dan ze vroeger deden en niet iedereen is daarop voorbereid"* (DeltaSync).

Especially financing these new innovative projects is said to be difficult. This is pointed out as an issue since investors consider floating development to expensive. Dura Vermeer explains that floating development is being considered as more expensive than regular construction, and together with the lack of incentives to innovate, no initiatives were deployed to be involved in these innovations:

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[20] Platform Floating Construction (Platform Drijvend Bouwen) is a network organisation that contains businesses, organisations and individuals that are involved with the development, design, construction and maintenance of floating development in the Netherlands. It functions as a knowledge pool that supports development, as well as export and international partnerships. Source: www.drijvendbouwen.com

"Drijvend bouwen wordt toch gezien als iets dat duurder is dan regulier bouwen, […] er was dus niet echt een prikkel om te ontwikkelen" (Dura Vermeer).

To make investing in floating communities in Rotterdam more attractive, the municipality has adopted a particular form of contracting to create flexibility at the market. This flexibility is an important contributor for the involvement of private companies and organisations in the process. The new forms of contracting that leave room for the market to come up with new solutions (see appendix II, network view political capital). DeltaSync explains that the municipality of Rotterdam (designated for the development of the floating community) has put the Rijnhaven in the market for private companies to design new schemes for the dock. The fact that the municipality of Rotterdam will provide a thirty-year lease on the Rijnhaven makes this development even more unique (Stadshavens, 2013). This leasehold means that the winning consortium can make use of the water bodies and the surroundings in the dock for thirty years. After this period of time the municipality will determine whether or not to prolong the leasehold or not. According to DeltaSync this is a unique development, and they indicate that Rotterdam is one of the first cities in the world to place a dock into the market to enable floating development:

"De gemeente Rotterdam heeft de Rijnhaven in de markt gezet voor [private] partijen om met plannen te komen. Het is wel een unieke ontwikkeling, omdat Rotterdam een van de eerste steden is op de wereld die dus een haven echt in de markt zet op drijvende ontwikkelingen mogelijk te maken" (DeltaSync)

This form of contracting marks the shift in the Dutch planning regime, where governments move away from the top-down controlled blue print planning, towards a more decentralised plan-led system (see paragraph 6.3). At the same time these active involvement of stakeholders is rooted in the typical Dutch 'Polder model', where it is believed that power flows from consensus and participation. This is reflected in the way that private developers, universities and authorities work together in network organisations, like Clean Tech Delta and Platform Floating Construction (Platform Drijvend Bouwen), to come up with new solutions for urban development in the face of climate change. Together these organisations form highly dense institutional networks that are needed in the Dutch planning regime and Dutch Polder model.

 The focus of the municipality on new forms of contracting and the role that private stakeholders can play in the developments in the Stadshavens reflects the awareness and willingness to trigger change in Rotterdam. Social relations and collaboration (social capital) exists between companies, but these social relations and collaborations are encouraged by the municipality of Rotterdam, as can be learned from policy documents and interviews. The role that the municipality plays in the creation of social capital creates the link to political capital.

5.3.3 Political capital

As mentioned in the previous paragraph, the municipality of Rotterdam has the awareness and willingness to trigger change in the former city docks. Traditionally, the municipality had a very central led approach towards urban planning, but more recently the municipality is shifting from a top-down controlled model towards a more bottom-up approach that leaves room for market incentives. Consequently the role that the municipality is playing with new developments in the city is changing and more responsibility is placed at the private stakeholders.

With this new role comes a new form of contracting which emphasises co-operations with private parties and less financial support. It means that both political capital and social capital become more intertwined with social relations between authorities and private parties. With this type of development, there is more room for flexibility and freedom for developers to come up with new ideas. The new form of contracting is described in the bid book for the floating community:

> *"The city wants to apply a new type of integral area development in the Rijnhaven. The city opens this A location for a long-term co-production with private parties, citizens and institutions. This new type of area development requires a new definition of the public sector's role, […] the city does not bring a fully developed plan to the table. We won't bring a sum of money to the table either. This is a radical shift compared to the traditional client-supplier model. Let the public and private sector come together and explore these new roles"* (Stadshavens Rotterdam, 2013, p. 8)

This social and political learning process is described by Dura Vermeer during an interview. He explains how Rotterdam is forced by financial incentives to renew its procurement policies, where emphasis is being placed at market responsibility. This new form of contracting brings forth several problems that are related to the roles that different parties play, for example more responsibility is placed at the private organisations, whereas the municipality has to release control:

> *"[…] dat zie je bijvoorbeeld in Rotterdam, dat was natuurlijk altijd een gemeente van 'de gemeente bepaald en betaald', […] maar door de crisis is Rotterdam gewoon bankroet. Dus de gemeente heeft nu eigenlijk het nieuwe beleid: 'de markt moet het doen en wij faciliteren en wij scheppen een aantal condities'. Bij elke transitie is natuurlijk het probleem dat de rollen nog onduidelijk zijn en opnieuw moeten worden vastgesteld, daardoor zijn er veel problemen"* (Dura Vermeer).

During the interview, the municipality of Rotterdam agrees with this dilemma. According to the municipality this conflict emerges from the fact that room has to be given to the market, however, due to existing rules and regulations the municipality restrains the market at the same time. This emphasis on rules and regulations originates from the Dutch planning framework, which is based on the comprehensive integrated approach that establishes high legal security.

"Ik bedoel, die aanbesteding is daarin gewoon beperkend. Dus je doet het om de markt uit te dagen, maar ondertussen beperk je die markt ook weer enorm. Dat ervaar ik als een dilemma" (Gemeente Rotterdam).

Roles between authorities and private stakeholders have to be redefined in order to come to enable this form of contracting to become a success. Therefore, to deal with the lack of security and certainty, the municipality of Rotterdam allows and facilitates the winner of the bid to develop its own land-use plan for the Rijnhaven area. This steps away from the municipal responsibility to provide for local land-use plans, and thus enables contractors to come up with ideas that are not bound by existing land-use plans. Though much more flexible, the municipality still provides clear preconditions about the development of the Floating City, for example about purpose of the floating community.

The development of the floating communities in Rotterdam is partly being done from a climate adaptation perspective. Research is an important aspect of the development of floating communities. In several policy documents the municipality clearly states the desire to enhance the adaptivity of the city, and this desire fits in the ambition of the city to become world leader in climate adaptation. In the Rotterdam case the development of the floating communities is a tool to make the city more climate adaptive and it thus contributes to the ambition of the city to become the world's leader in the field of climate change and adaptation:

"Klimaatverandering biedt kansen op groei. En bij het inrichten van de stad kunnen slimme oplossingen de stad klimaatbestendig en tegelijk aantrekkelijker maken om in te wonen en te werken" (Gemeente Rotterdam, 2013, preface).

According to the Adaptation Strategy of Rotterdam this means the municipality, the water boards and central government play an important role in increasing the robustness of the city, but also increasing the resilience of the urban fabric, so that the floating community can move along with climate change:

"Het onderhouden van het huidige robuuste systeem is ook in de toekomst een taak en verantwoordelijkheid van overheden. Naast de gemeente spelen waterschappen en het rijk een rol. […] De strategie van 'beschermen' vullen we aan met adaptieve maatregelen die gericht zijn op het vergroten van de veerkracht en die meebewegen met klimaatverandering. We doen dat door het adaptief bouwen en herontwikkeling van buitendijks onroerend goed en drijvend bouwen." (Gemeente Rotterdam, 2013, p. 7 & 68).

According to the Adaptation Strategy, floating development and adaptive constructions on floodplains can contribute to the adaptivity of the city, and thereby contribute to climate adaptation in the city. This has to become the unique selling point of Rotterdam, if the city wants to become world leader in climate adaptation. Focusing on climate change can therefore be seen as a policy strategy to increase the competitiveness of the city and in this way contributes to the local economy.

However, to actually understand the results and know how institutional capital can be used to increase resilience in coastal cities, a comparison is made. The next paragraph compares the results of both case studies, to provide a better comprehension about the differences and similarities in the development of floating communities.

5.4 Comparing the cases

To compare both case studies, the results of the empirical observations have been analysed and placed in the conceptual framework, as can be read in the previous paragraphs. Subsequently both cases have been placed in the conceptual framework again, however now a distinction between the differences and similarities has been made. This means that there are two frameworks, one with differences and one with similarities.

First the differences of both cases are discussed. In figure 13 on the next page the differences between London and Rotterdam are displayed. The figure provides a clear overview in the differences in availability of institutional capital in both cases.

5.4.3 Differences between both cases

The most striking differences between the London and Rotterdam cases are related to intellectual capital. As can be seen in figure 13, it appears in the London case that actively involved knowledge institutions and exchange of knowledge about floating communities are lacking. There is little evidence that London uses the development of their floating village to increase knowledge about climate adaptation and flood resilience. This stands in sharp contrast to the Rotterdam case, where knowledge is considered one of the most important assets of the development of floating communities. In both policy documents and in-depth interviews knowledge is highlighted as an important product of the development of floating communities and this product can be exported and exchanged. The focus of this knowledge development is on climate adaptation, because the city of Rotterdam aims to be a front runner on this topic in the world. In the Netherlands networks exist in the field of climate adaptation and floating development, like Platform Floating Construction and the Clean Tech Delta. These networks consist of private developers, municipalities and knowledge institutions. These actively involved stakeholders bring forth the differences in social capital.

The main differences between London and Rotterdam in terms of social capital are related to which parties collaborate with each other and which social relations exist between involved stakeholders. It is important to note however, that London is significantly further in the planning process of the floating communities, since a preferred consortium has been announced that came best out of the procurement process. In the Rotterdam case there is the dense network of involved private developers, universities and authorities, which all cooperate on climate change related topics. These stakeholders work together in networks, as mentioned above. In both policy documents and from the interviews it becomes clear that the municipality acknowledges these networks as important, for they gain and possess the knowledge that is necessary for the development of the floating city in Rotterdam. This stands in contrast to the London case, where the Carillion Igloo Genesis consortium has won the bid to develop the floating village in the Royal Docks. But other than this consortium, there is no clear indication of private stakeholders working together in networks or consortia.

From the conceptual framework in figure 13 it becomes apparent that in the London case there is collaboration between different local authorities, whereas in the Rotterdam case there is one local government collaborating with private stakeholders. With multiple authorities involved, social relations exist between authorities and private stakeholders, but also between authorities themselves. As discussed in paragraph 5.2.2 (results social capital in London), social relations between the GLA, London Borough of Newham and RoDMA are complex and this affects the development of the floating village in London. In the Dutch case social relations with the authorities are more straightforward, since the municipality of Rotterdam is the manager of the project; it owns the land and it is the responsible planning authority.

Furthermore, these social relations are related to the political capital in both cases. The most significant differences between the Dutch and British case are related to the role of the authorities and the reason for the development of the floating communities. Some of these differences are rooted in the institutional characteristics of the planning regimes in both countries. The most striking differences have to do with the role that the local authorities play and how they procure the development of floating communities. Furthermore, planning proposals in the UK mainly tested by local politics, whereas in the Netherlands plans are being tested by bureaucrats and less by politicians. These planning specific characteristics therefore explain certain differences between both case studies in the case of political capital.

First of all, the role of the authorities in Rotterdam is different in nature than that of the authorities in London. In Rotterdam, the municipality is shifting away from a top-down controlled planning regime in the city towards a more bottom-up approach that leaves room for market initiatives. However, due to this new role of the municipality, there are some problems related to the role that the other stakeholders play. This means greater responsibility at the market side and the municipality has to release control. This is a difficult thing to do for the municipality, since rules and

Case	Intellectual capital	Social capital	Political capital
London	**Research:** - There is no clear indication that research is being done or encouraged - Some research that is being done on floating development, is mostly done by architects	**Collaboration:** - Between the GLA, RoDMA and London Borough of Newham is direct collaboration in the procurement process - Carillion Igloo Genesis, a consortium of different private parties that have won the bid for the floating village	**Awareness and willingness to trigger change** - The Mayor of London aims at making London a competitive city - Top down managed by the GLA, Borough of Newham and RoDMA - Several involved authorities, each with different responsibilities - Conflicting ideas between authorities about the development of the floating village, which slow decision making down - Floating village as a unique visitor attraction
	Exchange of knowledge: - No clear indicators are apparent that knowledge is actively being exchanged between universities, developers or other organisations	**Social relations** - The London City Airport, Siemens Crystal and other private companies have a direct stake in the development - There is a particular hierarchy and complex social relation between the involved authorities	**Shaping policy agenda's** - Development of floating village fits within the Mayors ambition with the city of London - Making use of the water as a policy strategy - Adapting to climate change is considered a responsibility for authorities, in this case the Environmental Agency
Rotterdam	**Research:** - TU Delft, UNESCO-IHE, Hogeschool Rotterdam and the RDM Campus are directly involved in research about floating communities - Emphasis is put on the importance of research about climate change and climate adaptation - Knowledge as output from the development process of floating communities	**Collaboration** - There is a dense network of developers and universities that cooperate with each other - Due to the new form of contracting, the municipality explicitly leaves plan making at the private stakeholders. They collaborate with the municipality to design these schemes	**Awareness and willingness to trigger change** - Relatively bottom up approach with direct incentives from the municipality - The municipality shifts from a top-down to a more bottom-up approach, adapting a facilitating role for other stakeholders - The municipality of Rotterdam provides a new form of contracting, which makes development difficult - Both municipality and private stakeholders struggle with this new form of contracting
	Exchange of knowledge: - Universities, knowledge institutions and developers work together to design floating communities - Knowledge about floating development and climate adaptation as export product for Rotterdam	**Social relations** - Different stakeholders working together in covenants and consortia like Clean Tech Delta and Platform Drijvend Bouwen - There is a greater responsibility for private stakeholders, as the public sector places more responsibilities at the private sector	**Shaping policy agenda's** - Rotterdam aims at being leader and frontrunner in climate adaptation and the development of floating communities fits within this ambition - Climate change is considered a responsibility for local governments, but with the help of residents, knowledge institutions and companies

Figure 13: Differences between both cities, entered into the conceptual framework

regulations restrain the municipality at the same time. The planning regime in the Netherlands is historically very top-down in nature, and this is reflected in these rules and regulations. In the London case the main issues are related to the social relations between the authorities. These differences are related to the fact that there is a specific hierarchy between the authorities, which is rooted in the Localism Act of 2011. In this act more power is placed at the local authorities, but in the London case, the GLA owns the freehold over much of the land in the borough. Both authorities have different aims with the development of the Floating Village and this causes the complex relations and conflicting interests between the authorities.

