

FLOOD RESILIENCY IN URBAN AREA DEVELOPMENT

The performance of flood resiliency policies in waterfront development projects:

A comparative study of Rotterdam and New York City

GRADUATION REPORT

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ABSTRACT

How can we make our cities more sustainable? And in particular, how to build the resiliency of urban environments to the effects of climate change and increased urbanization? This is one of the main challenges that urban planners are dealing with today. The relevance of this issue is reflected in the large number of cities around the globe that have recently developed climate adaptation strategies. These plans set out policies to build the capacity of vulnerable areas to withstand and bounce back from external disturbances; build their resiliency. In Delta cities the particular focus lies on improved water management and limiting the negative impacts of increased flooding.

The study observes the actions public and private development actors are currently taking in New York City (NYC) in the United States, and the Dutch port city of Rotterdam. What policies have the planning authorities of these two cities adopted to stimulate the building of flood resiliency of in the process of area development? And how do these policies affect behavior of actors in development areas along the waterfront?

The motivation behind the international comparison is to examine the effect that factors of the socio-political environment, the institutional landscape, have on the workings of these policies. In both NYC and Rotterdam a case study is conducted on a particular waterfront area. In addition to the literature study and document analysis, multiple semi-structured interviews have been conducted with planning and water management experts, city authorities and local actors. This has resulted in valuable insights in the process of development and incorporation of flood resiliency measures.

The findings of this study contribute to the body of knowledge regarding this process of adaptation and, more specifically, building urban resiliency. Outcomes provide understanding in the influence of the institutional landscape on building this flood resiliency in the process of urban area development. Findings point to several aspects of the institutional landscape that affect the effectiveness of public policies. Insight into these aspects can help urban authorities to increase the effectiveness of their policy instruments. The findings furthermore allow for the formulation of recommendations for improving policy effectiveness. The recommendations are aimed at city authorities in both NYC and Rotterdam, as well as other cities that are trying to build their resiliency.

Key words: Flood resiliency, Institutional Landscape, Urban area development, Planning Policy Instrument, Comparative case-study

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I. INTRODUCTION

1. BACKGROUND

The translation of social and economic systems into the physical environment is a captivating process. Especially urban areas, forming the nodes of societal networks, layered spatial arrangements and increasing economic relevance are intriguing. Balancing this multitude of goals and interests makes the management of urban development a very delicate but crucial process in shaping sustainable cities.

The increasing issues of water management in the urban environment are currently addressed by various cities worldwide. Water takes a crucial role in this challenge of adaptation. Context determines whether cities deal with challenges like increasing water shortage, excess or quality issues. Either way, measures to improve water management are generally considered to hamper urban development and vice versa.

Even though water is indispensable for human life, a proper balance in the living environment is crucial. The integration in Dutch policy of water management and spatial planning is often seen as a source of inspiration for the future of adaptation in various cities around the globe. Nevertheless, over recent decades efforts regarding the incorporation of water management solutions in urban development project are often seen as a burden where market dynamics prevail.

This report is based on the notion that the solution is to be found in a shift of focus in development practice, away from immediate risks and costs and towards a more long-term investment perspective. For actors in urban development this means letting go of distrust and paying more attention to mutual gains rather than individual losses. Rather than a burden for area development, water management could be seen as a chance for local parties to start collaborating. By framing the improvement of water management as a common challenge, it could become an instigator for wider strengthening in social and economical sense of vulnerable urban areas.

Within water management and urban development this study specializes in the effect of governance efforts in the field of flood resiliency. How are actors involved in urban areas that are becoming increasingly vulnerable for flooding influenced by public policy to safeguard their future? This focus is developed in consultation of various experts and professionals from practice, as well as scientific background. Therefore, scientific as well as professional relevance of the study, as elaborated upon in the next paragraph, is ensured. A list of all interviewees and attended events on this specific topic can be found in the appendix.



“Water is our connecting factor” (source: Helpdesk Water (2008)).

A. PROBLEM DEFINITION

Over recent years, we have seen several extreme weather events around the globe with disastrous impacts for urban regions. Therefore, various cities have started to adopt ambitions in preparing themselves for the anticipated effects of climate change. For cities located in delta regions, most urgent matter lies in particular anticipation of excessive water quantities. Current predictions indicate that increased river remittance, more extreme precipitation and rising sea levels are expected to lead to severe flooding damage in the near future (IPCC, 2014). Therefore, an important aspect of urban climate adaptation strategies of delta cities is building flood resiliency of their urban systems and physical environment. The various plans and strategies that have been developed over the last few years express high ambitions, set goals and propose actions to be taken by public as well as private urban actors. However, recent reports (IPCC [2014], Birkmann, Garschagen, Kraas, & Quang [2010], Rijke [2007], Hordijk & Baud [2011]), indicate that realization of these ambitions is currently hampered. This concern is confirmed in various interviews conducted

for this research with scholars scientists (Rijke, Aerts, van Buuren) as well as urban water management experts (Jacobs, Ovink, Westerhof). Questions remain as to how the of flood resilient measures is hampered.

Different explanations for this obstruction can be put forward, amongst which a lack of urgency, financial restraints and difficulties arising in governance. In this research, the influence of this last aspect of governance on policy effectiveness is examined. Several studies have already hinted at the shortfalls of public governance efforts when it comes to building flood resiliency (Timmermans, et al [2013], Rijke [2007], OECD, [2009], Veerbeek et al [2010], MCD [2013]). While the technical and scientific solutions for the integration of water management measures and area development are considered widely available, the strategies now face difficulties in their implementation (Timmermans et al. [2013], Rijke [2007]). As Zevenbergen mentions in the Water & the City conference proceedings (2013, p. 22):

"Perhaps the hardest part of a [flood resilient urban development] project is implementing it with all stakeholders involved and with funding from public and private parties. The current need for integration is increasing the level of complexity."

Thus, it is the complexity of urban development processes and policy that now seems to hamper the ambitious goals from being realized. This can easily be understood as area-based development projects are generally marked by their long timespans, multitude of stakeholders and according interests, as well as by the effects these projects have on different spatial levels of scale and policy domains.

The concept of governance is built on the understanding that we live in a network society. In planning this concept translates in the notion that processes of change take place in different 'systems'. Not one actor alone can achieve specific goals, but collective action is needed. Parties depend on each other's means and interests are strongly interlinked. If the goal is of public interest, and collective action is not sufficient, public agencies may choose to adopt or adjust policy to stimulate this. In such cases, public actors have a wide variety of policy instruments at their disposal, intended to shape, regulate, stimulate or otherwise build capacity of the other actors. In this reasoning, the system is a set of generally accepted rules, authorities and processes in a society, so-called *institutions*. These institutions change over time and vary per region and field of practice. Therefore, this 'system' is in this research defined as the *institutional landscape*.

Actors operate and interact within this institutional landscape, are bound and formed by its rules and processes and, by being part of it, can simultaneously shape and affect it. It is formed by culture and history as well as shaped by actors' perspectives, market situation and other external influences. The institutional landscape is understood to influence the effectiveness of governance efforts for it determines the ambitions and expectations set for the pursued goal, the set of policy instruments employed and actor behavior to achieve goals. To assess this influence, the study examines the specific institutional landscapes according to characteristics as also applied by Inam (2013) of arrangements, structure, rules and policies, norms and values and interests of actors.

The assumption that institutional landscapes have a substantial influence on the realization of cities' ambitions in building flood resiliency can be well understood when one considers the large number and strong variety of actors involved such processes. This underpins the assumption that this underlying structure, that shapes actors' position and interaction, is key in providing the prerequisites for collective action, crucial for the achievement of flood resiliency in urban areas.

Different characteristics of institutional landscapes are used to interpret the ability of policy instruments to affect the realization of flood resilient urban areas. To this end the study compares the efforts and progress of Rotterdam with that of New York City. Both these delta cities are dealing with increased flood risks while having adopted similar ambitions for increased resiliency over the past few years. This makes them widely acknowledged front-runners and leading examples in global networks for urban climate adaptation. Furthermore, findings of exploratory research indicate that policy instruments in both cities are largely comparable. However, while some first steps are taken, voices have recently been raised that realization in Rotterdam is currently only slowly progressing in certain areas. In NYC, with super storm Sandy fresh in mind, resiliency plans were developed expeditiously from a strong feeling of urgency. Even though these plans feature a multitude of projects with specific guidelines for implementation, actual realization of these measures in urban areas turns out to be difficult. Thus, how is it that policy doesn't seem to achieve its intended effect? The study compares Rotterdam and NYC on action that development actors are actually taking, and how these actions could be influenced by public policy. The study thus examines how the instruments perform in a certain institutional landscape, which is understood to be fundamentally different between both cities.

Contrary to global developments that affect local financial and natural climate as well as most cultural aspects, public agencies are in the position to change their governance efforts and (to a certain extent) influence the institutional landscape they operate in. The capacity of institutional landscapes to adapt to answer new issues in society (adaptive governance capacity) may seem limited. However possibilities for fundamental change may open up when increased urgency calls for political action creates a *policy window*. To improve the effectiveness of policies for building flood resiliency the institutional landscape itself might well need to change. This study thus also aims to help public agencies, in particular those of Rotterdam and NYC, in providing recommendations for adjustments to the institutional landscape and the creation of policy windows.

Noticing the multitude of cities with high ambitions for climate adaptation and building resiliency, a comparison of their approaches and progress seems obvious. Such a comparison could provide valuable lessons, not only for the studied case cities but also for other delta cities worldwide and the practice of strategic urban planning in general. However, in interpreting the findings, certain factors of local situation need to be taken into consideration.

B. RESEARCH GOAL

Today, many cities around the globe face the challenge to become more resilient to the anticipated effects of climate change and increased urbanization. Hence, the predominant goal of this study is to contribute the body of knowledge regarding to the process of adaptation and, more specifically, cities building their resiliency to the effects of increased flood risks. Outcomes are intended to gain understanding of the influence of the institutional landscape on building flood resiliency. The aim is to find distinctive aspects of institutional landscapes that affect the effectiveness of public policies. Insight into these aspects will help urban authorities of cities in general to increase the effectiveness of their policy instruments for building flood resiliency in urban development practice. Conclusions also form the basis for practical recommendations for both studied cities to carry forward their ambitions. Lastly, key lessons for the scientific domain of urban area development are distilled.

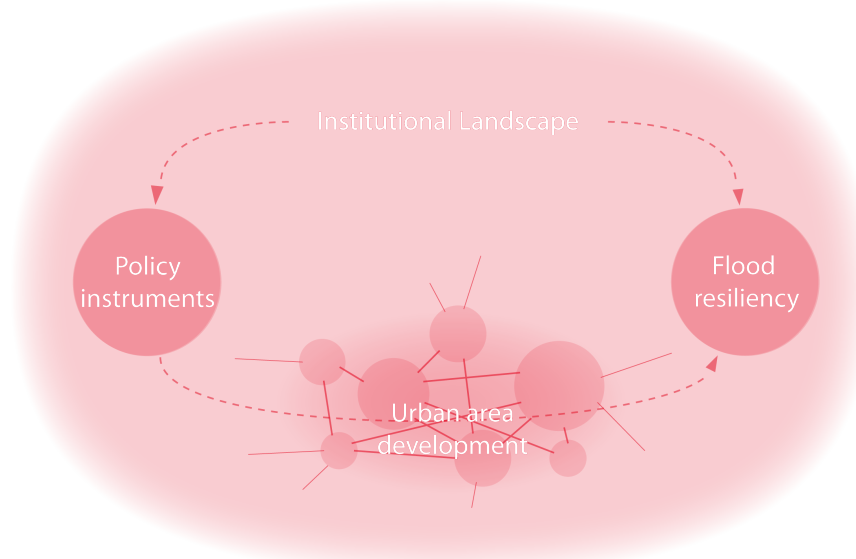


Figure 1. Conceptual relationships

C. READERS GUIDE

The report is structured as follows. First, the design and methodology of the research is explained. Consequently, the theoretical framework is elaborated upon by a detailed description of the key concepts of institutional theory, flood resiliency and actor behavior. We continue by explaining the results and findings of document analysis and the case studies for both cities. This forms the basis for the following Conclusions chapter. Lastly, recommendations are made for public authorities to enhance the building of flood resiliency in NYC, Rotterdam and delta cities in general and directions for further research are proposed.

2. RESEARCH DESIGN AND METHODOLOGY

The knowledge gap and research goal as introduced in the previous chapter form the basis for the research approach, design and methodology. First, a conceptual framework and key definitions provide a background for the set of research questions. The chapter goes on in explaining the methodology; how the study is conducted in order to find answers to the formulated questions. Here, an elaboration is given on the research design and methods. Lastly, the validity of the used methods, and the limitations to generalization of the study's outcomes are explained.

A. GOAL AND CONCEPTUAL MODEL

The focus of this research is on the cities of Rotterdam and New York City (NYC); both internationally understood as leading examples in climate adaptation and marked by their vulnerability for increased floodings. As explained, the choice for this comparison is furthermore rooted in similarities and differences in their environmental situation, urban planning practice and approach to resiliency. The research questions and objectives are based on the following assumptions:

- a) The building of flood resiliency in NYC and Rotterdam is hampered
- b) Public policy instruments that are currently employed are not effectively stimulating actors to take action in raising flood resiliency
- c) Institutional landscape characteristics influence the effect of public policy on actor behavior in area developments.

These are tested throughout the study.

Initial examination of cities' efforts in building flood resiliency points to their inability to stimulate collective action on this point in area development. Therefore, this research is aimed at providing insight in realized flood resiliency and the influence of public policy on urban actors and development processes. Hence, the goal of the comparison between Rotterdam and NYC is twofold:

- I. Assess the **effectiveness** of current policy instruments in building flood resiliency of urban areas
- II. Identify characteristics of institutional landscape that **influence** the effectiveness of these policy instruments

These focus areas are illustrated in the figure below; the conceptual model.

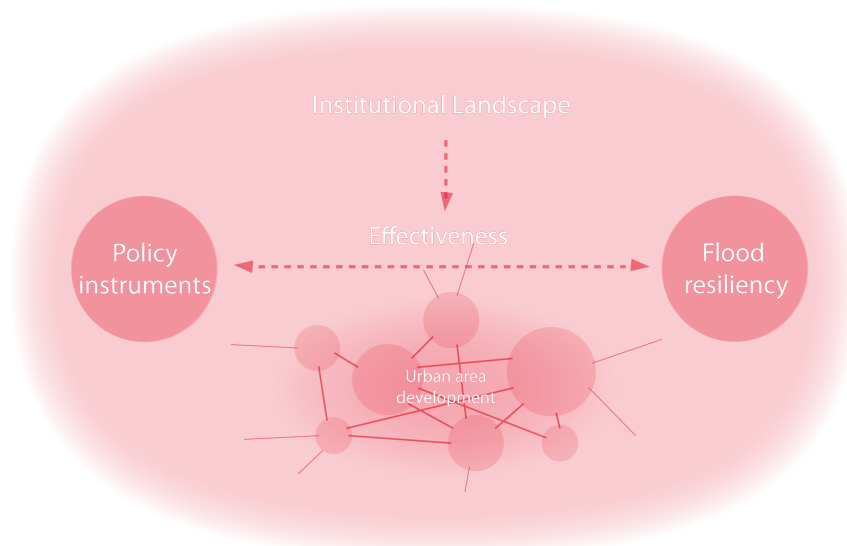


Figure 2. Conceptual model

B. KEY DEFINITIONS

The key definitions, as used in this research are:

- (Flood) Resiliency
The capacity of a social, economic, or environmental system to respond to an external disturbance (in this context: flooding) and bounce back to its normal way of functioning. Based on IPCC (2014) and Keenan (2014b)).
- Urban Area Development
The realization of an explicit and defined set of physical interventions in a geographically distinct urban area, marked by the behavior and interaction of actors involved. Based on Daamen (2010).
- City authority
Governmental body or agency assigned with formal political authority as well as public responsibility for a specific urban region.
- Urban area development actor
An organization or representative individual actively involved or concerned with the development of a certain urban area. Based on Heurkens (2012).
- Public (planning) policy
The approach public parties take in intervening in land and property development market to carry out plans and achieve government goals.
- (Planning) Policy instruments
Public actions or initiatives intended to affect the decision environment and behavior of actors in the development process. Based on Tiesdell & Allmendinger (2005, p.57/58)
- Governance
A system's capacity to organize collective action toward specific goals. Adopted from Hillier (2002, p. 4)
- Institutional landscape
The structure and characteristics that describe the socio-political environment of institutions in a certain policy domain and location. Focus is on accepted modes of governance, range of embedded cultural values and formal and informal processes of communication through which governing processes are rendered legitimate.
- Policy instrument effectiveness
The extent to which a policy instrument influences the decision-making of actors in the direction of planning goals.

C. RESEARCH QUESTIONS AND OBJECTIVES

The study assesses how public policy influences the process of building flood resiliency, as illustrated in the figure below. To this end, the development process of waterfront areas in Rotterdam and NYC is examined. The first main objective is to **assess the effectiveness of current policy instruments in raising flood resiliency in vulnerable areas**. This is done by first assessing the flood resiliency of certain case areas in both cities. Then, the currently employed policy instruments are mapped and compared with those that are predominantly experienced by local actors. Consequently, the policy instruments that are currently lacking, or are deemed necessary, for further building of flood resiliency in the area can be listed. This objective is aimed at helping city authorities Rotterdam and NYC to realize the ambitions for the enhancement of flood resiliency of urban areas.

To make the findings of the study also relevant for other cities that aim to build their resiliency, the effect of local socio-political factors on the workings of these policy instruments in the practice of area development is examined. To this end, the concept of institutional landscape is introduced. Specific characteristics of the institutional landscape of NYC and Rotterdam were defined. Subsequently, the influence that these characteristics have on the effectiveness of policy instruments is rationalized. This outlined the second objective: to **identify specific characteristics of institutional frameworks that influence the effectiveness of policy instruments**.

This brings us to the operationalization of the study. First we compare *if, to what extent and how* public policy instruments perform in building flood resiliency in vulnerable urban areas (ensure realization of affect actors and their behavior) within the different institutional landscapes of Rotterdam and NYC. The following research questions, to be answered for both cities, are formulated:

Comparing practices of urban area development in Rotterdam and NYC:

- I. What are the **main characteristics of the institutional landscape** in building flood resiliency?
- II. **Planning policy**
 - a. What policy instruments are **currently deployed** to build flood resiliency in vulnerable areas?
 - b. To what extent are these policy instruments **experienced** by local actors?
- III. **Flood resiliency**
 - a. How is flood resiliency **currently assessed** in vulnerable areas?
 - b. What aspects of building flood resiliency should be **strengthened**?
- IV. What is the **effectiveness** of current policy instruments in building flood resiliency?
- V. What is the **influence** of the institutional landscape on the effectiveness of policy instruments?

The research approach is illustrated in the figure below. First, a literature review allows the building of a theoretical framework as described in the following chapter. This enables processing, structuring and interpreting of the findings of the study.

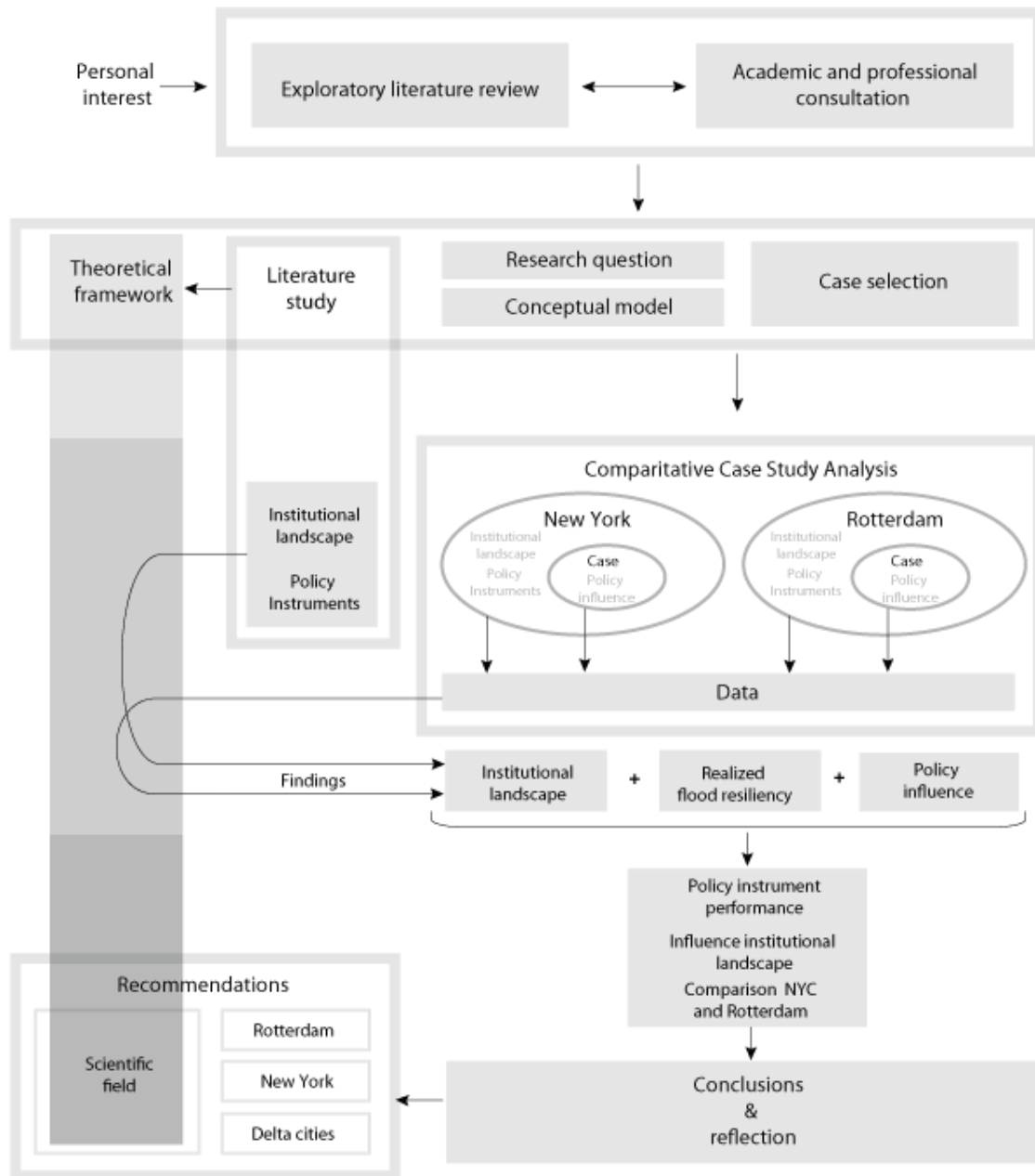


Figure 3. Research approach

D. RESEARCH STRATEGY & DESIGN

The research strategy is qualitative. The concepts and their relations are examined through document analysis, expert and actor interviews. Actors’ perception of their role and the process play a vital role in this research. This strategy is taken because it is in these perceptions that the relations and behavior of actors are shaped. By conducting various interviews, a coherent overview of the situation in the case areas is constructed. This approach reflects an interpretive research paradigm, where ‘reality’ is built up from a multitude of perceptions (De Lange, Schuman, & Montesano Montessori, 2011).

The research design is comparative. This is in accordance with the definition as provided by Bryman (2012, p.72, p.74) stating that comparative research design entails “(...) Studying two contrasting cases, using more or less identical methods” or “(..) two or more cross-sectional studies carried out at more or less the same point of time”. In this research the cases will be formed by the development process of selected urban development projects.

E. RESEARCH METHOD

As a representation for practice in both cities, the study examines the effectiveness of policy instruments that are currently adopted to enhance flood resiliency in certain *case areas* of Rotterdam and NYC. Document analysis and expert interviews with local authorities as well as main policy issuing agencies are used to construct an overview of the currently applied policy instruments. This then is compared to the effects that actors experience of these instruments. Actors’ and experts’ suggestions as to where the current policy instruments are falling short complement the assessment of the effectiveness.

The study then uses literature and expert interviews to interpret these findings in the perspective of the specific characteristics of the local institutional landscape. An overview of the applied research methods and the aspect they are aimed at to provide insight in is given in the figure below. The darker dots indicate a primary source of information, the lighter ones are intended to offer confirmation on certain subjects.

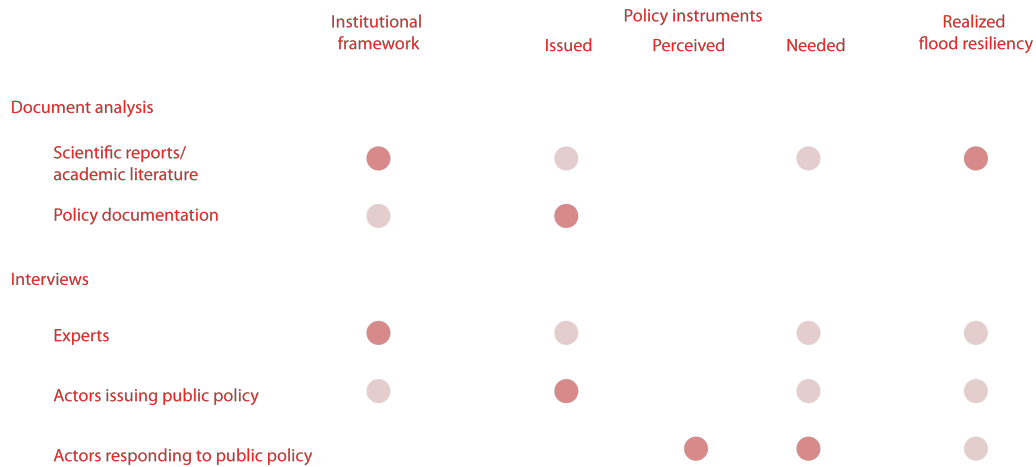


Figure 4. Research methods with according knowledge building application

Thus, for this research two main research methods will be used, document analysis and semi-structured interviews, making it a ‘mixed method design’ (Van Thiel, 2010, p. 68). The sources to be consulted will in the first place consist of project documents and data. The examination of these written sources can be depicted as discourse analysis and content analysis (Bryman, 2012). The material gathered from these analyses is then supplemented by more in-depth information obtained through semi-structured interviews with involved actors or experts, as explained further on in this chapter.

LITERATURE REVIEW

The research is positioned at the interface of two overarching domains; urban planning and climate adaptation. Within these domains the scope of this study is further narrowed down to the corresponding focus areas urban area development and flood resiliency. A review of review of academic and professional literature is conducted to adequately place the research in current scientific discourse and theoretical models. Accordingly, appropriate frameworks are selected to process the findings of the case studies. Consequently, a study of available project documentation, as part of the case studies is carried out.

CASE STUDIES

The case studies are to offer insight in if and how the policy instruments, as defined by the document analysis and expert consultation, are becoming part of building practice. As mentioned, urban development projects are complex processes, and outcomes are formed rather through the interplay of the various stakeholders than the realization of one actor's vision. The role of these processes is illustrated in the figure below.

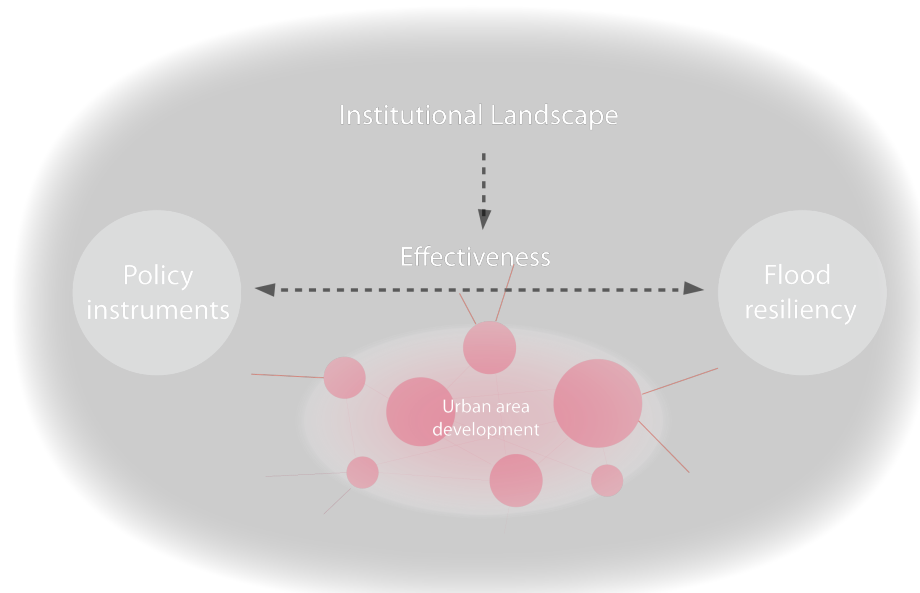


Figure 5. The process of urban area development in the conceptual model

A case study is a research method by which an example of a phenomenon is examined in real practice (Van Thiel, 2010, p. 99). To achieve a thorough understanding of the effects of policy instruments and actor behavior, the processes of a specific case area in both cities is examined. This entails both the content analysis of case documentation as well as semi-structured interviews with public agencies and local actors.

DOCUMENT ANALYSIS

The first part of the document analysis focuses on the institutional landscape of Rotterdam and NYC. Consequently, legislation, planning visions and research reports are examined to distill the currently employed policy instruments. The policy instruments will be set in the framework developed by Tiesdell and Allmendinger (2005), as described in the next chapter. Furthermore, case documentation like public area plans and project information is used to select key actors and outline the measures being taken in the case area. The cases' characteristics will be examined by content analysis of official public documents as well as private party documentation.

SEMI-STRUCTURED INTERVIEWS

For the sixteen expert interviews and fourteen actor interviews, the research method of semi-structured interview is applied. This method is again adopted for the interviewing of the case actors. Coolen (2013) describes a research interview as "... a conversation between two people in which one person (the interviewer) tries to direct the conversation to obtain information for some specific purpose." The method of semi-structured interviewing enables the researcher to assess all categories of stakeholders whilst maintaining the ability to obtain in-depth information from the interviewees (Bryman, 2008). The semi-structured interview is especially appropriate in this research since the information needed from the involved actors (interviewees) can be quite sensitive. This kind of information is more likely to be shared in a conversation than in for example questionnaires with standardized forms.

The document analysis provides an overview of the public policy instruments currently employed and the efforts set out in building flood resiliency in both cities. Consequently, these findings are checked in semi-structured interviews with local public agencies and experts. A list of the experts and public agencies interviewed can be found in Appendix 1. The leading interview questions as well as examples of questions prepared for expert interviews are included in Appendix 9.

CASE SELECTION

The case areas that have been selected in Rotterdam and NYC are comparable on to the following criteria:

- Public and private actors are involved in developments in the area
- The cases are located in urban areas that will become increasingly flood-prone in the coming century
- Building resiliency of these areas is part of public policy
- The building of flood resiliency in these areas seems to be hampered

These characteristics ensure that a comparison of the effectiveness of policy instruments aimed at raising resiliency is possible.

The choice was further narrowed down by finding areas that are highly similar between both cities. For this purpose we selected older port areas near the city center that have recently been adopted in city policy as areas for transformation and development; waterfront regeneration. The selection of these kinds of areas makes for better comparability with areas in other cities around the world. Waterfront regeneration areas are also chosen as it generally deals with both existing buildings as well as new structures, thus covering a broad variety of policy instruments. The content and process of waterfront development projects is considered particularly insightful for actor relations and the general approach of urban development in a city (Daamen, 2010). Further characteristics that make this type of areas especially interesting for this study are elaborated upon in appendix 3.

Waterfront regenerations typically feature the following characteristics:

- The areas are laid-out as harbor sites in the late 19th or early 20th century
- The areas are for a large part made up of piers of reclaimed land
- With the containerization of port activities over the 1960ies-1980ies a lot of original transshipment business has left. This resulted in deterioration and social stigma of the areas over the last decades. However, the areas still house industrial businesses or formerly housed port-related activities.
- More recently cities have begun to see the potential of these areas with regard to economical and social revitalization. The waterfront is seen as an important advantage and the focus of public plans lies on improving public access as well as functional or residential usage.
- Often, large parts of the land are owned by public agencies.

Together, these requirements have lead to the selection of the Merwe-Vierhavens area in Rotterdam and Sunset Park in Brooklyn, NYC. The background of the case areas will be further presented in the findings section of this report.

F. PROCESSING

Most policy and case documentation used for this research is available in public records. Other sources are provided by interviewed actors or experts. The findings of the document analysis have been combined in extensive Excel-tables of actors and policies prevalent in both cities. These overviews have been checked, supplemented and adapted in consultation with local experts.

The expert interviews are taped and transcribed. All interview transcriptions, as featured in the final report are checked and approved by interviewees. Important statements, used for the theoretical framework and policy analysis are highlighted, as shown in the example in Appendix 12. The actor interviews are taped and transcribed as well. However, these conversations are documented in a less detailed fashion, bullet-wise (see Appendix 8). This, because the semi-structured interview often does not provide clear-cut answers to the questions posed. To allow for comparing of the results, answers need to be interpreted and scaled. Actor answers and statements are used to score their perspective and behavior on the variables to be measured, the study's parameters as listed in the table below). These parameters are further elaborated upon in the next chapter. The tapings are used to score actors' perception and behavior on these parameters on a scale of 1-10.

Table 1. Research parameters

1	Flood resiliency characteristics	a	Considering the current situation
		b	Examining trends and future threats
		c	Learning from previous experience
		d	Setting goals
		e	Initiating actions
		f	Involving the public
2	Policy instruments experienced by actors	a	Shaping
		b	Regulating
		c	Stimulating
		d	Capacity building
3	Policy instruments experienced by actors	a	Shaping
		b	Regulating
		c	Stimulating
		d	Capacity building
4	Policy instruments to be improved	a	Shaping
		b	Regulating
		c	Stimulating
		d	Capacity building

Parts of the document in which the scoring process took place are illustrated in Appendix 13.

G. RESEARCH PLANNING

The study is carried out between February 2014 and December 2014. The first few months were dedicated to defining the study’s focus, formulating research questions and establishing a theoretical framework. Congruently the research design was developed and accordingly, appropriate case projects were chosen. The overall planning is

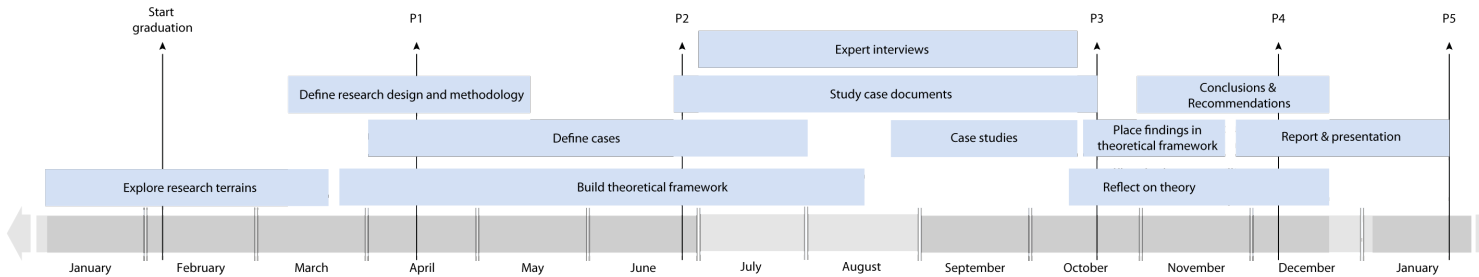


Figure 6. Planning graduation research (own illustration)

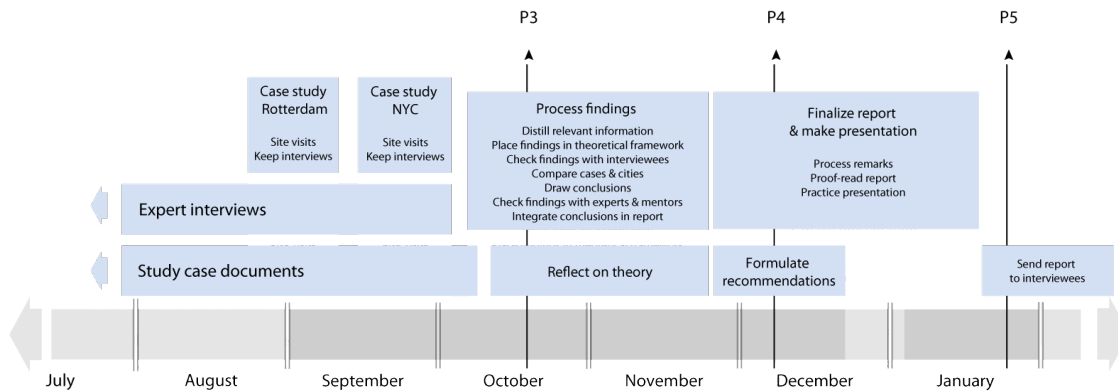


Figure 7. Planning second half graduation research (own illustration)

depicted in figure 6. The arrows stand for formal presentation and feedback moments.