This brings forth the second notable difference in the political capital between the London and Rotterdam cases. The reason for developing the floating communities both contains similarities, however there are also differences related to the designated function for the floating communities. Whereas in Rotterdam the floating communities should help Rotterdam to gain more knowledge about climate adaptation, in London the floating village should become a visitor attraction that attracts tourists to the area, it should generate jobs and economic growth for the region. In some policy documents attention is being paid to flood resistant and resilient construction, but from the interviews it becomes clear that this is not an important incentive for developing the Floating Village. In contrast to the London case, the development of the floating communities in Rotterdam is partly being done from a climate adaptation perspective. However, this aim for climate adaptation reflects the economic incentive for development, since a leading role in climate adaptation in the world creates opportunities for economic growth.

5.3.3 There are also similarities

Besides some striking differences between the cases, there are evidently several similarities in the planning process of the floating communities. From figure 14 (see next page) it becomes evident that the least similarities between London and Rotterdam exist in the case of intellectual knowledge. This originates from the fact that there is hardly any evidence that emphasis is placed on research and knowledge exchange in London, whereas in Rotterdam this is a key asset of the development of the floating communities. However, there are in fact some minor similarities in intellectual capital. For example both London and Rotterdam are members of the C40 and Connecting Delta Cities (CDC) groups. These network organisations encourage knowledge exchange between world cities and delta cities, to exchange best practices on for example water management, climate change and rising sea levels in deltas. Another similarity between both cases is the presence of two visitor centres that have been developed in the Royal Docks and the Rijnhaven. The 'Floating Pavilion' in Rotterdam and the 'Crystal' in London both function as a visitor centre, that have the emphasis on learning, research and exchange of knowledge in the field of climate adaptation and sustainable development.

Case	Intellectual capital	Social capital	Political capital
London	**Research:** - The Crystal a visitors and exhibition centre, owned and operated by Siemens, does research on sustainable urban development	**Collaboration:** - Floating communities are uncharted territory, or a "terra incognita", which makes development and collaboration difficult - Royal Docks Management Authority (RoDMA) collaborates with Greater London Authority (GLA) and London Borough of Newham	**Awareness and willingness to trigger change** - Resilience as such is not being seen as a reason for developing floating communities - Incentives to develop are provided by the authorities - Reasons for development is mostly of an economic nature - Environmental constraints make the development complex (e.g. development site underneath the flight path of the airport)
	Exchange of knowledge: - Both London and Rotterdam are members of the C40 and CDC groups	**Social relations** - Developers are hesitative to invest in this project - Stakeholders in the direct surroundings of the developments sites have an interest (e.g. London City Airport, ExCel etc.) - Bidders in the procurement produced a concept to pitch at the assessment committee	**Shaping policy agenda's** - Governmental bodies, such as the GLA and Borough of Newham, clearly set the policy agenda's for the regeneration of the Royal Docks - Mayor of London's aim to make London a competitive city
Rotterdam	**Research:** - The Floating Pavilion is a pilot for floating development, that serves as an conference, exhibition and visitor centre	**Collaboration** - Floating communities are uncharted territory, or a "terra incognita", which makes development and collaboration difficult - Havenbedrijf Rotterdam collaborates with the municipality of Rotterdam	**Awareness and willingness to trigger change** - Besides the climate adaptation, the reason for development is also of an economic nature, therefore resilience is not a main reason to develop floating communities - Incentives to develop are provided by the authorities - Environmental constraints make the development complex (e.g. development site active docks that are being used by shipping traffic)
	Exchange of knowledge: - Both London and Rotterdam are members of the C40 and CDC groups	**Social relations** - Developers are hesitative to invest in this project - Stakeholders in the direct surroundings of the developments sites have an interest (e.g. Nieuwe Luxor Theater, Codrico etc.) - Bidders in the procurement have to produce a concept to pitch at the assessment committee	**Shaping policy agenda's** - Governmental bodies, such as the municipality, clearly set policy agenda's to regenerate the Stadshavens and to encourage climate adaptation - The municipality of Rotterdam sets policy agenda's to become leading in climate adaptivity

Figure 14: Similarities between both cities, entered into the conceptual framework

Social capital provides more similarities between the cases, of which one similarity is quite an obvious one. This first similarity has to do with collaboration between the local authorities and the operator of the water space, in the case of London this includes collaboration between the GLA and Borough of Newham with the Royal Docks Management Authority, and in the Rotterdam case this means collaboration between the municipal government and the port Authority (het Havenbedrijf) of Rotterdam. Furthermore, local users of the water bodies have a stake in the development of the floating communities in both cities, since they set preconditions for the development of the communities.

However, the most striking similarity between both cases is the hesitant attitude of private parties towards investing in the development of floating communities. The development of floating communities is still uncharted territory, or 'terra incognita', which implies that stakeholders are concerned with uncertainties about construction, legal uncertainty and financial aspects of development. The interviewee from Dura Vermeer pointed out that this 'terra incognita' can create both opportunities and potential pitfalls. Opportunities emerge from the fact that restricting rules do not yet exist. This provides chances to 'out of the box' thinking and development. On the other hand it reduces certainty about legislation and finances. These issues concerning uncertainty with the development of floating communities are inherent to the fact that it is completely new. However, these potential pitfalls can be overcome by learning through pilot projects like the Floating Pavilion in the Rijnhaven, so that possible bottlenecks and problems can be prevented with larger scale applications of the innovations in the future. Furthermore adjusting regulations and legislation to fit these new developments is paramount, this way authorities can facilitate private parties to invest in the development of floating communities. An example of adjusting legislation could be making use of local land allocations plans, to designate certain water areas for residential development. Again, pilot projects enable developers to point out where problems occur and are thus important to indicate where legislative changes are desired. Adjusting regulation and regulation brings forth the importance of political capital.

The development of floating communities is mainly being triggered by incentives from the local authorities. Though there is evidence of floating development pilots by private developers in Rotterdam, the development of the entire floating communities in the Royal Docks and in the Rijnhaven are mainly triggered by the authorities. The initiative for development lies at the municipality of Rotterdam and the GLA, which is not a surprise since both authorities have certain ambitions with the cities in which the floating communities play a role. In the London case this means making the city more competitive and unique. . In the Rotterdam case the development of the floating communities is a tool to make the city more climate adaptive and it thus contributes to the ambition of the city to become the world's leader in the field of climate change and adaptation and it provides chances for economic growth.

Another similarity is the fact that increasing the flood resilience in both cities is not an important reason for development. Rather the floating community should be an asset for the Royal Docks and Rijnhaven in terms of uniqueness and contribute to the local economies, create more jobs and enhance the living environment:

> "*Twee doelen staan voorop: de economische structuur van de haven en stad versterken én aantrekkelijke en hoogwaardige woon-en werkmilieus creëren*" (Stadshavens Rotterdam, 2009, p.7).

> "*I suppose what's of value in the setting in the context returns of the Royal Docks in how it features as a vital part of London's ambition and indeed future growth and includes obviously jobs and homes and the capacity for which London has to live within the GLA boundaries to accommodate all of this*" (GLA).

These two quotes explain the main reasons for developing the floating communities in both case studies. In the policy document of the Stadshavens Rotterdam two goals of the regenerations in the Rijnhaven are mentioned, namely reinforcing the economic structure of the docks and creating high-end living and working environments. The same is true for the Royal Docks case, where the Mayor of London the ambition has to make the Royal Docks a stepping stone for Canary Wharf, to manage job creation and create unique living environments. Furthermore, the London Borough of Newham would like to see the floating community in the Royal Docks as a unique visitor attraction that can be an addition to the local economy.

5.5 Conclusion: recapitulating the empirical

From the comparison between both cases it becomes clear that there are some striking differences and similarities between London and Rotterdam. The least similarities are found in the intellectual capital, since Rotterdam places great emphasis on research, whereas London does not. Political capital on the other hand, appears to be important in both cases and the completed conceptual framework with similarities indeed shows most parallels are visible in the political capital.

In the London case it becomes clear that basically the entire planning process of floating communities is driven by political capital. From both the interview and document analysis in the UK, the majority of information is related to political capital. There is a much smaller role for involved stakeholders and networks that create social capital, and there is even less attention to research and gaining knowledge. In the UK the importance of social capital is mentioned more often in the interview analysis than in the policy documents. From the interviews it becomes clear that the social capital is formed by social relations between local governments and businesses around the Royal

Docks that have an interest in developments in the docks, this also is reflected in the conceptual framework (see figure 11). The lack of social capital in the form of networks between private stakeholders and developers is even more true for intellectual capital, as there is hardly any evidence about the existence of networks, apart for the winning consortium. However, from the interviews there is some evidence that research is being done by architects to examine whether floating development is applicable for the Royal Docks.

Contrary to the London case, Rotterdam shows that both social capital and intellectual capital play a much more significant role in the planning process of the floating communities. In both policy documents and in-depth interviews emphasis is placed on the role of social capital and intellectual capital to come to the development of the communities. For example in policy documents 'research and knowledge exchange' are explicitly mentioned as important for the developments in Rotterdam (see figure 12). Besides emphasis on the role of knowledge institutions, room is given to developers and architects to develop pilot projects, which are used for increasing the knowledge about floating communities. With these actively involved architects and developers, social capital is clearly available in Rotterdam. Furthermore political capital is clearly available, since the municipality placed the Rijnhaven in the market for developing the floating community.

With the analysed data and completed conceptual frameworks about the development of floating communities in London and Rotterdam there is one thing to be done; answering the research question. The next chapter provides conclusions, recommendations and reflections on the results, that have been discussed in this chapter.

Chapter 6

Conclusions and reflection

In the face of a changing climate new solutions are needed to adapt coastal cities to hazards such as sea level rise and increased precipitation. The development of floating communities can provide such solutions to make the former docklands of coastal cities more resilient in the events of flooding. To govern for more flood resilience in cities, new government arrangements are needed to foster institutional capital. This institutional capital can be used to make cities more flexible and adaptive to change. This chapter provides answers to the research questions about how to govern for flood resilience. By answering the three sub questions, the main question: *"how can institutional capital be acquired to govern for flood resilience, analysing the example of the development of floating communities in the cities of London and Rotterdam?"* is answered. This chapter provides recommendation and it reflects on the theory and methodology used in this thesis. Lastly recommendations for future research are provided.

6.1 Learning from both case studies

To learn from both cases, empirical reflections are needed. It is important to reflect on what is now known about the development of floating communities in both case studies. Data about the context of London and Rotterdam, the use of institutional capital in the planning process of the communities and flood resilience is necessary to draw conclusions. Therefore, empirical reflection on both cases is provided. First the case study of London is discussed with reflections on what is now known and what the most important conclusions that can be drawn from the data are. Subsequently the case study of Rotterdam is discussed.

6.1.1 Reflecting on the London case

In August 2014 the winner of the competition brief for London's Floating Village was announced; the Carillion Igloo Genesis consortium had the best proposal for the new development in the Royal Docks. This announcement marks the very first stage of developing a floating community in the London. The first ideas to create the floating community emerged several years ago as a means to regenerate the former docks near the city centre of London. The regeneration of the Royal Docks is

part of the larger and comprehensive regeneration project in the Thames Estuary 2100 Plans, to provide for economic growth in the former city docks. This economic growth is the major incentive for redeveloping the Royal Docks and developing the Floating Village. However, according to the Thames Estuary 2100 Plans the docks are very prone to flooding, especially in the face of climate change and sea level rise. Therefore the TE2100 plans stress the importance of increasing flood resilience in the region. This raises the question what role flood resilience plays in the development of the floating community. But from both policy documents and in-depth interview analysis it became clear that resilience is not a driver behind development at all. Rather, main drivers are increasing economic activity and creating a unique place in London that can start a visitor economy.

These motives behind development are stressed by the Mayors of London and the Borough of Newham. Both Mayors would like to see economic growth in the Royal Docks; however their points of view differ fundamentally. The Mayor of London sees the Royal Docks a steppingstone to Canary Wharf and thus a high end destination, whereas the Mayor of the Borough of Newham would like to see economic growth that would be beneficial for the local inhabitants. He expresses his fear that the Royal Docks' Floating Village would merely attract rich yuppies, rather than providing chances for the locals. This conflict between both Mayors and authorities is, among other things, caused by institutional characteristics in the UK. Its' planning regime of Land Use Management system places planning responsibility at the local authority, in this case the Borough of Newham. However in the London case the regional authority, the Greater London Authority, owns the majority of the land. Furthermore a third authority, the Royal Docks Management Authority maintains the water bodies. These social relations between involved authorities create tension, which is the main characteristic of the political capital in the London case.

These social relations within the political capital also create the main relations in the social capital. The three authorities collaborate with each other on the development of the Floating Village. Furthermore, users of the Royal Docks and the winning consortium are stakeholders that are involved in the development of the floating community. They are also part of the social capital in the redevelopment of the Royal Docks. Few involved stakeholders are hesitant to invest in these developments, since the development of floating communities is so completely new. Other than that there is little evidence of actively involved stakeholders. There is no evidence of private stakeholders and knowledge institutions creating networks or social relations with each other, for collaboration on this topic.

This fact also marks the lack of research and exchange of knowledge, or in other words: intellectual capital. From the interviews it became clear that there is indeed a Dutch architect in London has done research of floating development, but according to the interviewees and the policy documents there are no universities or knowledge institutions actively involved in the development process of the Floating Village. This stands in sharp contrast to the Dutch case.

6.1.2 Reflecting on the Rotterdam case

In contrast to the London case, knowledge is considered an important part of redeveloping the Stadshavens and designing the Floating City in Rotterdam. The municipality of Rotterdam considers knowledge an important product of the development the floating communities, a product that can be exchanged and exported. In this way the development of the Floating City can contribute to Rotterdam's ambition to become world leader in the field of climate change and climate adaptivity, which could lead to economic growth in the city. Investing in floating development can thus be considered as a tool to contribute to the local economy of Rotterdam. This emphasis on knowledge in the field of climate change is reflected in the way private stakeholders and knowledge institutions are incorporated in the research into floating development.

This leads availability of social capital in the Rotterdam case. From the interviews and policy documents it became clear that there are quite some engaged networks and consortia that are collaborating on the topic of floating construction. Together these stakeholders, authorities, universities and knowledge institutions form actively involved networks and platforms that promote floating development.

However, although floating development provides opportunities for business and economic growth, investors are also hesitant to invest in floating communities. This is similar to their colleagues in London and it can be related to the fact that floating development is still uncharted territory, or "terra incognita". This hesitant attitude is even more induced due to the fact that the municipality provides a new form of contracting. The municipality has placed the Rijnhaven in the market for consortia to come up with ideas. However, both the municipality and private stakeholders struggle with this new form of contracting. This is due to the fact that on the one hand this form of contracting provides opportunities because there are not yet rules about this type of floating development. On the other hand this creates potential pitfalls since this type of contracting does not provide any certainty, financial and legal security. This form of contracting and retreating municipal government is the most striking characteristic in the political capital in the Rotterdam case.