The literature study is, with an accent on the first few months, carried out throughout the entire research. After the first half-year the case studies took place and expert interviews were held. Afterwards, results were processed and findings were interpreted and placed in the theoretical frameworks and compared. Ultimately, this resulted in the formulation of conclusions and recommendations. A more detailed planning of this second phase is illustrated in figure 7.

H. VALIDITY AND GENERALIZABILITY

Research validity checks if the concepts that are examined in the study can be adequately measured by the research design. Validity is furthermore largely determined by the accurate and consistent measurement and processing of variables. First of all, as explained above the research methods applied are considered most applicable to study the content of the strategies as well as the process of area development. Triangulation, the use of multiple forms of information gathering (document analysis as well as semi-structured interviews) adds to the validity of the findings (Van Thiel, 2010).

To ensure internal validity of the results the quality of the examined documents is checked on the aspects of authenticity, credibility, representativeness and meaning (Bryman, 2012, p. 516). Furthermore, as some of the studied documentation is in Dutch, special consideration is paid to the interpretation of concepts used in these texts. This, to ensure valid comparison with literature and documents in English. When deemed necessary, the interpretation of the used terms is checked with experts and actors themselves during the interviews. To measure the studied concepts and their relations, indicating factors, or parameters, are defined. The validity of the findings on this aspect largely depends on the interpretation of the raw data acquired in the interviews. To ensure this, the transcripts are checked with the interviewees.

Consistency in the interviews is obtained by addressing the same questions to the various interviewees, as proposed by Van Thiel (2010). The questions were not communicated with the interviewees beforehand. According to the model of the semi-constructed interview, several general questions form the foundation. The conversation is then allowed to further develop according to interviewee's emphasis or focus. An overview of the questions is presented to the interviewees at the start of the interview. The interviewer is supplemented with a topic list and follow-up questions to ensure the discussion touches on all relevant themes. In drawing up these interviewing schemes, special attention is paid to the formulation of the questions. As recommended by (Bryman, 2012) steering on specific anticipated answer patterns is prevented. Furthermore, as interviews will be kept in Dutch as well as English, consideration is again paid to the proper translation of the terms used.

The interpretation of actors' answers in the scoring regime can lead to results that are open for discussion. The risk of biasing is limited as the interviewing, transcription and interpretation works were all carried out by the same researcher. This made that to some extent also notes of non-verbal communication could be featured in the scorings. Also, the interpretations the researcher made were well informed in the sense that they were made against thorough knowledge of the backgrounds of studied literature and documentation. Besides, the scorings that resulted from the interpretations have been used to visualize findings rather than quantify them. As shown the resulting diagrams are intentionally left scale-less to illustrate emphasis fields rather than exact measurements.

External validity checks if the findings are generalizable to other cases of the studied concepts and phenomena. Every development process is different and largely shaped by factors like the behavior of individuals and local characteristics of the economic, social and spatial environment. This hampers the transferability of conclusions to other cases of area development. However we consider that by mapping these factors and having placed them in a framework it is possible to distill more general conclusions. Thus the transferability and relevance of the conclusions to other cases of building flood resilience in area development projects within the two cities is strengthened.

A possible limitation to the generalizability of the conclusions and recommendations for other (delta) cities lies in the similarities of the two cities. For instance, New York and Rotterdam are both located in developed countries in the Western world. This will be reflected in certain processes or cultural aspects of development markets, shaping the environment of the case studies. Prior to the application of any of the conclusions or recommendations in other cities, the local development processes and differences in social structures should be taken into consideration. Besides, the structures of urban planning policies vary largely throughout the Western world and even within specific countries. While this difference is on the one hand part of the validation of a comparative research, it may impose limitations on the further transferability of the conclusions to other cities or urbanized delta regions in Europe or the US.

Lastly, both cities have characteristics that set them apart from any other city in their respective countries or state. Rotterdam is one of the largest seaports in the world, thus forming one of the main drivers for the Dutch economy. Furthermore, Rotterdam aims to be a leading international example in climate adaptation of the urban environment. New York City on the other hand is a metropolis, and is a prominent global center for economic activity, culture and innovation. These characteristics imply both advantages as well as restrictions for adaptation to flooding. However, other cities in the Netherlands or the US may identify with most of the policies and processes as featured in this study. Therefore, keeping the specific features of Rotterdam and NYC in mind, the conclusions aim to be largely transferable to other cities in the US and the Netherlands that aspire to enhance their resiliency to flooding.

II. THEORETICAL FRAMEWORK

This chapter presents the main progression of academic discourse, contemporary professional practice and scientific discussion regarding the key concepts of this study; institutional landscape, policy instruments and flood resiliency.

1. INTRODUCTION

The study's main aim is to examine the efforts of urban authorities of Rotterdam and NYC with respect to the effectiveness of their policies in building flood resiliency. Within all factors possibly influencing policy effectiveness, this study takes the governance efforts as a basis for comparison. This, because ineffective governance is in various recent studies found to be the main hampering factor in increasing flood resiliency of the built environment (Veerbeek, Ashley, Zevenbergen, Rijke, & Gersonius [2010] and Birkmann, Garschagen, Kraas, & Quang [2010]). This can be explained by the societal shift towards a civilization made up of networks¹ (Castells, 2006). As a result of this changing society, public planning authorities see their role, tools and partners changing. Existing institutional arrangements are no longer capable to accommodate the intensified exchange between actors (Kickert, Klijn, & Koppenjan, 1997). As a result, planning authorities often find themselves not addressing the right actors, facilitating the right means in the right context (Kickert, Klijn, & Koppenjan, 1997).

The concept of governance is built on the understanding that we live in a network society, further elaborated upon in appendix 3. In planning this concept can be translated in the notion that processes of change take place in different 'systems'. Not one actor alone can achieve specific goals, but collective action is needed. Parties depend on each other's means and interests are strongly interlinked. This forms a socio-political environment that is in this study referred to as the *institutional landscape*. The focus of this study on culture, institutional structures and procedures is based on the understanding that public agencies are in the position to affect the effectiveness of their governance efforts. To enhance their effectiveness city authorities need to be (made) aware of this environment, the institutional landscape, they operate in. By mapping the socio-political landscape they operate in, policy objectives as well as limitations can be understood and anticipated upon.

This chapter provides a background for the key concepts of this research (see figure below). First explains the concept of the institutional landscape and its characteristics. Consequently a typology for policy instruments is presented. Lastly, the background and interpretation of flood resiliency in this research is explained.

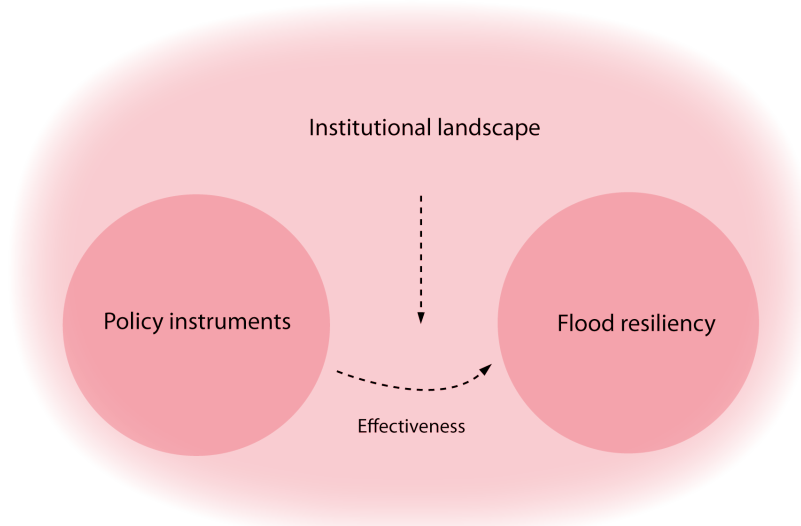


Figure 7. Key concepts covered in theoretical part

2424

¹ This theory of the network society and its relationship with urban planning is further elaborated upon in appendix 3.

2. INSTITUTIONAL LANDSCAPE: EXPLAINING THE SOCIO-POLITICAL BACKGROUND OF URBAN ACTORS

Urban policies can be interpreted as operating within a certain governance landscape, determined by socio-political characteristics like cultural values and (in-) formal structures. This landscape affects, but is also formed by the behavior of the actors within a certain domain. In social institutionalism, it is assumed that individuals' activities are 'structured' to both consistent and socially appropriate behavior. These structured courses of action within a community are referred to as being *social institutions* (Hall & Taylor, 1996). These institutions constitute the written and unwritten preconditions for human interaction (Scharpf, 1997). Together, the institutions form a systems or 'structures' of rules, which could also be described as 'culture' (Giddens, 1984; Hall & Taylor, 1996). The actor-network approach, as further elaborated upon in appendix 3, follows the sociological account of institutionalism as developed by Giddens (1984). Healey (1997; 2007) considers this theory of structuration a useful theoretical tool to develop a closer understanding of processes of urban development (Healey & Barrett, 1990).

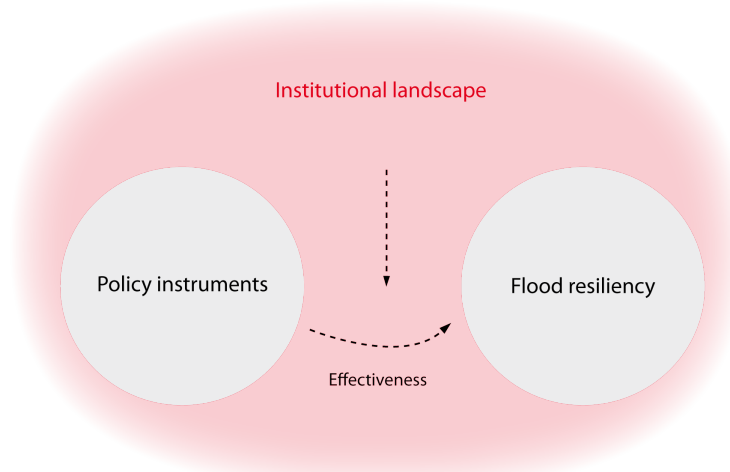


Figure 8. Key concept covered in this paragraph: Institutional landscape

Institutionalism focuses on the dynamic relationship between 'agency and structure', the interaction between actors' behavior and the specific environment in which this takes place (Daamen, 2010). An examination of this interaction forms the basis of this study as interventions in the physical environment are understood to be the outcome of these processes. Institutions provide insight in the broader social and political context that is presumed to shape and form these processes.

There are different models for the different levels of institutions. According to Scharpf (1997) social institutions can take on three forms:

- formal rules: for example the laws which have to be followed in a certain society to avoid a legal penalty
- informal rules: generally respected social norms, violation of which is sanctioned by social penalties like the loss of reputation and hierarchic position, community disapproval, withdrawal of cooperation and rewards etc (Scharpf, 1997, p. 38).
- symbolic systems: communicative systems, letters and numbers, paradigms and cognitive scripts (ideas, guides) and moral frameworks like values and desires.

The governance model of Healey (2007) is similarly linked to institutionalism. It specifies different levels of governance with specific characteristics according to their level of performance (Lu [2011] and Healey [2007]):

- Specific episodes: actors: roles, strategies, interests; arena: institutional sites
- Governance processes: networks and coalitions, discourses: language, metaphor, derived from frames of reference
- Governance cultures: range of accepted modes of governance, range of embedded cultural values, formal and informal processes of critique through which governing processes are rendered legitimate

The levels of the institutional model of Koppenjan and Groenewegen (2005) are highly comparable. This model also distinguishes a separate level of behavior, formed by actors and their interactions. The figure on the right illustrates this model.

All three models are based on the notion that the different levels of institutions influence the actors operating in a certain policy domain. Also, the boundaries between the different levels are fuzzy as all levels influence each other. This is also indicated by the arrows in the figure on the right.

Aim of this study to examine how -in the field of flood resiliency in urban development- characteristics of these levels influence the relationship between policy and actor behavior. In the model of Healey this study focuses on how the governance level of culture influences actor behavior and interaction; the level of specific episodes. This study refers to the concept of *institutional landscape* to correspond to the level of governance culture in the model of Healey. This specific episode is examined in the case studies for both Rotterdam and NYC.

Concluding, the models feature some differences, but overall are highly similar. An overview of these different models and their corresponding levels of institutions is given in the table below.

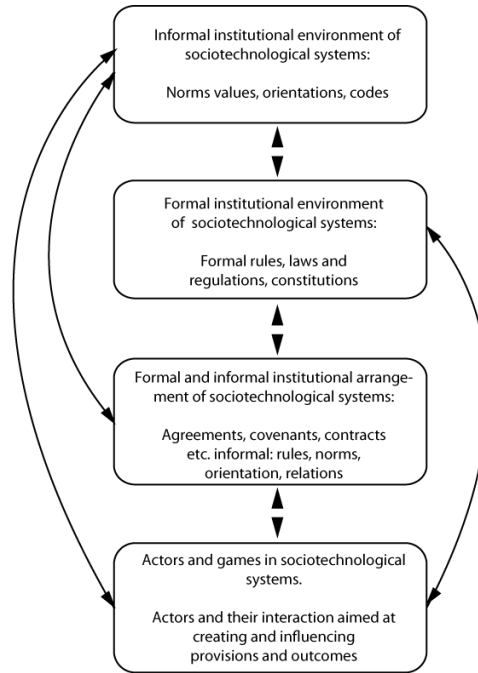


Figure 9. Levels of institutions according to Koppenjan & Groenewegen (2005).

Table 2. Models of levels of institutions and according characteristics.

Scharpf (1997)	Koppenjan & Groenewegen (2005)	Healey (2007)	Level characteristics
Formal rules	Formal institutional environment	Governance cultures Formal	Range of accepted modes of governance; formal rules, laws, regulations
Informal rules	Formal and informal institutional arrangements	Governance cultures Informal	Generally respected social norms agreements, covenants, contracts, rules, relations
Symbolic systems	Informal institutional environment	Governance processes	Communicative systems, paradigms, moral frameworks, norms and values, networks and coalitions, language
	Actors and games	Specific episodes	Actor interaction, means and outcomes, roles, strategies, interests

MAPPING THE INSTITUTIONAL LANDSCAPE

The study maps the socio-political environment of flood resiliency and spatial planning in both cities. We focus on the level of 'Output' of institutional analysis as described by Inam (2013). This level examines a specific policy or programme (in our case: building urban flood resiliency) and treats character of a planning institution and actors and stakeholders who shape it as the variables. This means we collect data by drawing on information from interviews with officials, observations of institutional behavior and analysis of institutional documents. This analysis examines how output, or policy outcome is determined by institutional structure and individuals' preferences. Variables include institutional mandate, decision making processes and budget priorities. The characteristics or elements analyzed on this level of output are

- institutional arrangements,
- institutional structure,
- institutional rules and policies,
- institutional norms and values and
- interests of actors.

The study uses these characteristics to compare the institutional landscape of flood resiliency in NYC and Rotterdam. The found characteristics are used to explain the effectiveness of current policies (see figure below).

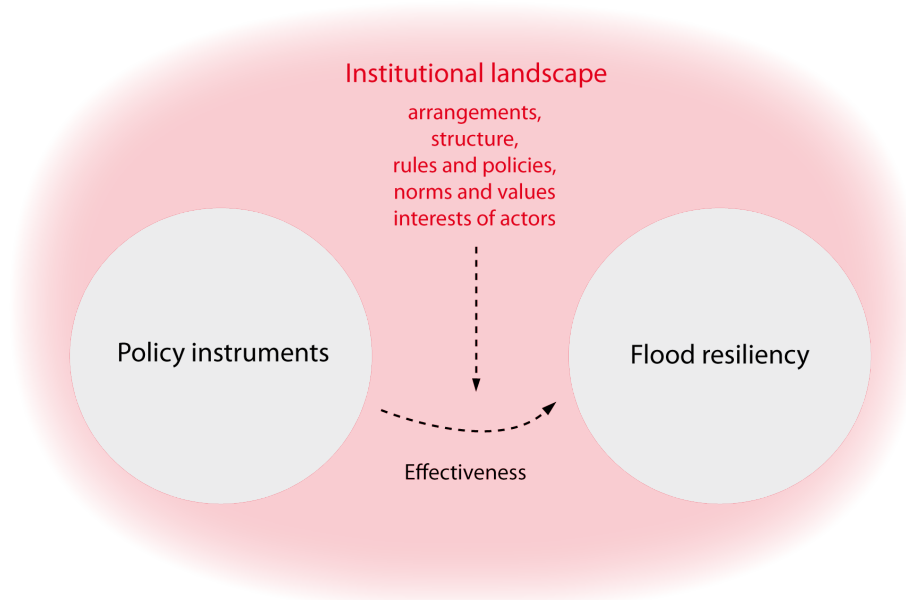


Figure 10. Key concept of the institutional landscape and its characteristics

The mapping of the institutional landscape is assisted by Prof J. Keenan for the situation in NYC and J. Jacobs (Municipality of Rotterdam) and dr. Ir. T. Tasan-Kok for Rotterdam. The overview of the characteristics is obtained by the findings of various expert interviews. The actors and policies are classed on their predominant intentions according to the policy intention framework of Tiesdell and Allmendinger, as explained in the following paragraph.

3. POLICY INSTRUMENTS: HOW PUBLIC AUTHORITIES AIM TO AFFECT ACTOR DECISION-MAKING

In order to get an overview and compare the adopted policies, the currently deployed planning instruments need to be categorized (see figure below). An appropriate framework for this categorization is found in the work of Tiesdell and Allmendinger (2005). This model is based on the notion that a strict separation of market and state is often not achievable, in practice as well as theory (Alexander, 2001). A further elaboration on institutional market theory is featured in appendix 3. Following Tiesdell & Allmendinger (2005, p.57/58), planning tools or instruments are in this study defined as "...policy actions or initiatives intended to affect the decision environment and behavior of market actors and to achieve desirable societal objectives."

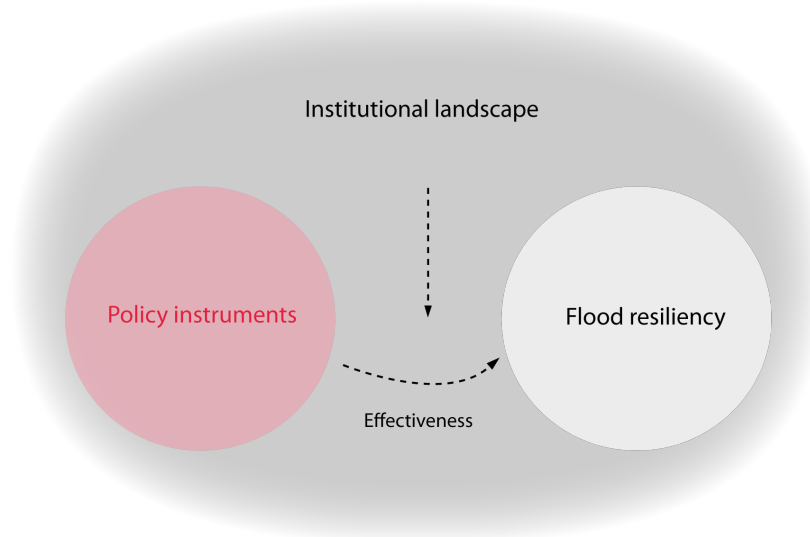


Figure 11. Key concept covered in this paragraph: Policy instruments

PLANNING INSTRUMENTS

According to the theory of Tiesdell and Allmendinger (2005), particular planning instruments are considered to have specific effects on the decision environment of land and property market actors. Urban planning is thus recognized to have impacts that go beyond the obvious effect on supply and demand. It can play a crucial role by, for instance, providing authoritative information, reducing risks and determining the number and range of participants involved in a project.

These intended effects form the basis of the classification of the tools. Hence, according to Tiesdell and Allmendinger (2005) planning tools are either intended to:

- shape markets,
- regulate markets,
- stimulate markets,
- or develop the capacity of market actors.

This framework thus categorizes public policies based on their intention of affecting the behavior and decision-making of actors in urban development. An overview specific instruments of urban area development in this categorization is listed in the table below.

Table 3. Categorization of policy instruments in urban area development (based on Tiesdell & Allmendinger, 2005).

Instrument intention	Influence on market actors	Typical sub-types	Examples
Shaping	Shaping the decision environment or context	Development plans	Public infrastructure investment plans Statutory plans and strategies; national planning policy and development plans Non-statutory plans, strategies and advise; spatial visions, research reports
		Regulatory plans	
		Indicative plans	
Regulation	Defining parameters of the decision environment	Public law	National regulations and legislation Contractual (or bi-lateral) regulation; restrictive covenants attached to land transfers
		Private law	
Stimulation	Restructuring the contours of the decision environment	Indirect/fiscal measures	Subsidies, tax (breaks), grants Land expropriation Joint ventures Project investment/realization
		Direct public action	
Capacity building	Developing actor’s ability to identify and/or develop more effective/desirable strategies	Initiating actor-network relationships	Arenas for interaction Collaborative partnerships Application of innovative solutions
		Building social capital	
		Shaping cultural perspective	

This categorization is added in the research overview in the figure below. By comparing Rotterdam and NYC on the actions development actors are actually taking the study examines how the different instruments perform in a certain institutional landscape, which is understood to be fundamentally different between both cities.

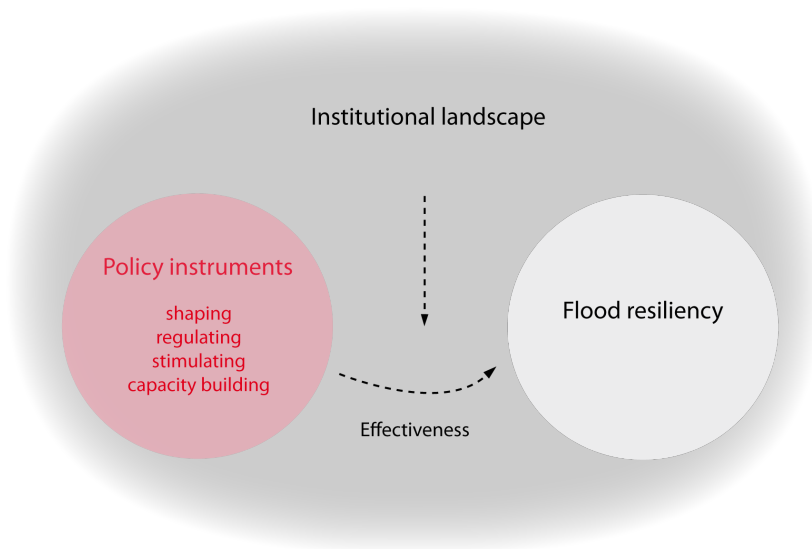


Figure 12. Key concept of the Policy instruments with according categorization

I. SHAPING INSTRUMENTS

Planning tools intended to shape markets (figure 13) are for example strategies and plans formulated by public authorities. They alter the decision-environment of market parties by limiting uncertainties regarding external effects. The impact of external influences (for instance, the strength of property rights, law enforcement and the availability of information) might be hard to identify, due to the imperfect nature of the development market and heterogeneity of land and property as commodities. However, the effects can be significant. We have already elaborated on plans as planning tools in section 3D. In appendix 3 a further elaboration on strategies and plans as shaping instruments is featured. This side-research was conducted to study the implementation of climate – adaptation strategies in general.

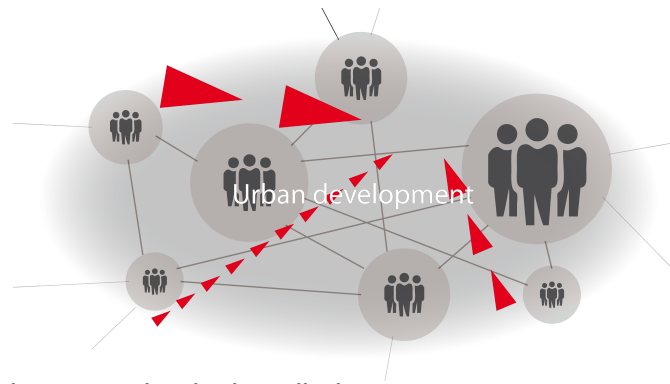


Figure 13. Market shaping policy instruments

II. REGULATING INSTRUMENTS

Planning tools intended for market regulation (figure 14) are aimed at regulating and controlling market actions and transactions. Regulations affect decision-making by defining the boundaries of the actor's opportunity space, thus restricting the set of choices available. In the context of area development, these regulating tools often take the form of public rights on land ownership and/or usage, accompanied with permits granting exception on these rules for development rights.

Regulations can take many forms. They can be imposed by the state and universally applicable or bi-lateral, only applicable to parties within the contract. Regulations can be enforced by law when they are subject to legal sanctions. These can be called regimes. Cultures on the other hand are regulations not enforced by law but subjected to social sanctions like the loss of privileges, disapproval or the harm of self-interest. In general, strict regulatory planning in combination with a rigid statutory system is considered to provide assurance of authoritative information to base development decision-making on (Alexander, 2001).

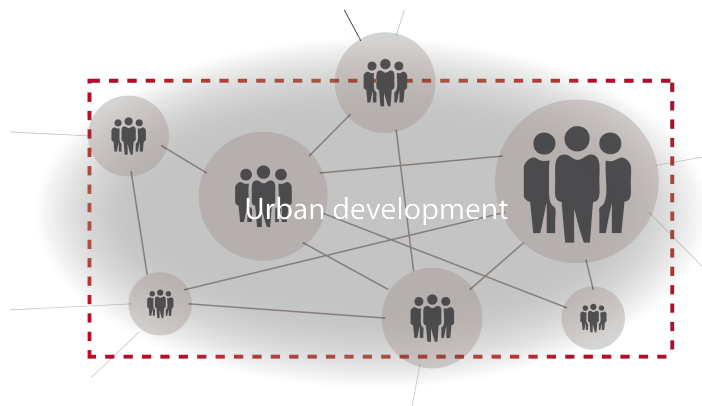


Figure 14. Market shaping policy instruments

III. STIMULATING INSTRUMENTS

Planning tools intended to stimulate (figure 14) development change the contours of the decision-making space of market actors. However, the focus is here on increasing the opportunities of these actors through either fiscal measures or direct state intervention. Fiscal measures respectively encourage or discourage actor activity through subsidies or taxes. Examples of direct intervention are the provision of public infrastructure and the acting on expropriation rights (Tiesdell & Allmendinger, 2005).

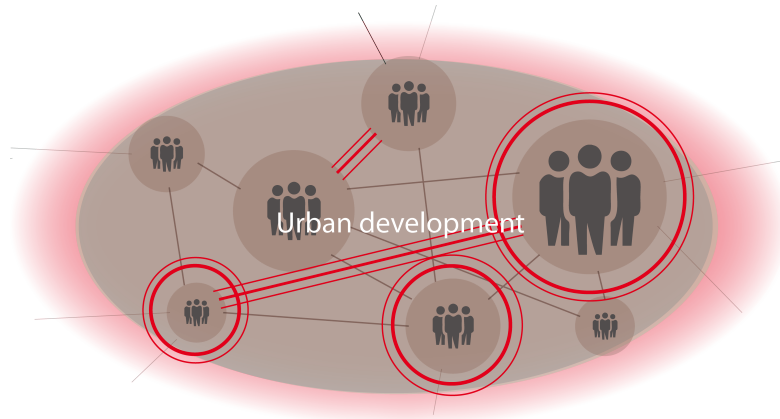


Figure 14. Market stimulating policy instruments

IV. CAPACITY BUILDING INSTRUMENTS

Capacity building tools (figure 15) are aimed at enhancing skills, knowledge, networks, communication and working practices of market actors. While these can be considered a special form of stimulation tools, a separate category is validated by the core objective to improve the effectiveness of the other planning tools. Capacity building tools focus more on social processes like building relations, trust and social capital among the range of involved actors. Three interrelated subtypes of social capacity are distinguished (Tiesdell & Allmendinger, 2005):

- Actor-network relations: the establishment of (in)formal stakeholder arenas for the exchange of information, enlargement of pool of available resources and creation of new solutions by synergy
- Social capital: building social institutions as means of reducing costs, uncertainties and risks of market parties.
- Cultural perspectives: overcoming narrow problem and solution perspectives resulting from the various professional fields and organizational backgrounds of market actors. This may be an important challenge especially in urban area development where discussions among actors are often characterized by linearity, narrow-mindedness and box-like thinking (Landry, 2000).

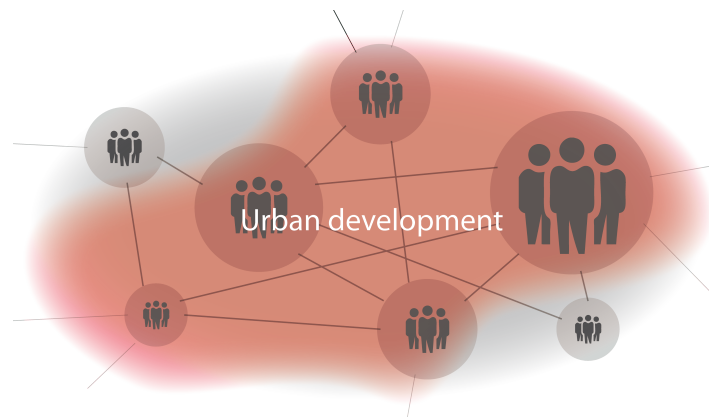


Figure 15. Capacity building policy instruments

4. URBAN FLOOD RESILIENCY: HOW TO ASSESS HAMPERINGS

As mentioned, this study examines the effectiveness of public policy on achieving the goal of increased flood resiliency of urban areas. To measure if this goal is reached, the study examines to what extent local actors perceive these aspect as being realized in the area. This approach, rather than quantitative assessment of for example reduced flooding risks or a decrease of assets in vulnerable areas, is a conscious decision. Firstly this approach is based on the perspective that there is no set of objective measures for flood resiliency. As resiliency assesses the ability of a society or community to prepare and bounce back from disturbances, it is understood as a cultural concept. Also, based on the theory of the network society, the physical outcomes are ultimately the outcome of actors' interaction and social processes. This means that for example generally accepted safety levels and the emphasis on either the preparedness or response aspect of resiliency can vary between countries and regions.

Urban flood resiliency is in this research approached as a form of climate adaptation within spatial planning. Therefore, to get a full understanding of the backgrounds of urban resiliency the concepts of climate adaptation and urban planning are examined and described in appendix 3. The figure below illustrates how in order to assess the effectiveness of policy instruments we need to look at to what extent the socially desirable goal is attained. Policy instruments are intended to stimulate collective actor behavior towards this goal, in our case, increased flood resiliency in urban area developments.

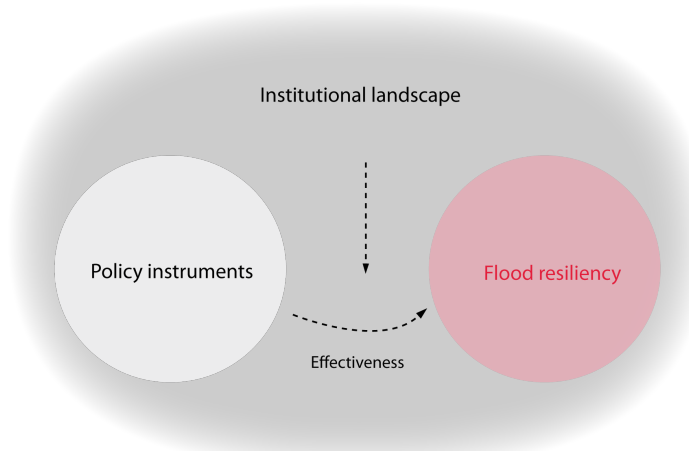


Figure 16. Key concept covered in this paragraph: flood resiliency

Currently, within the domain of water management a shift is taking place in the view on how societies should deal with water issues. Where water management measures were previously often considered as a burden on the built environment (Teeuw & Luising, 2005, p. 11), nowadays water solutions for water excess or shortages are more and more perceived as opportunities (Veerbeek, Ashley, Zevenbergen, Rijke, & Gersonius, 2010). Potential benefits can be realized by proper design, extending water retention, preventing the diffusing of polluted water and bringing back the level of water usage (Teeuw & Luising, 2005). Crucial is the integration with other functions and a focus on benefits for other stakeholders. As a result, urban water management and, more specifically, flood resilience now has to deal with not only technical aspects, but institutional, socio-economical and ecological factors as well. For example, more room for surface water can be necessary to create extra retention space but can simultaneously add extra quality for the urban environment. This is a mere illustration of how the integration of water management measures can add to the sustainability of the built environment, more of which are provided by Teeuw & Luising (2005).

From a water-management point of view the planning of urban developments can cover a range of policy options. Examples include a combination of upgraded protection infrastructure, managing subsidence (in susceptible cities) and various land use planning to both reduce vulnerability. Furthermore, new developments can be diverted away from floodplains and flood warning and evacuation plans are developed (Nicholls, 2008).

In current academic discourse, as well as climate adaptation practice, the concept 'resiliency' knows many interpretations (Keenan J. , 2014). Urban resiliency can be broadly defined as a city's capacity to absorb disturbance and retain its functions and structures. In general scholars define two aspects of a system's resiliency to these disturbances; its robustness and its responsiveness, as shown in the figure below. Robustness limits the impact of disturbances and responsiveness indicates the speed of recovery of the city's systems and structures.

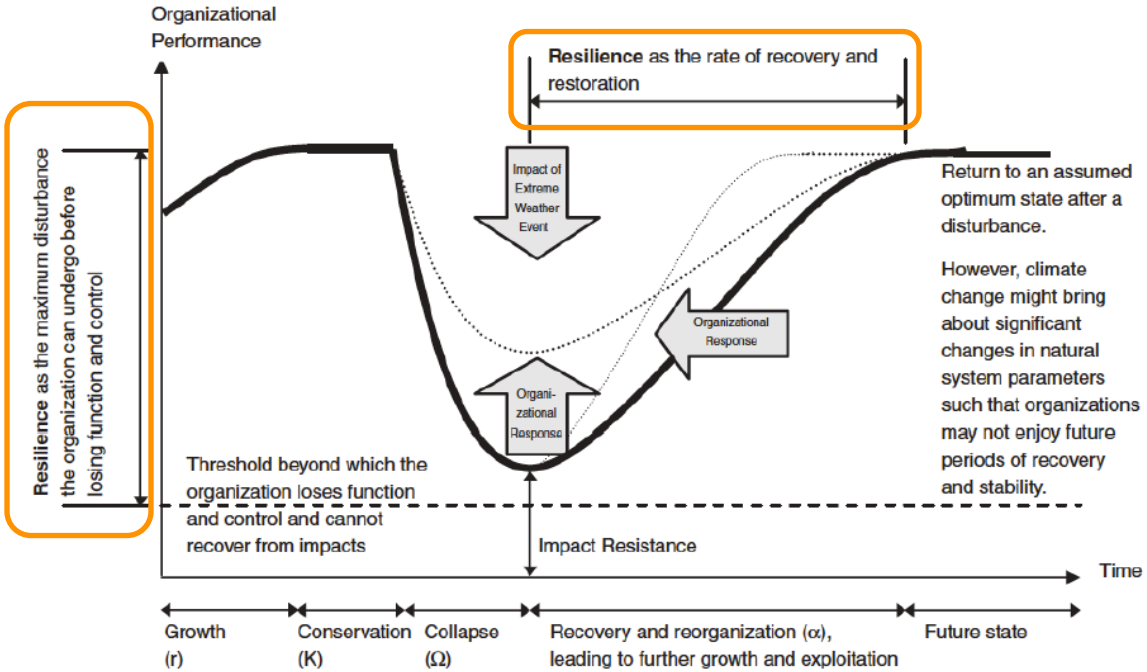


Figure 17. Resiliency aspects of limiting impact and speed of recovery (Source: Linnenluecke & Griffiths, [2010] in Lu [2011])

According to these different stages of adaptation to external disturbances, urban resiliency can be broken down into a respective preparatory and a performance part. The figure below shows this division. It is important to note that a city may score high on preparedness while performing weakly in responsive and recovering actions.