Lastly, like in the London case, flood resilience does not play an important role in the development of the Floating City in Rotterdam. There is a difference however, in what is written about resilience in policy documents and what is mentioned in the interviews. Increasing flood resilience is being addressed as important in the policy documents, but this stands in contrast to the discourse in practice. For in the interviews flood resilience is not being addressed as a driver behind developing the floating community in the Rijnhaven. Rather the Floating City is considered a means to contribute to the aim of Rotterdam to become a front runner in the field of climate change. Furthermore development on water is said to be a solution for delta cities that face population growth. With this knowledge some lessons can be learned from both case studies.

6.2 Recommendations

'What can London and Rotterdam learn from each other's approach towards governing institutional capital for increasing flood resilience in their cities?' There are some lessons to be learned from both case studies that have to do with the use of institutional capital, but also with the role resilience plays in the development process of floating communities. Although institutional characteristics influence the development of floating communities in London and Rotterdam, there are some specific lessons to be learned that are related to the requirement of all three capitals in the development process.

6.2.1 Building institutional capital

The first lesson that can be learned is to acknowledge the important role that political capital plays in the development processes. This is no surprise, since local authorities are responsible for the (re)development of their cities and increasing the quality of life for its inhabitants. Authorities have the power to involve other stakeholders in the planning process, which is clearly being done by the municipal government of Rotterdam. This stands in contrast to the London case where a more top down approach is being used. The local governments in London hardly involve stakeholders in the development process of the floating communities, apart from the winning consortium. The same is true for the involvement of intellectual capital. However, from the analysis it is evident how important private stakeholders are, since private stakeholders have the opportunity to design, invest and experiment with the floating development.

This calls for new government arrangements where responsibilities are being placed at the market parties. New government arrangements can help governments shift towards dealing with flood risk and preparing a city for a disaster and create opportunities out of flooding. Exactly this is being done by the municipality of Rotterdam by placing the Rijnhaven in the market to enable contractors to come up with schemes to develop floating communities and providing the future winner of the bid with a thirty year concession to exploit the dock. Such new government arrangements are needed to govern for more flood resilience in cities, since the local community, private stakeholders, knowledge institutions and government together form the institutional capacity of a city that enables the city to become more adaptive, flexible and resilient to change. This institutional capital can be acquired by actively engaging stakeholders and knowledge institutions to cooperate on the theme of resilience.

❖ It is thus recommended to acknowledge the importance of institutional capital in the development process of flood resilience in cities. This institutional capital can be acquired by actively involving private stakeholders into planning processes, encourage the development of engaged networks and placing more responsibilities at private stakeholders and knowledge institutions.

6.2.2 Working with 'terra incognita'

Placing emphasis on institutional capital, and intellectual and social capital in particular, does not mean governments can completely retreat. During the comparative research it became evident that the development of floating communities is a 'terra incognita', or in other worlds uncharted territory. Because floating development on this scale is completely new in both countries, private stakeholders are hesitant to invest. This is due to the fact that there is a lack of suiting regulation, which inherently causes uncertainties and risks for investors.

However, 'terra incognita' provides both chances and pittfalls related to legislation and regulation. It is the responsibility for authorities to provide for legislation that fits water related construction; this can be done by for example designating areas in land allocation plans for floating development. In this way legal and financial security can be ensured, which can provide encouragement and incentives for private developers to invest in future projects. The current projects in the Royal Docks and Stadshavens can provide valuable lessons where adjustments to legislation and regulation are needed, but social capital and intellectual capital are necessary to identify where change is needed. Intellectual capital and social capital can help distinguishing where changes in legislation is needed, since local developers, architects and investors can indicate where bottlenecks in legislation and regulation occur with the development of floating communities.

- ❖ It is therefore recommended that local authorities use intellectual and social capital to distinguish where adjustments in legislation and regulation is needed, to enable private stakeholders to invest in the development of floating communities.

6.2.3 Flood resilience as an opportunity for growth

The focus of this thesis on the development of floating communities illustrates a third lesson that can be learned. Although increasing flood resilience is not a driver behind the development of floating communities, it can be indeed useful to incorporate the notion of flood resilience into these first development projects.

From the analysis it became evident that a discrepancy exists between policy documents that address the risk of floods as stressing, and interviews where it became clear that the development of floating communities is being done from economic incentives, not flood resilience. For the sake of clarity, regeneration of former docks to spur economic growth is a good thing, as it creates jobs and enhances the quality of life of these areas. Furthermore several interviewees have pointed out that floating development can be a solution for the growth of populations in coastal cities and that is considered a main value. The more the population of cities grow, the more seaward growth is necessary and flood plains will be used more often. However, these areas are still prone to flooding and this is exactly where chances lie, for both increasing flood resilience and economic growth.

The floating communities should be considered as experiments for floating development, which are useful for other places, since it can become a show case for climate adaptive delta design that in turn can contribute to more economic development. This lesson can be learned from the Stadshavens in Rotterdam, where the development of floating communities is considered an experiment for larger scale application in the future. Because Rotterdam has an emphasis on climate change research, they can export this knowledge to other coastal cities in the world. The development of the floating village in the Royal Docks could also be considered a pilot, which can export knowledge about flood resilience to flood prone areas throughout the country. This makes the development of floating communities an ideal opportunity for economic growth and urban expansion in the face of climate change.

This focus on flood resilience as an opportunity for economic growth might even place the GLA and Borough of Newham on to a par. By considering the development of the floating village in the Royal Docks as an experiment for flood resilient development, it provides chances for economic development which are beneficial for the entire city of London and the Borough of Newham itself. Both intellectual and social capital are needed and the authorities have the power to build these capitals to govern for flood resilience in London and other parts of the country.

❖ It is thus recommended that the floating communities are considered as a complement to the flood resilience of coastal cities, for it can accommodate communities in places that are at high flood risk, as it provides chances for learning and implementation of floating communities on larger scales and in other coaster cities around the world.

6.3 Theoretical and methodological reflections

Increasing flood resilience in cities demands a new approach towards flood risk management, since merely technical measures no longer suffice and more emphasis is being placed on a combination of technical and social measures to reduce and mitigate flood risk. New government arrangements are needed to govern for more flood resilience in cities, as flood risk management shifts towards dealing with flood risk and preparing a city for a disaster and create opportunities out of flooding. These social measures include new government arrangements that put emphasis on the vital role of the local communities and business that help foster the adaptive capacity of cities.

The planning of floating communities in London and Rotterdam has provided a concrete example of creating both robust and flexible constructions in urban space. It shows how flood resilience can be incorporated in urban development. This thesis therefore aimed to assess whether or not the development of floating communities was indeed done from a flood resilience perspective and how these new government arrangements can lead to more flood resilience.

The conceptual framework was used to assess how institutional capital can be acquired to govern for flood resilience. This framework provided the basis of this thesis, since it helps to assess the availability of intellectual-, social- and political capital, by examining to what extent certain criteria are present in the development process of floating communities. The focus on institutional capital is very important, since from the analysis of the data it became clear just how significant private stakeholders are in development of the floating communities. These private stakeholders are, amongst others, developers and architects, but also knowledge institutions have the ability to do research, exchange knowledge and invest in new innovations. Therefore the local community, private stakeholders, knowledge institutions and government together form the institutional capacity of a city that enables the city to become more adaptive, flexible and resilient to change.

The framework to assess to what extent the institutional capital is available contains two criteria for each particular capital that shows to what extent that capital is available during a planning process. The criteria in the framework enabled the assessment what relations were existent between stakeholders, whether or not research was done and exchanged, and it showed how the local authorities mobilised action. The framework that was generated provided output about opportunities and potential pitfalls concerning the availability of institutional capital. These possible opportunities and pitfalls included the availability or lack of the three capitals.

However, it must be said that the conceptual framework provided a more generic assessment framework for examining the availability of institutional capital in the case studies. It can be thus used for more objects of research, rather than just using it for assessing governing flood resilience in coastal cities. This generality is due to the fact that it was not possible to create a more specific assessment framework based on the resilience literature. Moreover, this research did not provide enough information to adjust the conceptual framework, since the main driver behind developing the floating communities was not increasing flood resilience. In conclusion, it can be said that the conceptual framework in this model provided a good basis to assess the availability of institutional capital in practice, however to actually govern for more flood resilience, a more specified framework will be needed.

The fact that the conceptual framework is generic did not influence the research strategy and the execution of the data collection. The research strategy provided the steps that had to be taken to execute the empirical observations. It proved to be a good choice to analyse the background and institutional context in both London and Rotterdam in the first two steps, since it provided an important basis for understanding both cases. During the analysis of the data from the empirical data selection, this knowledge about institutional characteristics and planning practices proved invaluable for understanding the results. With the help of the conceptual framework, interpretation of the date became feasible.

Data collection itself however, proved to be more difficult. The lack of response to invitations for interviews turned out to be quite a challenge. Furthermore, reflexivity on the data was essential, since most respondents were related to involved authorities. This means that one has to be aware of the researcher's positionality towards the analysis of the interview transcripts. The same is true for the policy document analysis, since most documents were written by these same authorities, which creates a bias in the documents. With the help of ATLAS.ti as an analysis tool, these issues have been dealt with. ATLAS.ti itself provided a useful tool to analyse the vast amounts of data generated by the interviews and policy documents. However, analysing the data with this tool was very time consuming and reflexivity was necessary with the textual analysis of the data.

Reflexivity on the theory and methodology is important to reveal the strengths and weaknesses of the conceptual framework, theoretical basis, data collection and analysis. Furthermore, the reflections in this thesis are important, as they provide opportunities for future research.

6.4 Future research

The fact that the conceptual framework was a more generic framework to assess the availability of institutional capital in practice, rather than specifically assessing flood resilience in practice, provides opportunities for future research. It is necessary to specify the conceptual framework on the basis of empirical observations, since the existing literature does not provide enough information to make this specified framework. Such a framework can provide valuable lessons for the governance of flood resilience in the future.

Secondly, the fact that it will still take some time to come to development provides opportunities for future research in the field of using institutional capital for governing flood resilience in cities, the development of floating communities itself and how these developments can be encouraged. Especially research after legislation and regulation in this new terrain of floating development is necessary to provide for more certainty in planning, which might stimulate stakeholders to invest in floating development. It should be examined what the right balance is between strict regulation a lack of rules entails. A balance should be found between certainty in planning and freedom to design new schemes, but which may be uncertain in terms of financing and generating profit.

Furthermore it is recommended that research should be done on how the future inhabitants in floating communities can contribute to the resilience in that area. They may provide further valuable lessons for larger scale development of floating communities in the future, since there is high probability that water based development will be *the solution to accommodate the ongoing growth of the population of coastal cities around the world.

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Appendices

Appendix I: Interview guide

Interview guide

Legend:
- Question
  - Probe

Governance (municipality / (central)government)→ political capital
Knowledge institutions→ intellectual capital
Private organisations and possible inhabitants →social capital

Interview X

Respondents' name
Name organisation

Introduction
- Introduce myself

- Explain what the research is about

- Confidentiality and anonymity (necessary?)

- Ask permission for recording the interview

Opening (start of the interview):
- **Could you tell me more about the flood risk management approaches of *organisation X*?**
  - Link with resilience
  - Initiating floating village?
- **Why and how is the *organisation X* involved in the development process of floating village in the Royal Victoria Dock?**
  - Mayor Boris Johnson
  - Motives for developing floating village
  - Role of public and private parties
  - Role political capital
- **What is the purpose of developing the floating village?**
  - Resilience, climate adaptation
  - Harbour regeneration

Key questions:

About the planning process and motives

- **See opening question 2**

- **How is the project floating village established?**

  - Occasion (aanleiding)

  - Inspiration sources

- **In 2013 the news about the floating villages appeared in the media. What has happened since that moment?**

  - Tender open (when does it close?)

- **For what target group is the floating village being developed?**

  - Higher educated?

  - Young people?

- **What do you think of the speed of decision making?**

  - Fast/slow

  - Why?

- **What are factors that stimulate the process, and which factors slow the process down?**

- **Which steps have to be taken to come to actual development?**

  - Tender win

  - How long will development/construction take?

About stakeholders

- **Who, besides the RoDMA, Borough of Newham and the GLA, are involved in the decision making process of the floating village?**

  - Stakeholders

  - GLA, RoDMA, architects, steering group floating community, Royal Docks Management Authority, London Development Agency, Universities

- **What is the role of these different stakeholders?**

  - Why are they involved?

  - Specific contribution

  - Social capital

- **How do these stakeholders cooperate?**

  - Relations between stakeholders

- **Where do the bottlenecks and synergies lie between the stakeholders?**

- **How does the *organisation X* cooperate with the stakeholders?**

  - Relation public and private parties
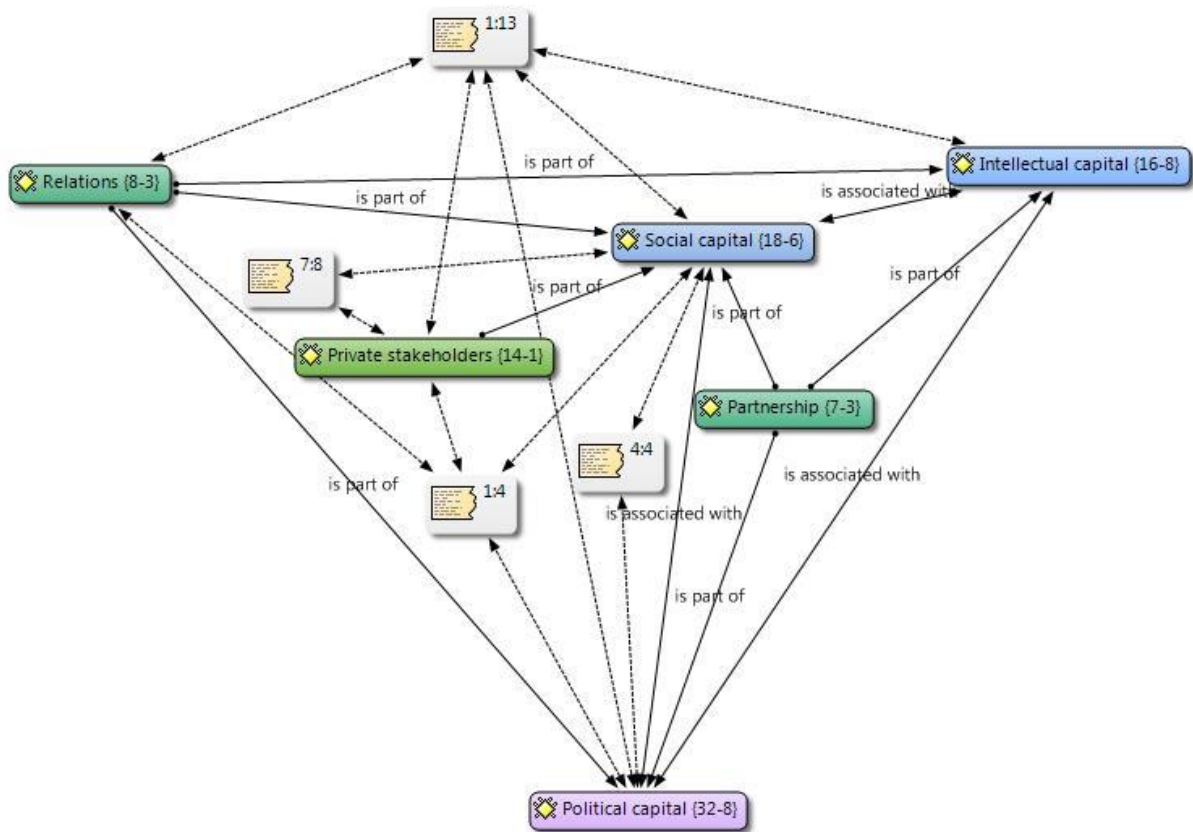
  - Social and political capital

About the future

- **How do you see the development of the planning process and future outcomes?**

  - Tender

  - Actions that have to be taken

  - Role of different stakeholders

- **Is the knowledge that will be gained from the planning process, shared with other countries?**

Closing (end of the interview):

- What are the potential changes and potential pitfalls of the development of floating communities?
- To what extent can floating architecture be part of flood risk management?
- Concluding the conversation
- Do you have any questions?
- Who would you recommend to get in touch with?

Appendix II: Document analysis NL

II.i Network view: Intellectual capital

The network view from the document analysis in the Rotterdam case shows that the code 'intellectual capital' appears sixteen times in the HU 'document analysis NL'. It furthermore shows that research, knowledge institutions and university related codes are frequent. Several quotes that are related to the codes are shown in the network, these codes are provided below.

Quote 1:13
"The Rijnhaven is a good place for an organic development, which offers space to the intitiabives of the Rotterdam citizens and companies. Linking the activities related to the Rijnhaven area development to for example study programmes, employment, community building, work experience, internships and existing in the direct environment…" (Stadshavens, 2013, p. 18)

Quote 3:7
"Stadshavens profileert zich wereldwijd als proeftuin voor duurzame water- en energietechnologie." (Stadshavens Rotterdam, 2009, p. 11)

Quote 4:14
"Het fundament van de Rotterdamse adaptatiestrategie is gelegen in het onderzoek dat binnen het programma Kennis voor Klimaat en nationale Deltaprogramma is uitgevoerd." (Gemeente Rotterdam, 2013, p. 11)

Quote 4:22
"Mogelijkheden zijn er ten slotte volop in de scholing van jonge Rotterdammers met specifiek op deltatechnologie en adaptatie gerichte scholingsprogramma's en onderwijs. Van praktijkonderwijs naar hoger technisch onderwijs, bijvoorbeeld de RDM-campus. Klimaatadaptatie is talentontwikkeling én kennisontwikkeling." (Gemeente Rotterdam, 2013, p 29)

II.ii Network view: Social capital

The network view from the document analysis in the Rotterdam case shows that the code 'social capital' has strong links with both the codes 'intellectual capital' and 'political capital'. The code 'social capital' appears eighteen times in the HU. A lot of the links with quotes are also related to the code 'political capital'.

Quote 1:4
"The Rijnhaven is the first and only place in the Netherlands where public or private parties have the opportunity to realize a development in, on and by the water, right in the heart of the city." (Stadshavens, 2013, p. 6)

Quote 1:13
"The Rijnhaven is a good place for an organic development, which offers space to the intitiabives of the Rotterdam citizens and companies. Linking the activities related to the Rijnhaven area development to for example study programmes, employment, community building, work experience, internships and existing in the direct environment…" (Stadshavens, 2013, p.18)

Quote 4:4
"Maar klimaatadaptatie veronderstelt meer. Om veerkrachtig en flexibel te zijn, zoeken we naar extra ruimte voor adaptieve maatregelen in de openbare ruimte én de private ruimte van de stad. Daarmee wordt klimaat adaptatie een zaak van andere partijen dan alleen de overheid. Klimaatadaptatie betekent het samenwerken met nieuwe partners en stakeholders." (Gemeente Rotterdam, 2013, p. 26)

Quote 7:8
"Het onderhouden van het huidige robuuste systeem is ook in de toekomst een taak en verantwoordelijkheid van overheden. Naast de gemeenten spelen waterschappen en het rijk een rol. Den kaan het nationale Deltaprogramma Maar adaptatie vereis ook een samenwerking met andere partijen. Omdat adaptatie zich afspeelt in de stedelijke ruimte, kunnen naast gemeente ook bewoners, bedrijven, kennisinstellingen en belangenorganisaties participeren." (Gemeente Rotterdam, 2013, p. 7)

II.iii Network view: Political capital
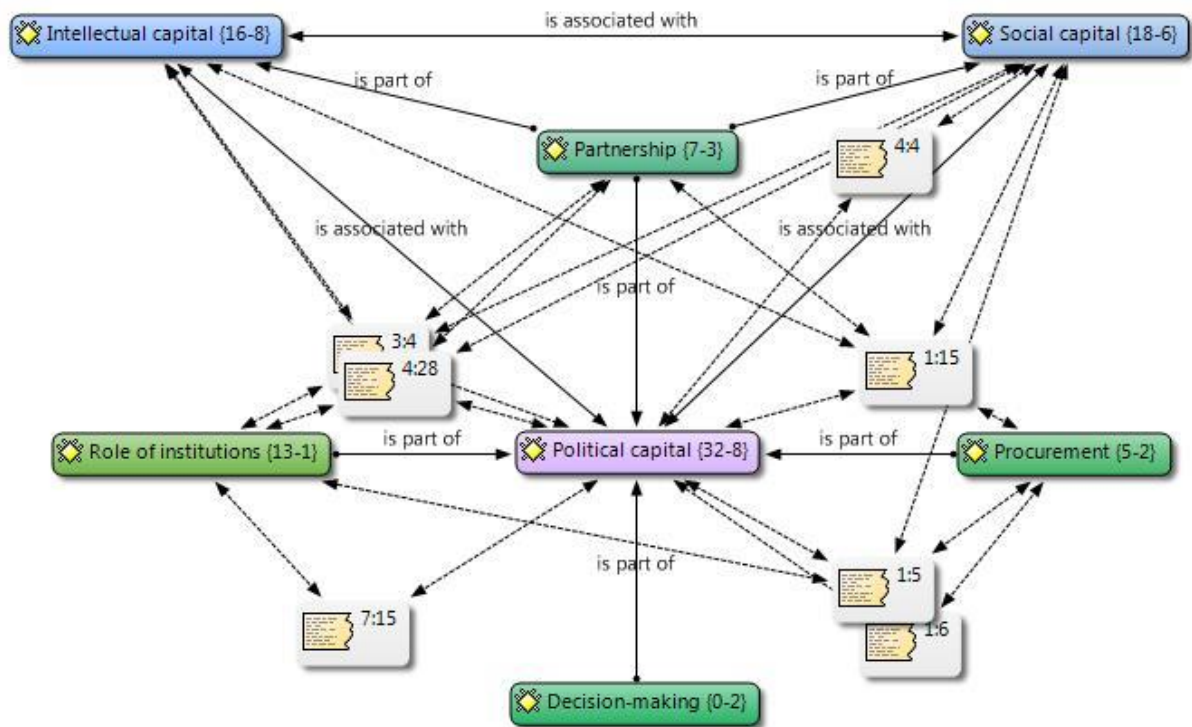
The network view from the document analysis in the Rotterdam case shows that the code 'political capital' has strong links with both the codes 'intellectual capital' and 'political capital'. Furthermore the code 'political capital' is strongly linked with partnership, which means that the local authorities are actively involved in local networks. Remarkably he code 'decision-making' has a frequency of zero in the document analysis, which means that the code does not occur in this HU.

Quote 1:5
"Each of us, whether public or private, will need to ask ourselves new questions, to find new answers and to forge new types of collaboration. Let the public and private sector come together and explore these new roles." (Stadshavens, 2013, p. 8)

Quote 1:6
"A new type of area development requires a new definition of the public's role. As the harbour's owner, the city does not bring a fully developed plan to the table. We won't be bringing a sum of money to the table either. This is a radical shift compared to the traditional client-supplier model." (Stadshavens, 2013, p. 8)

Quote 1:15
"The Rijnhaven is a good place for an organic development, which offers space to the intitiabives of the Rotterdam citizens and companies. Linking the activities related to the Rijnhaven area development to for example study programmes, employment, community building, work experience, internships and existing in the direct environment…" (Stadshavens, 2013, p. 22)

Quote 3:4
"De gemeente wil met dit gebiedsplan overheden, havenbedrijven, maritieme bedrijven, technologische instituten, opleidingsinstituten, ontwikkelaars en culturele instellingen verleiden om daadkrachtig aan de slag te gaan met de metamorfose van de Rijnhaven-Maashaven." (Stadshavens Rotterdam, 2009, p. 7)

Quote 4.4
"Maar klimaatadaptatie veronderstelt meer. Om veerkrachtig en flexibel te zijn, zoeken we naar extra ruimte voor adaptieve maatregelen in de openbare ruimte én de private ruimte van de stad. Daarmee wordt klimaat adaptatie een zaak van andere partijen dan alleen de overheid. Klimaatadaptatie betekent het samenwerken met nieuwe partners en stakeholders." (Gemeente Rotterdam, 2013, p. 26)

Quote 4.28
"Wie: Gemeente Rotterdam, Doepel Strijkers Architecten, Deltares, Unesco-IHE, Universiteit van Utrecht, Vrije Universiteit van Amsterdam, Arcadis" (Gemeente Rotterdam, 2013, p. 72)

Quote 7.15
"Er bestaat geen duidelijk beleid voor drijvend bouwen in Rotterdam. Aanvragen vanuit de markt om een drijvend object te realiseren worden door de gemeente en het Havenbedrijf per geval beoordeeld" (Gemeente Rotterdam, 2011, p. 23)

II.iv Network view: Resilience
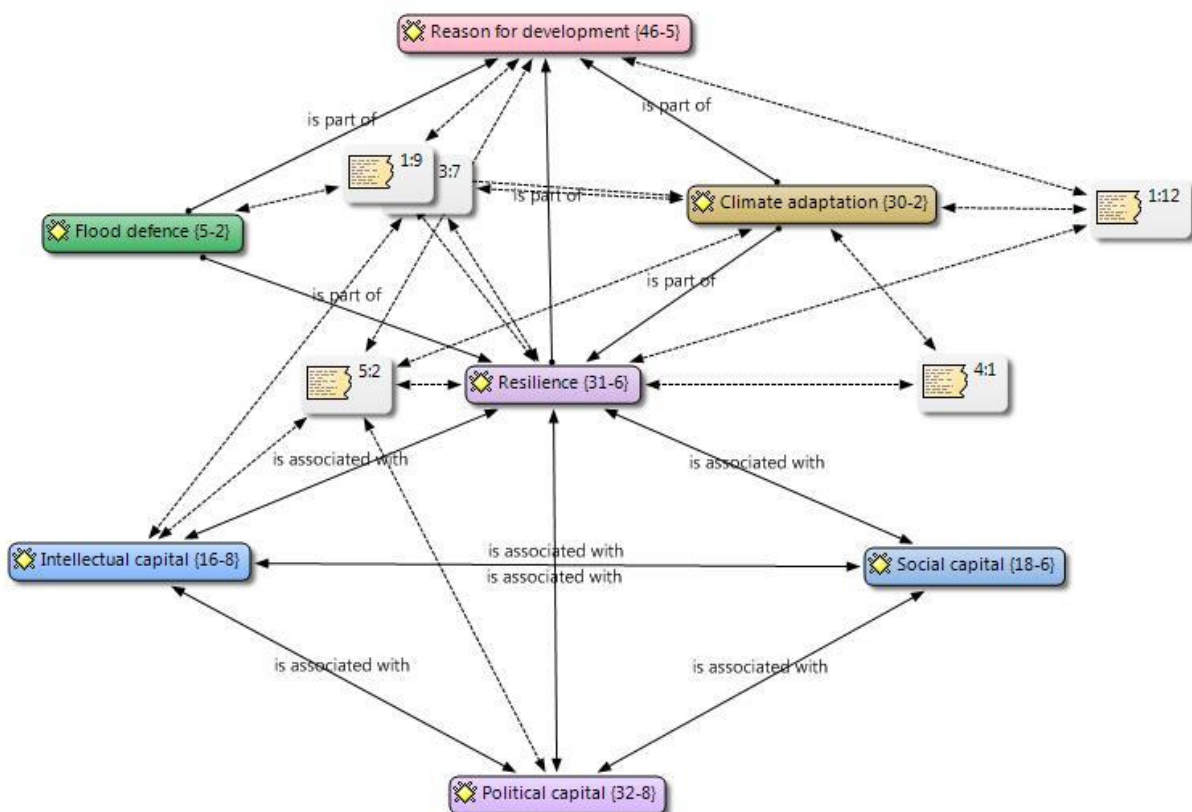
The network view from the document analysis in the Rotterdam case shows that the code 'resilience'. It mainly has links with the node 'intellectual capital', but also with 'political capital'. This is due to the fact that the local authorities in Rotterdam aim at making the city competitive in the field of climate change and climate adaptation.