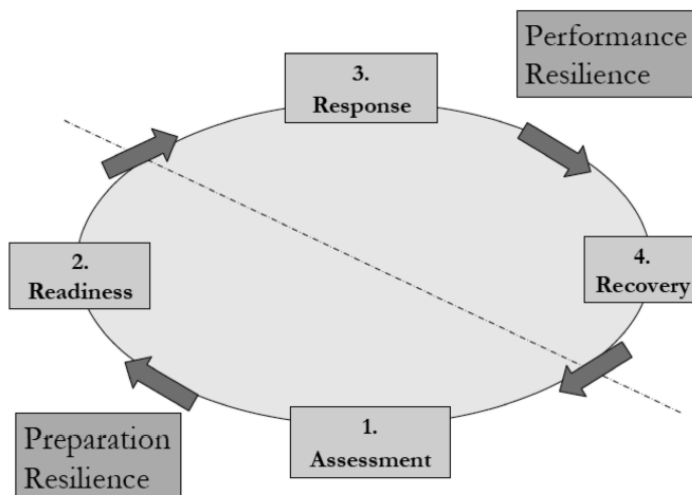


Figure 18. Preparation and performance resiliency (source: Foster [2006] in Lu [2011])

Based on these understandings of adaptation and resiliency, Lu (2011, 2014), in her comparative study on flood resiliency in Rotterdam and Asian cities, has developed a framework to examine urban governance on flood resiliency. In congruence with Lu, this study specifically looks at preparation resiliency for the assessment of the governance, or planning for adaptation of urban areas. Performance resiliency is left out of the scope because this is hard to assess without the occurrence of a significant disturbing event. Based on various scholars, Tasan-Kok, Stead, and Lu (2013) and Lu (2014) defined six criteria of planning preparedness, as listed in the table and figure below. These are based on characteristics mentioned by various scholars or public policy for urban of flood resiliency.

Table 4. Urban resiliency characteristics (adapted and supplemented from Lu, [2011])

Indicators flood resiliency urban area development	Source
Considering the current situation	Walker and Salt, 2006 UK Cabinet Office, 2012
Examining trends and future threats	UK Cabinet Office, 2012 Bouwer et al., 2010
Learning from previous experience	Walker and Salt, 2006 Hutter, 2011, Hutter et al., 2011, Hutter, 2010, Bernhard, 2010 van den Brink et al., 2011, Gupta et al., 2010
Setting goals	Godschalk, 2003 Fleischhauer, 2008 van den Brink et al., 2011, Gupta et al., 2010
Initiating actions	Fleischhauer, 2008 Hutter, 2011, Hutter et al., 2011, Hutter, 2010, Bernhard, 2010
Involving the public	Godschalk, 2003 Davoudi and Strange, 2009 UK Cabinet Office, 2012 Hutter, 2011, Hutter et al., 2011, Hutter, 2010, Bernhard, 2010 van den Brink et al., 2011, Gupta et al., 2010

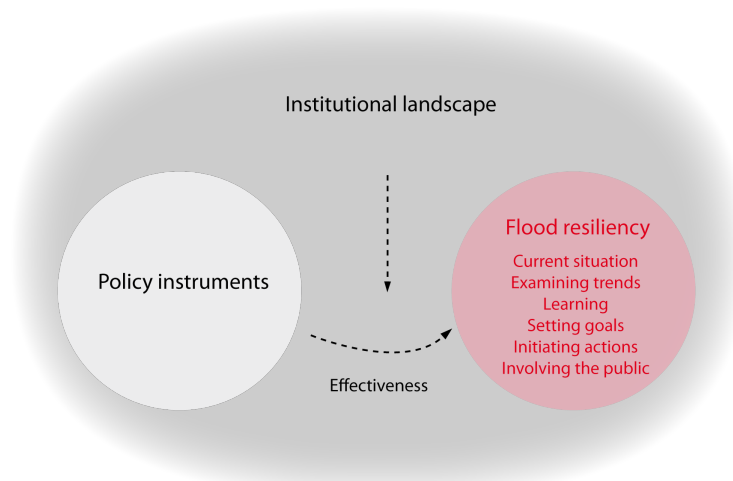


Figure 19. Key concept of flood resiliency and its characteristics

III. CASE STUDIES

1. NEW YORK CITY AND ROTTERDAM

The choice to compare Rotterdam with NYC is based on the assumed differences in the institutional landscape of flood resiliency in urban planning between these cities. The comparison focuses on the question as to how policy instruments perform this landscape. By studying the network of local actors to assess the study aims to get insight in the effectiveness of current policies in realizing flood resiliency in area developments (see figure below). Findings of this examination are based on case studies of waterfront development projects; Sunset Park in NYC and Merwe-Vierhavens in Rotterdam.

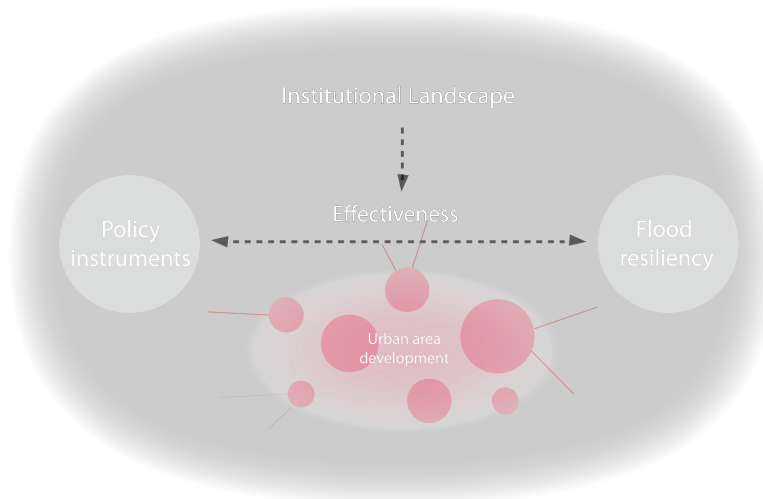


Figure 20. Networks and actor behavior of the urban development process in relation to key concepts

There are a number of preconditions, both similarities and differences, that need to be kept in mind in focusing on Rotterdam and NYC in a global comparison. Firstly, the geographical situation: as urbanized deltas makes that increased chance of flooding is a pressing matter in both cities. However, there are differences as to the causes and nature of these floodings, as will become clear in the introductions of the respective city chapters of this report. Furthermore, the governments of the cities have both developed ambitious strategies to adapt to the effects of climate change. They are taking leading roles and form examples in international city-networks for urban climate adaptation. The respective climate adaptation strategies studied are PLANYC for greater New York, and Rotterdam Adaptatie Strategie (RAS) for Rotterdam, report covers of which are depicted in figure 21.

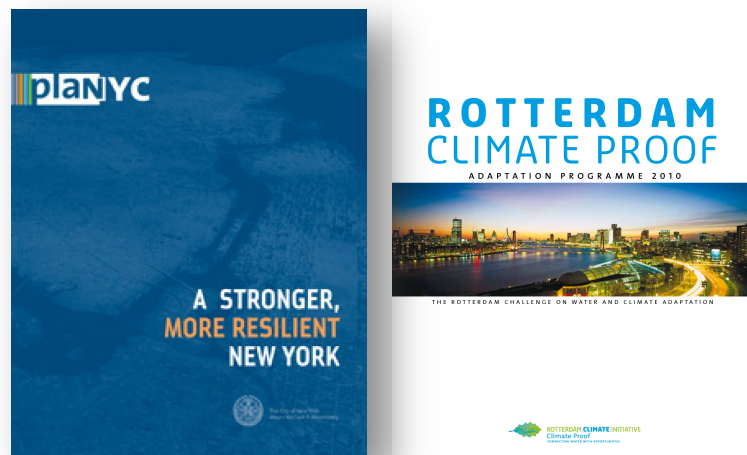


Figure 21. Climate adaptation strategies of New York City and Rotterdam

In the field of urban development management, the approach to public planning and the condition of the local land and property market largely differ. However, both cities have stated a similar position in their public responsibilities for the realization of adaptation in spatial development. This approach is best described as stimulating private initiative and investment in building resiliency while limiting public spending. This can take the form of providing information on risks and technical solutions, revising legislation or offering procedural and management support throughout the development process.

Based on the preliminary literature review and consultation of experts and practitioners, table 5 lists the assumed differences between the institutional landscapes of Rotterdam and NYC in flood resiliency and urban development.

Table 5. Main differences New York City and Rotterdam in building flood resiliency

	Rotterdam	NYC
Main flooding causes	Land subsidence, rising sea levels, river flooding	Rising sea levels, storms
Historic response to flooding	Prevention	Insurance
Relation to water	Living with	Fighting against
Adaptation speed	Slow	Fast
Strategy formulation	Proactive	Reactive
Flood resilience measures mapped	By functional environment	By neighborhood/district
Urban development	Small interventions	Large developments
Adaptation focus on	Maintenance and renovation works	New-build projects and repairing works
Funding	Not incorporated in strategy	Proposal incorporated in strategy
Collaboration focus	Individual citizens and public parties	Private parties, communities and local authorities
Realization initiative	Top-down	Bottom-up
Real estate market/land prices	Weak	Strong

As mentioned earlier, many cities around the globe have developed climate adaptation strategies. Some cities are even further in the process and have adopted special policy programs for building flood resiliency. In this field, Rotterdam and NYC are highly similar in their level of ambition as well as approach. Both cities aim to be leading examples for urban climate adaptation, branding themselves as innovative and sustainable environments. This, in turn, is believed to attract businesses, residents and capital flow. Ultimately this is intended to strengthen the competitive position of the city on the longer term. Besides sharing these high ambitions, the strategies of Rotterdam and NYC also show similarities in their vision of how to achieve them. Their approach to climate adaptation - and flood resiliency in particular - is marked by not formulating one set plan, but rather a protective measures on different spatial scales and within various urban domains. Also, they are both based on the notion that for full realization of the stated goals collaboration between public and private actors will be crucial.

In recent years, NYC and Rotterdam have both gained interest in each other's methods in urban planning (Heurkens, 2012; Daamen, 2011) and approach to climate adaptation (Rotterdam Climate Initiative, 2014; C40 Cities, 2014; NUWCRen, 2012). Like many other adapting cities, NYC can learn from the Dutch tradition of uniting water management with spatial development in integrated design solutions (Meyer, Morris, & Waggonner, 2009; Meyer & v.d. Burg, 2005). The 'Rebuild by Design' competition for instance, features a Dutch consulting or design firm in almost all participating teams (Rebuild by Design, 2014). Rotterdam, on the other hand, has recently been faced with severely diminished financial resources. Where public investment initiated and shaped area development as well as climate adaptation programs before, the city now needs to find new ways to stimulate the private sector to realize her objectives (Gemeente Rotterdam, 2012). NYC has seen a recent shift in policy towards increased in government control. However, historically it forms a classic example of neoliberal urban planning, limiting public intervention as much as possible (Fainstein, 2001).

2. RESILIENCY AND DEVELOPMENT IN NEW YORK CITY

New York City (NYC), with its waterfront spanning more than 500 miles, is shaped by the water (DCP, 2013). The waterfront is the longest and most diverse of any city in the United States and forms one of the main physical assets of the city. The buildings and urban areas along the water are characterized by the open views. This is considered to add largely to spatial quality of this otherwise dense city. However, it also implies risks with regard to rising sea levels and increased fluvial discharge (DCP, 2013).

When Hurricane Sandy struck the city in October 2012, the city was already looking into ways to adapt to the anticipated effects of climate change, especially with regard to increasing flood resilience (DCP, 2013). However, the damage and disruption Sandy caused brought renewed sense of urgency to this work. Besides the fresh wounds of Sandy, changes in federal flood insurance policies and the updating of flood zoning maps ask to fast track the process of building the resilience of waterfront communities.

In 2008, in preparation for the PlaNYC report, the New York City Panel on Climate Change (NPCC) was conducted. This group of climate scientists and risk management experts projected a rise in sea levels of more than two feet (~60 cm.), in 2050 for the city to deal with. This rise will expand the zones at risk of coastal flooding and lead to larger impacts on the neighborhoods already at risk. Besides rising sea levels, the risk of flooding in NYC mainly comes from the increase in the number and severity of extreme weather events like tropical storms, hurricanes and so-called Nor'easters. Most of the city, with exception of the harbor areas, which are typically built on reclaimed land, is founded on stony underground. This relieves the city from the issue of land-subsidence, prevalent in most delta-cities.

Congruently, the Federal Emergency Management Agency (FEMA), one of the most influential public bodies on US water management, is in the process of updating its risk maps. Most influential are the 100-year floodplain maps, which depict the zones that have a risk of flooding once every century. This risk is based on the Base Flood Elevation (BFE), the estimated height of floodwaters in a storm that has a 1-percent annual chance of occurring (DCP, 2013).

These maps form the basis for the premiums of the National Flood Insurance Program (NFIP), as explained in the textbox on the right. As the maps are updated, the floodplain zones are largely increasing. The city expects that the number of residents living in the 100-year floodplain zone actually lies around 450.000, more than double the number using the old maps (DCP, 2013). A preliminary version of the updated FEMA 100-year floodplain map is depicted in figure 22.

THE NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

FEMA administers the National Flood Insurance Program (NFIP), through which private properties' flood losses are covered by insurance premiums paid by property owners. New or substantially improved buildings in the 100-year flood zone are required to maintain flood insurance to obtain loans from federally insured banks, as well as to be eligible for federal disaster assistance. At the same time, coastal communities participating in the NFIP are required to match their local codes with FEMA's requirements. FEMA reports that, as of May 2011, over 20,000 communities in coastal areas are participating in the NFIP, including New York City. (DCP, 2013)

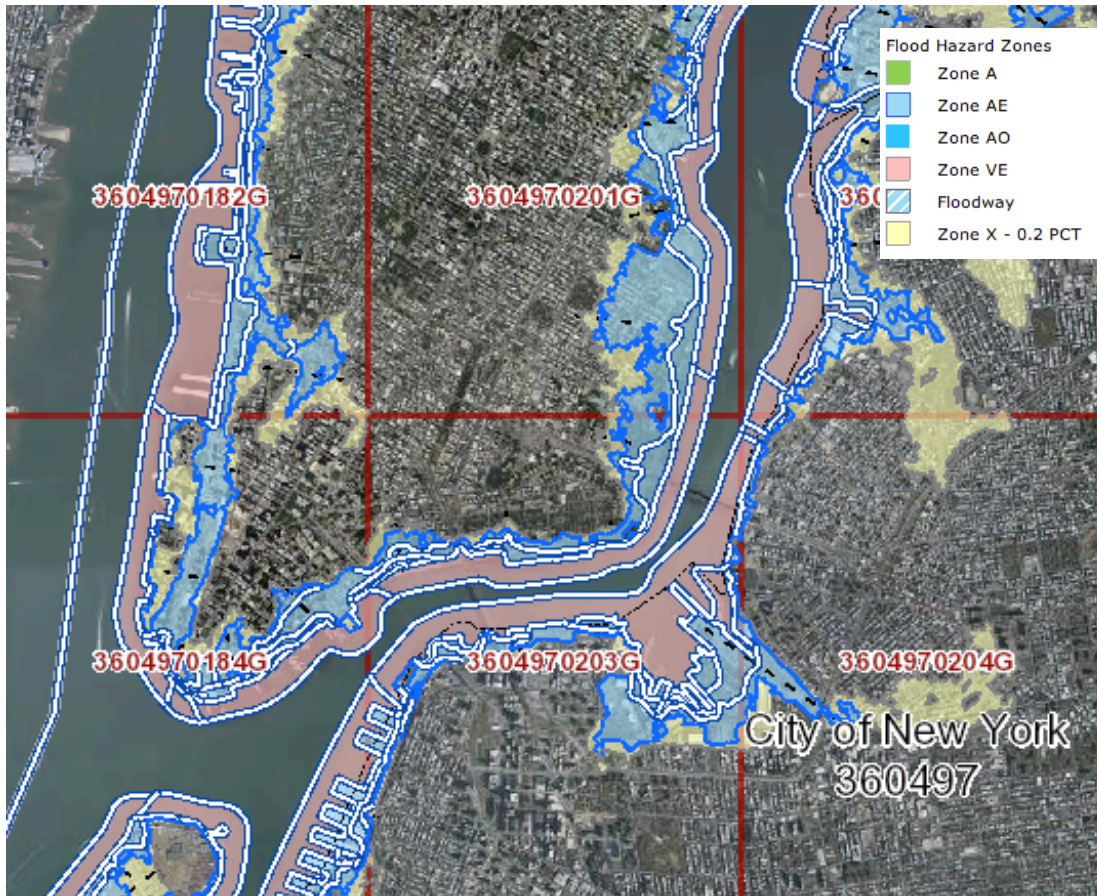


Figure 22. Preliminary Flood Insurance Rate Map (FIRM) of lower Manhattan and parts of Brooklyn (FEMA, 2013)

Hurricane Sandy stressed the potential effects of climate change for the city. This event exposed to need for direct action in both research and policy fields; assessing exposure, mapping risks, and developing mitigation and adaptation strategies. *PlaNYC - a greener, greater New York* (2007) has been developed as the main climate adaptation strategy for New York City. This strategy and the proposed actions are based on environmental analysis reports like the ones of the intergovernmental panel on climate change regarding the *Physical Science Basis, Mitigation of Climate Change and Impacts, Adaptation and Vulnerability* (IPCC, 2014). It proposes mitigation policies, aimed at reducing the causes and effects of climate change (for example reducing greenhouse emissions). The updated version; *PlaNYC – a stronger more resilient New York* (2013), considers the impacts of Sandy. In understanding the inevitability of climate change and the effects this will have on the city, this new strategy is specifically focused on adaptation of social and physical structures, anticipating external disturbances (DCP, 2013) Policy thus shifted towards building resiliency rather than taking mitigation measures.

The resulting policies aim to enhance communities' ability to withstand and recoup from extreme weather events. Besides improving social as well as physical emergency infrastructure, the main elements of these strategies propose the adaptation of physical existing structures and of public space. Furthermore, well considered zoning and land-use plans and more strict requirements for constructions in flood-prone areas are suggested as directly enforceable policy measures.

An example of these policy changes is the adding of so-called 'freeboard'; elevating the flood-proof level of buildings in flood-prone zones. This flood-proof level has historically been set at FEMA-designated flood elevation level. This implies a change in building codes, increasing the elevation by one or two more feet to add a margin of safety addressing uncertainties in flood modeling and sea level rise (DCP, 2013). While this measure seems obvious from a

flood resilience point of view, elevating buildings brings its own difficulties. Not only is it technically a huge challenge, especially for existing buildings, it can also impose limits to the otherwise vibrant public realm. Visual connectivity of ground floor level activity will be changed, in turn distorting pedestrian experience of the neighborhoods. Here lies the challenge of finding integrated solutions, building flood resilience as well as *adding* quality to the urban environment (DCP, 2013).

A. URBAN DEVELOPMENT IN NYC

The socio-political environment of urban planning and development in NYC is the other domain of public policy that shapes the institutional landscape this study focuses on. First, North-American urban development practice is briefly described. This background is necessary for a better understanding of the subsequently described situation in New York City in particular.

NORTH-AMERICAN SPATIAL PLANNING AND DEVELOPMENT PRACTICE

The approach to spatial planning in the United States (US) has largely been shaped by the country's liberal socio-political background, also characterized as the Anglo-Saxon societal model (Fainstein, 2001; Hackworth, 2007; Heurkens, 2012). In practice, this entails limited power and position of planning institutions and policies due to the internal contradiction of neoliberal planning (as further explained in appendix 3). However, the purely regulative role of the planner to stimulate market dynamics now seems too limited (Peck, Theodore, & Brenner, 2009, p. 51). Firstly, neoliberal planning has been linked with the intensification of economical, social and spatial inequalities. Furthermore, the importance of involvement of local stakeholders in planning processes and fostering of bottom-up approaches in contemporary society is growing. Lastly, the increased emphasis on spatial quality of the urban environment asks for more coordination of development projects. The rise of the network society has changed the task and effective approaches of *neoliberal* planning institutions as well. Thus, traditional neoliberal planning practice has become ineffective in being too passive to deal with property-led urban development (Fainstein, 2001).

ROLL-OUT NEOLIBERALISM

Amongst various cities in the United States there seems to have been a shift in planning policy. From the neoliberal pattern of deregulation dominating most cities during the 1980s, an emergent phase of more public intervention can now be perceived. This 'roll-out neoliberalism' implies active state-building as well as regulatory reform (Peck & Tickel, 2002). This shift is marked by an increased focus on purposeful construction and consolidation of neoliberalized public organizations, regulatory relations and modes of governance rather than the avoidance and resisting of social-collectivist tendencies (Peck & Tickel, 1995). This policy shift reflects the need for a more active planning response to unwanted emerging spatial patterns of segregation and growing inequalities, at the same time creating quality of place (Hajer & Zonneveld, 2000).

NEW YORK CITY

New York City has long been seen as the archetype of neoliberal urbanism (Hackworth, 2007; Harvey, 2005). The ideology of market competition, freed from any state interference or actions of social collectivities, with economic growth as its main driver, is very much evident in the city's skyline and layout. However, former NYC Mayor Bloomberg, since taking office in 2002, set out a new approach to urban planning for the city. This swift directly reflects the highly centralized political power structure (Fainstein, 2001) of the city. Before, NYC's planning policy was focused on deregulation, tax incentives, and privatization to stimulate development and attract businesses. Bloomberg departed from this strategy, emphasizing the need for public-sector intervention and investment. This shifted the role of city government in area development projects to a more pro-active one. This new style of governance, the "Bloomberg way" (Brash, 2006), fits the description of "roll-out neoliberalism" (Peck & Tickel, *Neoliberalizing space*, 2002). This more active form translates itself in the introduction of new institutions, policies and governmental bodies and –procedures (Schaller & Novy, 2010). This comprehensive urban planning policy was particularly aimed at providing opportunity for capital accumulation through property-led regeneration and place-making (Brash, 2006; Fainstein, 2005).

Under Bloomberg's administration, a top-down development agenda was created. This involved a multitude of area re-zonings, several urban redevelopment schemes and projects to improve the city's public space and infrastructure

(Schaller & Novy, 2010). This, to prepare for future population growth and stimulate economic development by enhancing the city's attractiveness to investors, residents and visitors. The (re-) development of New York's waterfront areas is seen as a crucial part of this strategy (Schaller & Novy, 2010). The strategy focuses on spatial quality to enhance the city's competitive position and accordingly proposes adjustments to planning policy instruments. For instance, a modification of former zoning regulations is targeted at increasing pedestrian experience as well as reducing the procedural bureaucracy involved with development (The Wall Street Journal, 2012).

In the early days of the current city administration, appointed in 2013, mayor Mr. de Blasio seems to focus on social sustainability rather than climate adaptation. This could lead to a shift in the city's development policy. From private, property-led waterfront developments, more room could be given for public intervention to provide for more social housing programs. Concluding, the increase in pro-active public planning seems to prevail, as this new agenda also stresses the importance of community involvement and partnerships with private sector (The New York Observer, 2014).

B. WATERFRONT AREAS

The natural harbor of New York was once one of the main drivers of the region's economy. In fact, it provided the basis for the city's rise as a global metropolis. However, the containerization of trade and transportation in the 1950-ies lead to the relocation of the port-industry. This left many of the inner-city docks idle (DCP, 2011). Up to the 1990-ies these areas were increasingly haunted by vacancy and pollution. Their abandoned piers formed an unattractive landscape and unsafe environment and formed a barrier between the city and its water. Over the last two decades, the City has started to regain these waterfronts, reducing pollution levels and stimulating redevelopment. These steps have been taken in response to a renewed understanding of the potential of waterfront access to add value to the urban environment. The city's shoreline is now considered an asset that could play an important role in strengthening the long-term competitive position of NYC (DCP, 2011).

In the 1990-ies public parties took on a rather passive role in the redevelopment of these waterfronts (Bowles & Kotkin, 2003). It was not until the election of M. Bloomberg as Mayor in 2002 that waterfronts were designated to be a major focus for policy efforts, driving the urban and economic development of the city. This plan was first laid out in the 'New waterfront regeneration program' (2002). Within only a few years all along the city's shoreline a vast number of sixty-one waterfront projects was getting realized (O'Brien, 2005). Most of these developments are property-led regenerations of abandoned industrial districts or terrains. New functions are predominantly commercial, residential and recreational (Schaller & Novy, 2010).

The waterfront redevelopments are generally applauded for their attention to the quality of the urban space and to environmental sustainability. Waterfront redevelopment, according to Vision 2020, entails several measures. Infrastructure must be created where none currently exists; in some cases roads must be built or reconstructed; and neighborhood amenities, public transportation, and facilities such as schools and hospitals must be developed (DCP, 2011, p. 175). The new plans are pedestrian-orientated; they feature mixed-use neighborhoods and largely increase the amount of green space in the area (Schaller & Novy, 2010). However, voices have also been raised about the negative effects of gentrification of these neighborhoods. Lower income households and manufacturing businesses are being replaced by luxury apartments and creative industries.

C. CASE PROJECT

The case area in NYC has been selected in consultation with Prof. dr. J. Keenan (Research Director Center for Urban Real Estate, Columbia University). The area selected is Sunset Park, a waterfront district located in Brooklyn (see figure 23). Like many other parts of Brooklyn like Red Hook and Navy Yards, Sunset Park was one of the districts that were highly affected by Sandy in 2012. The current FEMA flooding map of the area is depicted in figure 24. It has furthermore been featured as an important area for waterfront regeneration in the City's various development strategies, for example Vision 2020 and the Sunset Park Waterfront Vision Plan.

INTRODUCTION

Sunset Park is an industrial district, a cluster of City-owned and managed industrial properties on the Brooklyn waterfront. Sunset Park has suffered from substantial disinvestment over the past several decades. The

development of the port area started with the construction of the piers over 100 years ago. Sunset Park traditionally houses different manufacturing and distributing industries. Like other waterfront areas in NYC, the main challenge for Sunset Park today is to adapt and re-use the outdated industrial buildings and spatial layout. Aim is to develop Sunset Park into a contemporary mixed, dense and environmentally sustainable district, focused on manufacturing industry (NYCEDC, 2009).

Sunset Park extends from Erie Basin to Owls Head, covering an area of nearly 600 acres. Figure 17 illustrates Sunset Park and its relatively large amount of city-owned areas. The area is currently characterized by small-scale centers of industrial activity, water-dependent facilities, manufacturing districts and vacant sites and brownfields of significant size (DCP, 2011). Sunset Park was initially designated by the Comprehensive Waterfront Plan² as one of the six Significant Maritime and Industrial Areas (SMIA's). These waterfront neighborhoods were considered to have potential for economic expansion and industrial development through intensified use of and access to the waterfront. Of these SMIA's, Sunset Park features some of the largest vacant sites but also the highest employment density (DCP, 2011). The semi-governmental Economic Development Corporation (EDC) is an important stakeholder; it owns large plots of land in the area.



Figure 23. Location of Sunset Park in NYC (source: Sunset Park website, 2013).

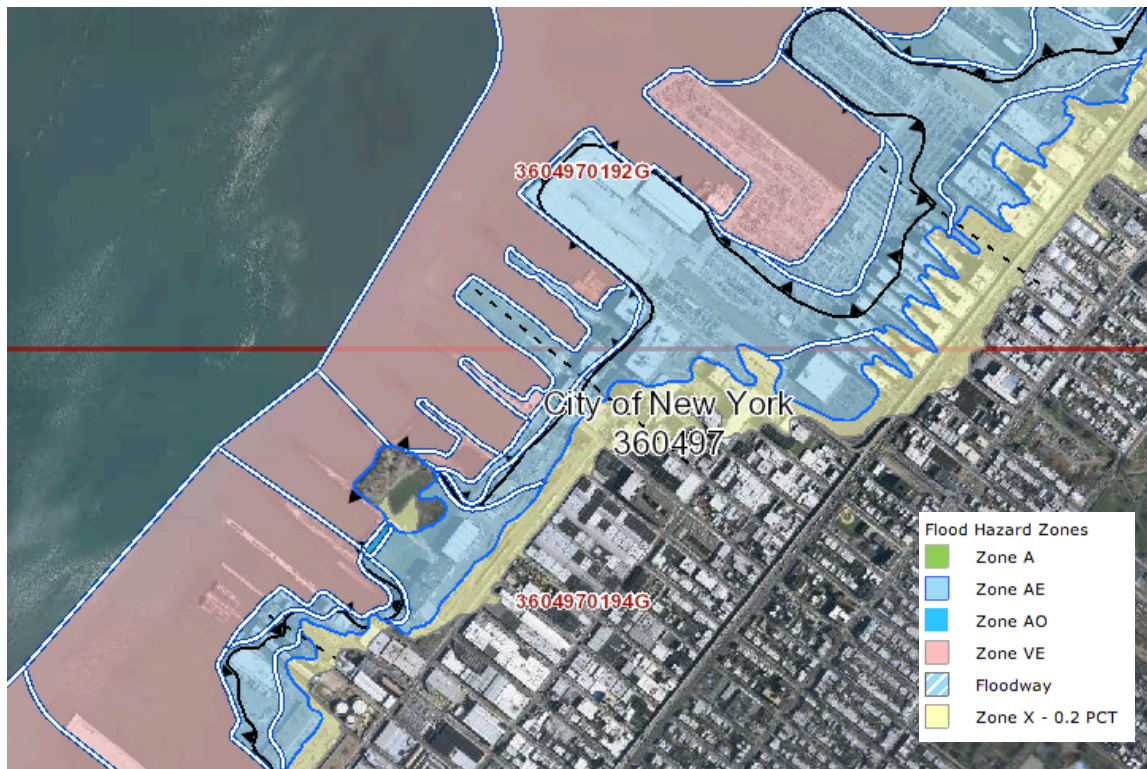


Figure 24. Sunset Park cutout of NYC flood risk map (source: FEMA, 2013).

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² the predecessor of the New Waterfront Revitalization Program (DCP, 2002) and Vision 2020 (DCP, 2011)

The EDC’s Sunset Park Waterfront Vision Plan (2009) provides a vision for the economic, social and physical development for the entire area. It features investments recommendations for the coming twenty years, and accordingly focuses on projects that can be realized on relatively short-term. The strategy is developed to stimulate physical developments and to provide plans that enhance both public access to the waterfront with sustainable industrial growth. The predominant goal of the strategy is to balance community objectives and regional needs with chances for industrial development.

Besides intensification of the area’s usage and the physical transformation of sites and properties, the regeneration of Sunset Park covers the expansion and enhancement of park space. Several environmentally conscious elements are proposed, for example on-site storm water retention, in line with the City’s policy of encouraging sustainable design.

ACTORS

Main actors in the development of Sunset Park are:

- Sunset Park Working Group:
 - New York City Economic Development Corporation
 - Mayor’s Office of Industrial and Manufacturing Businesses
 - New York City Department of Small Business Services
 - New York City Department of City Planning
 - Southwest Brooklyn Industrial Development Corporation
- Housed businesses
- Local non-profit organizations like Brooklyn Community Board 07 and UPROSE
- Development firms.

A more extensive overview is provided in the figure below.

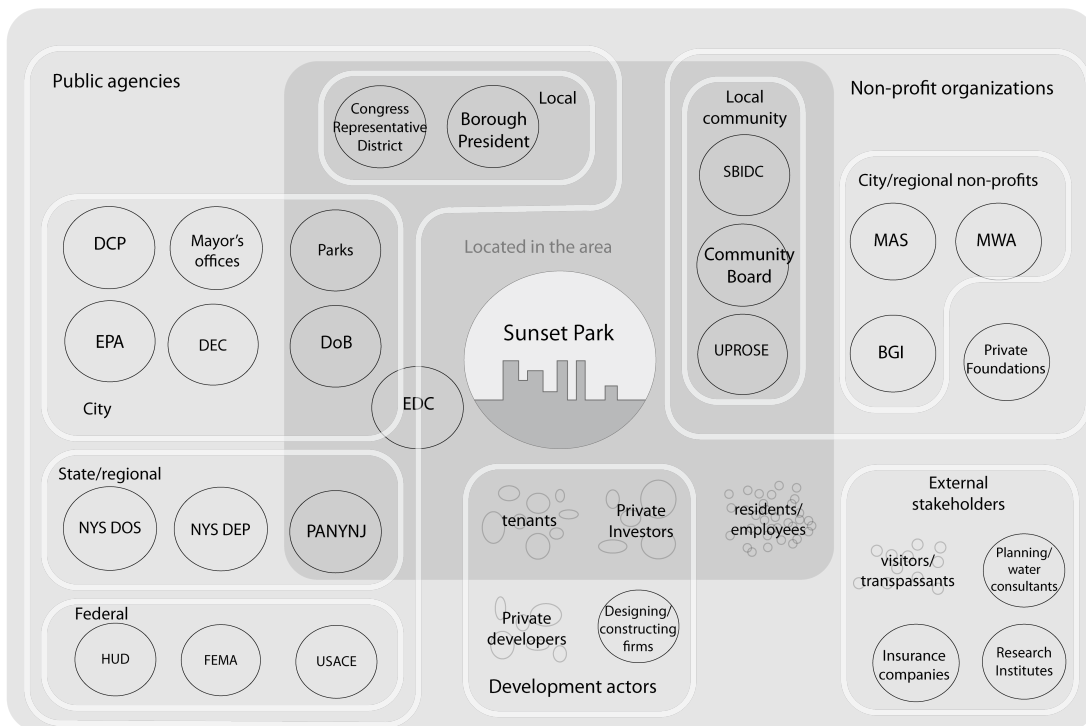


Figure 25. Actors involved in flood resiliency in Sunset Park developments

DEVELOPMENTS

While opportunities of the area are predominantly sought in enhancing industrial and economic activity, the challenge lies in simultaneously providing safe and attractive public access to the waterfront. Therefore, the waterfront, housing both industrial and public activities, requires a delicate balance between vehicular and pedestrian circulation. Closely related is the construction of the Brooklyn Waterfront Greenway Masterplan, a continuous public route of greenway, connecting Brooklyn waterfronts. Figure 26 provides an overview of Sunset Park with its piers and the lands that are currently owned by the EDC.

The transformations of old warehouses like Industry City, along the South Brooklyn Marine Terminal, and Federal Building #2, the old Navy building, are good examples of the current development projects taking place in Sunset Park. The Industry City complex for example is recently bought by Jamestown Properties, in a partnership contract with real estate financiers Angelo Gordon and Belvedere Capital (The Real Deal, 2013). The complex consists of 16 buildings with a total of 6 million square feet of floor space. The developers are transforming the old warehouses into a mixed-use complex of office, manufacturing and cultural facilities. Industry City, as well as Federal Building #2 is especially interesting for this research as they were both hit by Hurricane Sandy (The Real Deal, 2013). Their location directly in the low-lying flood-prone areas raises questions as to how developers are dealing with these risks.



Figure 26. Sunset Park with its piers and development areas (source: NYCEDC, 2009).

3. RESILIENCY AND DEVELOPMENT IN ROTTERDAM

As early as 2002 the municipality of Rotterdam has developed the WaterPlan (Gemeente Rotterdam *et al*, 2002). The plan was drawn up in collaboration with the Waterboards, the regional water management agencies, that are active in the Rotterdam. This strategic report was further developed to the Waterplan 2 in 2007 (Gemeente Rotterdam *et al*, 2007) and its most recent version in 2013 (Gemeente Rotterdam *et al*, 2013). This last reassessment incorporated notions of the overarching climate adaptation strategy, the 'Rotterdam Adaptatie Strategie' (RAS).

The RAS, a result of Rotterdams climate adaptation program 'Rotterdam Climate Proof' (RCP), defines challenges for the city as a result of the anticipated effects of climate change. It proposes mitigating and responsive adaptive measures and points to important actors that are to be involved in the process. The RAS functions as an umbrella policy document. It sets general guidelines for the city's climate adaptation program but leaves specific policy domains and studies to separate reports like the Themarapport Waterveiligheid (English: Theme Report Water Safety by van Barneveld [2013]).

Implementation of these strategies is proposed as a joint activity of two municipal departments: the Municipal Public Works Department and the Department of urban development. In addition, collaboration is sought with the Municipal Health Service (GGD), the Sports and Recreational Department, the Water Boards, various government bodies, NGOs and knowledge institutes (Rotterdam Climate Initiative, 2014).

De RAS explicitly states that even though the strategy forms a framework for government activities, building the city's resiliency for climate change, all urban parties need to engage in this process and pro-actively collaborate. Therefore, the strategies form a basis for the city's policy on this topic, but also functions as a starting point for discussion between planning parties and local urban actors. This reflects the municipality's current approach to planning and urban management. City government is on the one hand to provide a strong policy framework, and focus on clear legislation, communication and providing information on urban processes and public policies. On the other hand city government is to facilitate urban actors in supporting interaction and private initiatives of economic, social and physical development.

MAINSTREAMING SOLUTIONS

To carry out the stimulating policies that are proposed by the climate adaptation strategies, Rotterdam aims to integrate investment in public works with its ongoing operations. This approach of '*mainstreaming*' has been mentioned as a viable strategy for the implementation of smaller-scale flood resiliency measures by various experts, a.o Veerbeek *et al* (2010), Keenan (2014) and Rijke (2007). In mainstreaming municipalities map the possibilities to link the realization of climate adaptation measures with ongoing economic and political cycles as well as those of urban renewal. In strategic sense, mainstreaming is a form of implementation intention (Gollwitzer, 1999). This management concept links an anticipated future situation (opportunity) to a certain goal-directed behavior.