Quote 1.9
"A big change in the way we approach these water challenges is the realization that we need to move along with it. There are more options besides controlling water by creating canals, building dykes or protecting ourselves through imposing delta works technologies. 'Space for rivers' and climate adaptation are currently hot topics" (Stadshavens, 2013, p. 10)

Quote 1.12
"A showcase for harbour transformation/climate adaptation/water management/materials cycles/ energy and CO2 neutral developments which provide an impulse for circular economy and the development of Rotterdam as future proof delta city" (Stadshavens, 2013, p. 16)

Quote 3:7
"Stadshavens profileert zich wereldwijd als proeftuin voor duurzame water- en energietechnologie." (Stadshavens Rotterdam, 2009, p. 11)

Quote 4.1
"Adaptatie houdt in dat we zoeken naar oplossingen in de hele stedelijke ruimte die het systeem ontlasten en veerkrachtig maken." (Gemeente Rotterdam, 2013, p. 6)

Quote 5.2
"Als icoonproject van de Urgenda wordt Stadshavens de aanjager voor het klimaatbestendig maken van de Randstad. Hiermee wordt nauw aangesloten op het programma Rotterdam Climate Proof, dat de komende jaren voorziet in maatregelen om de gevolgen van klimaatverandering in Rotterdam op te vangen. Rotterdam is bovendien aangewezen als 'hotspot' in het landelijke programma Kennis voor Klimaat. De klimaatverandering is niet zozeer een bedreiging, maar biedt vooral kansen voor innovatie en kennisontwikkeling, nieuwe bedrijvigheid en werkgelegenheid." (Stadshavens, 2008, p. 6).
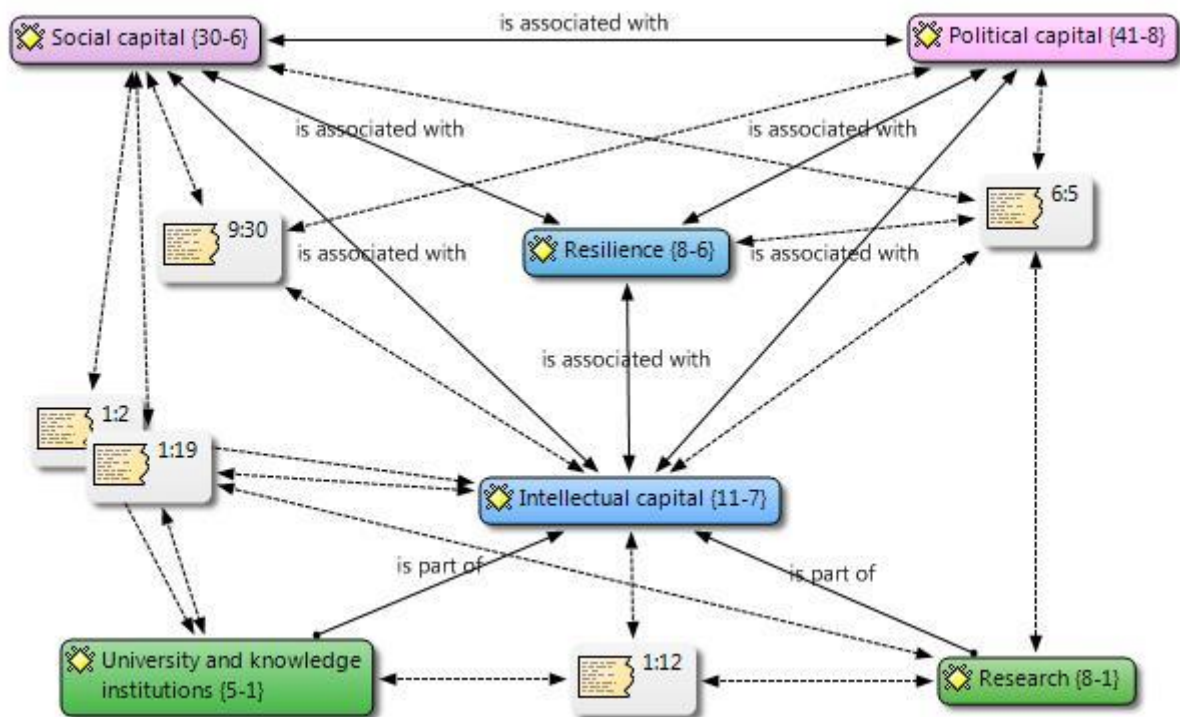
Appendix III: Interview analysis NL

III.i Network view: Intellectual capital

The network view from the interview analysis in the Rotterdam case shows that the code 'intellectual capital'. From the interviews it appears that the node 'intellectual capital' has strong links with the node 'university and knowledge institutions', but also with 'social capital' and 'political capital'. The node 'intellectual capital' is being mentioned quite often, with a frequency of eleven times.

Quote 1.2
"Ik werk bij Dura Vermeer, maar ik werk ook bij het IHE en vanuit het IHE is het ook heel interessant, omdat euh… als het gaat om dit soort bouwwijzen, waarbij je veel meer kijkt naar de omgeving en hoe het bouwwerk zich aanpast aan de omgeving" (Dura Vermeer)

Quote 1.12
"Ja, daar is vooral de faculteit Bouwkunde hè, daar wordt heel veel gedaan. We hebben veel studenten gehad vanuit de TU die allemaal ontwerpen deden. Het is een erg populair onderwerp." (Dura Vermeer)

Quote 1.19
"Dan denk ik ook dat vanuit euhm… de wetenschappelijke wereld het nogal wordt gestimuleerd. Het bedrijfsleven is minder enthousiast." (Dura Vermeer)

Quote 6.5
"De tweede reden is dat Rotterdam euhm… ja, zeer te maken heeft met natuurlijk klimaatsverandering, omdat het een laag gelegen stad is, aan een rivier, aan zee, dus ook de klimaat adaptatie kant speelt een belangrijke rol en daar wil Rotterdam graag internationaal in kop lopen. Onder andere in een samenwerkingsverband waar zij in zitten, dat heet het Connecting Delta Cities en dat is een internationaal samenwerkingsverband waar Londen ook in zit, om internationaal tussen steden kennis uit te wisselen om delta steden aan te passen op de effecten van klimaatverandering." (Delta Sync)

Quote 9.30
"[…] dat hieruit uit de aanbesteding is gekomen, dat krachtige consortium, waar kennis en realisatie bij elkaar komt, met een breed netwerk in het Rotterdamse en wat een meerwaarde voor de stad heeft betekend." (Gemeente Rotterdam)

III.ii Network view: Social capital
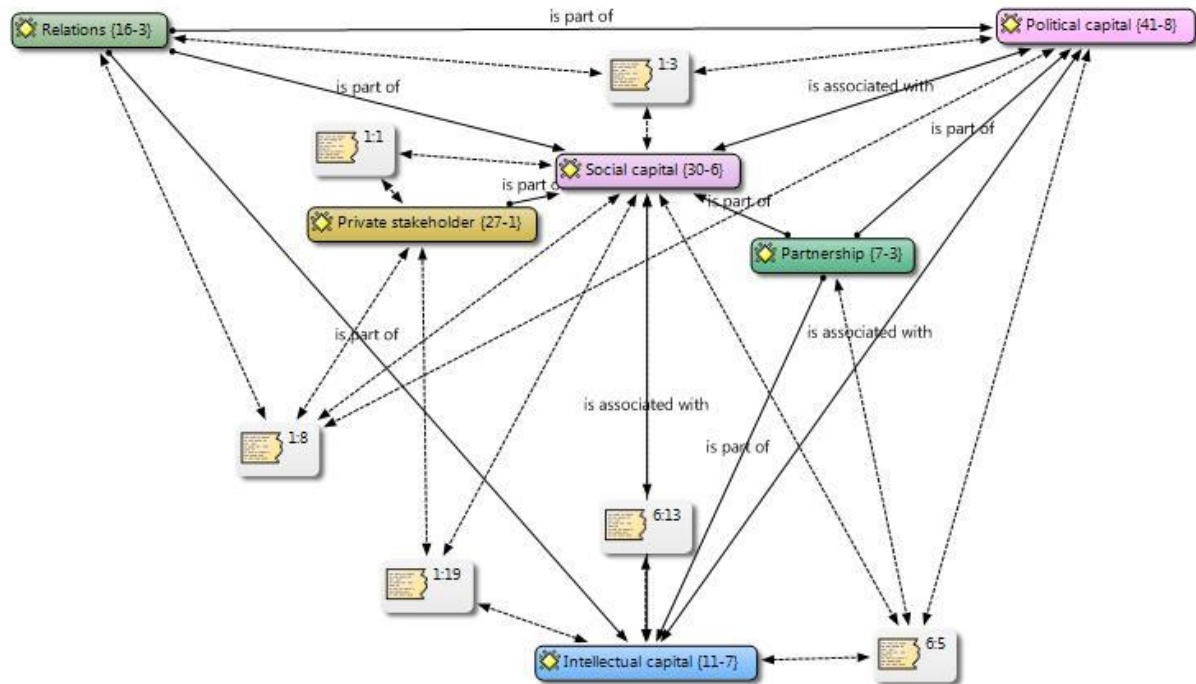
The network view from the interview analysis in the Rotterdam case shows that the code 'social capital'. The node in the network view has its links quite evenly distributed between 'political capital' and 'intellectual capital'. Furthermore, the node 'private stakeholders' appears quite often with a frequency of twenty-seven times in HU of the interview analysis NL. Also the main node 'social capital' appears often, namely thirty times.

Quote 1.1
"Ik werk bij Dura Vermeer, maar ik werk ook bij het IHE […]" (Dura Vermeer)

Quote 1.3
"Nouja, wat de nieuwe trend is… is met particulier opdrachtgeverschap, dat je eigenlijk de toekomstige kopers die alles gaan regelen. Die gaan de architect regelen, die gaan het bouwproces aansturen, die gaan de bouwer aannemen en samen vormen ze één plan. […] Dat kan erg door de markt gedreven zijn." (Dura Vermeer)

Quote 1.8
"Dus als je nou een analyse wil maken over hoe het gaat, dan is dus één kant dat je je moet realiseren is dat het hele ontwikkelen van water, drijvend vastgoed noemen ze dat geloof ik, is natuurlijk nieuw. Dat heeft voordelen en het heeft nadelen. En dan is de hele manier van aanbesteden die Rotterdam gekozen heeft, ingegeven door de crisis, natuurlijk ook nieuw. Dus het is een nieuwe rol waarbij de markt het moet doen."(Dura Vermeer)

Quote 1.19
"Dan denk ik ook dat vanuit euhm… de wetenschappelijke wereld het nogal wordt gestimuleerd. Het bedrijfsleven is minder enthousiast." (Dura Vermeer)

Quote 6.5
"De tweede reden is dat Rotterdam euhm… ja, zeer te maken heeft met natuurlijk klimaatsverandering, omdat het een laag gelegen stad is, aan een rivier, aan zee, dus ook de klimaat adaptatie kant speelt een belangrijke rol en daar wil Rotterdam graag internationaal in kop lopen. Onder andere in een samenwerkingsverband waar zij in zitten, dat heet het Connecting Delta Cities en dat is een internationaal samenwerkingsverband waar Londen ook in zit, om internationaal tussen steden kennis uit te wisselen om delta steden aan te passen op de effecten van klimaatverandering." (Delta Sync)

Quote 6.13
"Ja, dus dat is eigenlijk een proeftuin voor drijvend bouwen, waar ook van alles ontwikkeld zal gaan worden" (Delta Sync)

III.iii Network view: Political capital
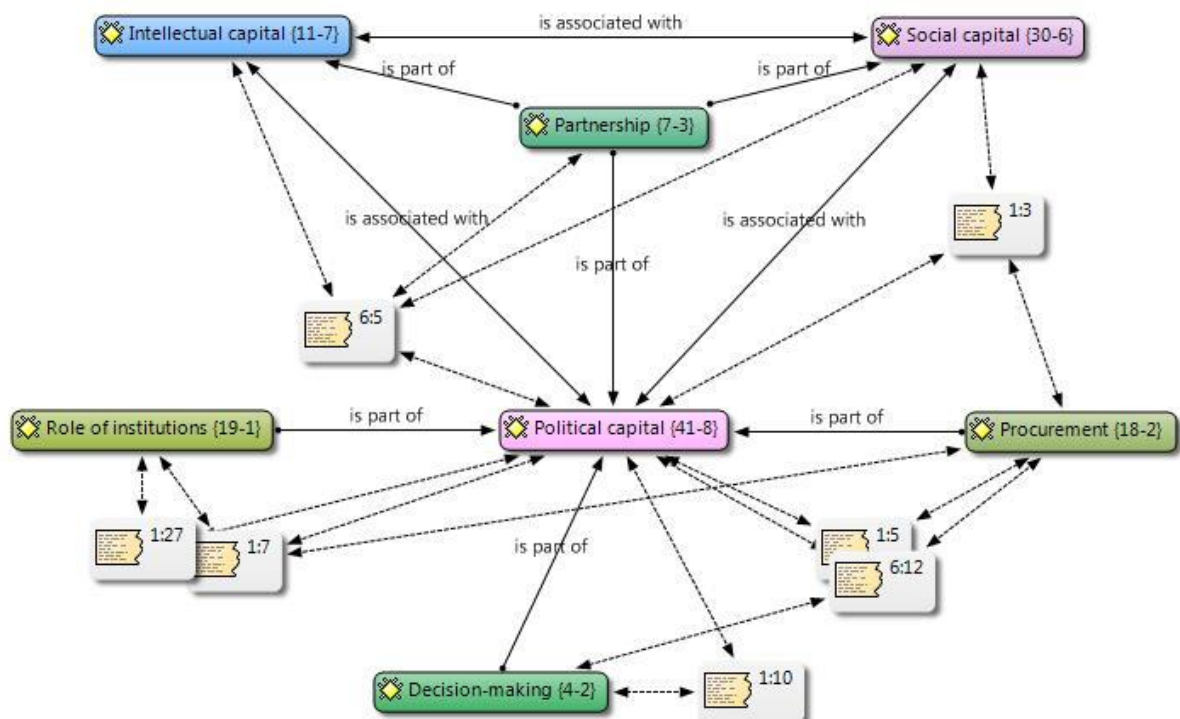
The network view from the interview analysis in the Rotterdam case shows that the code 'political capital'. The node in the network view has quite some quotes, linking it to the 'role of institutions', 'procurement' and 'decision-making'. Furthermore, the node 'political capital' occurs the most in the interview analysis HU in the Rotterdam case, for it has a frequency of forty-one.

Quote 1.3
"Nouja, wat de nieuwe trend is… is met particulier opdrachtgeverschap, dat je eigenlijk de toekomstige kopers die alles gaan regelen. Die gaan de architect regelen, die gaan het bouwproces aansturen, die gaan de bouwer aannemen en samen vormen ze één plan. […] Dat kan erg door de markt gedreven zijn." (Dura Vermeer)

Quote 1.5
"Dat zie je dus in Rotterdam, die gaat eigenlijk van een top down benadering en heel erg publiek gestuurd, meer naar de markt kijken. De markt moet het doen." (Dura Vermeer)

Quote 1.7
"'Terra incognita' heeft dus een groot voordeel dat er heel veel regels niet zijn die je misschien belemmeren, bijvoorbeeld als het gaat om regels in de ruimtelijke ordening. Aan de andere kant kan het ook wel weer belemmerend werken, omdat niemand dat durft." (Dura Vermeer)

Quote 1.10
"Er is een internationale review commissie en die moet dat [de uitslag] beoordelen." (Dura Vermeer)

Quote 1.27
"[…] dat je te maken hebt met een nieuw fenomeen. Dus wat kan dat inhouden in termen van, wat we eerder zeiden, is dat je met een heel schoon veld kunt beginnen en niet gehinderd wordt door regelgeving." (Dura Vermeer)

Quote 6.5
"De tweede reden is dat Rotterdam euhm… ja, zeer te maken heeft met natuurlijk klimaatsverandering, omdat het een laag gelegen stad is, aan een rivier, aan zee, dus ook de klimaat adaptatie kant speelt een belangrijke rol en daar wil Rotterdam graag internationaal in kop lopen. Onder andere in een samenwerkingsverband waar zij in zitten, dat heet het Connecting Delta Cities en dat is een internationaal samenwerkingsverband waar Londen ook in zit, om internationaal tussen steden kennis uit te wisselen om delta steden aan te passen op de effecten van klimaatverandering." (Delta Sync)

Quote 6.12
"Dat [sluiting van de tender deadline] wordt iedere keer uitgesteld door de gemeente. Dus eigenlijk zou die al geweest moeten zijn, maar iedere keer wordt dat later dan hun dachten." (Delta Sync)

III.iv Network view: Resilience

The network view from the interview analysis in the Rotterdam case shows that the code 'resilience', which can be seen on the next page. The node 'resilience' does not have a lot of occurrences in the transcripts of the in-depth interviews, namely eight. This means that quotes relating to resilience are not often mentioned. The node does have links with other 'reasons of development', like 'climate adaptation' and 'flood defence'. It is striking that the node has links with all the three capitals.

Quote 1.15
"Het idee was van, drijven bouwen is een oplossing voor… om de toekomstige groei van steden te accommoderen. Dat was het oorspronkelijke idee… Omdat ruimte op het water beschikbaar is en als je het goed doet, ook overstromingsbestendig kan bouwen, hè. Het kan meebewegen." (Dura Vermeer)

Quote 1.17
"Maar het algemene principe is dat je dus veel duurzamer kunt ontwikkelen door op een andere manier te bouwen. Dus of je dat nou resilience wilt noemen… Ja, ik denk het…." (Dura Vermeer)
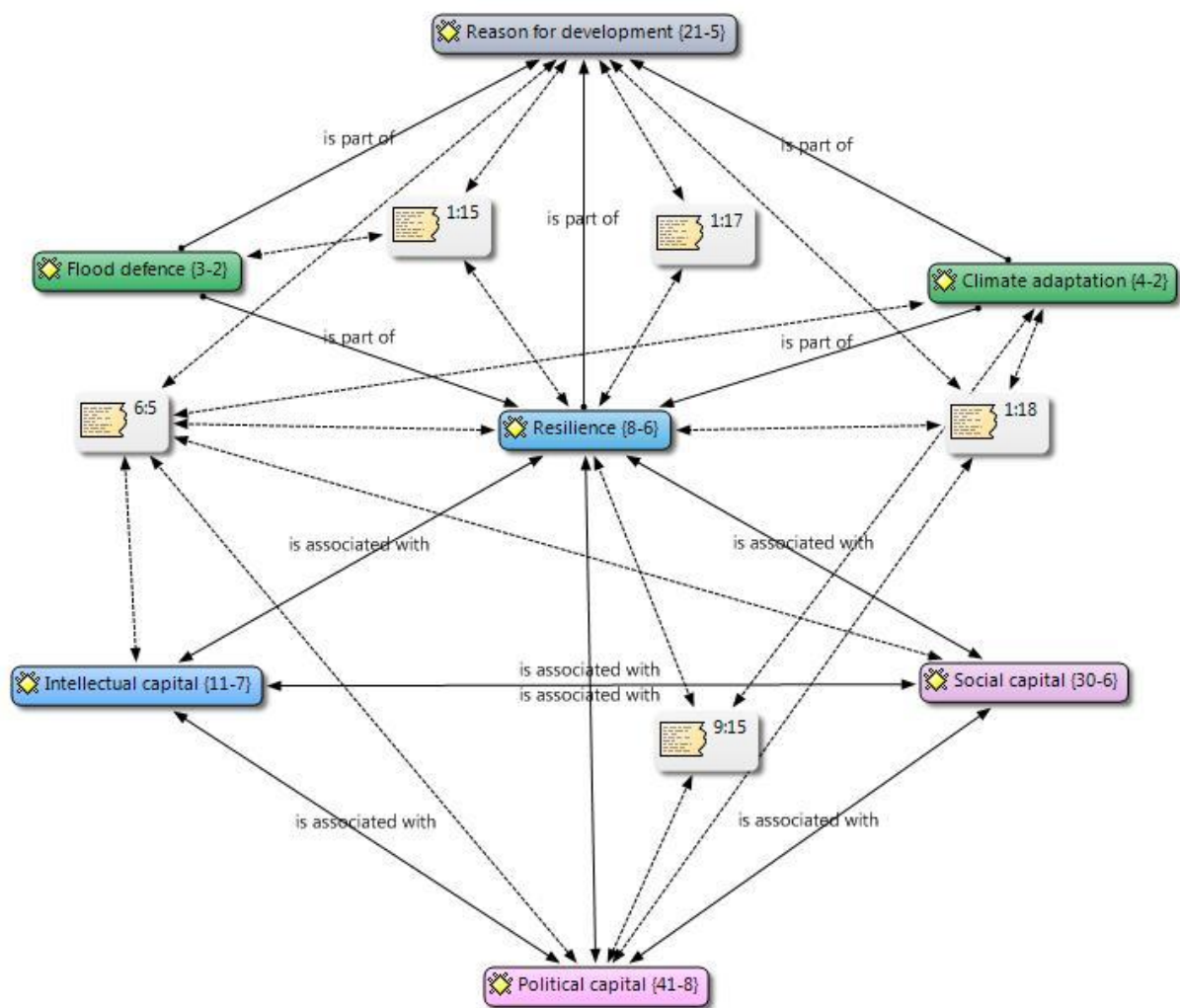
Quote 1.18
"Want Rotterdam wil natuurlijk echt de leidende stad zijn op het gebied van klimaat adaptatie in de wereld en ook nog wel breder." (Dura Vermeer)

Quote 6.5
"De tweede reden is dat Rotterdam euhm… ja, zeer te maken heeft met natuurlijk klimaatsverandering, omdat het een laag gelegen stad is, aan een rivier, aan zee, dus ook de klimaat adaptatie kant speelt een belangrijke rol en daar wil Rotterdam graag internationaal in kop lopen. Onder andere in een samenwerkingsverband waar zij in zitten, dat heet het Connecting Delta Cities en dat is een internationaal samenwerkingsverband waar Londen ook in zit, om internationaal tussen steden kennis uit te wisselen om delta steden aan te passen op de effecten van klimaatverandering." (Delta Sync)

Quote 9.15
"Daar [resilience] kan mijn collega uren over vertellen. Ik zit daar iets zakelijker in. Kijk voor mij is het vooral, volgens mij, klimaat adaptatie in Rotterdam, kijk daar zijn wij van hè. Eén van de CO_2 hoofdsteden in de wereld." (Gemeente Rotterdam)

Appendix IV: Document analysis UK

*IV.i Network view: Intellectual capital*
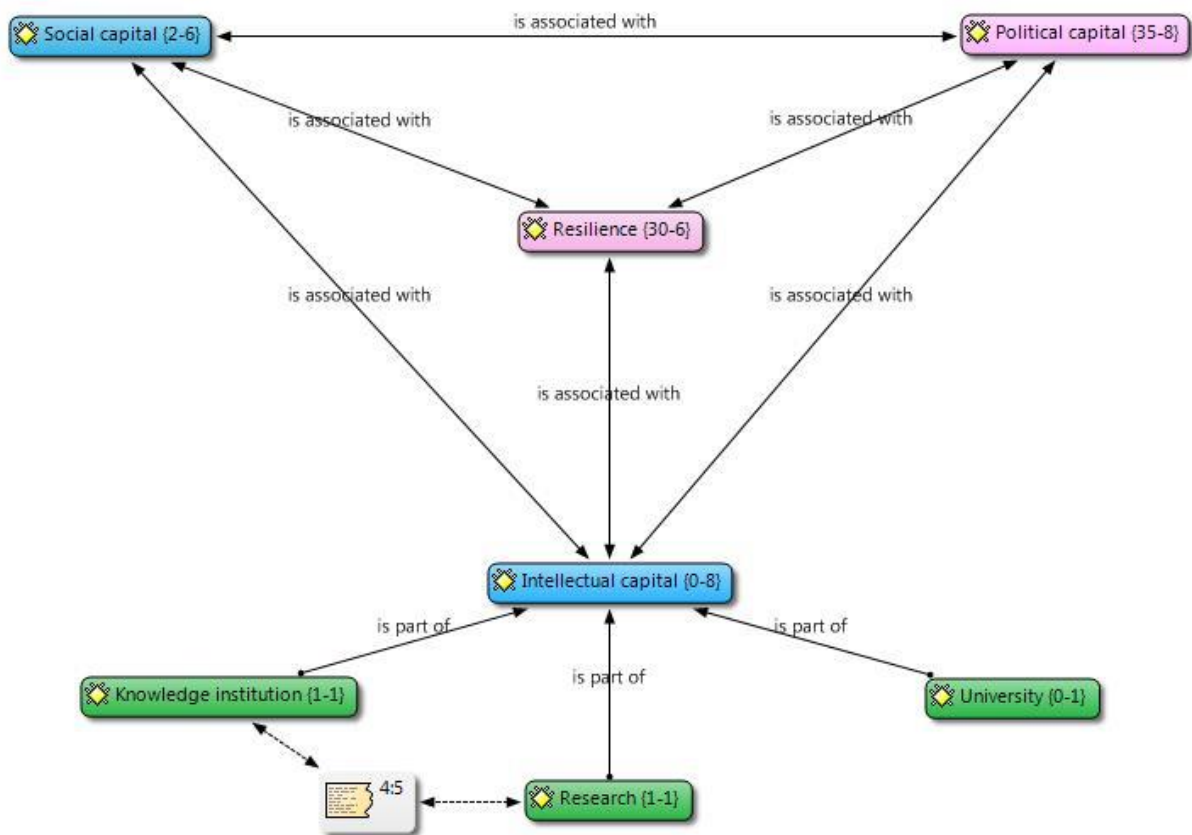
The network view from the document analysis in the London case shows that the code 'intellectual capital', does not appear in the documents at all. It has a frequency of zero. Only the quote 4.5 explains something about research in the area, but this is not directly related to the development of the floating community in the Royal Docks. Furthermore, the node 'resilience', which is associated with 'intellectual capital', only has links with 'political capital' (see also IV.iii network view political capital).

Quote 4.5
"The [Royal Docks] area has much going for it. The water front […] means that it is ideally placed as a business and leisure destination. This offer has recently been reinforced by Siemens' decision to invest in their European research and visitor's centre." (Greater London Authority, 2011a, p. 6)

IV.ii Network view: Social capital

Like in the previous network view, this network view is formed by document analysis in the London case. In this case it shows that the code 'social capital', which only appears twice in the policy documents. This means that there is little occurrence of quotes in the policy documents that can be related to social capital. For example quotes which tell something about the existence of networks or engaged stakeholders. In this network view, there are two quotes identified that can be related to the node 'social capital'.
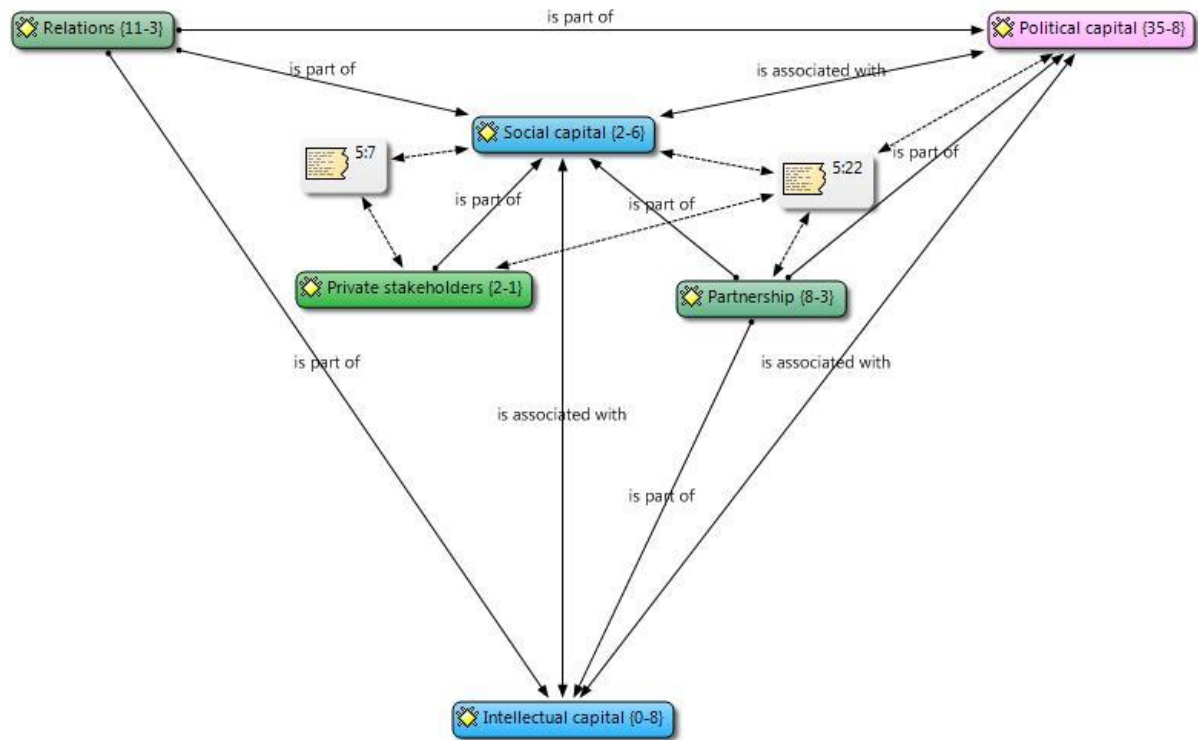
Quote 5.7

"Businesses and the community as a whole have an important role in preparing for flood by finding out if they live or work in a flood risk area, signing up for our flood warning service and taking approapriate action to keep their property, employees and family safe" (TE2100 Plan, 2012, p. 23)

Quote 5.22

"The Environment Agency's teams responsible for spatial planning will promote these works in partnerships with landowners and local authority planning teams" (TE2100 Plan, 2012, p. 128)