In this strategic planning, mainstreaming is primarily intended to disperse the costs of large projects over various ongoing programs. This, in turn, is aimed to increase the chances of implementation of these projects. Furthermore, it might provide valuable insight in the involved urban systems and networks. This, in turn, can lead to the identification of new stakeholders and possible collaborations bringing forth more advantageous and sustainable solutions for the urban environment.

By identifying appropriate entry points in various planning cycles to apply planning instruments, the chances of implementation and successful realization can be increased (OECD, 2009). In urban planning and development this approach implies adaptive measures to be integrated in the early project stages of design and problem definition instead of being added separately afterwards (Veerbeek, Ashley, Zevenbergen, Rijke, & Gersonius, 2010). To give an example, major building renewal cycles typically occur every 30-50 years. Significant infrastructure renewal cycles are planned at timescales of more than 100 years. Here lies the challenge for public authorities; to anticipate these works and enable adaptive measures to be integrated in the next design for renewal.

NATIONAL WATER MANAGEMENT POLICY

From an international point of view Rotterdam has one of the highest safety levels for its levees. The protected areas have a flooding chance of 1:4.000 to 1:10.000 years. Though, given the gradual but persistent issue of land-

subsidence and considering the effects of climate change combined with the increase in assets and the number of people they protect, the pressure on these dikes increases. The figure below illustrates the extent to which the protected areas would be affected by a failing of regional flood defense systems in the Rotterdam region. Therefore the national water management body 'Rijkswaterstaat' has developed a national strategy, complemented with area-specific programs, to provide continued safety: the 'Deltaprogramma' (Rijkswaterstaat, 2013). This strategy combines the heightening and strengthening of levees with deliberately leaving areas open for temporal inundation; *giving room* for the water.

However, large parts of the city of Rotterdam lie outside of the system of embankments. These areas currently house 40.000 residents and the entire port, which forms the city's main economic driver and is the largest harbor of Europe. As these areas have higher ground levels, the risks for flooding are different. Obviously they are more susceptible to frequent flooding as sea levels rise and fluvial discharge increases. However, the impacts are generally less dramatic as water levels here will rise gradually and predictably and the water can also recede easily (van Barneveld, 2013). The chance for victims is thus very limited and consequences are mostly found in economic loss and environmental damage (van Barneveld, 2013).

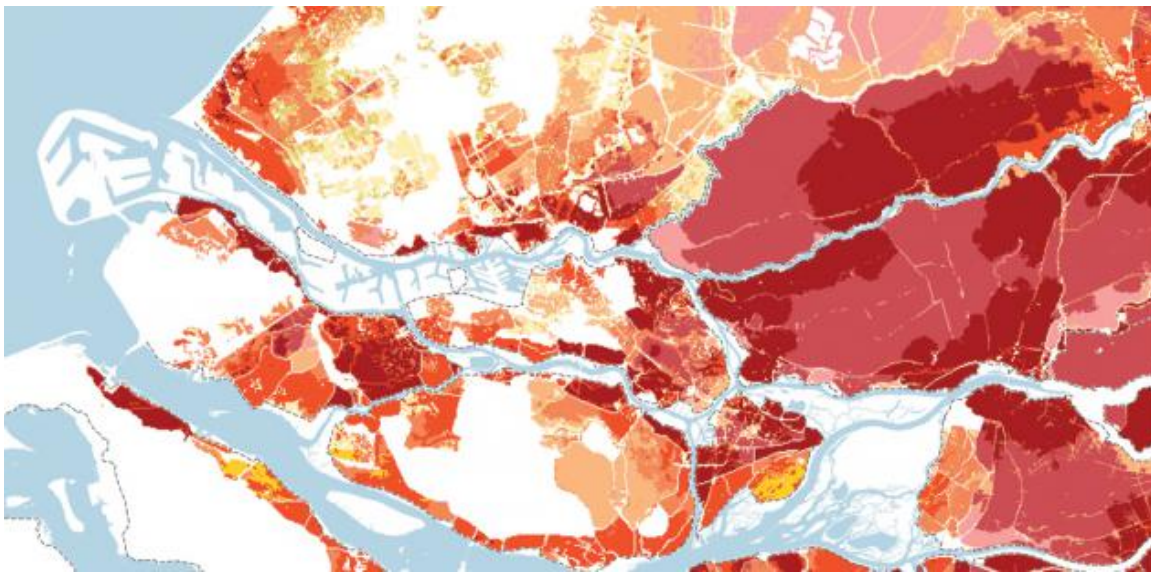


Figure 27. Vulnerability of embanked areas for failing of flood defence system in the Rotterdam region (source: Rijkswaterstaat, 2013).

Rotterdam still deals with the consequences of the financial crisis of 2008, predominantly marked by a shattered land- and development market. Nevertheless, aiming at future growth of the port industry and according local recovery of property market, the city has ambitious development and densification plans. Considering most of the new developments (80%) are located in the outer-dike areas and scenarios for sea level rise fluctuate between 35-85 cm (~1-3 feet), a strategic approach to building flood resilience of the city is crucial.

To map the risks Rotterdam uses newly developed 3D models and computation models. This enables setting priorities and adequately match design solutions to the predominant cause of the flooding at hand (Gemeente Rotterdam *et al*, 2013). The city expressively strives to realize its ambitions in water management by the explained mainstreaming approach; linking the proposed measures to urban developments and other programs in the urban environment. However, in some districts it has already become apparent that this policy is not effective enough to provide safety and achieve the ambitions of the city (Gemeente Rotterdam *et al*, 2013). Water is understood to pose challenges, as well as opportunities for integration with spatial planning and urban area development (Gemeente Rotterdam *et al*, 2013):

- Every development offers chances for water retention. Water management should be an integral part of design and planning from the early stages of development throughout.

- Many areas in Rotterdam face social and economic challenges, leading to investments in the spatial quality of these areas. Water can contribute here, by making the neighborhood more attractive and the city environment more livable.
- Water retention can be added to programs for green infrastructure, child-friendly neighborhoods, sewage replacements and maintenance of public space. This offers many possibilities on small scale by for instance removing pavement and giving room to park areas.
- Prioritize the design of water resilient open space. The system of discharge of precipitation should be taken into consideration.
- Spatial developments can influence ground water flows. Especially in urban areas with multi-layered use of ground and multitude of cables and networks in the ground this poses significant risks. In the design, the effects on groundwater should be taken into consideration.

An overview of the strategies in climate adaptation, building flood resilience and waterfront developments is given in table 6.

Table 6. Adaptation and waterfront strategies Rotterdam

Strategy	Main focus
Rotterdam Climate Change Adaptation Strategy (RAS)	The relation between climate change and the city.
Rotterdamse adaptatiestrategie Themarapport waterveiligheid Waterplan II (2007), with reassessment report in 2013	Translating overall climate adaptation guidelines of the RAS to the specific focus of water safety, both quantity as well as quality. Working on water for an attractive and climate resilient city.
Rotterdam Stadsvisie 2020	Housing & development agenda for attracting businesses, visitors and residents
Stadshavens Rotterdam 1600 ha. – Creating on the edge	Defining former port areas to be redeveloped with a focus on innovative solutions in energy and water management.

A. URBAN DEVELOPMENT IN ROTTERDAM

Urban development in the Netherlands, and in particular in Rotterdam, is facing major challenges. Cities face issues like climate adaptation, food supply and sustainable energy, while being confronted with a changing economic system, fluctuating market demand and shifting societal needs and preferences. The search for new ways of working is crucial. Fostering private and community initiatives, focusing on potentials of integration of functions in area development and allowing for changes of development roles, methods and planning instruments are vital in this new approach. For a part, this means letting go of control over the city's development. However, spatial planning of the port-city is still considered necessary in strengthening its global competitive position (Gemeente Rotterdam, 2012). To truly understand planning processes in Rotterdam first the background of spatial planning in the Netherlands is examined.

DUTCH SPATIAL PLANNING AND DEVELOPMENT PRACTICE

Dutch spatial planning is renowned for its effectiveness and comprehensiveness (Hajer & Zonneveld, 2000). Prevailing corporatist practices of negotiation, complemented with representative democratic political environment, generated involvement of various stakeholders while providing consensus on the outcomes (Hajer & Zonneveld, 2000). This integrated approach also implies technical, legal, political, economic, demographic, ecological, and socio-cultural aspects of a project all to be taken into account throughout the development process (Daamen, 2010). Planning practice in the Netherlands can thus be described as formalistic and rationalistic and are based on the Rhineland model of socio-political structures (Heurkens, 2012).

Often the approach is applauded for its integrated organization: "... *spatial planning is conducted through a very systematic and formal hierarchy of plans from national to local level, which coordinate public sector activity across*

different sectors ...” (European Commission, 1997, p. 36). This government-controlled planning approach can be understood to come forth from the socio-political concept of the welfare state (Tasan-Kok T. , 2012), as is predominant in the Netherlands. However, it is argued that since the 1990-ies this way of working is no longer viable due to changes in the institutional and societal environment (WWR, 1998).

These changes reflect a shift towards the neoliberalization of public planning that has been noted in the Netherlands since the 1990-ies (Heurkens, 2012; Hajer & Zonneveld, 2000). This is understood as the direct effect of the rise of the network society together with (partial) departure from welfarist ideology towards a more liberal political inclination. This development can also be understood in response to the former rigid and all-comprehensive approach. Ever since the late 1970s academic discourse has emphasized the need for greater flexibility and the loosening of rigid rules in spatial planning (Healey & Williams, 1993). A further elaboration on neoliberal planning can be found in appendix 3.

This socio-political shift raises the need for a new approach to urban planning, as suggested by Boelens (2010). He states that spatial planning practices in the Netherlands should be based on an actor-oriented, rather than government-oriented, perspective. This, as opposed to the postmodern planning strategies, predominant in the Netherlands since the 1980-ies. These last heavily promoted private investment and initiative, with public parties’ interventions limited to set guidelines and boundaries. While this clearly departs from the former state-controlled planning methods, Boelens (2010) argues there was no real shift in the planning paradigm. This, because the new approach was still based on the effects of public interventions, rather than actor behaviors and networks. Furthermore, postmodern planning practices have been considered less fruitful in promoting sustainable collaborations. In current Dutch practice of spatial planning and urban development several new planning concepts have developed. Most are based on the notion that market parties (developers, companies, investors, and institutions) and individuals (entrepreneurs, community organizations and residents) are increasingly taking the initiative to invest in (urban) areas (Heurkens, De Hoog, & Daamen, 2014). Subsequently the practices of planning by invitation (Van Rooy, 2011), planning in coalitions (de Zeeuw, Franzen, & van Rheenen, 2011), organic area development (Buitelaar, Feenstra, Galle, Lekkerkerker, Sorel, & Tennekes, 2012) and privately controlled area development (Heurkens, 2012) can be defined.

ROTTERDAM

Over recent years, due to various cost-reducing programs, municipal services in Rotterdam are reduced and integrated in the single cluster of Stadsontwikkeling Rotterdam. Main strategy therefore is to play a *facilitating* role in urban development challenges (Heurkens, De Hoog, & Daamen, 2014) as already elaborated upon in chapter 3. In Rotterdam practice this implies the abandonment of the prior directing role of the municipality, demanding new forms of public management (Gemeente Rotterdam, 2012). Of course, supporting developments and facilitating private initiatives is not new for the municipality of Rotterdam. However, the decreasing financial means and corresponding more receding role has led to an increased focus on the formalization of this role and its potential to substitute other policies (Heurkens, De Hoog, & Daamen, 2014).

Stadsontwikkeling Rotterdam is currently experimenting with new methods, tools and collaboration models to show market parties the chances that lie in investments in area development. However, to accommodate these initiatives more freedom for the private parties is wanted. They need to be enabled to act more autonomously in public space. This translates in the need for less restrictive legislation and time-consuming procedures. The new role for the municipality in urban development is thus focused on facilitating initiatives of private market parties, supporting the process with minimum financial support (Heurkens, De Hoog, & Daamen, 2014). By anticipating and responding to the initiatives of private parties the city authorities of Rotterdam now expect to reach their goals in strengthening the regional economy and enhancing the attractiveness of the living environment, despite the limited resources of the municipality (Gemeente Rotterdam, Concern Rotterdam. Overheidsorganisatie voor Rotterdammers, 2012).

However, in reality these experiments show that the municipality still needs to act in a more pro-active fashion rather than merely responding by offering support (Heurkens, De Hoog, & Daamen, 2014). Market parties still need more financial and procedural incentives stimulation in their decision-making to invest in area development. Thus, the municipality of Rotterdam has set the internal organizational goal to take on a facilitating role in area development, but still has to define what this role exactly entails and how these policies will translate to actual projects (Heurkens, De Hoog, & Daamen, 2014).

The analysis of Heurkens, De Hoog and Daamen (2014) concludes that not one specific category of the planning instruments framework of Tiesdell and Allmendinger (2005), but rather a mixed typology of public interventions on the development market is needed for effective area management. Besides acting on regulating and shaping policies, Stadsontwikkeling Rotterdam has indicated to continue initiating public interventions in area development, but in a reduced amount. This initiating role, enlarging area potentials and providing financial possibilities for the market, can be considered a stimulating form of planning policy (Tiesdell & Allmendinger, 2005). With the provision of subsidies and the construction of public facilities in an area private parties are stimulated to participate in the development, thus profiting from public investments.

This role will be limited to areas where from a societal perspective change is necessary, but where private parties see no potential for development or investments. Often this can be achieved with existing planning instruments, but in some cases it may be necessary to look into new collaborative and financial models to answer to changing societal demands (Heurkens, De Hoog, & Daamen, 2014). This, to ensure actual realization by creating an economically feasible business case for all investing parties. In these kinds of areas it may be necessary for the municipality to initiate the process of development, and (financial) resources may be deployed to support or even organize this process (Heurkens, De Hoog, & Daamen, 2014). Nonetheless, keeping in mind the stark reduction of financial means of the municipality, this approach should only be taken in areas where economic potential is low, social need for change is high and the impact of investments is believed to be substantial (Gemeente Rotterdam, 2012).

B. WATERFRONT AREAS

Like in NYC, over the last few decades much of Rotterdam's port-industry has left the inner-city harbors. This is mostly due to containerization from the 1960's onwards and more recently the development Rotterdam's new port areas like the Maasvlakte I and II. This abandonment brings vacancy and deterioration of large parts of the city. In congruence with New York and many other port cities, the municipality responds to this process by developing strategies for regeneration of the inner-city waterfronts. These visions define these harbors as high potential areas for housing, business and commercial developments. An important partner for the municipality in management and development of these areas is the port-governing agency the 'Havenbedrijf Rotterdam'. Together with the municipality, this recently privatized agency owns the majority of the land in these areas.

The leading waterfront regeneration strategy in Rotterdam is 'Stadshavens Rotterdam - Creating on the Edge' (Stadshavens Rotterdam, 2006). The targeted locations are all located in outer-dike areas, as illustrated in the figure below. Predominant theme in the various areas and projects featured in this strategy is innovation, accentuating new solutions in energy transition and water management. Aim is to fully integrate these innovations in designs for the developments and their urban environment. The Stadshavens Rotterdam strategy aims at strengthening the position of both port and city by enhancing the economic structure and creating high quality working and living environments. Given the outer-dike situation, water retention is not a focus here. However, adaptive building and flooding safety are to play an important role in the design. For instance, in the Rijnhaven area features experiments with floating constructions (Stadshavens Rotterdam, 2013).

Stadshavens developments are intended to experiment with innovative water management solutions, but also make active use of these innovations in creating jobs and setting Rotterdam's international image as modern, adaptive water-city (Stadshavens Rotterdam, 2006).



Figure 28. Map of Stadshavens locations (white outline) and inner-dike areas (white with blue-dotted outline). Own illustration, adapted from Stadshavens Rotterdam, 2006.

C. CASE PROJECT

The area selected for the case study in Rotterdam is the Merwe-Vierhavens district. This area is chosen for its similarities with the NYC case in scale, location, former usage, current situation and envisioned future. Both cases show opportunities for economic growth in the industrial/manufacturing sector as well as economic development by functional diversification. The project has been selected in consultation with J. Jacobs (program manager of the Climate Adaptation office Rotterdam).

INTRODUCTION

The Merwe-Vierhavens district spans about 200 hectares. Half of this of outer-dike area is water. It is part of the larger Stadshavens development (1600 ha.) that spans various old port areas near the city center. Most of the land is owned by either the City of Rotterdam (municipality) or the Port of Rotterdam. Like Sunset Park, Merwe-Vierhavens was initially developed as a harbor area and is characterized by its dock-structured layout. It still houses industrial and port businesses, mainly operating in the transshipment and handling of fruit. However, with increased automatisisation and containerization over the last decades, many have already left the area or will relocate in the foreseeable future. This leaves the area marked by abandoned and deteriorating warehouses and a freezone for illegal activity. Furthermore, while the dikes that form the border of the area create a physical barrier, also social and economical connection to adjacent districts is weakened. This, because the area provides less and less jobs for the surrounding working population. Recent decision of the municipality to relocate its main offices out of the Merwe-Vierhavens to the newly developed Wilhelminapier seemed to be the final blow for any positive outlook that still existed. To stimulate future development, the municipality established a special area management team; AMT M4H. This team, together with the larger Stadshavens organization, aims to transform the area over the coming decades to a vibrant urban area. Various policy instruments have already been employed to start this process. For example a vision document on the area's development and the creation of the Keiletafel; a platform for local businesses to connect and discuss shared issues and opportunities.

ACTORS

Main actors in the development of Merwe-Vierhavens are:

- Municipality of Rotterdam
 - Area Management Team M4H (AMT M4H)
 - Department of City Development (DoCD)
 - Department of City Maintenance (DoCM)
- Stadshavens Organization
 - Municipality of Rotterdam
 - Port of Rotterdam
- Hoogheemraadschap Delfland (Waterboard of Delfland region)
- Housed businesses
 - Keiletafel
- Developers/investors

A more extensive overview is provided in the figure below.

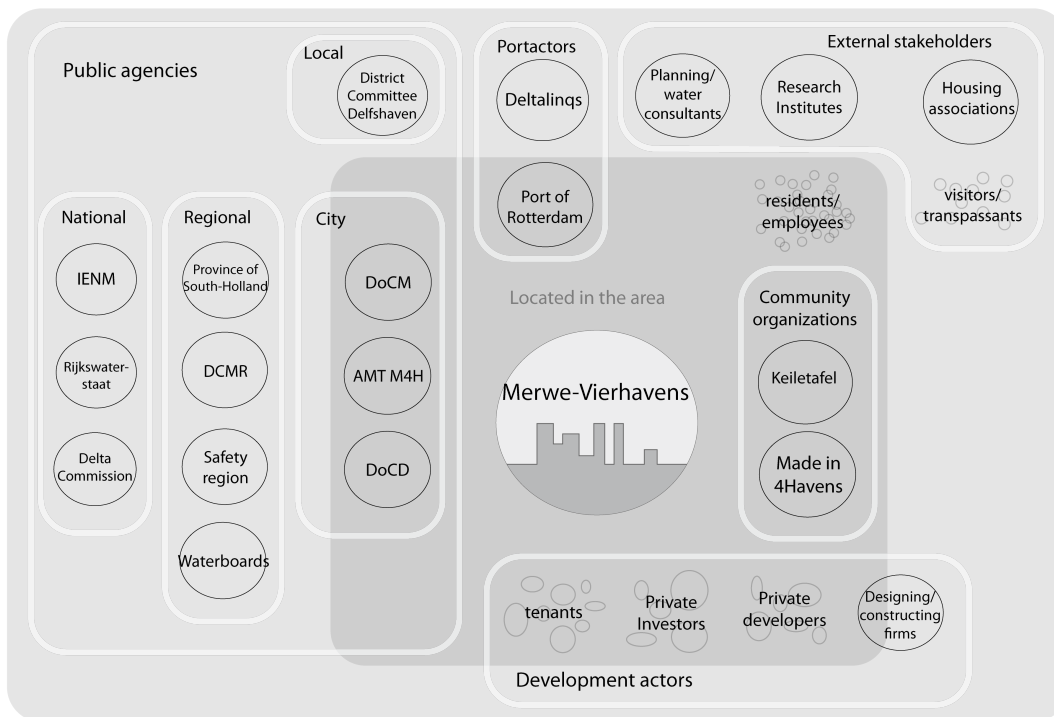


Figure 29. Actors involved in flood resiliency in Merwe-Vierhavens development

DEVELOPMENTS

Over the years, several municipal visions for future of Merwe-Vierhavens have been developed. Currently, confidence in new possibilities for the area is growing with the influx of small-scale, creative and start-up businesses and the realization of the 'Dakpark'. The Dakpark is the dike at the northeastern border of Merwe-Vierhavens and is an example of integrated water management. Besides its primary function, the dike houses a parking garage and various retail facilities and is features a park over its entire length. In recent years the connection with other parts of the city is improved by the establishment of a waterbus as part of the public transport network. Nevertheless, the persistent uncertainty on the future of port facilities together with difficult financial climate has lead to the lack of large-scale investment. The area's location in Rotterdam in relation to the other Stadshavens developments is shown in the figure below. The blue-dotted line again marks the border of endikement.



Figure 30. Merwe-Vierhavens (marked white) in the Stadshavens area. Own illustration, adapted from Stadshavens Rotterdam, 2006.

IV. CASE STUDY FINDINGS

1. FINDINGS NEW YORK CITY

A. INSTITUTIONAL LANDSCAPE

First, the institutional landscape of NYC in the field of flood resiliency in urban development is examined. As explained in the theoretical framework, this has been done according to the characteristics of institutional analysis as proposed by Inam (2013), distinguishing arrangements, structure, rules and policies, norms and values and interests of actors.

NORMS AND VALUES

Predominant norms and values that form the basis of US society include independency, progress and diversity. These driving forces are all linked to the freedom of the individual and are reflected in a focus on opportunity, results and ideology. The almost unlimited possibilities these convictions bring are based on the predominant belief that people can have total control over their environment.

"Developers are always going to act to protect their bottom line. That's just the way it is, certainly in NYC. As these kinds of larger, more regional projects are protecting the area from something that didn't happen, it is very hard to mark the benefits."

- M. Porto, MWA

INTERESTS OF ACTORS

The individual interests of actors are often in some way reflected in their behavior. In US society this link is very strong: actions and realized projects can often directly be explained by the objectives and goals of the individual actors involved. Often, these goals carry some component of financial or economic advancement. This is also reflected in the often-prevailing prerequisite for the realization of projects: a closing business case. This in turn marks the focus on control and individual, short-term benefit (i.a. Braamskamp, 2014; Ovink, 2014).

"If there would be any area-wide plans for raising resiliency it would be very dependend on content and costs of the plans if the property owner of this building would be willing to invest in it. The benefit should be really clear. We financially contribute to the chambers of commerce, community groups etc. because we want to see the area flourish. However, a new initiative would have to prove its benefits."

- I. Siegel, Salmar Properties

ARRANGEMENTS

The most important public actors involved in building flood resiliency in NYC and their respective focus in policy instruments are listed in the table below. A full overview is provided in Appendix 4.

"We have different area-wide projects like the Brooklyn Greenway and the Brownfield Adaptation program that really need the input of all stakeholders in the area, also of developers who have just recently come here. We organize workshops and committees that provide recommendation and build support for these plans."

- E. Yeampierre, UPROSE

Table 7. Policy issuing bodies flood resiliency in NYC

Actors	Main policy focus
National level	
Federal Emergency Management Agency (FEMA)	Shaping, Regulatory, stimulating
U.S. Army Corps of Engineers (USACE)	Stimulating
U.S. Department of Housing and Urban Development (HUD) > Sandy Recovery Task Force (SRTF)	Regulatory, stimulating Shaping, capacity building
State/Regional level	
NYS Department of Environmental Conservation (NYSDEC)	Regulatory, Responding
Port Authority of New York and New Jersey (PANYNJ)	Stimulating, Responding
City level	
New York City Department of City Planning (NYC DCP)	Shaping, regulatory, capacity building
New York City Department of Buildings (NYC DoB)	Regulatory
Mayor's Office Task Forces (ORR, OLTPS)	Shaping, capacity building
Area level	
Borough Presidents office	Shaping, capacity building
Community Boards (CB)	Shaping, capacity building

The overview shows that the number of public agencies that are *directly* responsible for water (front) planning is limited. This can, on the one hand, be explained by the fact that only a small part of the United States has a waterfront. Consequently, water management and spatial planning have not been crucial for US society to sustain itself. The restricted role of government in US society can explain the relatively small public sector of water management and spatial planning. However, the set of agencies that is making plans and draw up regulations for these areas is more extensive.

"We often act as a consulting partner for public agencies in the perspective of the local businesses."

"DCP contacts SBIDC for consultation on waterfront planning issues when businesses in the area could be concerned. DEC asked for advise on certain specific plans for the SIRR report."

- A. Devening, SBIDC

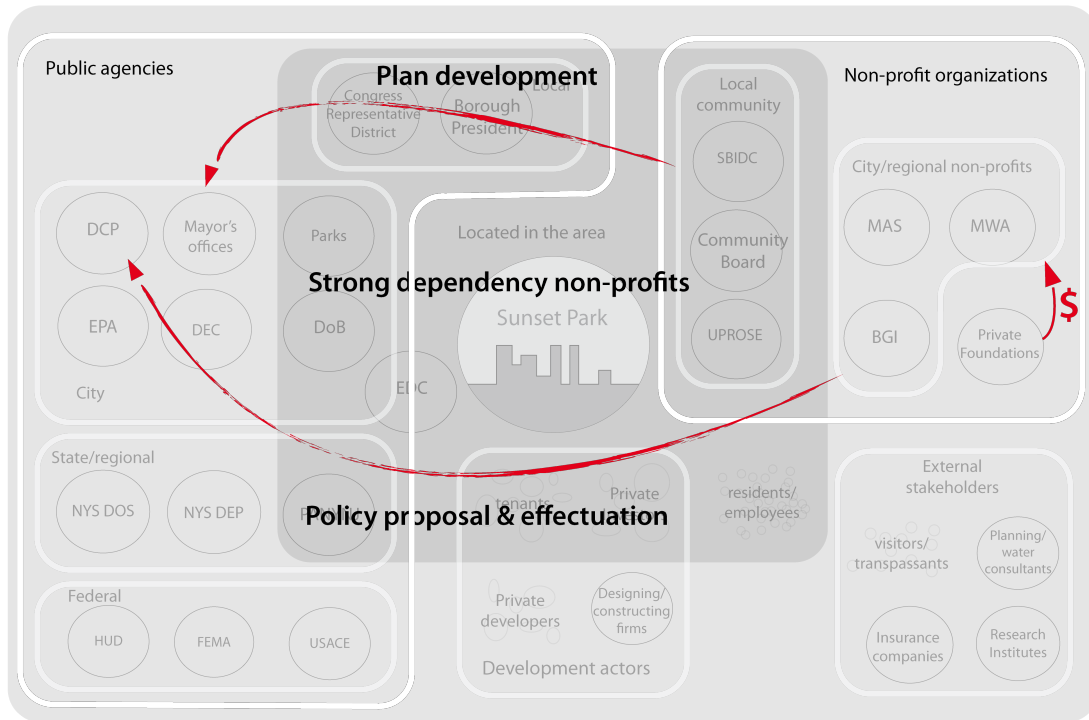


Figure 31. Roles of actor groups in the institutional landscape

Also, the strong Non-Governmental Organization (NGO) and private foundation sector naturally take up the development and implementation of policies; a process that would be carried out by public agencies themselves in other countries. This relation is illustrated in the figure below. Beneficiary organizations often fund public programs or research agendas (Carter, 2014; Ovink, 2014). As many globally operating foundations have their headquarters in New York City, they are often inclined to pay special attention to issues in this region. These foundations can play an important role in political decision-making that is not to be underestimated. This, because there is a lot of money involved, and the outcome of research reports often directly feed public policy and political agenda. Donations of these foundations, together with public subsidies fund NGO's that take on the responsibility to develop policy plans or carry out certain public projects (Porto, 2014). For example, the Metropolitan Waterfront Association (MWA) has taken the initiative to develop design guidelines for constructions in waterfront areas; the Waterfront Edge Design Guidelines (WEDG). The drafting of these guidelines was proposed as a project in the SIRR-report (see 'Rules and Policies'), but wasn't taken up by any public agency. Now, the MWA is working with DCP to work the guidelines into legislation. One must note that these kinds of collaborations or third-party initiatives are mostly stand-alone and project based.

"After Sandy we decided as MWA to take the design guidelines idea, get funding for it, and make them ourselves. Of course we partnered with City government, but it was primarily our project. They gave mandate, but they didn't fund it. And now they're helping us implement it in legislation. That's how government here often works, with the specialists' help of NGO's."

"Our constituency is the wider public and everyone that is concerned with the waterfront. The funding and support is mainly foundation money. And we lobby for City Council money for various little projects. Foundations are a big deal in NYC. Philanthropy programs and organizations are playing a large part in funding these kinds of projects and research."

- M. Porto, MWA

STRUCTURE

What we see in the structure of US government is that the departments are large, and functionally oriented, and that the boundaries between them are very strong (Di Girolamo & Davis, 2014). Therefore, in considering these horizontal relations, one could speak of a 'panarchy' in the organization (Keenan J. , Expert interview, 2014). With regard to the vertical orientation US government is very hierarchically structured (Cohen, 2014). If Federal funds need to be spent on local level, approval has to come from Federal, State and eventually City level. As a result, the process of spending public money can be quite lengthy and laborious. Because all levels have different regulations, procedures and requirements when it comes to grant approval, the process of spending public money can be quite lengthy and laborious (Chester, 2014).

"The bigger the envelope of stakeholders, the more uncertainties, the longer the time-span and the more complex the projects, the less enthusiasm. Investing on program level is not common, but investing on project level is. Public and private parties sharing power in one project doesn't happen very often. There is a lot of distrust in society towards government."

(translation) - H. Ovink, Principal 'Rebuild by Design'

Also, regulations of federal, state and city agencies are currently not optimally aligned. This makes building along the waterfront, which also involves environmental as well as planning permits very difficult (Porto, 2014). The relations between the departments within a certain level are characterized by high autonomy and independent acting of the agencies. The effect of these relations is illustrated in the figure below. Therefore, it is hard to achieve collaboration between the individual agencies, even when it comes to projects that feature joint challenges or opportunities for shared benefits (Ovink, 2014). For example, the construction of a highway would first and foremost be the responsibility of the Department of Transportation. This department takes on all design and planning work. Only to go to the stage of implementation, other agencies are informed and consulted on their specific policy domains (for example considering environmental and economical effects). This makes that spatial planning and infrastructure projects are often not integrating functions other than their primary purpose. Also, public construction projects have to comply with a number of strict regulations, based on proved working methods. This leaves little room for innovative solutions. However, NYC's autonomy in relation to State and Federal government is strengthened because of the city's international importance. Because of its history, size and the global significance of its markets the city's administration can operate more independently than other US cities. This in turn complicates

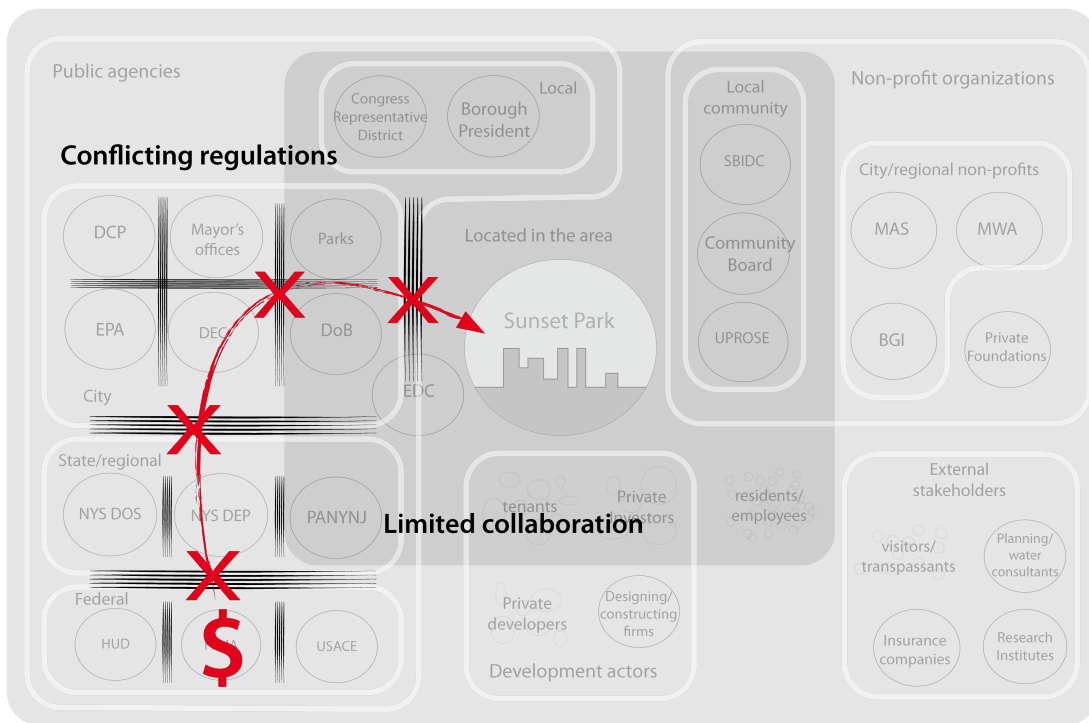


Figure 32. Obstructions caused by limited collaboration public agencies

the relationship with the direct neighbor: New Jersey. The difficult relation is reflected in the position of the Port Authority of New York and New Jersey (PANYNJ). This public agency, responsible for port management and development in the region, owns large parts of the waterfronts in both states. This could make it an important player in adaptation of these vulnerable areas. However, their actions have to be approved by governors of both states. Because they are currently not member of the same political party, often no agreement can be reached on policy changes that the PANYNJ proposes. Result is that although this actor might have interests and financial room to strengthen flood resiliency of the waterfronts, it has very limited power to take action in building resiliency.

US government can be characterized by the opposition of its political versus procedural side. US culture in politics is very much driven by liberal ideology and response-based policy. This is outlined by the large and hierarchical government framework, which is marked by its stiffness and bureaucracy. This solid structure further supports the high level of autonomy of the agencies and limited interaction that characterize day-to-day practice, as described above.

"The way in that the process is different from that in Europe I think is that it is more top-down. We get our money from the Federal government, then it goes to the State and the City, and you really need a political champion within the community, an elected official. That is one point that is crucial in NYC, you really need a champion, someone voted into office to bring everyone together en carry the project forward through realization. Often these kinds of projects are so large and long-term that they tend to get stuck and put on the shelf."

- M. Porto, MWA

"The way that collaboration and conversation can be started between the City departments is often through the Mayor's office."

- M. Porto, MWA

The figures below illustrates how for urgent matters, often special short-term 'task forces' are created. The existing framework of government agencies is in black. The thick lines indicate the strong boundaries between government agencies. The red squares and lines represent the task forces and their influence. The task forces respond to external disturbances and often span the domains of different agencies. Depending on the level of government, these are established by the office of the president, governor or mayor. Examples in response to Hurricane Sandy are HUD's Hurricane Sandy Rebuilding Task Force and NYC Mayor's Office of Long Term Planning and Resiliency (OLTPR). Created by head political figures like the Mayor or the President, political power behind these task forces enables them to cut across departmental or vertical agency boundaries and force collaboration. This generally results in reports and plans that propose further policy actions. The in NYC, the SIRR-report is a clear example. Sometimes also some form of collaboration between the departments last. However, the organization itself is decommissioned or shifts in task when other issues become more important on the political agenda. This can be the case with the assignment of a new administration or if the matter loses attention of the population or media. This can lead to problems because often there are no agencies envisioned to oversee the implementation and realization of the proposed policy programs.

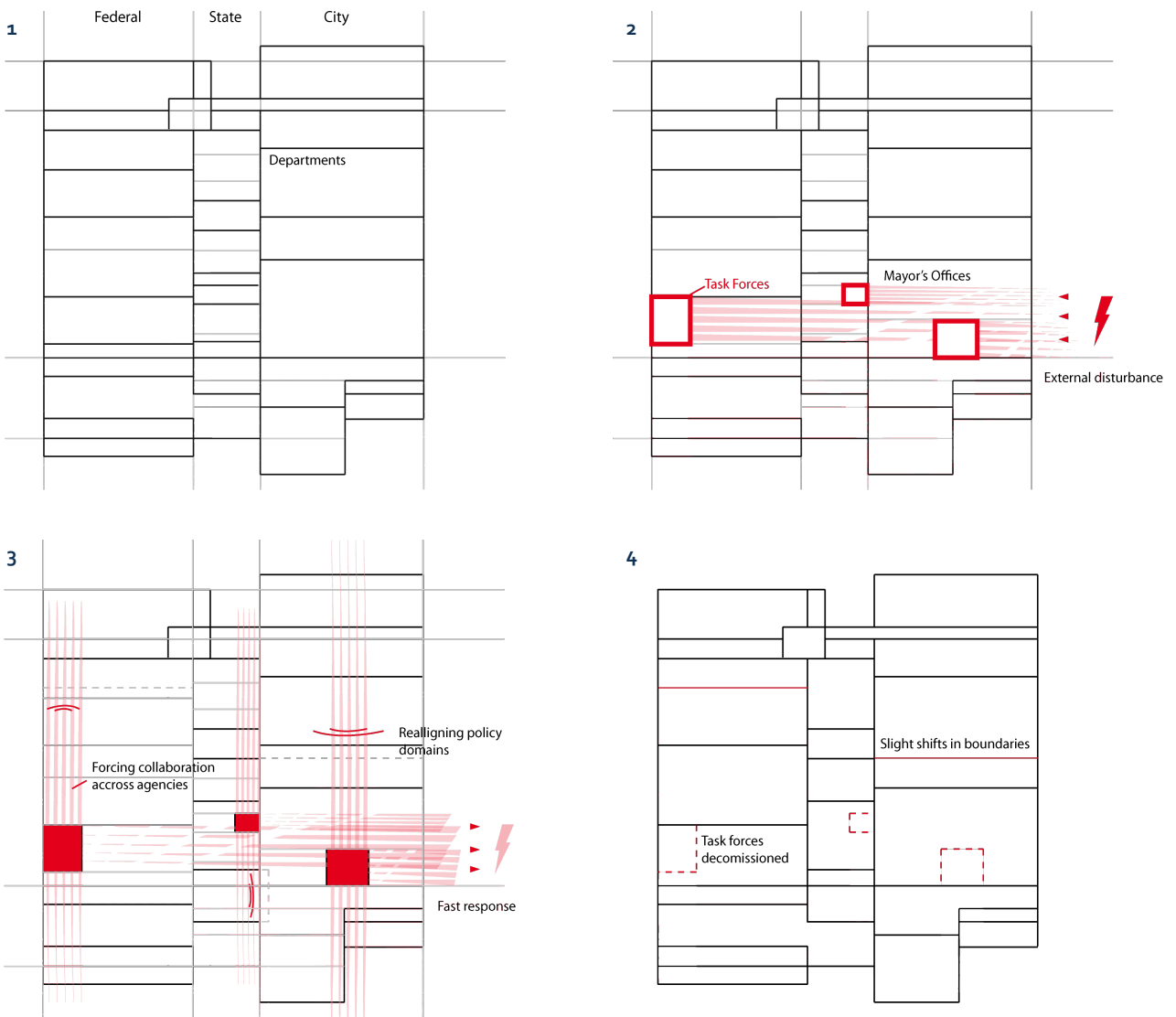


Figure 33. Institutional structure; task forces acting within and on the existing framework

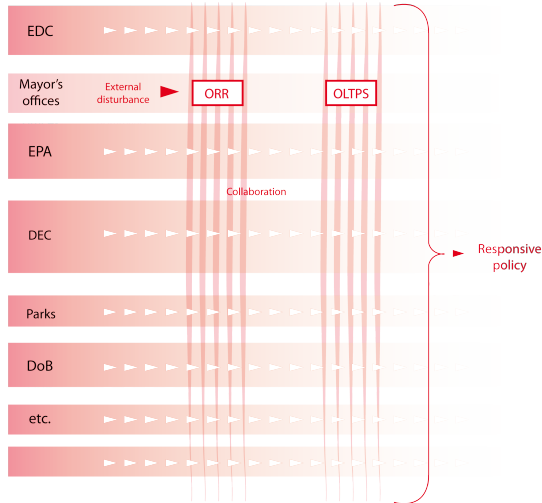


Figure 34. Influence of responsive task forces on collaborative policy (own illustration)

"Currently there is no discussion in projects between different domains, which means that in the best case there are chances being mist. In the Netherlands this is taken care of by documents and agreements like the MIRT [Meerjarenprogramma Infrastructuur Ruimte en Transport ,or, in English: long-term program infrastructure, planning and transport]. This entails a regional vision in which separate sectorial investments meet each other in one plan."

- H. Ovink, Principal 'Rebuild by Design'

"The reason for this lack of collaboration is partially a protection of one owns legal dominion. And then there is also a lot of uncertainty; who mediates the conflicts? In theory the executive of the president or mayor would, but in practice it doesn't work out that way because they have very limited power in the organization. That's also the challenge of resiliency officers of for example the office of long term planning and resiliency. In theory their position is high enough to enforce some action, but the legal and political implications of their policies is not backed within the system."

-J. Keenan, CURE. Columbia University

RULES AND POLICIES

The main policy instruments adopted for raising flood resiliency in NYC waterfront developments are listed in the table below. Several grants and relief funds have been established after Sandy struck. The most important is the federal Community Development Block Grant-Disaster Recovery fund of nearly \$1 billion, issued by HUD. The public flood insurance program (NFIP) is another policy in this study categorized as stimulating. The table below lists the most important policy instruments and their issuing agencies on building flood resiliency in NYC’s urban environment. The other forms of US policy instruments on flood resiliency that apply to NYC’s waterfronts are listed in the table below.

“There needs to be a whole new strategy for the question as to how this federal funding, now some \$10-15 mrd for NYC, will get spent. Spending needs to comply to an extensive set of regulations. Hence, on the one side it is important to acknowledge who is in charge and on the other hand there still is a lot of uncertainty when it comes to the financing [of the flood resiliency plans].”

(translation) - E. Westerhof, Arcadis US

Table 8. US policy instruments on flood resiliency applicable to Sunset Park

Instrument intention	Policy	Main issuing agency	Level
Shaping	SIRR report	ORR	City
	Vision 2020	EDC	City
	PlaNYC	ORR, OLTPS	City
	Flood & elevation maps	FEMA	National
Regulation	Building codes	HUD, NYS, DoB	National, State, City
	Zoning plans	DCP	City
	Environmental protection legislation	NYS	
Stimulation	Sandy recovery funds	FEMA	Federal
	Community Block Grant	HUD	Federal
	NFIP		
	BOA Program	FEMA	Federal
	Rising Small Businesses Program	DOS, DEC	State
	Game Changer competition	NYS OSR	State
Capacity building	New York Rising program	HUD	Federal
	Community workshops	NYS	Federal
	Rebuild by Design	DCP, PANYNJ	City/local
		HUD	Federal

An important finding is that general building codes are set by federal government, but States as well as city governments also draw up their own. This is the direct result of the findings on arrangements and structures that show limited collaboration and high levels of autonomy. Also, all levels of government feature agencies (NY State Department of Environmental Conservation [NYS DEC], and NYC’s Department of Environmental Protection [NYC DEP]) that are involved with environmental protection. This, added to the involvement of federal agencies like USACE and FEMA, makes for overlapping and sometimes even conflicting regulations when it comes to waterfront construction in NYC (Porto, 2014; Di Girolamo & Davis, 2014). This makes complying with all regulations and the process of acquiring permits for any construction in these areas an unclear and elaborate process.

“There is a huge disconnect between public policies and practices on spatial planning and land-use and building codes.”

-J. Keenan, CURE. Columbia University

Apart from strengthening the natural distrust of US society towards public agencies, another important outcome of this regulatory inconsistency potentially forms an environmental

“In the USA slow, conservative government agencies and policies are accepted, but new initiatives are placed next to it. These can provide a dynamical reality that can answer to pressing issues. In the end, by an exchange of results, these initiatives can make small changes to the slow and cumbersome framework. Agencies like USACE are really open to collaboration and want to learn new methods and research, but they are bound by longstanding rules.”

(translation) - H. Ovink, Principal ‘Rebuild by Design’

hazard in waterfront areas. While environmental legislation in the US is extensive, building codes for industrial properties are not very strict. This regulatory inconsistency potentially forms an environmental hazard in waterfront areas. Little prevents chemical plants or companies vital to society, to be located in unprotected buildings in flood-prone locations (Di Girolamo & Davis, 2014).

PLANYC

An important finding is that there are no predominant spatial plans on State or regional level that directly influence NYC's spatial policies. This affirms the autonomy of the city to develop its own planning strategies and visions. PlaNYC is New York's main shaping policy instrument when it comes to climate adaptation. The new version of 2013 incorporates most of the findings and recommendations of the Special Initiative for Rebuilding and Resiliency (SIRR) report. This report was the result of the research carried out by a special Mayor's task force in the months after Sandy struck in 2012. In the field of flood resilience, the City recently also developed the plan for Designing for Flood Risk (2013). The City's waterfront revitalization plan, together with the climate adaptation strategies, form the basis for the 'Coastal climate resilience. Urban Waterfront Adaptive Strategies' report (2013). An overview of the strategies in climate adaptation, building flood resiliency and waterfront developments is given in the table below. These strategies are policy instruments themselves in giving insight in political vision. However, their effect is also found in proposing new policies or changes to existing instruments.

"The regulatory process is really tough in NYC. Regulations have to be opened up to allow for more innovative solutions to be implemented. This also has to do with the different layers of bureaucracy and legislation. There are about fifteen different entities that provide legislation for waterfront construction. There should be one agency that incorporates all these and just administers the waterfront areas of the region, that would be great."

"I don't think that a regional waterfront authority is feasible at this point. We of course have the PANYNJ, but it is politically limited in taking any action. Politics are a great deal in America; it is the nature of our democracy. This also is connected to the fact that government is so decentralized. For example, places like New York or New Jersey have a multitude of jurisdictions. It is so localized that it becomes hard to build anything that transcends any of these boundaries."

- M. Porto, MWA

Table 9. Adaptation and waterfront strategies NYC

Strategy	Main focus
PlaNYC: a greener, greater New York (2007/2013)	The relation between climate change and the city.
Designing for Flood Risk (2013)	<i>Designing for Flood Risk</i> focuses on preparing buildings to withstand the threat of coastal flooding, while ensuring that they support everyday livability and quality of life. (DCP, 2013)
Vision 2020 – New York City Comprehensive Waterfront Plan and New York City Waterfront Action Agenda (2011)	Housing & development agenda for attracting businesses, visitors and middle- to high income residents . (This report is part of the Waterfront Vision and Enhancement Strategy [WAVES]).
The New Waterfront Revitalization Program (2002)	Coordinating and stimulating property-led waterfront regeneration projects throughout the city.
Coastal climate resilience. Urban Waterfront Adaptive Strategies (2013)	Identifying and evaluating potential strategies for increasing the resilience of waterfront communities to coastal flooding and sea level rise.

What is found with respect to these strategies is that shaping instruments like plans and visions in the US are generally not binding for either private or the public parties themselves. For example, a lot of the projects as proposed by the SIRR-report aren't taken up by public agencies. This is explained by a lack of clear responsibilities and limited department budgets. When strategies or visions are drawn up under the guidance of a task force, implementation by departments doesn't make a clear-cut case. Furthermore, these studies and proposed policy actions are often drawn up in a rather short time span. This results in a lack of actor consultation and alignment with stakeholders' perspectives. When urgency and political attention of the issue decreases, the proposed projects and implementation of the plans comes short in a general base of support.

OVERVIEW INSTITUTIONAL LANDSCAPE NYC

When the involved public agencies are mapped according to their main policy instruments, the overview as illustrated in the figure below is obtained. The figure lists the agencies that are involved on each level of government, going from national (the most outer layer) to local level (inner core). This illustration shows that there is a large gap between public fundings, which are substantial but mainly issued on federal level, and the local level. To make the grants and other forms of financial support available to the community initiatives, parties have to run through a lengthy process of Federal, State and City approval. Local community non-profits have a hard time getting public grants and subsidies approved to fund their local projects. For example, UPROSE made significant efforts trying to get a project in Sunset Park approved for funding through the State's Brownfield Opportunity Area program (BOA). However, the process stranded in discussions between city and state agencies. This public funding problem is persistent on the scale of large-scale programs like Rebuild by Design down to the individual business owners who want to apply for recovery grants. This makes the effects of the federal funds currently quite limited.

"The EDC is constantly ignoring and blocking our ideas because they underestimate the power and capacity of the people in the community. Therefore we see ourselves forced to go over their heads and talk to the Mayors office to get our ideas realized and eventually get the EDC working along."

- E. Yeannierre, UPROSE

"There is very little room for discretion or interpretation in Federal and State level laws. There are various levels of discretion within federal and state level agencies about their regulations and it is made even more complicated by the very litigious character of our society and civic domain."

-J. Keenan, CURE. Columbia University

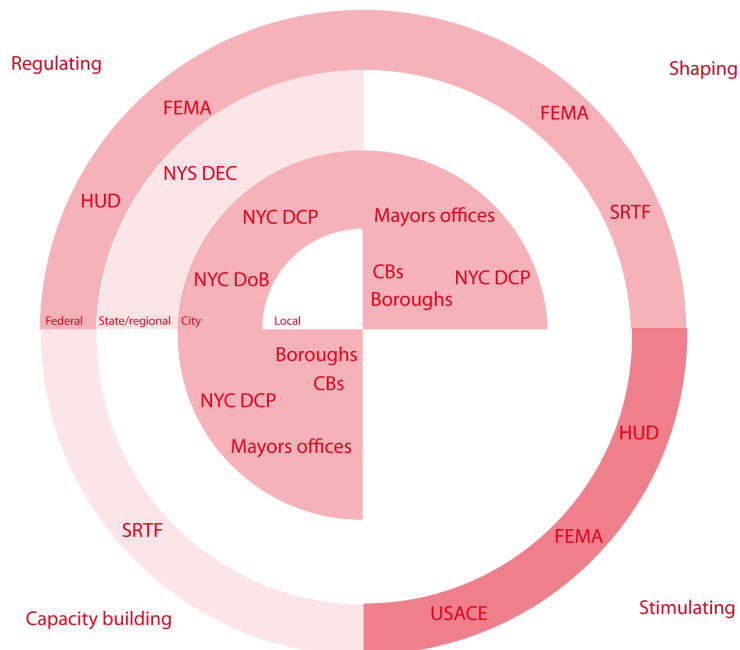


Figure 35. Public agencies according to the typology of their main policy instrument in building flood resiliency in NYC

This overview also shows that various agencies on different levels of government are drawing up regulations for NYC's waterfronts. The reason lies in the fact that the issue of flood resiliency spans jurisdictions as well as policy domains. Development and the building of flood resiliency in these areas is affected by regulative policy on several domains like environmental protection, building codes and water management. Missing alignment between the involved agencies makes the total set of regulations unstructured and sometimes inconsistent.

Another finding is the limited involvement on the State/regional level. The limited involvement of State agencies now only adds to the complexity in regulations and grant approval. This, because the State forms a separate layer of agencies with their own policies and regulations, rather than bridging the gap between federal and local level policies. State agencies focus in particular on regulations. In flood resiliency this lack of vision on State or regional level is particularly unfortunate. Naturally, water management challenges are similar throughout a region with the same environmental characteristics. Also, protective solutions are often more efficient on larger scale. Lastly, sub-regions largely depend on each other's economic, physical and social structure, which makes a strong case for investment in the protection of neighboring areas.

The fourth finding is that US government sends different messages in its efforts to enhance flood resiliency. People see impressive plans and ambitious visions but are confronted with a lot of resistance when it comes to the realization of local projects. This can be explained by the discrepancy between the objectives and the means of the involved agencies. The DCP, Parks Department and Mayor's offices, have access to shaping, capacity building and regulating instruments, but they have very limited budgets. DoB and EDC on the other hand would be able to invest in larger projects. However, these agencies have limited contact with local communities. Also, their policy focus makes them reluctant to take on responsibilities in projects that lie beyond their core mission. Also, large amounts of funding have been made available on federal level for rebuilding works. However, requirements to apply for these funds are extensive and very strict because they are set by various agencies on different levels of government. Improved collaboration between the departments and between the levels of government could perhaps provide a solution.

"Perhaps there needs to be a new agency that just deals with resiliency and flooding issues, but I haven't studied that. There are some Mayor's offices, but there isn't any oversight through the City council. They could take initiative, but I think there is more weight held by an agency.."

- J. Laufer, Community Board 07

"When you build along the waterfront you have to get a permit from DEC, the Army Corps and other various entities. But those are the main ones. Projects have to comply to the local coastal zone management plan. NYC has its own, the WRP, the DCP oversees that. The DCP looks at planning and zoning of the sites, where DEC is focused on environmental issues and the Army Corps makes sure the water is clear for navigation and, to a lesser extent, considers environmental implications in their permitting. It is a really laborious process when you want to build something along the waterfront. We're working on making this easier. The WEDG certification could provide a starting point for some sort of one-stop-shop for permits for these waterfront projects."

- M. Porto, MWA

"Another big issue is that the communities that have been hit by Sandy have actually been community-processed to death by City agencies and research institutions. They have brought all the stakeholders together, and they have done all the visioning and planning, but there is no actual ability for a community organization to take leadership in carrying these projects forward. That again forms the perception of the community; they have no power, are not respected and are not listened to."

-M. Rowe, Municipal Art Society (MAS)

B. POLICY INSTRUMENTS AND FLOOD RESILIENCY

First, the currently deployed policy instruments of the Department of City Planning (DCP), NYC’s main city-planning agency, are mapped. The findings from the interview with this agency are visualized in the diagram below. The higher the scorings of the answers, the more outward the line is placed in the diagram. Thus, the fact that the points of capacity building and stimulating are near the core of the web indicate that these are not the main focus instruments of current policy. Current policy

“DCP focuses on adjusting building codes and zoning plans. Our other main task is to communicate, provide information to professionals as well as residents. For example, we provide retrofitting guides and resiliency guidelines.”

-E. Di Girolamo, NYC Department of City Planning

Current policy instruments

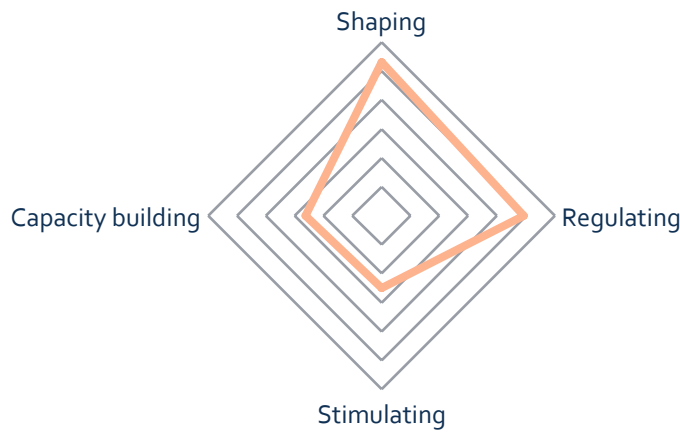


Figure 36. Current DCP policy instruments on flood resiliency

in NYC is on the one hand providing information in the form of plans, visions, research reports and design guidelines. On the other hand, zoning plans and building codes are being adjusted. While DCP does stress the importance of the involvement of local communities and the accessibility of grants and funds, this is not considered to be their core responsibility.

The flood resiliency as perceived by the interviewed actors is mapped in the diagram below. Most actors think the current situation on flood risk in the area and the future threats are currently adequately assessed. Interviewees indicate that this knowledge has mostly been built after Hurricane Sandy struck in 2012. This is also confirmed in several expert interviews (Aerts, 2014; Westerhof, 2014; Porto, 2014). Weaknesses lie in the translation from visions and plans to actual measures being taken and a lack of clear goals for resiliency of the area.

"We were aware of risks prior to Sandy, but Sandy increased attention on the issue and lead to release of new reports that we can use as guidelines. Prior to Sandy, it was hard to get the right data, so we used some draft estimates of sea-level rise (over 50 years) in setting the elevation of the buildings."

- T. Outerbridge, Sims Municipal Recycling Facility

Perceived flood resiliency

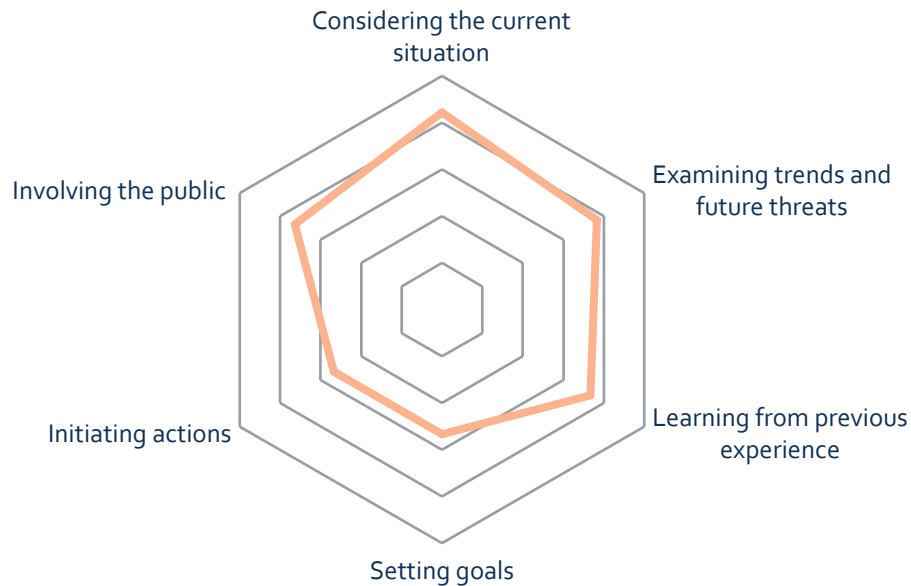


Figure 37. Characteristics of urban area flood resiliency experienced by development actors in Sunset Park

Further findings, visualized in the diagram below, indicate that government efforts in building capacity of local actors are experienced by all actors, even though this is not one of the main focus areas of DCP. This can be explained by the work of local community groups (UPROSE, Community Board, SBIDC) who largely take up the task to implement these policies themselves. However, these NGO's do indicate that more involvement from City government in organizing workshops and information meetings would be appreciated. However, these local groups like to stay in control of content of these plans and predominantly rely on the City for funding and expert consultation. This is in congruence with US culture of skepticism towards public interference and focus on local and result-driven projects.

"DCP has set no specific goals for flood resiliency of the area. Existing goals are building codes and zoning plans."

-E. Di Girolamo, NYC Department of City Planning

"One of the issues we have with the City is that the developers and local communities are on their own in taking these measures. They do the design themselves, there isn't an overall strategy between properties."

- J. Laufer, Community Board 07

Most actors are aware of the City’s ambitions and strategies for climate adaptation and building flood resiliency. Yet, they often do not consider that there is a direct link between these visions and their business location or operations. Also, some of the actors are not aware of local visions like the Sunset Park Waterfront Vision plan.

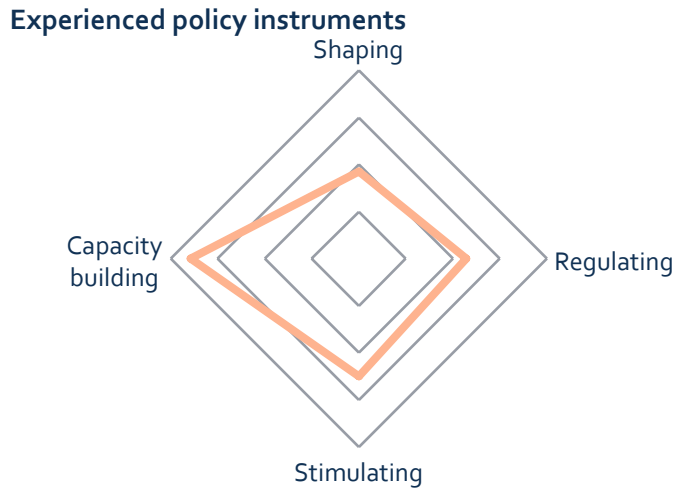


Figure 38. Policy instruments on flood resiliency in Sunset Park as experienced by local development actors

Subsequently, these findings on experienced policy instruments are compared to the policy instruments that are deemed necessary by the interviewed actors to enhance flood resiliency in the area. These are illustrated in the figure below. We now see that there is a great need for stimulating policy instruments; either by directly realizing proposed plans or by making funds available for private parties to carry out projects. This funding is necessary for area-wide as well as individual recovery and protection measures.

"We see ourselves as partners for public agencies since none of them has the complete authority in the decision-making. They should see us as partners that add assets to decision-making. They see us as people they need to manage. This, while we have so much local expertise and our support is really necessary to make any of their plans happen. What is needed in government is a shift of culture. We both have resources that, when combined, can make real change in these communities."

- E. Yeampierre, UPROSE

"Congresswoman Velazquez actually tried to get federal, state and local agencies to form coalitions to work together in actually making these grants available for the businesses that were hit. Another example is the New York Rising programme to get the community-based projects implemented. However, the State can't get these projects realized without the federal CDBG fundings. The State had to hire a consultant to provide insight in how these funds could be spend, as there are so much regulations to comply to. "

- A. Devening, SBIDC

"An example [of flood resiliency measures in Sunset Park] is a school in the area that had flooding issues and needed renovation. We invited them for a workshop to help them incorporate flood mitigation measures. Now they have incorporated permeable pavement, lots of green spaces, sewerage systems under the playground and slowly timed downspouts."

- J. Laufer, Community Board 07

Also, even though there are already a lot of capacity building policy instruments in place and experienced, actors indicate they think this needs even further strengthening. This improvement may come from the policy contents rather than their quantity. For example, the frequency or constitution of the workshops may be adequate whereas the topics discussed may be not directly applicable for attendees. Also, some groups may have been involved in workshops, but do not feel themselves heard or understood by public parties. Furthermore, the community workshops are often small-scale and focused on a specific project or aspect of resiliency.

Important notion is that several actors mentioned strong leadership as another crucial element that is currently missing in the building flood resiliency in Sunset Park. More specific, a project champion is necessary to make parties in the area collaborate, drive fund-raising and promote the area in political decision-making.

"Also, one of our important tasks is building the capacity of the individuals in the community by connecting them. Most of the measures we propose are at building level."

- E. Yeampierre, UPROSE

"Communication with local stakeholders, as well as integration of resiliency in regulations and zoning are the most important aspects of current City policy that could be improved. "

- A. Devening, SBIDC

Necessary policy instruments

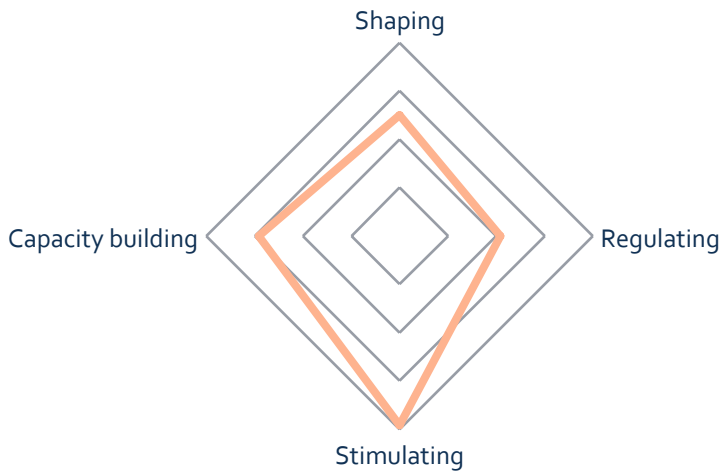


Figure 39. Policy instruments on flood resiliency in Sunset Park as experienced by local development actors.

C. SUMMARIZING FINDINGS NYC

Several characteristics stand out in NYC's institutional landscape of flood resiliency in urban area development. First of all, jurisdictions of public agencies are set by functional boundaries rather than characteristics of the natural landscape. This reflects that US civilization is established in seemingly limitless amounts of available land.

Besides, the role of government is based on answering to the direct needs of individuals of the pioneering society. This can also be explained by the norms and values of these pioneers, which focus on individual rights and freedom. Since there is little horizontal and vertical collaboration between public agencies, their jurisdictions also determine and restrict the scope of spatial policies. The focus on autonomy and individual agency action is combined with a strong influence of political ideology and result-oriented view on public policy.

Another characteristic is the response-based nature of US government and its policies. This makes that task forces agencies that answer to external disturbances can realize a lot in a relatively short timeframe. The focus on responsiveness is reflected in the findings on flood resiliency. Since the experiences of Hurricane Sandy in 2012, information about current and future flood risks is considered to be largely improved. While local actors do have the feeling they are involved in this challenge, so far, goals set for the local level are not very much observed. Also, community groups do not feel that their initiatives are supported or stimulated by government. This gap between can be explained by limited collaboration and the discrepancy between the means and visions of public agencies'. Also, the actors' accent in the need for stimulating aspects of flood resiliency may be better understood as an outcome of the result-driven culture of US society.

The importance of individual freedom, short-term results and local action can also be used to explain the strong emphasis on capacity building policy instruments. More emphasis on stimulative instruments also reflects the natural distrust with regard to public intervention. Local parties would rather be involved in planning issues and have direct control over changes to their environment.

"Since there are so many layers of government involved with these issues, it is really hard to actually get anything done. The environmental review process in America to build something is extremely laborious and stringent. This leads to situations where you need to show that for example a flood protection construction in the water is not going to harm the ecological system in place, even when this might historically not have been the natural habitat of the species that live there now. In addition to having a leader or champion for these kinds of projects, a change in these strict regulations is really necessary for the larger projects to actually get realized."

- M. Porto, MWA

"The integrated Greenway design was part of the Game Changer proposal, but eventually the City decided not to go through with it. There was this large coalition of the BGI, the Brooklyn Chamber of Commerce, Industry City and possibly UPROSE. We put together this huge proposal to try to look at transportation as well as flood resiliency and protecting the industrial business zone and access to the waterfront. All these things were integrated in a solid proposal that was presented to EDC and we were one of the finalists of the competition. However, then the federal government decided they didn't want the funding to go in that direction. This was a huge disappointment."

- A. Devening, SBIDC

"Collaboration is hard to accomplish, it would take a lot of time and joint effort. Unaware business owners don't have that time and in short term i think you will see more progress if people safeguard their own businesses, while these longer term, wider scale planning programs are underway.."

- T. Outerbridge, Sims Municipal Recycling Facility

2. FINDINGS ROTTERDAM

A. INSTITUTIONAL LANDSCAPE

In Rotterdam, the institutional landscape on flood resiliency in urban development is addressed according to the characteristics of institutional analysis as proposed by Inam (2013). This analysis distinguishes aspects of rules and policies, norms and values, arrangements, structure and interests of actors.

NORMS AND VALUES

As mentioned in the paragraph on water management in the Netherlands, Dutch culture and public decision-making are based on collaboration, integration and equality. Government intervention is based on the predominant aim of social inclusiveness, creating equal chances for all individuals by means of redistribution. Decision-making and policy formulation are process- rather than result-driven. Lengthy procedures, deliberations and (re-) negotiations are generally accepted necessary to ensure consensus.

INTERESTS OF ACTORS

In line with the traditional 'Polder'-culture and the strive for consensus, actors in the Netherlands are generally more open to solutions that are not only in their own best interest. Solutions that partly answer to their objectives can be accepted, if these are clearly beneficial for other parties. It is believed that by this exchange of interests, a higher level of prosperity can be achieved. This explains why policies, as the outcomes of political decision-making, are often not marked by the vision of one party but rather reflect a congregation of intertwined objectives. This is in line with the more administrative approach to government (as opposed to the political focus in the USA). Policy outcomes are based on ongoing and long-term processes of negotiation and collaboration rather than stand-alone projects in the interest of individual actors.

"We always see the added value of approaching these kinds of issues in a collaborative manner. If flood resiliency for the area would be improved I think some sort of public private partnership could prove a solution. Maybe by establishing some sort of water-safety fund, where we can also tap into the expertise of the businesses that are already located in the area."

-E. Tom, Panoptic Architecten/Made in 4Havens

ARRANGEMENTS

The main government actors involved in building flood resiliency in Rotterdam and their respective focus in policy instruments are listed in the table below. A full overview is provided in Appendix 6.

Table 10. Policy issuing bodies flood resiliency in NYC

Actors	Main policy focus
National level	
Ministry of Infrastructure and Environment (IENM) > Rijkswaterstaat > Delta Program Commissioner	Shaping, Regulatory, stimulating Shaping, Regulatory, stimulating Shaping, Regulatory, stimulating, capacity building
State/Regional level	
Provincie Zuid-Holland	Shaping, Regulating
Safety region Rotterdam-Rijnmond	Stimulating, Responding
Waterboards > Hoogheemraadschap van Delfland > Hoogheemraadschap van Schieland en de Krimpenerwaard > Waterschap Hollandse Delta	Regulating, Stimulating
Environmental Protection Agency Rijnmond (DCMR)	Regulating
City level	
Municipality of Rotterdam	
a. Stadsontwikkeling (Department of city development; DoCD)	Shaping, regulating, stimulating
b. Stadsbeheer (Department of city maintenance; DoCM)	Stimulating, regulating
c. Gebiedsteam inM4H (Area management team Merwe-Vierhavens; AMT M4H)	Shaping, Capacity building
Rotterdam Climate Initiative (RCI)	Shaping, capacity building
Stadshavens	Shaping, capacity building
Area level	
Gebiedscommissie (Municipal district committee)	Shaping, capacity building

The European level of government forms basis regulations and legislation on flood safety and initiates special programs for urban adaptation. However, Dutch legislation on water management is in many cases more stringent and thus, leading in Rotterdam practice. Also, European programs are far less influential on local planning and decision-making than National, regional or Municipal programs. Therefore, agencies on this level are not featured in the main involved levels of government in this overview. The city departments in Rotterdam are treated as acting as one entity as the boundaries between them are less prevalent than in NYC. This is partly due to a recent reorganization but can also reflect a more collaborative way of working in the Netherlands.

One important notion is that while the port authority is a public agency in NYC, where in Rotterdam it has been privatized several years ago. Therefore it is not included in the overview. The Port of Rotterdam (PoR) however owns and manages most of the land in Rotterdams port areas and is working closely with the municipality on spatial planning issues and water safety. This is most obvious in the Stadshavens partnership.

"Yes, we do collaborate with the waterboard. This is mostly about the main flood defences that bound the area. There is a new legger being developed, which also takes into consideration the foreland of the dikes as part of their strength. Therefore, what happens in the area is also important for the flood defences. And from our point of view it is of course important to keep the dikes as low as possible for urban design reasons."

- C. Andriessen, City Development Department Rotterdam

What we see is that issues of (water-) safety are largely taken care of on a regional level. Jurisdictions of these agencies are historically defined and based on characteristics of the natural landscape (land elevation, soil conditions) or spatial usage (industrial/residential zones). This makes that they largely coincide with specific water management challenges. Rather than reducing impact on an area in response, these demarcations thus make sense in the aim of risk limitation and prevention. However, they often don't match the jurisdictions of provinces and municipalities. This is clear in Rotterdam's case, where three Waterboards are active.

Where in NYC NGO's and private foundations take on a large role in plan making and research for flood resiliency, in Rotterdam specialized engineering and consultancy firms, (urban) design firms and knowledge institutes help in this process. As the number of public agencies involved in water management and spatial planning is vast, their role is mainly to stimulate innovation and integrate water management with economic development and international networks.

Also, social housing associations play an important part in spatial planning in the Netherlands. They own large portions of the housing stock and are often involved in the development of the areas they are or will be located in. There are currently no housing associations active in Merwe-Vierhavens.

"We have made arrangements with the municipality on what is possible in the development of these outer-dike areas. Together we've made a list of criteria for changes or developments."

-R. Ammerlaan, Hoogheemraadschap Delfland (Waterboard region Rotterdam)

"In recent years the municipality has become more aware of their role and are certainly taking action. This is also visible in the Rotterdam Climate Proof and the Adaptation Strategy. These initiatives gave a lot of insight in the risks and set the public agenda, on local as well as regional level"

-R. Ammerlaan, Hoogheemraadschap Delfland (Waterboard region Rotterdam)

What we see is that the municipality has taken a pro-active role in establishing long-term public-private partnerships for the realization of the city's ambitions on climate adaptation. The Rotterdam Climate Initiative creates a platform for government, organizations, local businesses and knowledge institutes to collaborate in making the city more sustainable. Main aims are to achieve a fifty per cent reduction of CO₂ emissions, adapt to climate change, and promote the economy in the Rotterdam region (Rotterdam Climate Initiative, 2014). Another example is the CleanTechDelta program. An overview of the collaborating partners is illustrated in the figures below.