IV.iii Network view: Political capital
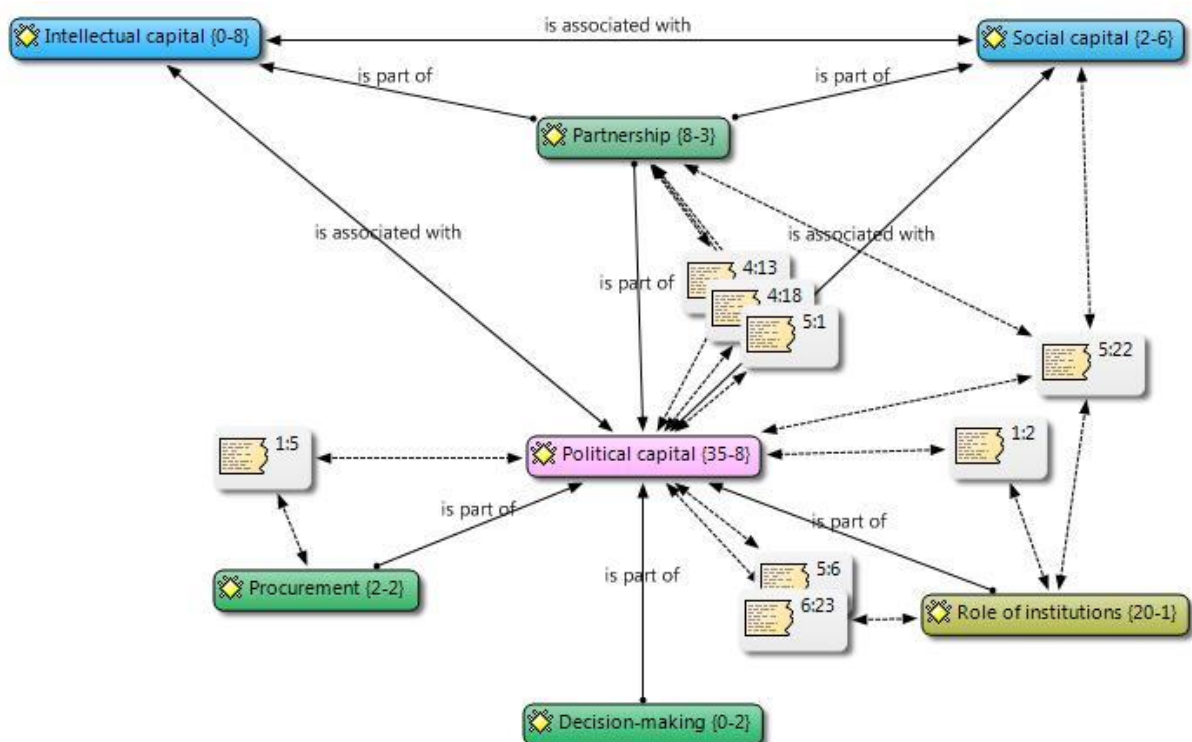
In contrast to the previous network views, the network view from the document analysis in the London case shows that the code 'political capital', does indeed appear quite often in the policy documents. It has a frequency of thirty-five. Most quotes related to the node 'political capital' are related to 'partnership' and the 'role of institutions'. This is due to the fact that the social relations between authorities are very complex.

Quote 1.2
"The area is protected from flooding from rivers or sea by the Thames Flood Defences, which provide a standard of protection of 1 in 1000 years until 2030. The Environment Agency is progressing the 'Thames Estuary 2100' scheme, which will continue providing protection." (Ecobuild, 2014, p.1)

Quote 1.5
"London's first floating village in the Royal Docks- a new vibrant leisure destination incorporating floating bars, restaurants, and other commercial space, homes and serviced apartments." (Ecobuild, 2014, p. 2)

Quote 4.13
"The Mayor of London and the Mayor of Newham will campaign to make the Royal Docks attractive to business and investors through a combination of new funding models and dedicated economic zone business incentives, streamlined bureaucracy, proactive planning policy and on-going advice and support." (Greater London Authority, 2011a, p. 22)

Quote 4.18
"The Mayor of London and the Mayor of Newham are committed to achieving this vision in the Royal Docks. This jointly signed document is underpinned by a steering group, jointly chaired by the Mayor of London and the Mayor of Newham." (Greater London Authority, 2011a, p. 38)
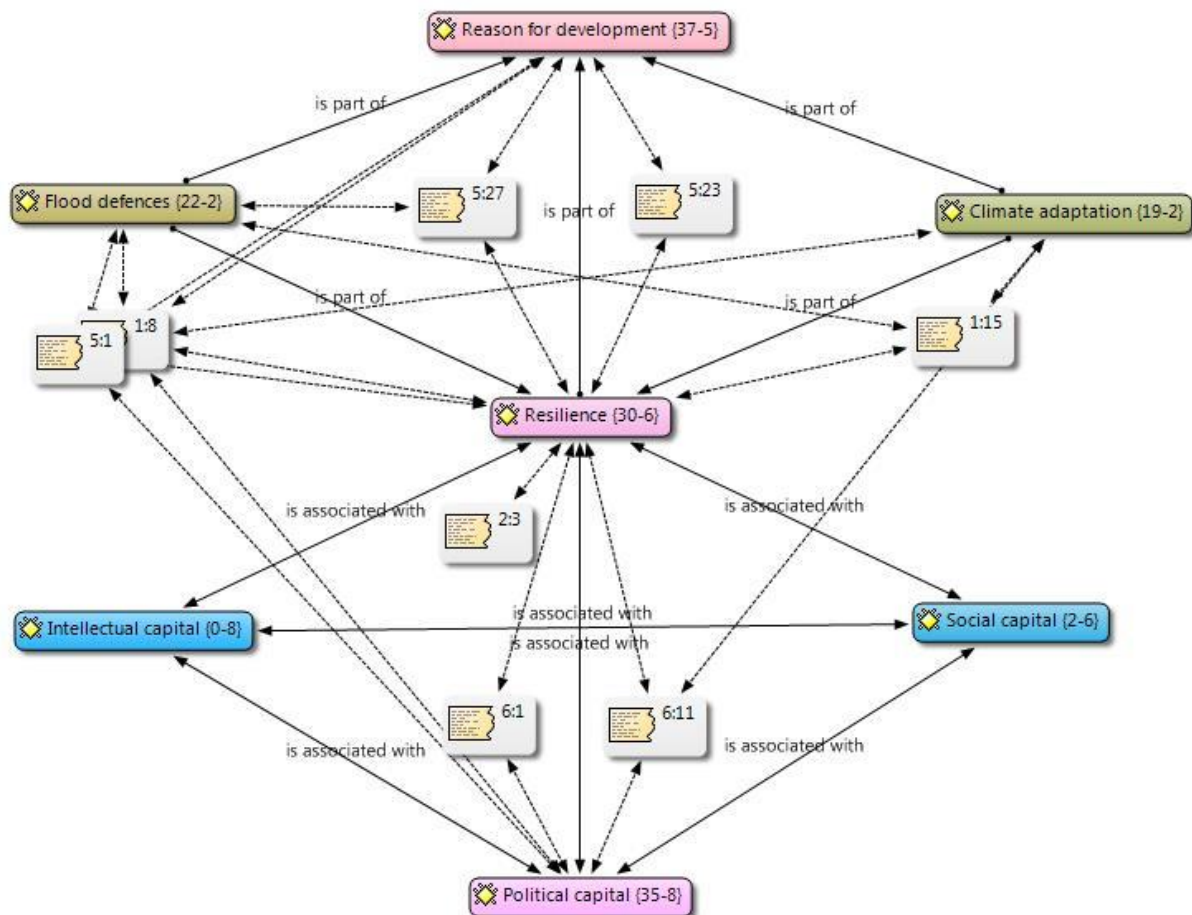
Quote 5.6
"Regional and local authorities are responsible for ensuring that flood risk is taken into account at all stages of the planning process in order to manage and reduce the consequences of flooding." (TE2100 Plan, 2012, p. 22)

Quote 5.22
"The Environment Agency's teams responsible for spatial planning will promote these works in partnerships with landowners and local authority planning teams" (TE2100 Plan, 2012, p. 128)

IV.iv Network view: Resilience

The last network view of the document analysis in the UK is the network view that shows that the code 'resilience' (see the network on the next page). This code actually appears quite a lot, since the frequency of the code is thirty. This means that in the policy documents, quotes related to resilience appear often. Resilience can thus be considered as prominent in the policy documents from the London case.
It is furthermore striking that there are no links with quotes between the nodes 'resilience', 'social capital' and 'intellectual capital'. In contrast to the lack of links between social-, and intellectual capital, links with quotes between 'resilience' and 'political capital' are common.

Reason for development {37-5}

is part of

Flood defences {22-2}

5:27

is part of

5:23

Climate adaptation {19-2}

is part of

is part of

5:1 1:8

1:15

Resilience {30-6}

is associated with

2:3

is associated with

Intellectual capital {0-8}

is associated with

is associated with

Social capital {2-6}

6:1

6:11

is associated with

is associated with

Political capital {35-8}

Quote 1.8
"The Royal Docks was chosen as a location to hightlight some of the design ideas that could promote water sensitive design (WSUD). WSUD is a land planning and design approach which integrates the urban water cycle, including storm waters, groundwater, and wastewater management and water supply, into urban design to minimise environmental degradation and improve aesthetic and recreational benefits." (Ecobuild, 2014, p.5)

Quote 2.3
"Planning decisions: […] improvements to appearance and resilience of the building" (Greater London Authority, 2011b, p. 160)

Quote 5.1
"In this plan the importance of working in partnership with other organisations to improve our preparedness for flooding, and in reducing the consequences of a tidal flood" (TE2100 Plan, 2012, p. 1)

Quote 5.27
"Flood resilience: designing and constructing a building or infrastructure in such a way that flood water may enter and cause minimal impact. This aids swift recovery after a flood by ensuring that no permanent damage is caused, structural integrity is maintained, and drying and cleaning are made easier." ((TE2100 Plan, 2012, p. 223)

Quote 6.1
"In this strategy 'adaptation' is used to define action to a) understand the risk and opportunities we face from extreme weather today and further changes to our climate in the future, b) to identify, assess and prioritise the options to manage the risks and opportunities and c) to develop, deliver and monitor actions to manage these risks and realise these opportunities." (Greater London Authority, 2008, p. 18)

Appendix V: Interview analysis UK

V.i Network view: Intellectual capital
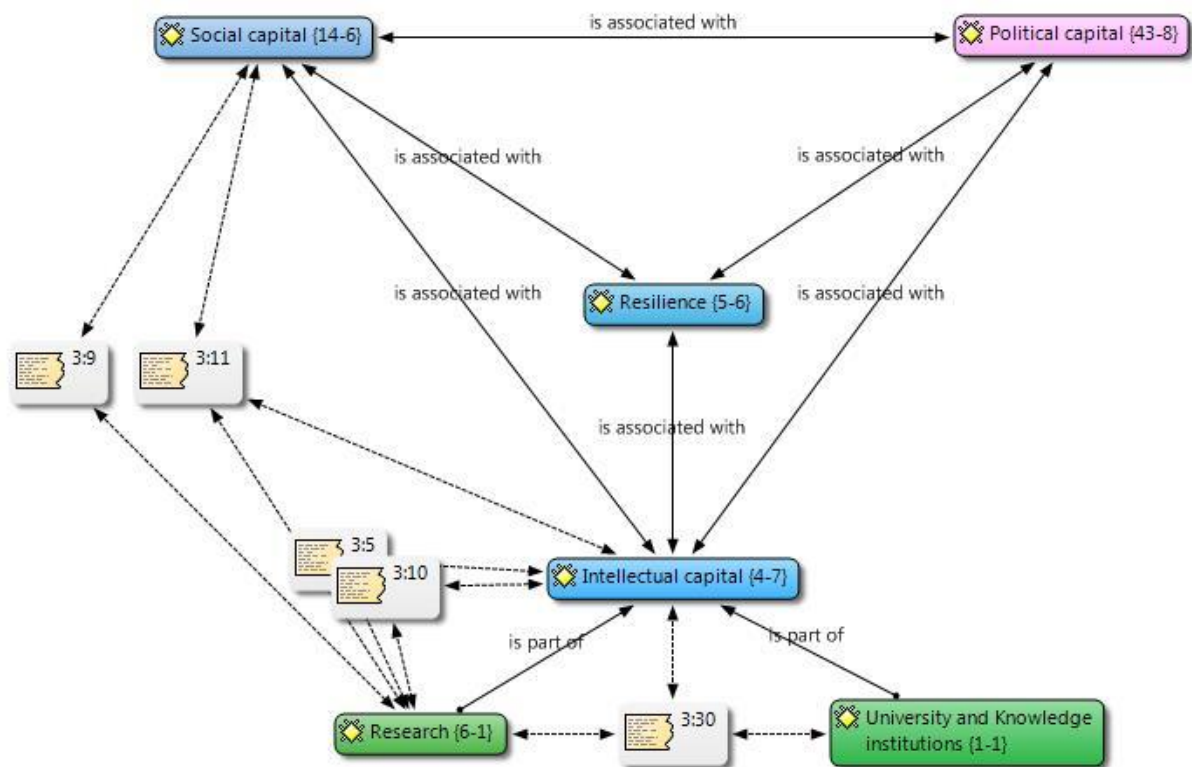
The network view from the interview analysis in the London case shows that the code 'intellectual capital' has a frequency of four. This means that quotes related to the node 'intellectual capital' like 'research' and 'university and knowledge institutions' occur a couple of times in the transcripts of the in-depth interviews. However, with such a low frequency, intellectual capital is not considered important in the London case.