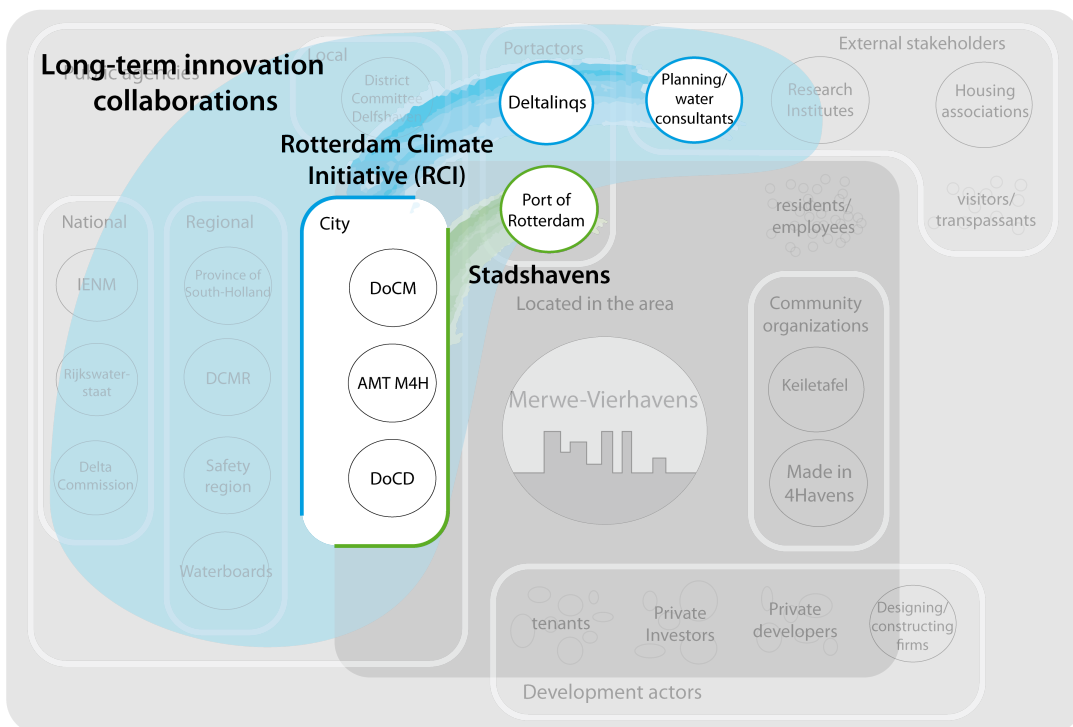


Figure 40. Overview of public-private partnerships to promote climate adaptation in Rotterdam

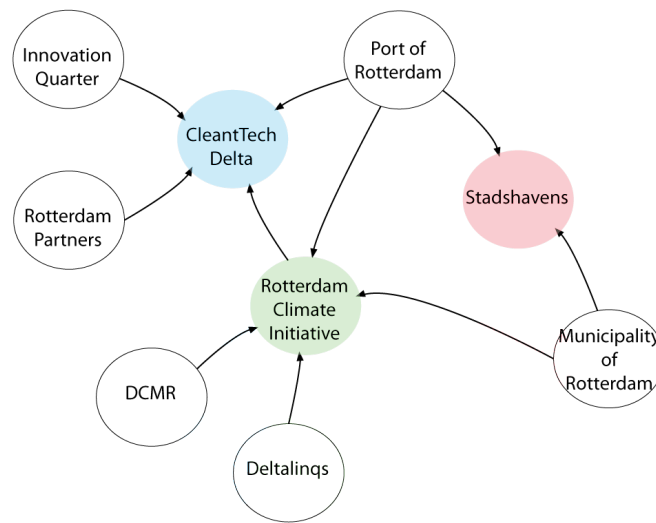


Figure 41. Overview of public-private partnerships to promote climate adaptation in Rotterdam

STRUCTURE

The role and responsibilities of especially water management bodies is historically defined and fixed in national law (Ammerlaan, 2014). Rijkswaterstaat, as part of the ministry on spatial development (IenM) is accountable for safety and protection systems on a national level. On regional level the Waterboards are liable for maintaining flood protection constructions and managing water levels and quality within their jurisdiction. To this end, they need to collaborate closely with Provinces and Municipalities on issues of infrastructure, land-use and other spatial developments. Like municipalities, they issue taxes to carry out their operations. The Veiligheidsregio's (safety regions), in working on protection of society against all external disturbances, are also associated with flood safety. However, they often operate more separately and focus on evacuation plans, information sharing and responsive measures rather than preventive measures (Andriessen, 2014; Ammerlaan, 2014). Within the domain of spatial planning the ministry of IenM is also leading in providing national plans and strategies (Ovink, 2014). On a regional level the provinces are responsible for planning policy and on a local level municipalities manage spatial development.

The culture of collaboration and aim for integrative solutions is reflected in the open relationships between public agencies. Spatial policy is based on discussions including all public stakeholders in various functional domains of a certain area (horizontal integration) and policy programs on economic or social subjects intend to incorporate the views of agencies of the different levels of government within a certain domain (Van Buuren J., 2014). To facilitate this process, platforms for discussion are formed as illustrated in the figure below. All involved public agencies are invited to take part in this dialogue. When plans are taking a more definite form, (a selection of) this formation takes up the task to carry out the works with the help of the involved agencies. Thanks to this rather lengthy process of discussion, inclusion and shared objectives the role of these teams are generally accepted by the agencies in the existing structure. A lot of these longer-term collaborations are established on a semi-formal sub level of institutional structure. This process is illustrated in the figures below.

"The Deltaprogramme has made it possible to come to a preferred strategy. It has marked the political urgency and opened up communication between all public parties on water management."

-R. Ammerlaan, Hoogheemraadschap Delfland (Waterboard region Rotterdam)

"From the municipality we have conversations with the district organization of Delfshaven, but there is no direct contact with the residents themselves."

- C. Andriessen, City Development Department Rotterdam

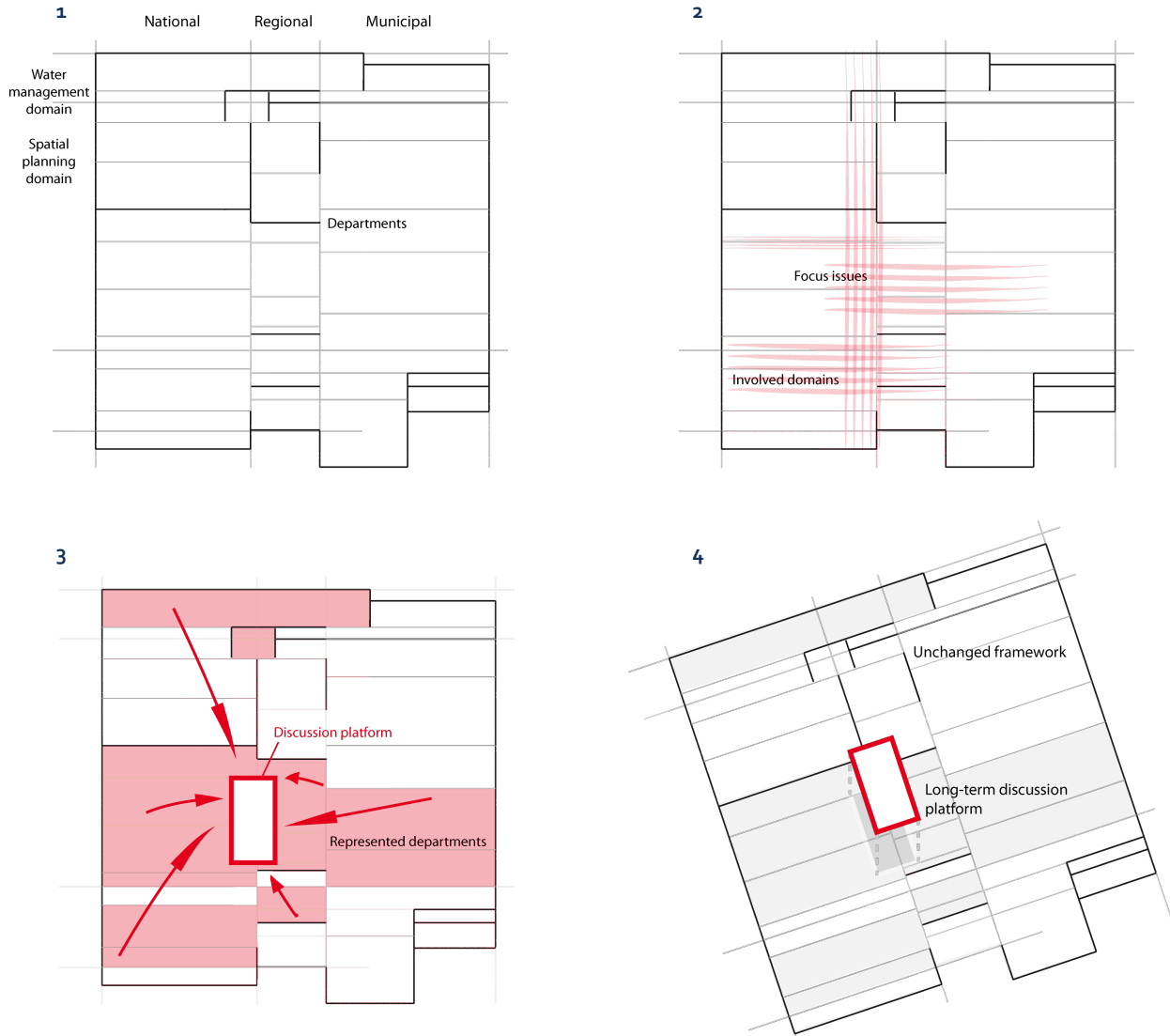


Figure 42. Institutional structure; long-term discussion platforms

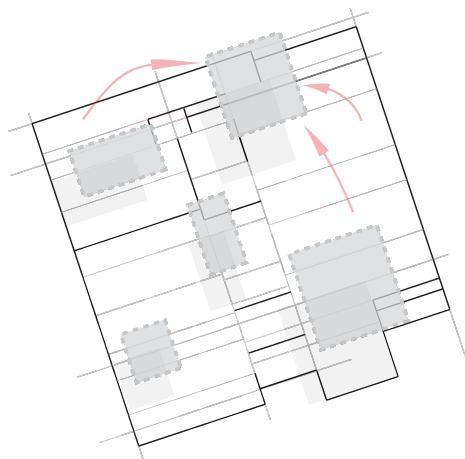


Figure 43. Collaboration and discussion platforms operating on separate level

"No, we were not aware that this area is outer-dike. Right now we also wouldn't now where the dikes are situated. As far as I know we've never received a letter from the municipality to make us aware of this or inform us about the risks. I also can't recall this being told when we bought this property, but it was probably featured in the land-lease contract. "

- R. Borst, Vervat Vastgoed

However, this focus on collaboration between public parties has left less government attention to the communication with individuals and local communities. This means that currently, many Dutch citizens are currently not aware of water management policies or issues of flood risk. This is an important obstacle for Rotterdam. Considering how awareness is the first step to community involvement, which is one of the main characteristics of the flood resiliency of urban areas.

"We have no plans for if there would be a flood and our building would be damaged. This is probably not covered by insurance. We also never discussed it within our organization."

- R. Borst, Vervat Vastgoed

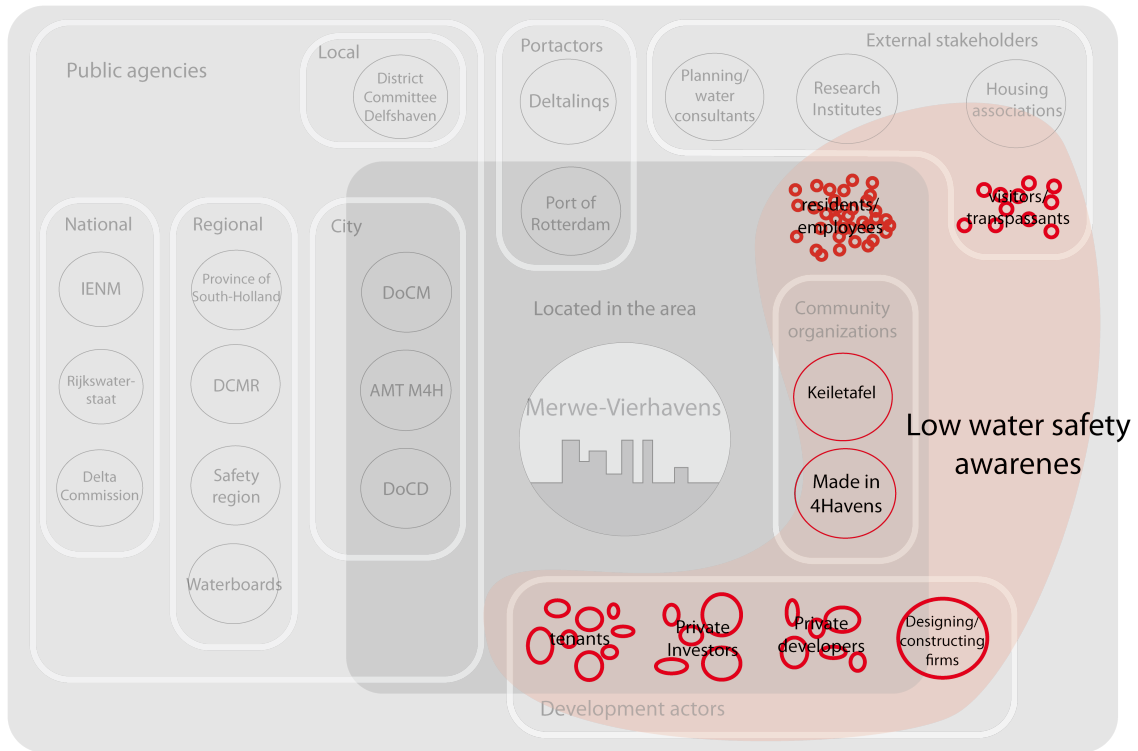


Figure 44. Low awareness and lack of involvement private parties

RULES AND POLICIES

An overview of the policies in the field of water management and urban planning that are currently employed in the Netherlands is provided in the table below. We see that spatial plans have a more central role in Dutch policy than in the US. This is in line with the emphasis on characteristics of the physical landscape for jurisdictions of public agencies and policies. Each level of government drafts maps of future spatial development of their respective jurisdictions. The national and provincial structure visions, strategies and administration agreements are the results of conversations and consultations with various (in-) directly involved public agencies. They provide a common understanding of future developments and thus limit uncertainty. Therefore, the agencies that present them are binding their future policy to the views in these documents.

"We're looking at what's already present in the area, what scenarios are anticipated and what do we want with the area. When it comes to flood resiliency, the base level of land issuance is set at +3.60m above sea-level for basis components and +3.95m for vital infrastructure. This applies to all of Rotterdam's outer dike areas. "

- C. Andriessen, City Development Department Rotterdam

Table 11. Dutch policy instruments on flood resiliency applicable to Merwe-Vierhavens

Instrument	Policy	Main issuing party	Level
Shaping	• Rotterdam Climate Proof	RCI	City
	• Waterplan I & II	Municipality of Rotterdam	City
	• Deltaprogram	Deltacommission	National
	• Structure Visions & PIP	Provincie Zuid-Holland	Regional
	• Pilot projects	Municipality of Rotterdam	City
Regulation	• Building codes	Ministry of IenM	National
	• Zoning plans	Municipality of Rotterdam	City
	• Watertest	Delfland Waterboard	Local
	• AMvB Ruimte	Ministry of IenM, Provinces, VnG	National
Stimulation	• Legger and Keur	Waterboards	Regional
	• Deltafund	Deltacommission	National
	• Infrastructure maintenance	Ministry of IenM	National
Capacity building	• Land sellings and development tenders	Municipality of Rotterdam	City
	• Keiletafel	Municipality of Rotterdam	City

Within the clearly defined structure of the institutional landscape that typifies the Netherlands, policy emphasis lies traditionally on standards and norms. This results in regulating and stimulating policies rather than capacity building initiatives. This view is confirmed Van Buuren & Ellen (2013) and in this study's analysis of the currently employed policy instruments in Rotterdam.

Only the most local level plans of the municipal 'bestemmingsplan' and the Waterboards 'legger' have juridical power in the relation with third parties. As mentioned in the previous paragraph, Waterboards are accountable for flood protection works, management of water levels and -quality within their jurisdiction. To this end, they have the disposition of several policy instruments. The 'legger' and accompanying 'keur' are the counterparts of the building code and land-use plan, with a singular focus on water defense works and according safety levels (Ammerlaan, 2014). They are the most important policy instruments of the Waterboards. Any new constructions, transformations or change of land usage in within the scope of these documents need permits from the Waterboards. Like zoning plans, every few years the legger and keur get updated. Adjustments to either the spatial zoning- or the water management plans are

"We're responsible for drafting the legger and keur. We do this according to national and local criteria and safety zonings. In this process we consult all involved public agencies and to capture new plans into fixed legislation local parties are also heard and asked for their feedback on local changes. "

-R. Ammerlaan, Hoogheemraadschap Delfland (Waterboard region Rotterdam)

carried out in close consultations between municipalities and the local Waterboards. In recent years the municipal process of issuing building permits has been largely simplified. There is now also discussion on national level to include Waterboard permits in this process. Also, a Waterboard consultation is also formally included in the process of making plans for spatial development by public parties. This is fixed in the Watertoets (English: "Water test"). The extent to which this relatively young procedural step is currently carried out in practice differs amongst regions. General understanding is that if applied correctly this early consultation and alignment could provide added value for the outcome of these larger spatial plans.

Like in NYC, the problem that there is more funding available on national level, but less on municipal level is noted in Rotterdam. On the one hand, as a result of the recent crises in the financial and property markets, municipal budgets are decreased because of declining revenues in land sales. Moreover in recent years national government has adopted an approach of decentralization and has allocated more responsibilities to the municipalities. Hence, the municipalities are now faced with an extended range of responsibilities and a very limited budget. In the stimulation of climate adaptation programs, this has led to the decrease of municipal spending of Rotterdam on for example pilot projects, development stimulation and subsidy programs. Instead, confirming the findings of document analysis, the mainstreaming approach and facilitating initiatives by private parties are now much more emphasized (Andriessen, 2014). Other public funding on local level could come from the Waterboards, which have their own funding structure that is based on special Waterboard taxes. However, these can only be employed for the construction and maintenance of water management works.

"We've mapped the problem areas and will eventually take measures in elevating these. However, we're waiting for moments that specific parts of the areas will come to development. Then we can mainstream these elevation works to other construction or enhancement of public space."

- C. Andriessen, City Development Department Rotterdam

"It is the responsibility of Rotterdam to assess the risks in these outer-dike areas. They've fixed the required elevation of these areas according to the functions and future development. This is also done in collaboration with the provincial authorities and the Rijkswaterstaat program Rijnmond-Drechtsteden. "

-R. Ammerlaan, Hoogheemraadschap Delfland (Waterboard region Rotterdam)

An important difference between the US and the Dutch situation is that municipalities in the Netherlands traditionally take a more active role in area development. While this practice was particularly prevalent in former decades and has since recent crises been largely discouraged, public agencies still play an important role in making plans for urban developments. In the case of Merwe-Vierhavens the municipality, owns large plots of land and is making plans to sell these in the coming years for redevelopment. In this selling, requirements are set for the developments to be realized by buying parties. To formulate these desired developments is the main task of the Stadshavens organization. This land issuance can work in two ways to stimulate flood resiliency measures. Traditionally the revenues of land sales are (partly) used by the municipality to carry out improvements of public space, which may also include water management works. Another possible approach that is currently considered in Merwe-Vierhavens is to allocate more of the risks of development at the side of the private parties. This less controlled approach through tendering procedures is already applied in the other Stadshavens district of the Rijnhaven. Developing parties are provided with information on current water management systems and risks of the area and requirements for safety standards of the new development (Stadshavens Rotterdam, 2013). This approach is expected to bring more innovative design solutions and takes away the need for municipal investments. If successful, this method could also be used as blueprint for the development of Merwe-Vierhavens (Andriessen, 2014).

OVERVIEW INSTITUTIONAL LANDSCAPE

When the public agencies in Rotterdam are mapped according to their main policy instruments in development and flood resiliency, the overview of the figure below is obtained. One of the main conclusions is that there is a lot of focus on shaping instruments; agencies on all levels of government are making spatial plans and visions. Because these visions are drawn up in close collaboration with other public parties, their contents align and complement each other.

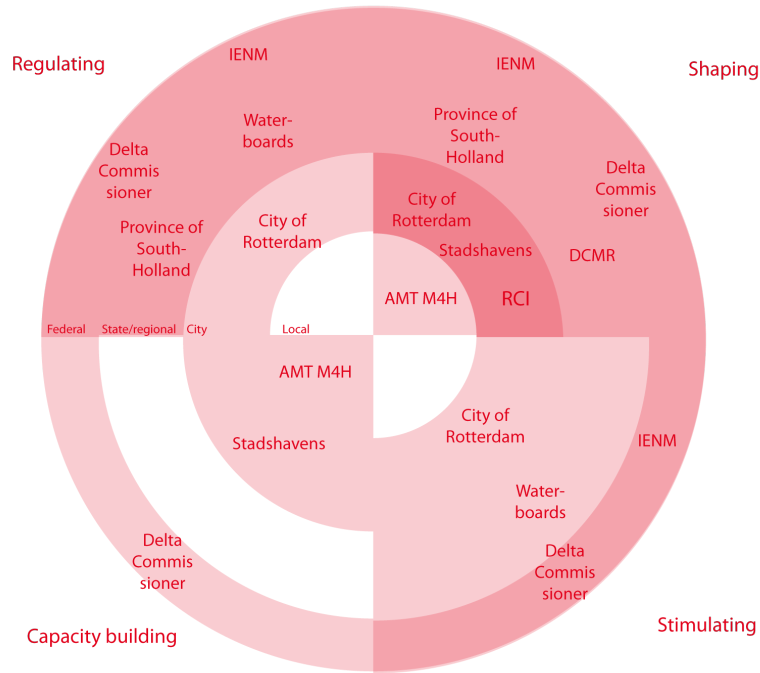


Figure 45. Public agencies according to the typology of their main policy instrument in building flood resiliency in Rotterdam

The same situation holds for regulatory instruments, as of various levels of government are making use of this type of policy instrument. Different public agencies draw up regulatory plans and issue permits for waterfront constructions and land usage; the municipality in the form of zoning plans and the Waterboards in the form of the Legger and Keur. This layering and integration of policies can be understood considering the Dutch cultural emphasis on inclusiveness, redistribution and consensus. While this may provide integrative and longer-term solutions, the process of plan making and realization generally takes a long time.

The problem that there is a lot of funding available on higher levels of government but less on local level is also prevalent in Rotterdam. Therefore, the municipality seeks ways to enhance flood resiliency by new ways of land issuance and increased collaboration with private parties. Another conclusion of the overview is that the capacity building instruments are poorly represented. While Delta program has featured some workshops with citizens, these are kept local and have a limited influence on the wider population. This ommittance in building capacity is also reflected the low awareness of Dutch citizens on their locations with regard to water safety. This is the result of strong collaboration between public parties and water management expert, but poor communication with individuals and the population in general, as illustrated in the figure below.

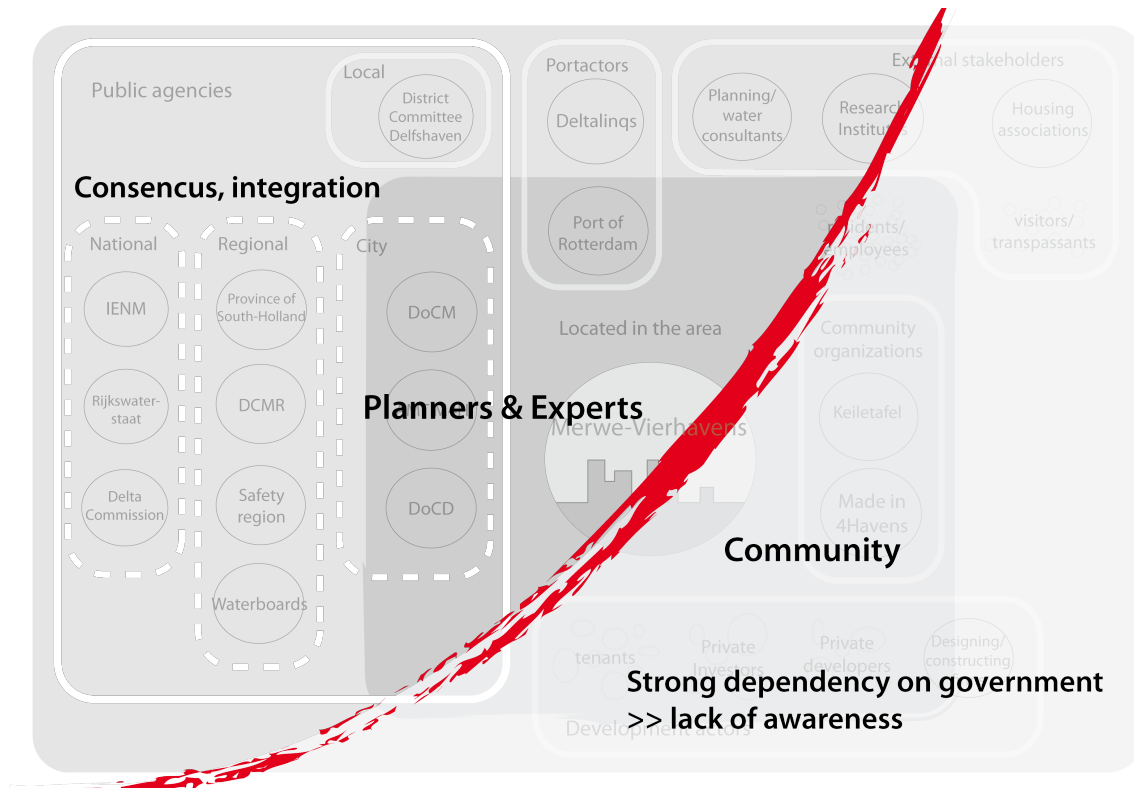


Figure 46. Gap between planning and expert discussion and the local community

B. POLICY INSTRUMENTS AND FLOOD RESILIENCY

Firstly, the municipality was asked what kind of policy instruments are currently focused on for the enhancement of flood resiliency in Merwe-Vierhavens. Findings are in line with the conclusions on institutional landscape, as presented in the previous paragraph. Rotterdam indicates to concentrate on determining safe base levels for elevation of these outer-dike areas and build public-private networks on climate adaptation. The diagram below visualizes these focuses. As there is little room for public investment and taking further stimulating action, necessary works are projected to be mainstreamed with other municipal programs like road and sewerage improvement.

"The most important instruments of the municipality are the required level of elevation for land issuance. And furthermore providing information and raising awareness. Also maybe they could take initiative in developing evacuation plans and making sure vulnerable functions and critical facilities are safe."

-R. Ammerlaan, Hoogheemraadschap Delfland (Waterboard region Rotterdam)

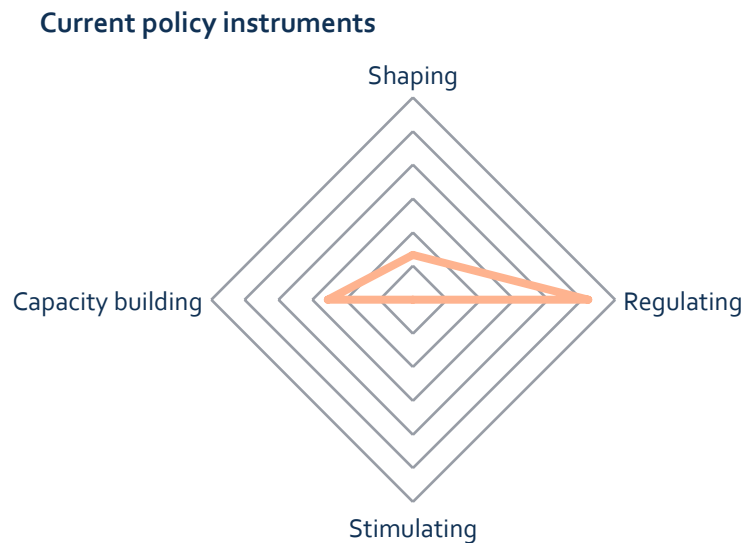


Figure 47. Current municipal policy instruments on flood resiliency

When asking local actors how they see the realization of the different aspects of flood resiliency, the overview in the figure below is obtained. We see that actors believe that the current risks and future threats are adequately mapped. However, they assume their safety is first and foremost a government responsibility. Therefore, they are not paying much attention to water management policies and flood risks. The lack of the involvement of local communities in issues of water management is understood to result in a certain blindness for actions that are being taken. For example, the Dakpark-dike is strictly speaking not protecting Merwe-Vierhavens, but rather the neighborhood behind it. However, in enhancing safety for the wider area this may add to resiliency in providing a safe haven for evacuation in the case of an event. While all actors know the Dakpark, some of them simply are not aware of its water management function.

Considering this lack of awareness, the low score on involvement of the community is hardly a surprise. Furthermore, there are very few flooding experiences in Merwe-Vierhavens itself to recall for lessons to be learned.

"We're not aware of any measures being taken to increase flood resiliency. We haven't been contacted about this by the municipality and it is also not discussed at the Keiletafel."

- H. Pum, Rotterdams Collectief

"We do not see any other developers taking measures to enhance flood resiliency in the area. I assume this [flood resiliency] is incorporated in future public plans for further development of the area."

- R. Borst, Vervat Vastgoed

Perceived flood resiliency

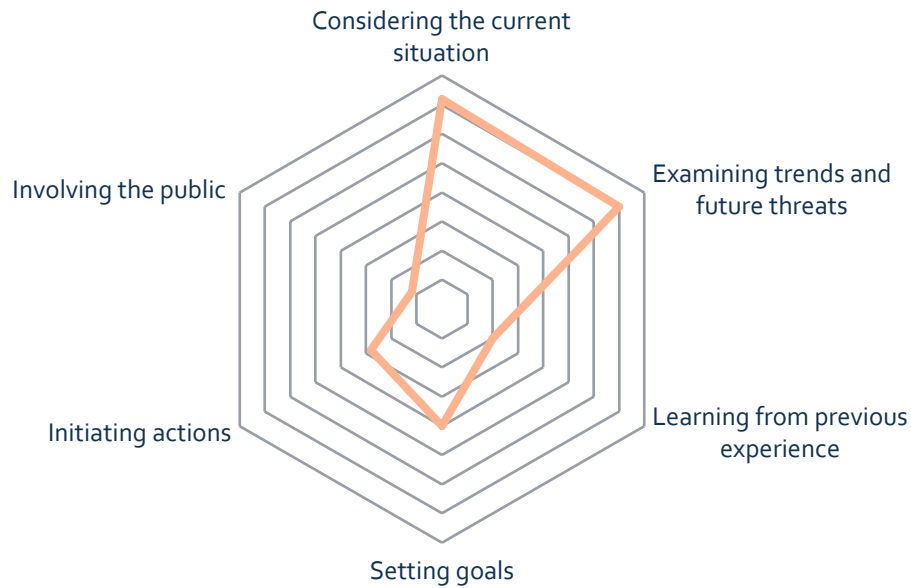


Figure 48. Elements of urban area flood resiliency experienced by development actors in Merwe-Vierhavens

The policy instruments that local actors *are* experiencing are predominantly the municipal visions and strategies on climate adaptation. These were mostly developed by municipality over the last years. Currently, the focus of policy instruments lies in the implementation, rather than formulation of these strategies. This explains the difference between local actors' perception on policy focus and the employed policies as indicated by the municipality. Also, these strategic visions are not proposing very specific projects for Merwe-Vierhavens in particular. A more general conclusion this diagram shows is that there is little awareness of local actors of public policy on flood resiliency in the area.

"There are concepts being developed for building on the water, we've actually made some plans for that as well. This could provide a solution for this issue, but if you look at existing piers and quaysides I don't see any strategies being developed. Also we see no strategy in how the municipality takes measures, for example in zoning-plans, to prevent flood damage in future area developments."

-E. Tom, Panoptic Architecten/Made in 4Havens

Experienced policy instruments

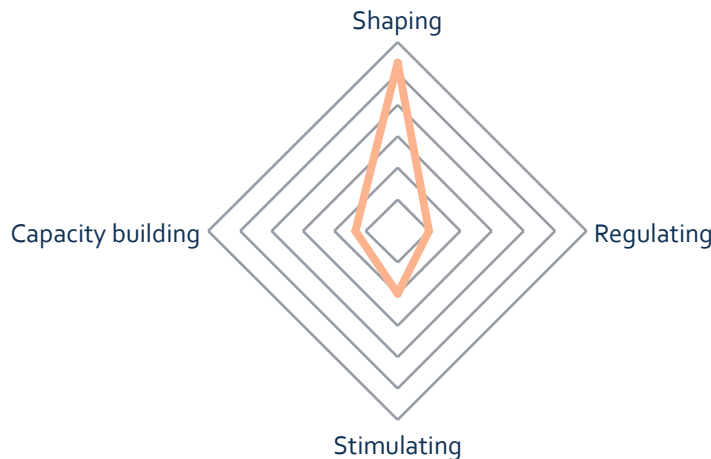


Figure 49. Policy instruments on flood resiliency experienced by area development actors in Merwe-Vierhavens

The policy instruments mentioned by actors to improve flood resiliency in the development of the area are illustrated below. The members of the local community, businesses as well as developers, indicate that citywide strategies are well known, but a development plan especially for Merwe-Vierhavens needs to be established. An interesting side-note is that the Stadshavens organization, in collaboration with research institutes, has actually already drafted such a vision. Clearly, this has not been communicated (enough) to the local community, affirming the shortcomings of government communication with the public.

Another notion is that many actors feel themselves connected to the area as a whole and would be willing to invest in it, may this prove necessary for long-term safety. However, public parties are expected to provide information and initiate such actions. While the Stadshavens organization has established the collaborative partnership of the Keiletafel, this is mainly aimed at the businesses in the area and strengthening economic development. Also, residents and business owners of the surrounding districts are suggested to be involved in plan making for Merwe-Vierhavens.

Interestingly, stimulating actions are not deemed as crucial as may be expected. It is understood that public agencies have limited funding for investments. Also, actors would like to be more involved in the plan making and have some sort of control over the development of the area. Options like area funds or other forms of public-private partnerships are mentioned as possible collaboration schemes.

"The most important policy instruments of the municipality to increase flood resiliency in these areas would be land-lease contracts. One could think of linking price levels to whether lessees are taking preventive or protective measures. The other way would be setting up area funds. At the basis would be information and communication through for example a central point where all information on a specific topic is provided. This could maybe be linked to other current topics in the area like CO2 reduction and decentralization."

-E. Tom, Panoptic Architecten/Made in 4Havens (actor Merwe-Vierhavens)

"We know the municipality is making plans to develop the area, but we have not seen any concrete plans or visions for making this area more flood resilient. Of course, if this is to be partly residential the area needs to be safe. There also lie chances certainly in these former port areas, for building and living on the water."

"I can imagine it would be possible or even necessary for the local businesses to get involved if an integrated plan for the area is to be developed. What kind of form this involvement should take, for example in knowledge or investment could later be determined."

- H. Pum, Rotterdams Collectief

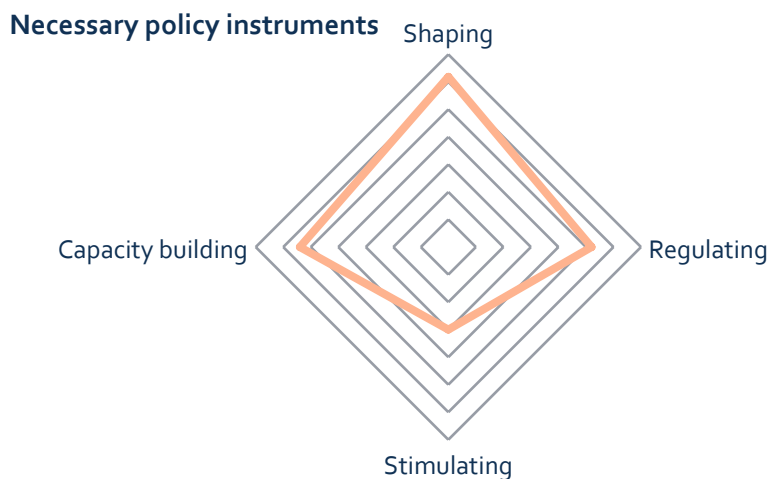


Figure49. Policy instruments on flood resiliency deemed necessary by area development actors in Merwe-Vierhavens

C. SUMMARIZING FINDINGS ROTTERAM

One of the main differences between the institutional landscape on urban flood resiliency of NYC and Rotterdam is that in the Netherlands water management is traditionally considered a special policy domain. While this domain is strongly integrated in all other issues of spatial planning, it has its own agencies and policies. Thanks to the emphasis of Dutch culture on inclusiveness, redistribution and consensus, this results in a layering and integration of policies rather than legislative and administrative disorder.

In congruence with the emphasis on functional and natural landscape characteristics as a basis for public structures, we see is that spatial plans have a more central role in Dutch policy than in the US. Also, policy outcomes are based on ongoing processes of negotiations rather than stand-alone projects in the interest of individual actors.

This lack of direct communication between public agencies and the local community is most clear in the fact that most actors in Merwe-Vierhavens are now aware that they are located in outer-dike areas. This, while it is the responsibility of the municipality to at least inform them of this. In general, Dutch citizens' lack of consciousness of their location with regard to flood risks is confirmed by Boer, Botzen, & Terpstra (2012). Therefore, besides local municipal action, a national awareness program is recommended.

One can conclude that topics like climate adaptation and resiliency in the Netherlands are very much prevalent in discussions and plan making of public agencies. Also, in the field of urban development collaboration and partnership with local parties and private actors are certainly sought and stimulated. However, this doesn't seem to be the case so much for climate adaptation and flood resiliency. While often actors indicate to be willing to take measures and invest in building resiliency, they simply are not aware of the possible risks and opportunities. Local collaborations like area funds or public private partnerships are considered to have great potential in taking action on these kinds of issues. Especially when solutions can be linked to shared interests of the actors like creating jobs, improving public space and reducing emissions, energy usage and other external dependencies this option seems very viable.

Findings from the interviews with both experts as well as actors indicate that the Waterboards are not connected to or visible for local communities. Also, they are perceived as rather conservative organizations. These issues are acknowledged by the Waterboards, as they are shifting their focus on stimulating more innovative solutions and are trying to collaborate in planning processes as early as possible.

"We do have contact with local businesses through the Keiletafel, but we've never discussed flood safety there. It could however provide a platform to inform them about this topic."

- C. Andriessen, City Development Department Rotterdam

"We have no insight in the current or future risks in the area, but we assume the government carries out studies and would take measures if areas aren't safe."

- H. Pum, Rotterdams Collectief

"In the Netherlands prevails an administrative culture rather than a politically activist culture. In that sense, the Deltaprogramma remains a program of which public authorities, decision-makers and planners determine the contents, while the population remains relatively unaware of these matters, both in its challenges and implications."

(translation) - H. Ovink, Principal 'Rebuild by Design'

"We have improved on communication in the sense that we've made clear on our website that flooding of these outer-dike areas is not our responsibility and whom should be contacted."

"However, we still see that awareness of the local community in these areas of their situation is still very low."

-R. Ammerlaan, Hoogheemraadschap Delfland (Waterboard region Rotterdam)

V. CONCLUSIONS

1. INTRODUCTION

A. URBAN DEVELOPMENT AND FLOOD RESILIENCY

Spatial planning and development is increasingly recognized by the water management sector to provide important opportunities for the functional integration with civil works (Zevenbergen *et al*, 2008). The integration of urban development and water management will become more and more necessary in planning for the effects of climate change. In particular measures need to be taken to raise flood resiliency in dense urban areas. To achieve this increased flood resiliency, various cities around the globe currently adjust public policy and legislation on area development and water management. All actors in urban development, for example building owners, urban planners, builders, professionals and other parties need to recognize the urgency of building resiliency and need to be stimulated in their efforts (Veerbeek *et al*, 2010).

Ultimately, this building of flood resiliency is intended to strengthen the competitive position cities on the longer term. Both Rotterdam and NYC have set high ambitions in their strategies on climate adaptation. Their proposed approach to realizing these goals, in particular on flood resiliency, are also highly similar. The strategies of both cities are marked by not formulating one set plan. Instead, they suggest the integration of an extensive set of protective measures on different spatial scales and within various urban domains. Hence, both cities depend for the effectiveness of their new policy instruments on the collaboration with other public agencies and private actors.

B. QUESTIONS AND ASSUMPTIONS

The study compared how current public policy instruments perform within the different institutional landscapes of Rotterdam and NYC. Performance is evaluated by looking at to what extent the characteristics of flood resiliency in is achieved in the development of vulnerable waterfront areas. This chapter is structured by answering the research questions, which are repeated in the section below.

This study compares practices of urban area development in Rotterdam and NYC to answer:

I. What are the **main characteristics of the institutional landscape** in building flood resiliency?

II. Planning policy

- What policy instruments are **currently deployed** to build flood resiliency in vulnerable areas?
- To what extent are these policy instruments **experienced** by local actors?

III. Flood resiliency

- How is flood resiliency **currently assessed** in vulnerable areas?
- What aspects of building flood resiliency should be **strengthened**?
- What is the **effectiveness** of current policy instruments in building flood resiliency?

V. What is the **influence** of the institutional landscape on the effectiveness of policy instruments?

The assumptions that these questions are based on were tested throughout the study. As will be explained in this chapter, findings from document analysis and expert- as well as actor interviews affirmed these assumptions, validating the approach and focus of the research. Hence, we can now confirm that

- a) The building of flood resiliency in NYC and Rotterdam is hampered.
- b) The effectiveness of currently employed public policy in flood resiliency could be improved.
- c) Institutional landscape influences the effectiveness of public policy in urban development.

C. APPROACH

The study assessed how public policy influences the process of building flood resiliency, as illustrated in the figure below. To this end, the development process of waterfront areas in Rotterdam and NYC were examined. Thus, one of the main objectives was to **assess the effectiveness of current policy instruments in raising flood resiliency in vulnerable areas**. First, the flood resiliency of certain case areas in both cities was assessed. Subsequently the currently employed policy instruments were mapped and compared with those that are predominantly experienced by local actors. This resulted in an overview of the policy instruments that are currently lacking, or are deemed necessary, for further building of flood resiliency in the area. This objective was aimed at helping city authorities of the studied cities to realize the ambitions for the enhancement of flood resiliency of urban areas.

To make the findings of the study also relevant for adaptation policy in other cities, the effect of local socio-political factors on the workings of these policy instruments in the practice of area development was examined. To this end, the study introduces the concept of the *institutional landscape*. Specific characteristics of the institutional landscape of NYC and Rotterdam were defined. Subsequently the influence that these characteristics have on the effectiveness of policy instruments is rationalized. This outlined the second objective; to **identify specific characteristics of institutional frameworks that influence the effectiveness of policy instruments**.

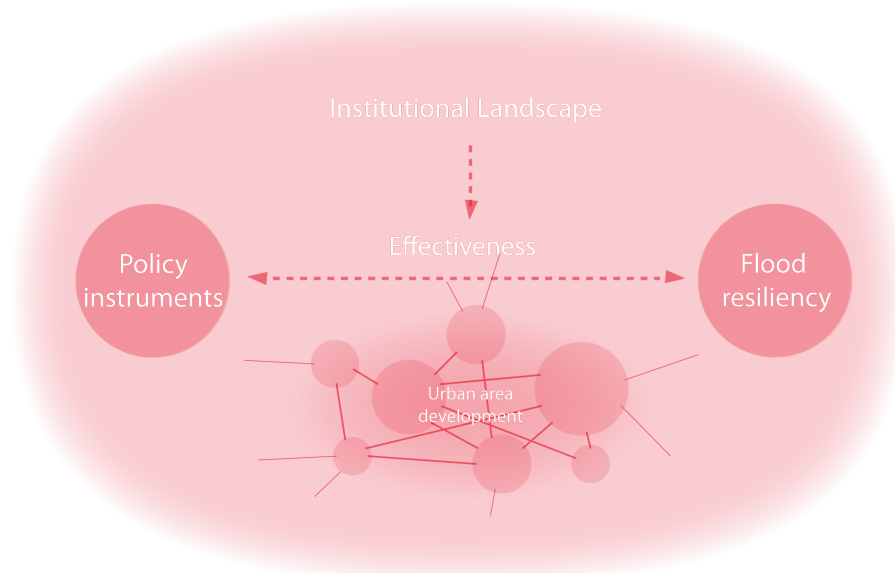


Figure 48. The conceptual model

2. CONCLUSIONS INSTITUTIONAL LANDSCAPE

The main characteristics (see figure 49) of the institutional landscape of NYC and Rotterdam are listed in the table below. The model that is in this study adopted to frame the findings is the model of institutional analysis by Inam (2013). The study analyzed the situation and characteristics on the specific level of policy 'output' of a policy program -in our case: the building urban flood resiliency. As Inam prescribes, this analysis was carried out by drawing on information from interviews with officials, observations of institutional behavior and analysis of institutional documents.

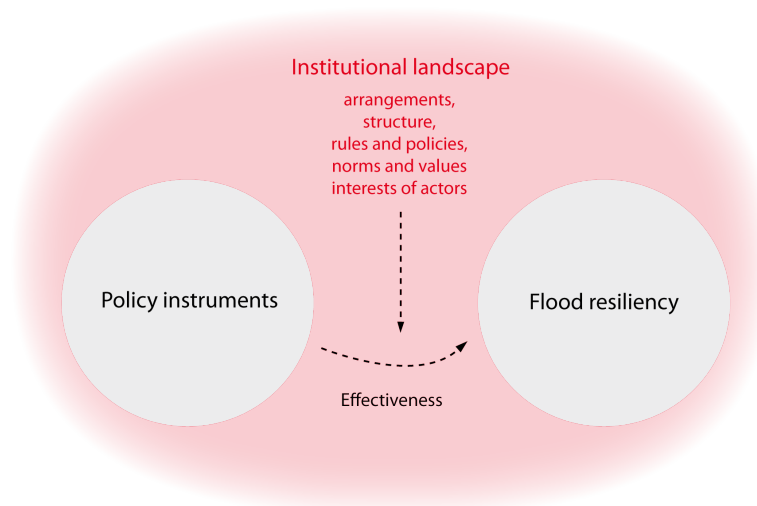


Figure 49. Key concept of the Institutional landscape in the conceptual model

Table 12. Institutional landscape characteristics of NYC and Rotterdam compared

Characteristics	NYC	Rotterdam
Norms and values	Freedom of the individual opportunistic, result-driven, ideology, diversity	Collaboration, concensus, equality, integration redistribution Process-driven, safety
Interests of actors	Strong, directly related to actor behavior/policy Often economic focus, local and short-term scope	Flexible, intertwined, loosely defined
Arrangements	Stand-alone, dynamic, project- based Strong politically driven, responding to external forces (task-forces)	Traditional, long-term, inclusive Planning and procedure-based, ongoing processes, Strong administrative driver; based on internal forces within government
Structure	Hierarchical in vertical relations, panarchy on horizontal level Also, significant role of community organizations, NGO's, private sector	Oligarchy (water management level) Network (spatial planning)
Rules and policies	Functionally defined – jurisdictions determine spatial projects Overlapping and conflicting	Spatially defined – spatial characteristics determine projects and jurisdictions Overlapping and aligned

Within the policy domains of water management and area development Rotterdam can be characterized by its strong tradition. This makes for a robust system of actors with clear responsibilities and relationships. The integration of legislation and spatial plans, drawn up by various agencies and on different levels of government, is stimulated by a culture of open communication and consensus. For example, the legger, a zoning plan with the sole focus on water defense works and according safety level is a crucial link between of Dutch water management and spatial planning. There is no similar planning policy instrument currently available in NYC.

On the other hand, New York City's area development and waterfront management is characterized by a panarchy of independently operating agencies. This autonomy and independent acting of public agencies and departments prevails on horizontal level as well as within the different government layers. Projects and policies are often the outcome of individual (agency) actions. Also, relations within government between public agencies are more short-term or project-based. The role of government in USs' society is rather limited in comparison to the Netherlands. This is directly linked to the strong role of various types of NGO's in NYC. Another finding in the comparison on socio-political structures is that in NYC there is less connection between spatial or landscape characteristics and public policy or -jurisdictions.

This study is based on the assumption that different policy instruments are more effective in different institutional landscapes. Here, effectiveness is defined as the achieved stimulation of collective action towards a predefined goal; flood resiliency. As the characteristics of the institutional landscape also describe the relationships between government agencies and the private market, this explains why public attempts to affect the market also work differently between institutional landscapes.

There are some characteristics of the institutional landscape of NYC's enhancement of flood resiliency in urban area development that stand out. First of all, jurisdictions of public agencies are either functional or arbitrary boundaries rather than characteristics of the landscape. This reflects the response-based nature of US government and goes back to a history where civilization was established by answering to the direct needs of a pioneering society. Since there is little horizontal and vertical collaboration between public agencies, these jurisdictions also determine the scope of spatial policies. This can also be explained by the norms and values of US society that focus on individual rights and responsibilities. These aspects of response and individualistic agency behavior are combined with strong political agendas and result-oriented view on public policy. This makes that often, political leaders establish so-called 'task forces' as a response to external disturbances or pressing matters in society. This institutional structure, with its strong boundaries and responsive task forces is illustrated in the figure below.

"In the Netherlands, the constitution secures the collective. In the USA the constitution limits the role of the government and favours the interests of the individual. That is an essential difference in perspective."

(translation) - H. Ovink, Principal 'Rebuild by Design'

"We think that the path to resiliency is through the local community; from the ground up. People that live in the area and work in the area need to be part of the planning effort, decision-making and visioning. You need the personal involvement of the local community to make any of these plans work."

- E. Yeampierre, UPROSE (NGO Sunset Park)

"The Stadshavens organization is very much involved in the development of the area. For example, if these older port businesses leave the area, they look at the property they leave behind and assess if it could be transformed."

- H. Pum, Rotterdams Collectief (actor Merwe-Vierhavens)

"...in the USA the approach is more individualistic and local and subject to old and complex, often conflicting regulations. This marks a fascinating contradiction: the American "can-do" attitude against the total fragmentation of bureaucracy, politics and legislation. This is why many projects get stuck."

(translation) - H. Ovink, Principal 'Rebuild by Design'

"It's hard to answer to the Federal regulations for how this money could be spent. In fact this creates barriers between the vision of the City, the agencies that also need money for their individual policies and community organizations and their initiatives."

-M. Rowe, Municipal Art Society (MAS)

In the Netherlands water management is traditionally considered a special policy domain. This is one of the main differences between the institutional landscape of urban flood resiliency in NYC and Rotterdam. Hence, while water management in the Netherlands strongly integrated in all other public issues, and in particular with spatial planning, it has its own agencies and policies. Thanks to the emphasis of Dutch culture on inclusiveness, redistribution and consensus this results in a layering and integration of policies rather than legislative and strategic confusion.

In congruence with the emphasis on functional and natural landscape characteristics as a basis for institutional structures, we see that spatial plans have a more central role in Dutch policy than in US policy. Also, policy outcomes are based on ongoing processes of negotiations rather than stand-alone projects in the interest of individual actors. These discussions and collaborations of public agencies take place on a different level, not affecting the existing structure. As illustrated in the figure above, platforms with representatives from different agencies are established to find answers to longer-term political pain points. This figure also shows the less pervasive boundaries between departments, representing the more open institutional structure.

"There is such a lot of bureaucracy to go through to get these measures actually realized that this may hamper the process."

"The City, State and federal government can sometimes argue about funding and planning responsibilities."

- A. Devening, SBIDC (NGO Sunset Park)

There are also similarities between Rotterdam and NYC's institutional landscape. Public planning policy in urban area development of both of the studied cities is moving towards a more facilitating approach (Schaller & Novy, 2010). Facilitating is in this study understood as complementing and supporting private parties in initiating (development) projects and taking according actions (Heurkens, 2012, p. 57). In line with the respective national trends, for New York the shift to a facilitating approach to policy means departing from the traditional neoliberal policy and taking on a more active role in development projects. For Rotterdam on the other hand, the move to facilitating policy entails a reduction of public involvement and its dominating role. In practice, both shifts result in the cities' governments reconsidering their responsibilities and role in area development. Both cities aim to actively stimulate socially wanted spatial developments while limiting public spending by enhancing market actors' abilities to invest. However, the findings of this study show that this shift, which would entail far-reaching changes in the institutional landscape, is not (yet) apparent in current development processes of both cities. In Rotterdam for example, the city still largely has its leading position in area development. The municipality owns large parts of the land and commissions tenders for the (re-)development of certain areas. Even while the requirements for- and government control over these projects has been brought back, the municipality still defines the development approach and sets many of the future characteristics for these areas. For instance, in the case of Merwe-Vierhavens this prevailing control is embodied by the municipality's Area Management Team (AMT M4H). In NYC on the other hand, the role the departments currently take is too limited to really facilitate the local actors. Rather, government agencies themselves are facilitated by various kinds of NGO's.

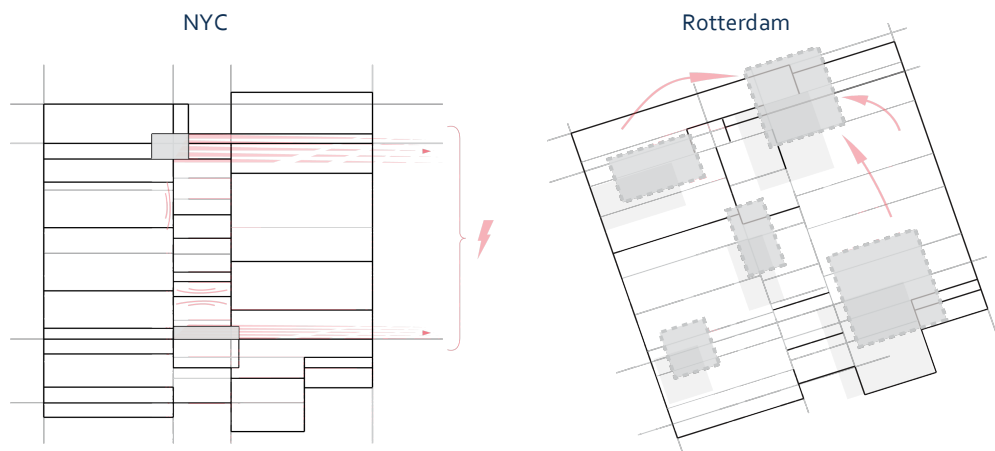


Figure 50. Structure institutional landscape NYC and Rotterdam

3. CONCLUSIONS FLOOD RESILIENCY

The study assessed flood resiliency of the studied areas according to the characteristics as proposed by Lu (2014). This model is chosen as it is developed especially for the field of in urban planning and in the perspective of international comparison. As mentioned, one of the main challenges of comparing flood resiliency lies in its definition. Resiliency in this study is understood as a capacity of a society or area to absorb and bounce back from external disturbances. The way this process takes place can vary between countries and regions. This makes it a social, cultural and local concept and affirms the assumption that policy effectiveness on this topic will be influenced by the characteristics of the institutional landscape.

"In the Netherlands, the situation is different. You're denser and have a strong tradition in government alignment. We're not that dense, and our government certainly isn't dense. As a result everything is packed in multiple jurisdictions. It is such a layered system here that makes it also complex. That makes the challenge of sea-level rise especially difficult as there is no real regional plan, this would be a question of governance, rather than government."

-M. Rowe, Municipal Art Society (MAS)

This study has found that the findings on the institutional framework can be used to explain the local expectations of society and natural points of focus within flood resiliency (see figure below). The main conclusion from comparing Rotterdam and NYC in this respect is that roughly two approaches to can be distinguished; the mitigating and the responsive approach.

The analogy of a spring can be used to explain these approaches. This is in line with the interpretation of resiliency as the ability of communities to 'bounce back' from external disturbances. The mitigating approach reflects a low elasticity of the material. This reflects a firm structure marked by its integration of a multitude of functions. This limits the impacts of external disturbances. However, thanks to the complexity of the structure and its arrangements, recovery will take a relatively long time. On the other hand, a high elasticity could illustrate the workings of a responsive approach. Here high impacts are accepted, but reaction schemes and high awareness allow for fast recovery. In understanding for example the *norms and values* we can draw conclusions on the local preference for either the mitigating or responsive approach.

In this analogy Rotterdam is characterized by its mitigating approach, as illustrated in the figure below. The Netherlands has a long history of integrating flood safety measures in spatial planning. The inner-dike areas of

"We consider water safety in the area the responsibility of the municipality. They should take measures in preventing damages and reducing risks. There are also probably national agencies involved like the Waterboards, but in first place I would hold the municipality responsible."

-E. Tom, Panoptic Architecten/Made in 4Havens (actor Merwe-Vierhavens)

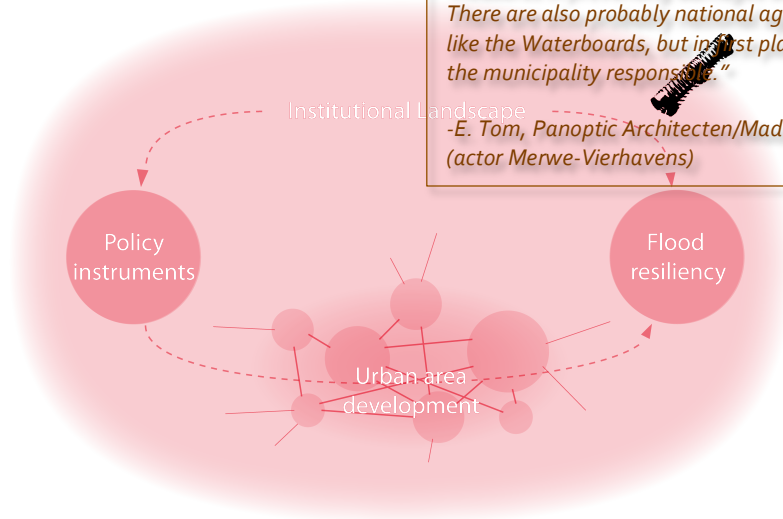


Figure 51. Relation between institutional landscape and flood resiliency

Rotterdam are very well protected against floodings. The outer dike areas, where a large part of Rotterdam's population is working and living are not protected. As apposed to the land that is protected by dikes, flood safety of these areas falls under the responsibility of the Municipality, rather than that of the Waterboards. Where formerly the City of Rotterdam carried out pilot projects and could invest in larger scale flood resiliency measures, budget cuts now make them shift to smaller projects and adopt a mainstreaming approach to spread the costs over various Departments fundings. Also, the private sector is increasingly looked at to take responsibilities and develop innovative solutions. These trends can also be observed in Merwe-Vierhavens. In plans for the development for the area the theme of living and working on and with the water is an important factor. The area is for the most part already elevated up to a safe level for the coming 50-100 years. To fix the last problem areas the maintenance cycles of roads and sewerage system will be leading.

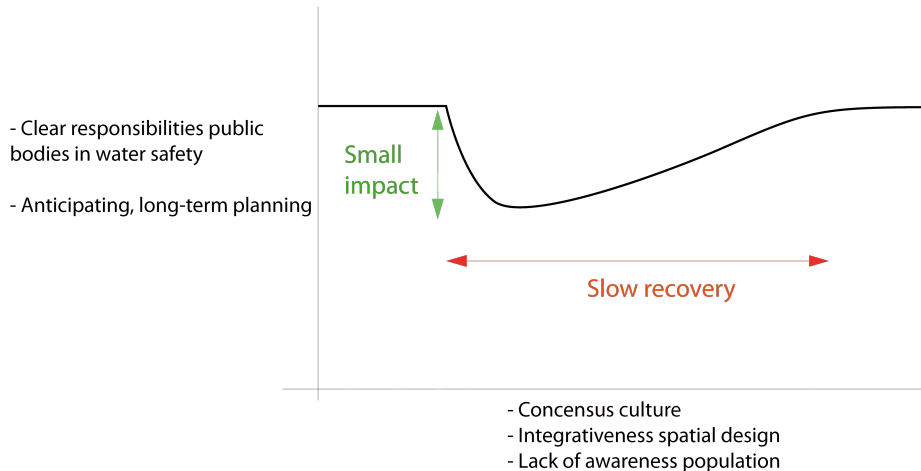


Figure 52. Rotterdams mitigating approach to flood resiliency

However, in interviewing the local actors some aspects of flood resiliency that Rotterdam still needs to work on came to surface. The weak scoring as featured in the diagram can be explained by the main problem that the local community is not at all involved in issues of water safety. Most actors in the area are not aware that they are located in an outer-dike area.

As described in the findings on the institutional framework of water management in the Netherlands there is a lot of discussion and integration with other matters of spatial planning. However, these discussions and plan making are predominantly kept within the government realm. The public is not involved in these considerations. This, together with no recent major flooding events, makes flood protection measures not very visible and safety naturally assumed by the public to be guaranteed. However, in these outer-dike areas, main responsibility to take actions lies with the community itself. A positive notion is that most actors, when aware of the situation indicate willingness to invest in an integrative solution to protect the area. Most important focus of Rotterdam's city authorities thus should be to better inform the actors of the risks of these locations and involve them more in plan making.

"If you want to develop an area in an integrative manner, a dike has to feature other functions than just flood defence."

-R. Ammerlaan, Hoogheemraadschap Delfland (Waterboard region Rotterdam)

"Long term flood resiliency is best handled by a comprehensive plan that would be driven by regulatory authorities not individual actions, however, we have no insight in to what kind of plans are available. That said, any individual property/land owner should do whatever he or she can."

- S. Martin, Selldorf Architects (actor Sunset Park)

The focus on the more responsive approach to flood resiliency is also based on the findings on the institutional landscape of the US. Characteristics are illustrated in the figure below. The urgency of improving flood resiliency in New York has been made clear by Hurricane Sandy in 2012. Before this event there was little attention for flood risks in NYC. It became clear that vulnerabilities weren't adequately mapped, there were almost no protective measures taken and there was no awareness of flood risks within government organizations, nor the local population. Since then, a lot of public action has been taken in (re-) assessing the risks and making plans to improve resiliency citywide. This can be explained by the strong responsive and result-driven institutional landscape of water safety in the US/NYC. Also, the importance of local action and community involvement is reflected in the current situation of Sunset Park, as perceived by local actors. However, as we can conclude the local community is not aware of any clear goals for resiliency defined for the area. The finding that there are few initiating actions by public parties perceived by local actors fits clearly in the limited role of government interference in US society.

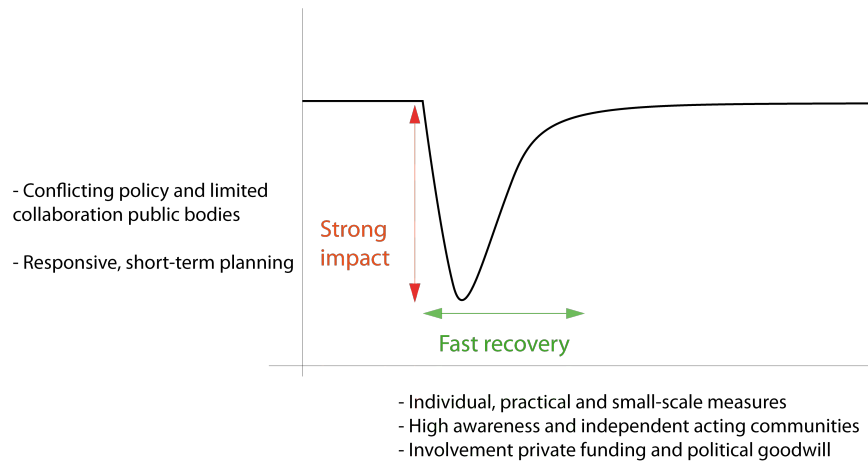


Figure 53. Rotterdams mitigating approach to flood resiliency

While the local community in Sunset Park does have the feeling to be involved in this challenge, so far, local goals or actions are not very much observed. This gap can be explained by the discrepancy between public agencies' means and goals. Also, actors accent in the need for these aspects of flood resiliency may be understood in the result-driven culture of US society.

Flood resiliency as perceived by the interviewed actors reflects these findings and is mapped in the diagram below. Actors in both Rotterdam as well as NYC consider the current situation on flood risk in the area and the future threats adequately assessed. Interviewees in NYC indicate that this knowledge has mostly been built after Hurricane Sandy struck in 2012. This is also confirmed in several expert interviews (Aerts, 2014; Westerhof, 2014; Porto, 2014). Weaknesses in NYC lie in the translation from visions and plans to actual measures being taken and a lack of clear goals for resiliency of the area.

"However, all levels of government are focussing a lot more on climate adaptation and resiliency. Also now Sandy is maybe not so fresh in peoples minds anymore, resiliency is part of the conversation now. The political will is in a place where acting on resiliency measures is a lot more feasible than it was maybe ten years ago. "

- A. Devening, SBIDC

Flood resiliency of Rotterdam's urban areas seems lagging behind New York according to the diagram below. However, one needs to keep in mind that this is actors' *perception* of flood resiliency. What these parameters reflect is that in different cultures, different physical requirements may be considered necessary for resiliency. Where one culture focuses on the capacity to respond to external influence, the other may try to achieve resiliency by taking preventing measures. This distinction is very apparent in the comparison of the approach of NYC (response) with Rotterdam (prevention).

Experienced flood resiliency

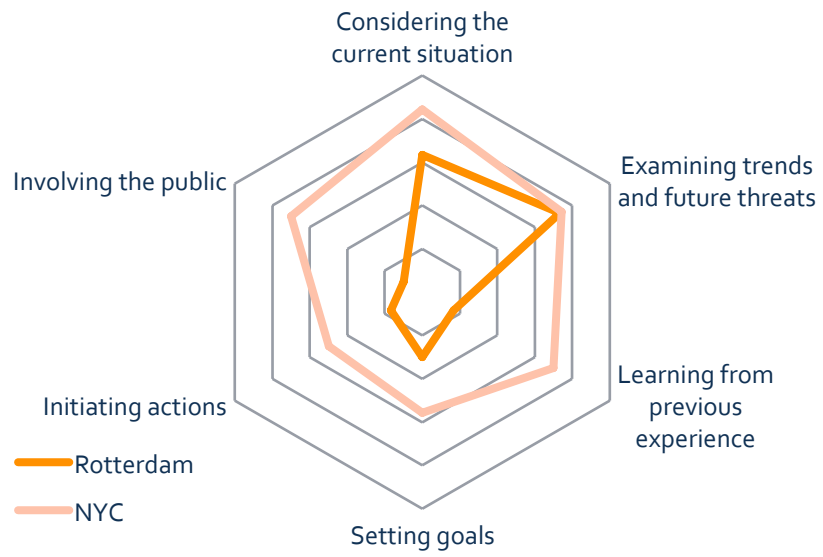


Figure 54. Flood resiliency in Sunset Park and Merwe-Vierhavens compared

4. CONCLUSIONS POLICY INSTRUMENTS

The working of policy instruments is defined by the perceptions and according behavior of actors in the studied areas (see figure below). The actions that are currently taken by actors in Sunset Park to improve flood resiliency are predominantly focused on building and parcel level. Answers further indicate that an integrated protection system for the whole area is expected to bring better protection. However, the uncertainties of the costs and benefits of such a project are considered too substantial to make a feasible business case. Also, actors indicate that risks are initially the responsibility of the individual businesses and organizations housed in the area. A long-term collaboration raises questions as to which parties should invest and who should take initiative and responsibility when it comes to realization.

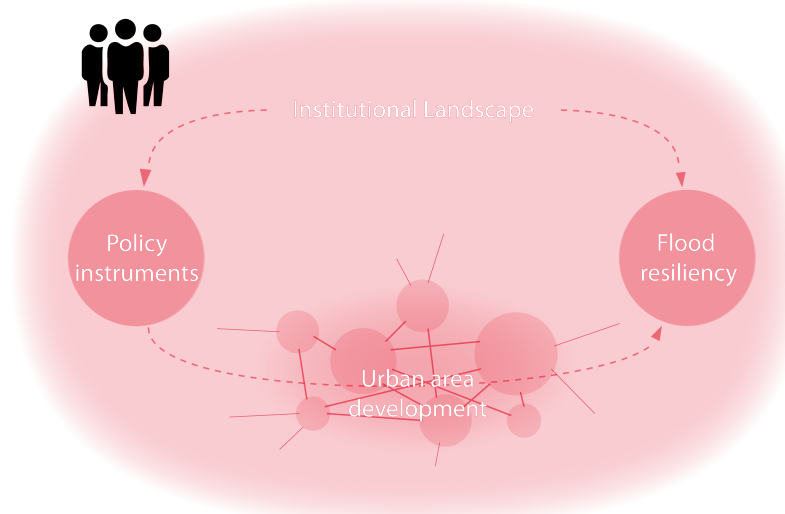


Figure 55. Relation between institutional landscape and policy instruments

An important incongruity in NYC's policy on building flood resiliency is the contrast of shaping policies, providing ambitious plans and visions with the lack of concrete actions or available funding. The strong hierarchy and panarchy of the institutional structure of US government now makes that policies are rarely able to reach local actors, let alone stimulate collective action.

In Rotterdam actions in building flood resiliency of Merwe-Vierhavens are predominantly taken by the municipality and the Stadshavens organization, a public-private partnership of the municipality and port authority. Safety levels of land elevation are established, providing clear goals for development. Plans to carry out elevation works are based on mainstreaming with other municipal interventions in the public space. Also, current and future risk maps and scenarios are regularly updated. However, current private actors in the area are not aware of, let alone influenced by these policies.

The diagram below shows the main types policy instruments as currently employed in Rotterdam and NYC. The predominant instruments that are currently deployed in NYC to build flood resiliency of the urban environment are of shaping and regulating nature. While actors experience a strong focus on community involvement, these initiatives are often carried out by local non-profit groups rather than by public agencies themselves.

"...we are making sure that when we're doing any maintenance works on streets and the sewerage system the new constructions will be at the level of +3.6om."

- C. Andriessen, City Development Department Rotterdam

Issued policy instruments

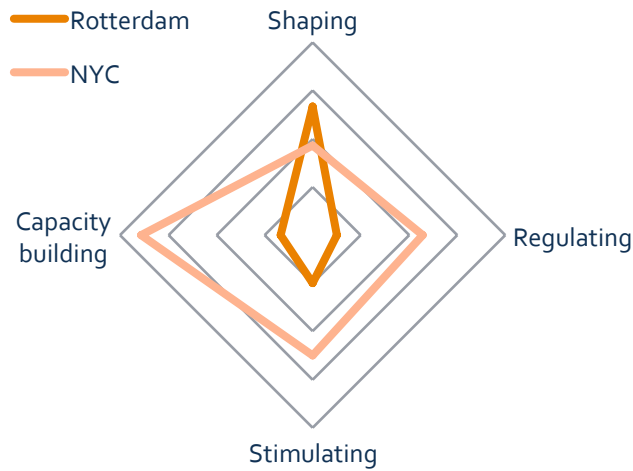


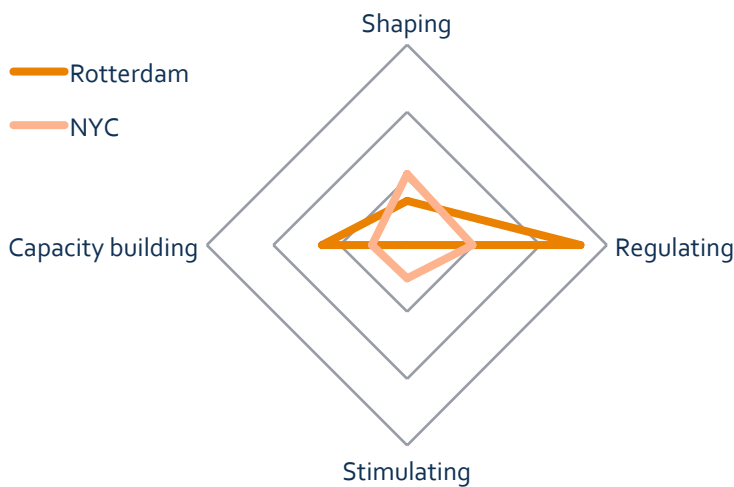
Figure 56. Issued policy instruments to stimulate collective action for flood resiliency in Rotterdam and NYC

The diagrams below visualize the findings on what policy instruments are experienced and which ones are missing according to local actors in Merwe-Vierhavens and Sunset Park. What we see is that even though in Rotterdam there is not much stimulating policy experienced when it comes to building flood resiliency of the area, actors indicate that this isn't crucial. This, opposed to the opinion of actors in NYC, who consider the current lack of public funding one of the main hampering factors in stimulating collective action towards flood resiliency of Sunset Park. While the experienced level of shaping, capacity building and regulating policies varies between the cities, would like to see them being enhanced equally. This indicates certain preferences of the actors. For example, capacity building policies are much more experienced in NYC, but still need improvement to achieve desired effects, just like in Rotterdam where little action is experienced in this field.