Quote 3.5
"And I've done a fair bit of research with things things like IJburg in Holland […], to look at floating communities in those places, to see how you can apply that technology in the Royal Docks" (RoDMA)

Quote 3.9
"As part of the project of looking at, bring the dock back to life. So the floating village came out of that as a sort of creative idea where we had a workshop where we were thinking about what else there is out there in the world of people who have used the water… And the masters of using water are obviously the Dutch" (RoDMA)

Quote 1.10
"So we've done a great deal of research at how we can make this project happen" (RoDMA)

Quote 3.30
"[…] Is the dean of the Royal School of Architecture in London, and I know he has done a lot of work in the RSoA on floating communities. But in terms of specific involvement in the projects, no there aren't, you know, the universities aren't involved" (RoDMA)

V.ii Network view: Social capital
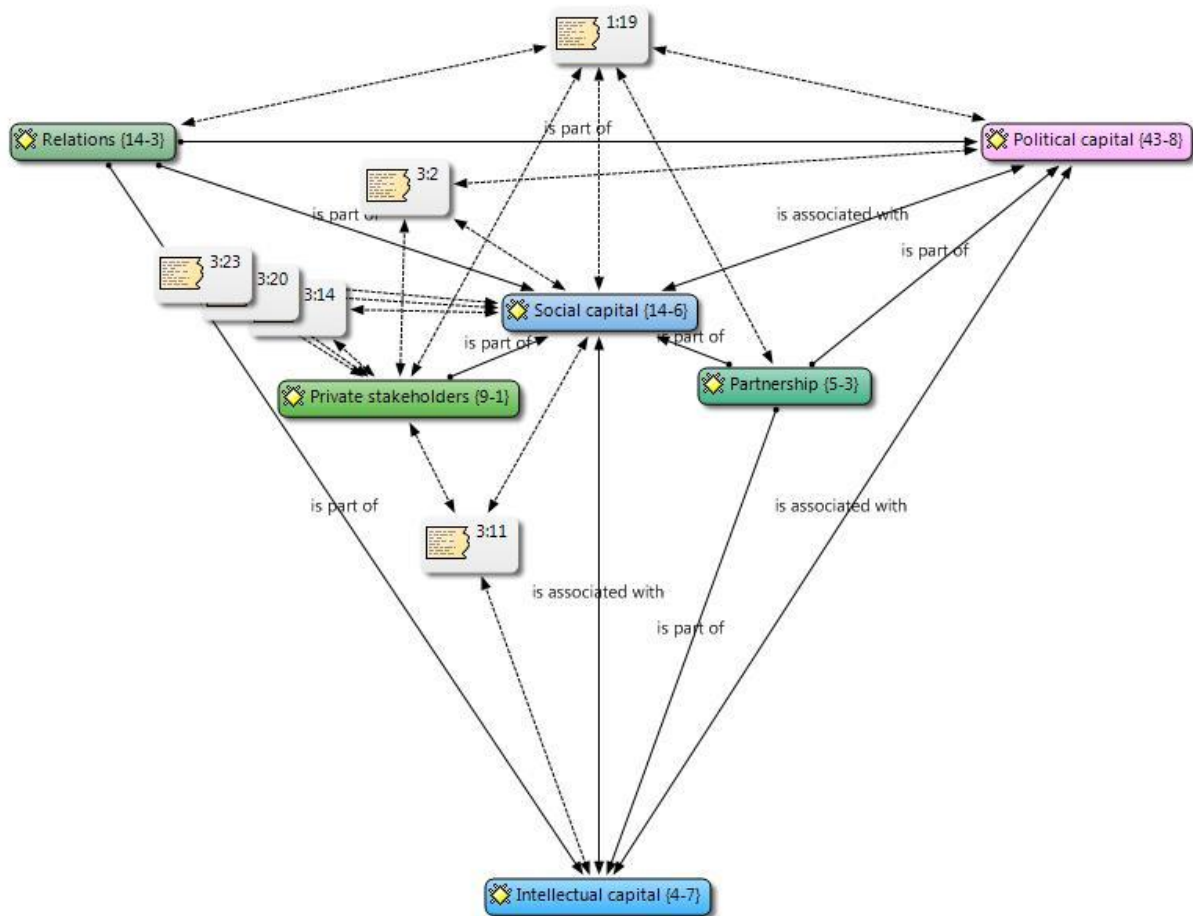
The network view from the interview analysis in the London case shows the network for the node 'social capital'. As can be seen in the network view, most quotes of the social capital are related to the node 'private stakeholders' and 'political capital'. The last connection can be explained with the complex social relations between involved authorities. Furthermore, most of the private stakeholders are the users of the water in the Royal Docks. With a frequency of fourteen, the frequency of the code 'social capital' is average compared to the frequency of the codes 'political capital' and 'intellectual capital'.

Quote 1.19
"So the RoDMA position is, he is accountable for the board members, they pay a service charge, unsurprisingly the service charge is of great debate and contention and what they ideally would like to see is a reduced service charge across the area. In turn, RoDMA needs to find ways to make revenue and finance, and deal with the fact that actually it is accountable to all stakeholders including us as the landowner to ensure that the infrastructure upkeep of what they inherited and what they will eventually, not in perpetuity, but eventually give that back to us as landowner, or other mechanisms for the Mayor to exit this area, which we haven't probably the time to go into. So, that is actually quite a useful way to say: 'RoDMA, working with us as the London Development Agency, now GLA, looked at the water space in its entirety and said: "Well out of all the assets we have including the water, put it principally, what is it we can do with this entire estate that would provide a whole suite of options, merely options, that would begin to generate an income for RoDMA and ultimately produce that service charge towards some sort of self-sufficiency?" (GLA)

Quote 3.2

"And then about three years ago the shareholders in my company who are all the occupiers around the docks decided to change our role for us to become an organisation who would lead the regeneration of the docks" (RoDMA)

Quote 3.14

"well what each of the bidders has done, is they produced a concept, they produced an architectural plan and they produced a financial plan, and they had to respond on various different categories we asked them to respond to in terms of how they would" (RoDMA)

Quote 3.20

"From a financial viewpoint, as far as the developers concerned, they make a lot more money out of residential development then they do out of commercial development" (RoDMA)

Quote 3.23

"And I've done a fair bit of research with things things like IJburg in Holland […], to look at floating communities in those places, to see how you can apply that technology in the Royal Docks" (RoDMA)

V.iii Network view: Political capital
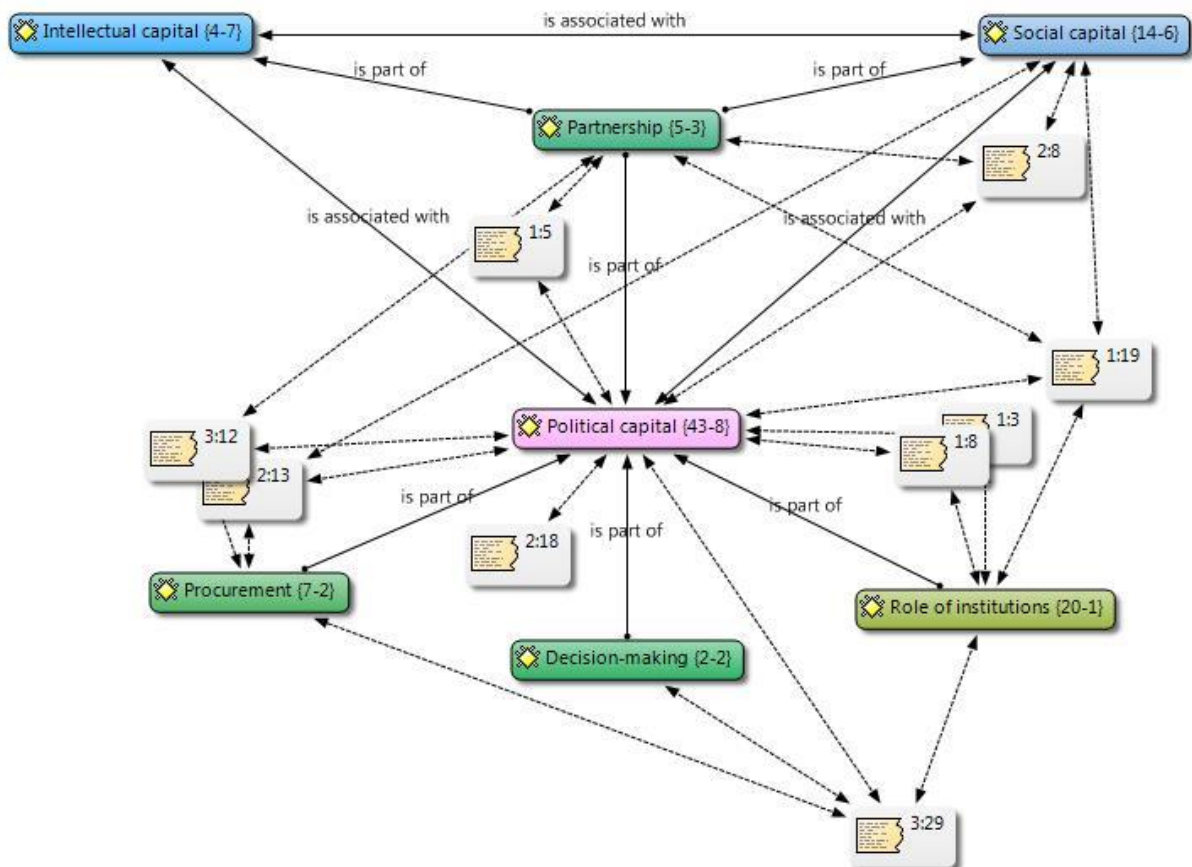
The network view from the interview analysis in the London case shows the network for the node 'political capital'. As can be seen in the network, this code has by far the highest frequency in the HU of the interview analysis in the London case. This means that the entire development process of the floating communities is driven by political capital. Moreover, there are no quotes that link 'intellectual capital' and 'political capital' with each other. There is however some interaction between the nodes 'social capital' and 'political capital'. The quotes that explain the links are written down.

Quote 1.3
"Localism Act, yes exactly. They decided that the best way to improve strategic thinking is to get rid of the people who have it. Now you just have national and local, which is great for London, because it enables us to argue things more coherently, and it is bad for the rest of the country." (GLA)

Quote 1.5
"Another leaver would be that we're working closely all over the authorities to, by virtue of new Localism Acts and the powers that the Mayor has in terms of funding grant delivery of homes for London in the region of London, through affordable housing schemes and a number of other aspects around which we now control. So we're able to work with housing providers who will provide affordable housing provision on sites, so we'll be able to work closely with our boroughs to ensure that the investment is distributed across London boroughs." (GLA)

Quote 2.8
"The GLA and the borough of Newham work together on some of the projects. And we try to work on the same goal […], and that's working with the developers and trying to ensure that schemes come forward that work." (Borough of Newham)

Quote 2.13
"You've got to, once you've secured the land, you've got to procure a kind of viable development and obviously you've got to take care of the stakeholders and all the surroundings around the area. For example, you're under the cable car, you're in the flight path." (Borough of Newham)

Quote 2.13
"It's politics" (Borough of Newham)

Quote 3.12
"So it's kind of being procured jointly by the GLA and RoDMA and Newham being involved as part of that team." (GLA)

Quote 3.29
"Yeah, we had to follow the GLA's procurement process, so that is quite specific about what we can and can't do during the bidding process. So it is set down a number of criteria they have to follow, and there have been some compensations and meetings that we've had during the process to clarify. You have to provide exactly the same information to both, or all the bidders to make sure the process is fair. And then ultimately it is up to them to come up with the right solution." (RoDMA)

V.iv Network view: Resilience
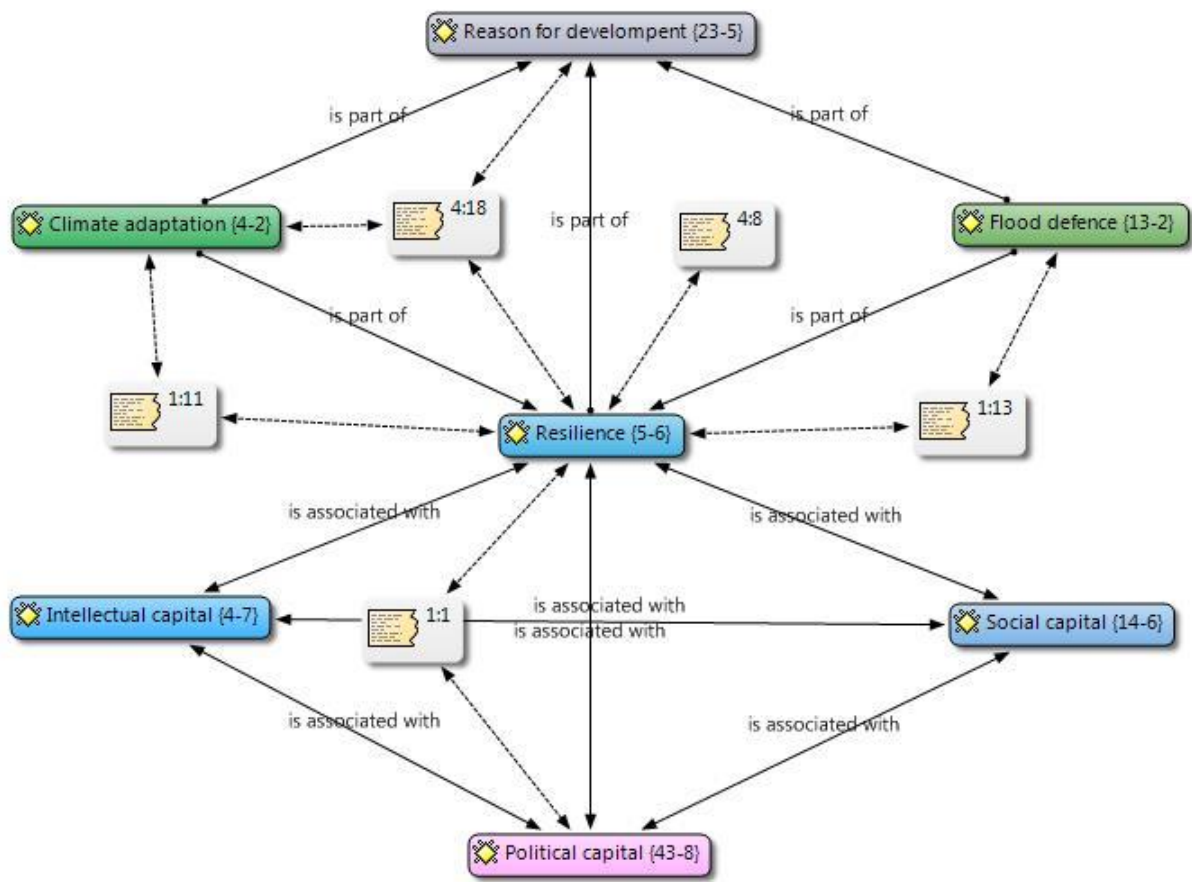
The network view from the interview analysis in the London case shows the network for the node 'resilience'. As can be seen in the network view the code has a relatively low frequency of five, which means that in the in-depth interviews there have been five quotes that are related to resilience. Furthermore, from the network view it becomes clear that concerning institutional capital, only the node 'political capital' has a quote that links both nodes. 'Social capital' and 'intellectual capital' are not linked to resilience in this network.

Quote 1.1
"And my official title is policy and programme manager for resilience and quality of life. Which is basically a very long way of saying: my job is to manage a team to basically try and make sure we manage natural hazards in London in a way that we keep London safe." (GLA)

Quote 1.13
"And basically, yes, it is about as the area gets redeveloped, making sure that we put in, we increase our flood resilience by making things less and less flood dependent, flood risky." (GLA)

Quote 4.8
"Not at the moment. That [resilience] is something we would like see in it, but it doesn't at the moment." (Borough of Newham)

Quote 4.18
"It [resilience] could be, I mean it is not part of the process, which is a shame, but when you look at modular construction in the longer term that could be used in areas where there is a flood risk. I mean, I

think there is issues if you are either building next to the coast or floodplains or in the water and how people deal with that in terms of the architecture is a big thing. But I think it is useful to investigate, I mean a lot of people don't believe in rising water levels and what damage it is going to do in the future" (Borough of Newham)