"Protecting the collective is a difficult problem. Problems lie both in funding as well as communication and coordination between government agencies."
 - J. Laufer, Community Board 07

"Communication with local stakeholders, as well as integration of resiliency in regulations and zoning are the most important aspects of current City policy that could be improved. "
 - A. Devening, SBIDC

Experienced policy instruments



Necessary policy instruments

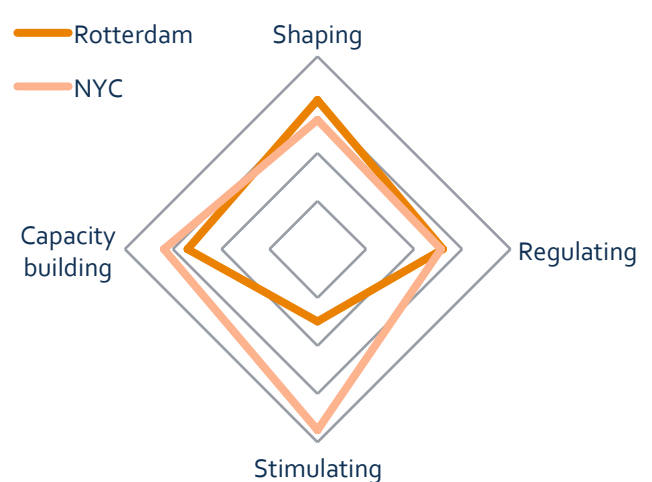


Figure 57. Experienced and needed policy instruments for flood resiliency in Rotterdam and NYC

5. INSTITUTIONAL LANDSCAPE AND POLICY EFFECTIVENESS

Lastly, this study focused on the influence of the institutional landscape on policy effectiveness (see figure below). What can be concluded from the findings on flood resiliency and institutional landscape, is the third assumption can be affirmed; differences in the institutional landscape indeed result in differences in the effectiveness of policy instruments.

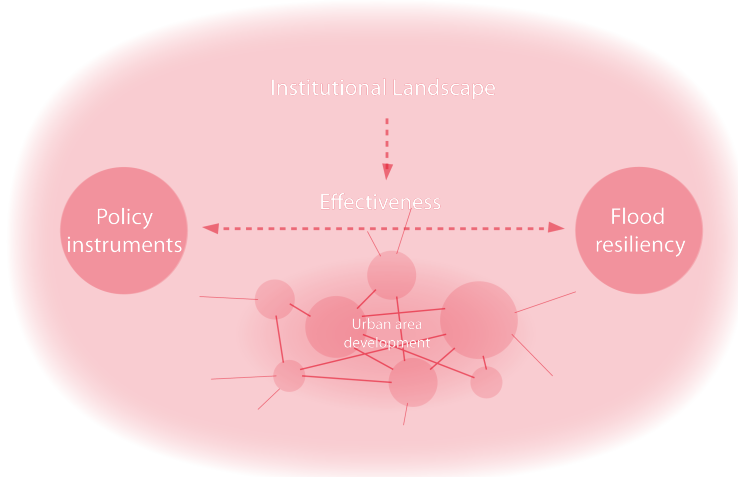
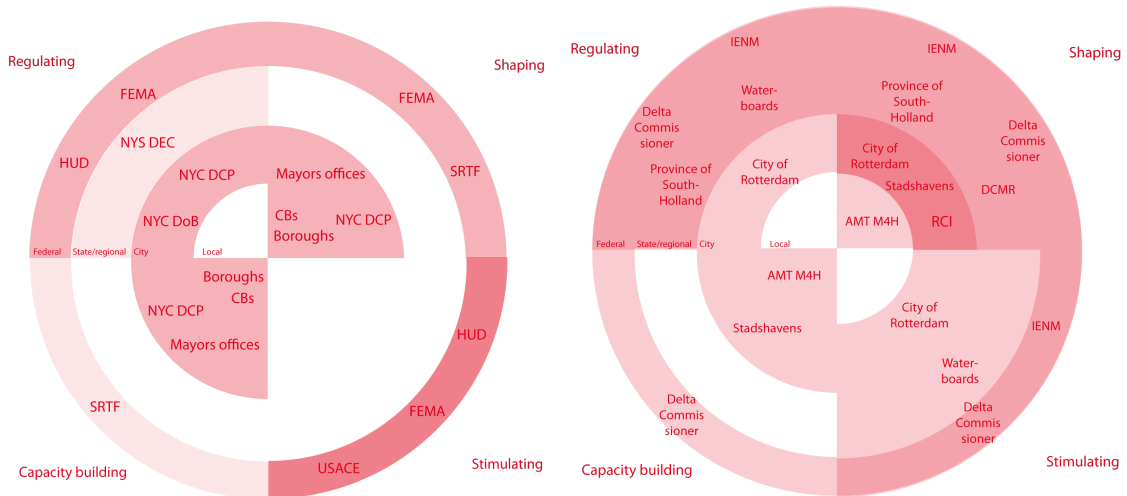


Figure 58. Influence of the institutional landscape on the effectiveness of policy instruments

When policy-issuing agencies in the field of spatial planning for flood resiliency are mapped, the figures below are obtained. These overviews clearly visualize the gaps the respective institutional landscapes create. While Rotterdam shows a strong spreading of agencies involved on all levels of government, the strong hierarchy of US government limits the effect of federal policies on local practice. Where shaping and regulating frameworks are well established and structured in Rotterdam, the main hampering factor here is the lack of capacity building policies.

"The Dutch model, I think, is more of a unitary model. Government, well-respected and trusted. Seen as the protector of the society. Here, government is not seen that way, which is too bad. Also it is very difficult to get coordination across jurisdictions. "

-M. Rowe, Municipal Art Society (MAS)



95 Figure 59. Public agencies according to the typology of their main policy instrument in building flood resiliency in NYC (left) and Rotterdam (right) compared

The emphasis of individual freedom, short-term results and local action, together with limitation of government intervention in the institutional landscape of NYC can be used to explain the strong emphasis on capacity building policy instruments. The natural distrust with regard to public intervention is also reflected in the actors' need for more stimulating policy instruments. Local parties would rather have control over projects in their environment and be involved in planning issues.

The lack of direct communication in Rotterdam between public agencies and the local community is most clear in the fact that actors in Merwe-Vierhavens now often are not aware that they are located in outer-dike areas. This, while it is the responsibility of the municipality to at least inform them of this fact. In general, Dutch citizens' lack of consciousness of their location with regard to flood risks is confirmed by Boer, Botzen, & Terpstra (2012). One can conclude that topics like climate adaptation and resiliency in the Netherlands are very much prevalent in discussions and plan making of public agencies. Also, in the field of urban development collaboration and partnership with local parties and private actors are certainly sought and stimulated. However, this doesn't seem to be the case so much for climate adaptation and flood resiliency.

"We would very much like to see more initiatives for workshops and collaboration in this neighborhood. Maybe these should be organized by more local parties like elected officials and non-governmental organizations like UPROSE. This would be much more beneficial than plans just dropped into our community. Funding should of course still come from City agencies, but these kinds of projects should really be carried out in close collaboration with local partners. These workshops could be run by those with the expertise, but have buy-in from people within this community."

- J. Laufer, Community Board 07

6. SUMMARIZING CONCLUSIONS

Overall goals of the study's comparison of Rotterdam and NYC were to:

- I. Assess the **effectiveness** of current policy instruments in building flood resiliency of urban areas
- II. Identify characteristics of the institutional landscape that **influence** the effectiveness of these policy instruments.

From the analysis of the institutional landscape of building flood resiliency in both Rotterdam and NYC several conclusions can be drawn, which will be explained below:

- The institutional landscape influences the effectiveness of policy instruments for building flood resiliency in urban areas.
- The cases of Rotterdam and NYC show that institutional factors that hamper the effectiveness vary amongst cities. Also, even for cities that have various similarities (Rotterdam and NYC both being developed western democracies, long-term harbor tradition, etc.) differences in the socio-political environment may make or break the effect of policy instruments.
- The characteristics of the institutional landscape are directly related to a city's preference in approach of building (flood) resiliency. Roughly two approached can be distinguished; the mitigating approach (Rotterdam) and the responsive approach (NYC).
- In NYC, the main hampering factor is a lack of coordination between public agencies. This issue plays between the different levels government as well as between the departments of a specific level. This lack of agency collaboration is particularly prevalent in waterfront development. This, because these projects typically span policy domains (to name a few: environmental protection, economic development, building/housing, social justice etc.) and various jurisdictions. Especially the lack of coordination of regulations and funding allocation and project implementation makes it very difficult for private actors to depend on or benefit from public intervention.
- In Rotterdam there is a lack of community involvedness. While there is a strong tradition in water management by public parties most discussion takes place amongst planners and water management professionals. This makes that local actors experience few incentives to take innovative actions, rely heavily on government action and most importantly have a low awareness of the flood risks that come with their location.
- In NYC initiatives are largely responsive and individual. As a consequence, integrative and area-wide projects are hard to achieve. However, taking advantage of a sense of urgency, small-scale initiatives can be carried out very quickly. In Rotterdam, processes are long-term and to a large extent driven by consensus. This makes larger projects with many integrated functions more feasible, but only over a long period of time and much discussion.

Overall:

- In spite of the policy efforts and ambitious strategies, both in NYC and Rotterdam, the integration of area development with the building of flood resiliency is a learning process that is far from being finished.
- Other delta cities in the world can learn and benefit from the experiences of NYC and Rotterdam. Given, however, the fact that even for these rather similar cases, the effect of the institutional landscape can differ largely, care must be taken in blindly projecting policy solutions to other places.

"We think some pretty significant measures need to be taken to prepare for climate change, however, as of now we see only small steps taken by businesses as well as public agencies."

- A. Devening, SBIDC (actor Sunset Park)

"The government shouldn't approach such tasks all by themselves, that is not efficient and there is no need for it."

- H. Pum, Rotterdams Collectief (actor merwe-Vierhavens)

EXPLANATION

Firstly, Rotterdam and NYC differ largely in their approach to flood resiliency as well as urban area development. Water management, as established since the Middle Ages, forms the basis of the Dutch political system as well as spatial planning practice. It is of no wonder that the various bodies that have developed over the centuries form a very strong framework with very distinct tasks and clear responsibilities. Nevertheless, with recent cultural and natural changes, hierarchical relations and responsibilities have become subject of discussion. Water management in the USA on the other hand has never been much emphasized. Accordingly, NYC experiences only little federal or state interference on this subject. The restraint role of government in the USA, and NYC in particular, also explains the strong involvement of local community groups and Non-Governmental Organizations (NGO's) when it comes to the realization public action in urban areas. The different norms and values dictate a very different perception on the allocation of risks. Where in recent years NYC has seen a shift towards more public involvement and responsibility, the gap with the facilitating approach of Rotterdam is still apparent. Even private parties that were affected by recent floodings in NYC underwrite the individual's responsibility of being located in these areas. The continuation of the public insurance program becomes all the more uncertain as flood risks are rising.

This is directly opposed to the Dutch approach where water safety is considered to be of national importance and costs are to be borne and distributed over society as a whole. All residents, even those living in non-protected areas pay Waterboard taxes, which could be interpreted as a form of flood insurance. This of course reflects the natural location that makes that in the Netherlands the majority of the population lives and works in areas that lie below sea level. Besides the firm framework, Dutch governance on flood resiliency is marked by platforms aimed at discussion and collaboration on specific challenges in society. Where historically these were mostly formed by public agencies, now also collaboration with private parties is increasingly sought. These kinds of platforms or program organizations involve discussions on all topics that may be integrated and affected by the issues at hand. Therefore, large amounts of stakeholders are involved and the programs are generally longer-term. Also, parties may be invited to join in the conversations; this openness makes the platforms dynamic in their composition. The authority, embeddedness in existing public institutions and responsibilities of such platforms varies. When comparing the Delta Program with the Rotterdam Climate Initiative one can see how these aspects are largely determined by the constituency of the parties that are involved and the scope of the issue which is focused on.

Within the clearly defined structure of the institutional landscape that typifies the Netherlands, policy emphasis lies traditionally on standards and norms. This results in regulating and stimulating policies rather than capacity building initiatives. Also, discussions and collaborative platforms are taking place in the planning sphere and do not often descend to individuals in the local community. This makes public awareness, involvedness and capacity to act of individuals rather limited.

A weakness of the strong framework is that agencies cling to their historical responsibilities and area of operations, while the challenges of water management especially in urban environments have drastically changed. What adds to this is that the platforms of collaboration are limited

"The implementation [of policy on flood resiliency] is substantially different from the implementation in the Netherlands. This does not mean that this is more effective or not, that is hard to compare."

(translation) - H. Ovink, Principal 'Rebuild by Design'

"The question is also; who pays for it? You could of course ask all members of the community to invest in it, but they are not going to do that. Basically it is a larger problem that people who live in non-flood zones currently pay taxes that subsidize people that live in floodplains. That's a political problem, you have to convince people to chip in for the common good. The dangerous part about thinking on a district level is to assess the true capacities of the people to collectively work together. Communitarism can be dangerous."

-J. Keenan, CURE. Columbia University

"Simply said, the Dutch approach [to flood resiliency] can be characterized as being integrated and with straightforward legislation. In the USA the approach is more individualistic and local and subject to old and complex, often conflicting regulations."

(translation) - H. Ovink, Principal 'Rebuild by Design'

in affecting the core operations of the agencies that are involved. Another disadvantage of the Dutch approach is that the population is taking for granted and has grown dependent of the government's responsibilities in water safety. However, with rising risks and decreasing budgets of local public agencies the awareness and involvement of local and private parties is to be increased if safety is to be guaranteed.

NYC on the other hand is marked by stronger boundaries between vertical and within horizontal layers of government. Also, the public intervention is much more limited. This makes that any public action is to have a clear purpose or goal that would not be achieved by individual action or the private market. This makes government interventions often responding to events or pressing issues within society. This more result-driven and short-term focus is linked to the important role of politics and ideology in US government. Elected officials are to protect the freedom of choice of individual citizens. This, together with economic development as the main driver of decision-making in the US makes that individuals are very much involved in both national as well as local politics. The belief in power to control and influence the environment explains the existence of task forces and the need for political champions. These smaller forces, thanks to their special status, are capable of quick action and sometimes even small but lasting changes within the rigid government framework. This makes individuals' awareness and willingness to take action in enhancing their situation and local environment also very strong.

Weakness of this system when it comes to highly complex challenges like flood resiliency and urban development is that there is that an integrative, collaborative approach may be necessary to make any action on area-scale possible. Where trust and sharing of interests between parties in the Netherlands seems natural, and can in fact be understood as the result the traditionally shared problem of water management, these crucial aspects are all too often lacking in US practice.

EXCHANGE OF POLICIES

This study concludes that Rotterdam and NYC may very well learn from each other's efforts in building flood resiliency. Both policy approaches differ largely and have their strengths and weaknesses. Some interchanging of methods between the cities could help raising effectiveness. For example; Rotterdam needs to pay more attention to involving the local community in their plans. NYC has a strong tradition of organizing community workshops and facilitating local actors in taking individual measures on parcel level. Looking at NYC's methods, Rotterdam could improve awareness on water management and flood safety in local communities.

However, policies can't simply be copied. This study has made it clear that insight in the characteristics of the local institutional landscape is crucial in choosing those policy instruments that will prove effective. The institutional landscape on the one hand clarifies expectations on flood resiliency and on the other hand reveals the workings of the socio-political system. Together these form the boundaries for policy instruments to practice their working, and thus mark their effectiveness. Proposed changes to strengthen the effectiveness of current policy for flood resiliency are featured in the recommendations chapter.

Water management policies like the multi-layer safety model, as employed by Dutch national government, wouldn't answer to NYC's needs in resiliency or fit in it's current institutional landscape. Just like the mainstreaming approach as currently adopted in Rotterdam, and the integration of other functions in water management works, this policy is based on far-reaching collaboration of public agencies. Also, these policies are aimed at providing strong preparedness and protective resiliency to flooding. Except, in accordance with the findings on culture and politics, NYC's actors have been found to stress the importance of responsive aspects. Besides, integrating flood resiliency measures on area-level may work in Dutch practice, where municipalities are traditionally very much involved in the spatial management and development of urban districts.

"In the Netherlands we're used to integrated thinking. This is how we try to bridge the fragmentations that also exist in Dutch government responsibilities. This also has its drawbacks: we can make things more difficult and complex than they need to be. This can obstruct the realization of certain projects. But in general we can integrate a lot of interests in our projects. Our governance system, legally, politically as well as financially is build to make this integrality and complexity possible. This is not the case in NYC. There policies and programs get broken down into the smallest possible parts. This, to make them achievable on the lowest scale by individual actors."

(translation) - H. Ovink, Principal 'Rebuild by Design'

Hence, to apply Dutch policies effectively in NYC the institutional landscape would need to be changed on fundamental aspects like culture, government structure and arrangements. Depending on all involved public as well as private actors, it is not very likely NYC's government is capable of making these drastic changes to its socio-political system. Even if it would be possible, these shifts would take a considerable amount of time. However, NYC needs to take action fast to protect its vulnerable areas for a next extreme weather event (Westerhof, 2014).

On the other hand, differences in institutional landscape indicate that NYC's policies may not always work in Rotterdam. Policy programs like Rebuild by Design often rely on large-scale community commitment and the involvement of NGO's and funding by private parties. This would not work in Rotterdam for several reasons. When it comes to water management and flood safety, the population's strong confidence in government actions has left awareness in the Netherlands rather low. Therefore, first the awareness of local communities needs to be built, before any commitment or investment in working towards solutions could be expected. Furthermore, the government's dominant position, in particular in water management and spatial planning, has left the role of NGO's less prevalent than in NYC. In general, in Rotterdam there are fewer external parties to rely on when it comes to the funding of civil works or further development of the city's policy programs. In Rotterdam too a (quick) shift in the institutional landscape that would make these specific policy instruments of NYC effective is unlikely. Besides, considering the overall high levels of flood safety, it is not very likely that Rotterdam would want to totally depart from its mitigating focus of flood resiliency from preparedness to responsiveness. The recommendations chapter presents the policy instruments that Rotterdam and NYC could learn from each other's approach and apply in their own situation with respect to their own institutional landscape.

VI. RECOMMENDATIONS

Over the course of the study, a working method has been developed to improve the effectiveness of current policy on increasing urban flood resiliency. Outcome of this step-by-step plan is to provide city authorities with practical information for policy changes, specifically tailored to the local characteristics of the socio-political environment. The working plan is based on the mapping of the institutional landscape and entails following steps:

1. Assess current **policy ineffectiveness**
2. Define **development drivers**
3. Select and facilitate **key actors**

Findings of the study show that the local socio-political environment, the institutional landscape, influences the effectiveness of policy instruments. Therefore, as local characteristics vary across cities and countries, outcomes of this working model will be different for each city. The institutional landscape is a key concept in this model, as it explains means and possibilities of actors on the one hand and on the other hand clarifies objectives for flood resiliency of urban areas. Furthermore, in providing starting points for possible solutions, the institutional landscape is found to explain development drivers as well as key actors.

The model is further explained in the following paragraph. This paragraph is aimed to help cities in general that are looking into possibilities to make their current policy on flood resiliency more effective. Consequently, the model is applied to Rotterdam and NYC. The comparative research of this study provides important lessons. These, structured by the step-by-step model for improvement, form the basis for the specific recommendations for these cities. The chapter concludes with formulating recommendations for further research.

1. RECOMMENDATIONS FOR CITIES BUILDING RESILIENCY

As explained, not only Rotterdam and NYC, but also many other cities around the globe need to build resiliency of their urban environment for the effects of climate change. Furthermore, other cities are also known to face obstacles in implementing their adaptation strategies. The development of a model for the improvement of policy effectiveness is aimed at translating the findings of the comparison between Rotterdam and NYC to information that is relevant for these other adapting cities. To enhance the effectiveness of current policy instruments, city authorities are advised first to map the local institutional landscape of urban development and flood resiliency. Following the same approach as this research, the characteristics of *norms and values*, *interests of actors*, *arrangements*, *structure* and *rules and policies* are to be examined. Findings on these local socio-political characteristics form the basis for going through the following steps.

A. ASSESS CURRENT POLICY INEFFECTIVENESS

First, an overview of all current policy instruments needs to be obtained. Here the findings on *arrangements*, *structure* and *rules and policies* guide the explanation on how these instruments can actually reach and affect the actors in the development process.

This step furthermore involves looking into the local expectations on flood resiliency. Roughly two approaches can be distinguished; a mitigating and a responsive approach. In following the analogy of the spring, the mitigating approach reflects a high stiffness of the material. This makes sure impacts of external disturbances will be limited, but recovery will take a relatively long time. A high elasticity could illustrate the workings of a responsive approach. Here high impacts are accepted, but reaction schemes and high awareness allow for fast recovery. In understanding *norms and values* we can draw conclusions on the local natural preference for either the mitigating or responsive approach. This preference defines the aspects of flood resiliency that will be most viable to realize resiliency measures. City authorities need to take this preference into consideration because for improved resiliency, also aspects of the other approach are necessary. For instance, a mitigating city will naturally pay more attention to mapping future risks and threats than to involving the public. In strictly following this single approach to resiliency, the capacity of the area to recover from impacts stays underdeveloped. Hence, in knowing the naturally preferred approach, current weaknesses in flood resiliency are easily discovered.

B. DEFINE DEVELOPMENT DRIVERS

When the *interests of actor* and *norms and values* prevalent in the local institutional landscape are known, the most important forces that drive development processes can be determined. In some cities that are marked by a liberal or capitalist culture, the most important driver may for example be the economic development of an area. Taking this example, it is clear that if the building of flood resiliency would also improve job opportunities, increase profits or provide chances for local businesses, measures would be more easily implemented. Hence, by linking flood resiliency measures to the drivers of (local) area development actors become involved and are more likely to take action. Furthermore, the design of the employed policy instruments must reflect these drivers. For example, to answer to a liberal institutional environment, stimulating policy instruments may take the form of subsidies and tax cuts rather than the direct realization of construction works by public agencies themselves.

Instead of capitalism or liberalism, the institutional landscape could also be marked by cultures that are based on, for instance, social inclusiveness, hierarchy or democracy. Then, one could make the similar arguments, but would define different driving forces, for cities in these socio-political environments.

C. SELECT AND FACILITATE KEY ACTORS

Characteristics like the *interests of actors*, *arrangements* and *structure* give insight in the roles that different actors play in the local institutional landscape. Within government, certain public agencies or departments may have more power than others. For example, the position of local public agencies can be very dominant in local practice and independent from higher levels of government or not. In this step, also the position and possibilities of private actors and individual stakeholders needs to be examined.

An analysis of the distribution of actors' means (f.e. budget, political power, leadership and realization capacity) needs to be conducted. This analysis focuses on the key drivers in the previous step. Key actors either have a strong personal connection with the area or are parties that have direct access to one or more of the key driving forces.

Last step is to facilitate these key actors and stimulate them to incorporate flood resiliency measures in their projects and actions. In cultures that are characterized by a focus on collaboration and partnerships, it may be best for city authorities to focus on capacity-building policy instruments. Selected key actors need to be connected here, and alliances promoted. This way, parties are stimulated to form long-term teams for the entire development of the area. These teams then represent high interests in the area but also feature access to all crucial driving forces. In more individualistic societies the formation of such a team may not be feasible. To make sure all facets of flood resiliency are covered in the development of vulnerable areas city authorities might be well advised to propose a set of comprehensive measures. Different actors can then take up these measures as their individual projects. Here it is important that city authorities need to ensure that for each project, and in the overall alignment of the program parts, the (set of) actors that is involved both have interests in development of the area and also have access to key driving forces.

"The problem itself could prove to work as a binding factor for local actors. It could be a reason for public agencies to emphasize this topic in order to create this community in the area."

-E. Tom, Panoptic Architecten/Made in 4Havens

2. RECOMMENDATIONS FOR ROTTERDAM

A. ASSESS CURRENT POLICY INEFFECTIVENESS

The ineffectiveness of current policy instruments in Rotterdam is elaborated upon in the findings and conclusions chapters. Most important shortcoming in the realization of flood resiliency is the lack of awareness and involvement of the local community. This is in line with the findings on Rotterdam's mitigating approach to flood resiliency. Current policy focuses on regulative and shaping instruments and doesn't answer to the needs to complement the current mitigating approach with responsive measures.

"We're not aware of any goals or plans specific for this area to raise flood resiliency. "

-E. Tom, Panoptic Architecten/Made in 4Havens

"We have no plans for if there would be a flood and our building would be damaged. This is probably not covered by insurance. We also never discussed it within our organization."

- R. Borst, Vervat Vastgoed

B. DEFINE DEVELOPMENT DRIVERS

Urban development in the Netherlands is often based on large-scale integrative projects and plans. Government involvement in spatial planning is considerable. Considering the limited amount of available land, the aim of Dutch government to stimulate equal chances and social inclusiveness is also pervasive in area development.

However, the negative effects of recent financial and property crises are widespread and are still felt by developers, landowners and business owners, in particular in Rotterdam. As prices are low, the profit margins may be considerable. Congruently, besides local interests, chances for economic development and social inclusiveness are considered as the main reasons for actors to get involved in development of Merwe-Vierhavens. These are defined as the main drivers.

"The area could very well function as a test site for educational and engineering pilots for water management projects. We have already been contacted by several interested parties and see a lot of possibilities to also link these initiatives and create a centre of technological innovation."

- C. Andriessen, City Development Department Rotterdam

C. SELECT AND FACILITATE KEY ACTORS

Findings on the *arrangements* and *structure* of the institutional landscape indicate that the national water management agency, the Delta commission, has important funding possibilities. As a public agency, it has an interest in the economic development of inner-city areas and the safety of inner- as well as outer-dike areas. To stimulate the involvement of this agency, Rotterdam could for example suggest the Merwe-Vierhaven district as a focus area within the regional implementation of the Deltaprogram.

Also, it is important that city authorities stimulate the Port of Rotterdam to become more involved in measures of flood resiliency and the overall development of the area. Considering its core business of economic development of the harbors as well as owning large parts of the land in the Merwe-Vierhaven area, connection to the area and interests in its economic development are clear.

"What we see in area development is that there is a shift in strategy from 'divide and conquer' to a more connecting and collaborative approach. By connecting actors in an area they could gain power to carry forward larger projects, since they have a lot of shared interests."

-E. Tom, Panoptic Architecten/Made in 4Havens

Also, the businesses that are currently housed in Merwe-Vierhavens view themselves as 'urban pioneers', being the first investors in this district. Therefore, they have a strong connection to the economic development of the area. This means that local businesses and development actors may be more susceptible for long-term projects and risky investment opportunities than in other parts of the city.

To complement the current mitigating approach to

flood resiliency, Rotterdam needs to pay more attention to communication with its citizens and communities. To improve response and recovery, the public needs to be more aware of issues of water safety. An important finding of the actor interviews is that individuals and local parties would be willing to participate in the planning for flood resiliency and get involved in projects in the area. However, as mentioned, they currently lack awareness. This awareness could perhaps easily be enhanced by involving local community groups like the Keiletafel and the district committee more actively in the process of (re-) development of the area.

Another important group is that of the designers and spatial planners. Some offices active in this sector are located in Merwe-Vierhavens. This gives them an interesting twofolded interest in getting involved in long-term developments and spatial plans.

The figure below marks the selection of the actors that can play a key role in the development of the Merwe-Vierhavens area, incorporating flood resiliency measures in the process. In connecting these actors, the example of the previous paragraph on partnership and collaborative cultures can be followed. This can be translated in the need capacity-building policy instruments to build a long-term team, including all key actors. By discussing plans and setting requirements for flood resiliency and further development of the area, such a team ensures access to key development drivers but at the same time improves communication and raises awareness within the local community.

"I can imagine it would be possible or even necessary for the local businesses to get involved if an integrated plan for the area is to be developed. What kind of form this involvement should take, for example in knowledge or investment could later be determined."

- H. Pum, Rotterdams Collectief

"The idea behind the collaboration of Made in 4Havens is to start and stimulate the integrated development of the area with the local manufacturing industry. It is a platform of architects, urban designers and other creative businesses in the area. It's based on the philosophy of Richard Florida and Jane Jacobs of linking the creative sector to local social context the to enhance the economical strength of the city. In recent years a lot of pioneering creative businesses have settled in this area and we wanted to use that as a strength for further development of the area."

-E. Tom, Panoptic Architecten/Made in 4Havens

"We have meetings with the municipality and other parties in the area to look at how to improve the public space around some of our buildings. What you see is that since there are a lot of property owners, there are of course a lot of shared and conflicting interests in this public space. It is a very good initiative of the municipality to facilitate the development of the area in this manner."

- R. Borst, Vervat Vastgoed

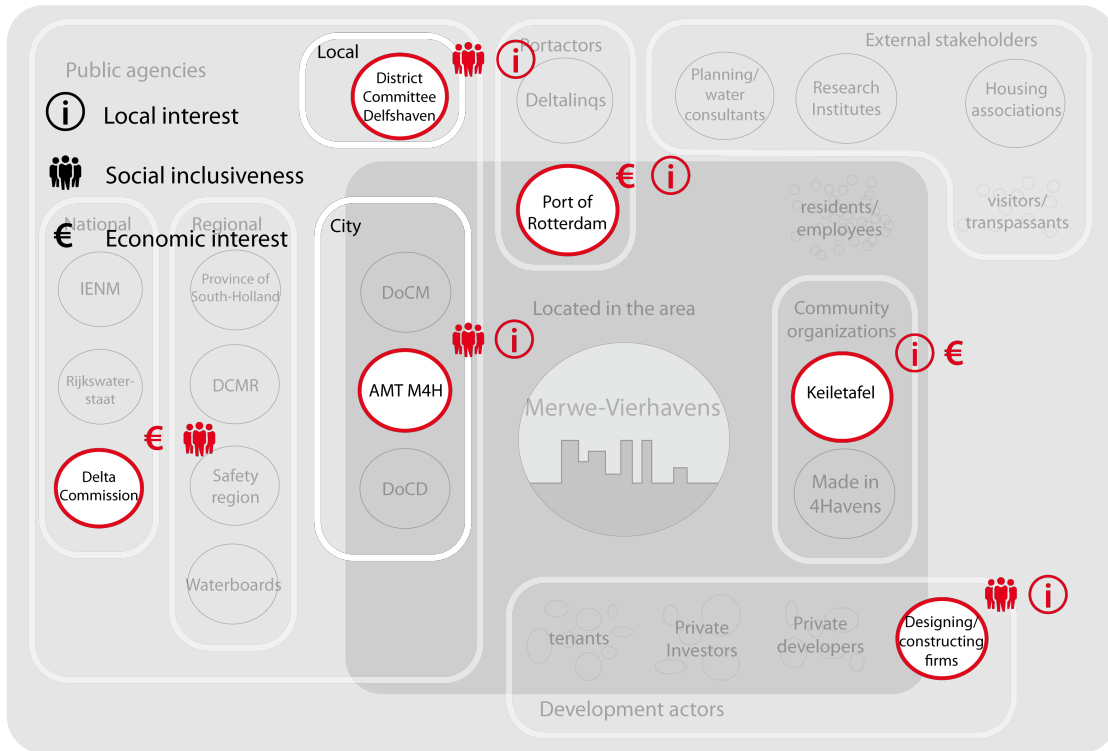


Figure 6o. Selected key actors and their main forces for area development in Rotterdam

3. RECOMMENDATIONS FOR NYC

1. ASSESS CURRENT POLICY INEFFECTIVENESS

The conclusions of this study give insight in the most important aspects that are currently lagging behind in NYC's policy on flood resiliency. In line with NYC's *norms and values*, the city's approach to flood resiliency is found to be predominantly responsive. The low scoring on initiating actions and setting goals reflects this focus. To complement the current approach, also these mitigating measures need to be taken.

Current policy is predominantly based on instruments like design guidelines and workshops that build the capacity of local actors. However, the institutional landscape of NYC is marked by its emphasis on independence and the individual. Development is therefore based on a short-term, result driven and project-based culture. Therefore, these capacity-building instruments do not naturally lead to any long-term collaborations or larger scale programs.

Also, the low alignment of policies of different public agencies currently obstructs the realization of waterfront plans. This ineffectiveness is prevalent in both stimulating instruments, for example the access to funds and subsidies, as well as in regulative instruments like building codes and environmental legislation. Thus, the current policy instruments cannot answer to the needs to complement NYC's approach to flood resiliency.

"A more regional approach is certainly needed. But then that creates problems like who's going to manage that. That complexity is what stops it in the first place. There lies a responsibility for the City to facilitate these kind of projects. The City is trying to balance these problems and do the ramifications, but it is just such a complex process of getting these projects realized. Because there are so much stakeholders involved; the public, but also the different levels of government."

- M. Porto, MWA

"Reports and plans like PlaNYC have influence on leadership but don't come down to the general community. The specific projects that are mentioned in these reports are hard to translate to concrete action within the community."

"The Vision plan for Sunset Park is more of an conceptual plan for the area, but not a concrete construction strategy."

- J. Laufer, Community Board 07

2. DEFINE DEVELOPMENT DRIVERS

In still following its neo-liberal tradition, NYC's development practice is largely plot- or parcel-based. This is directly opposed to the Dutch integrative and area-based approach, which is also marked by more government involvement. This reflects the more pervasive position of individual private developers and local businesses. Therefore, a financially feasible business case lies at the basis of almost all spatial developments.

Furthermore, political influence and leadership are often mentioned by as important to achieve government action and making public funding available. This too can be explained by the findings on the *norms and values* of NYC's institutional landscape.

"We're constantly networking. Because that's it with the greenway, you have to make people want it. That's really necessary to start getting any political support and public funding. These projects need elected officials to get behind the idea and champion it."

- M. Puryear, Brooklyn Greenway Initiative

"In the end you need leadership. When you examine all the organizational structures, at the end of the day it's all about leadership and especially the kind of leadership in connection to the kind of problem we're dealing with. A different kind of leadership is needed to deal in a post-disaster situation than in a normal day-to-day functioning of society."

-J. Keenan, CURE. Columbia University

3. SELECT AND FACILITATE KEY ACTORS

Given the limited possibilities for public parties in USA's society and the resulting limitations to interfere in area planning and development, city authorities of NYC are advised to make use of the strong private funding sector and local community enthusiasm and initiatives. As concluded from the study, private parties have a much larger role in NYC's development practice. Various NGO's, spanning from non-profit advising organizations to very active community groups and internationally operating private foundations, take on tasks that would be considered the responsibility of government agencies in the Netherlands. Therefore, their involvement in area development is vital, as illustrated in the figure below. The position of local community organizations is even further strengthened by their local interest.

Furthermore, while a large number of agencies on various levels of government may be involved in waterfront planning and legislation, many lack the financial capacity to fund large-scale (water management) constructions. Also, a direct interest of a public agency in specific areas is rare. Therefore, the role of agencies like the EDC and PANYNJ in the development of these areas is crucial. By owning land, properties or other assets in Sunset Park they both have interest in the economic development of the area. To strengthen their role, the involvement of the EDC in urban planning and collaboration with the DCP needs to be enhanced. In the case of the bi-state agency the PANYNJ, the influence in political playing field has great potential, but needs to be acknowledged and respected by current leaders of both New York and New Jersey. The districts current representative in congress has an important role in ensuring political cooperation and leadership.

This leading role of key public agencies is necessary for providing an integrated approach for the entire area. As mentioned earlier, the formation of a long-term team or partnership might not be feasible in NYC's highly individualistic society. Therefore, to include protective measures on wider scale in the process of development of the area lies in the hands of city authorities. They are recommended to make a plan or program that features a set of comprehensive measures. This is in line with the SIRR-report and PlaNYC, but this now needs to be taken a step further to a lower scale-level and linked to (already existing) plans for economic development of these areas. In the case of Sunset Park, the EDC could take the Sunset Park Waterfront Vision 2020 and see where suggestions of the SIRR-report and PlaNYC could be linked to the area's ambitions for economic development. By including individual actors within the local community in the process of drawing up such a program, their cooperation in implementation of the projects is all the more certain.

"What I would propose for Sunset Park is to protect the industrial businesses, maybe in an area-wide plan, but also with measures on building level. We talked to several parties, developers as well as local businesses, about possibilities to integrate flood protection in the BG [Brooklyn Greenway] to be realized there. We've also approached the EDC because they have complexes in the area and we think that the plan could provide protection for these assets. However, there is no funding for it. Neither the City nor the State is committed to take action."

- M. Puryear, Brooklyn Greenway Initiative

"Businesses are now taking their own measures, but that leaves the others vulnerable and also doesn't cover the problems of transportation and operations, which will still have to stop in case of flooding. An integrated infrastructure protection system would really be necessary to safeguard that. An area-wide plan like for example the elevated greenway plan would definitely be beneficial for the area. Right now no coordinated action on these kinds of plans is taken, as all businesses are more or less on their own."

- J. Laufer, Community Board 07

"We think a collaborative approach could be beneficial for the area. It is always good to have a dialogue."

- I. Siegel, Salmar Properties

"As soon as responsibilities and liabilities get shared everyone gets stressed; not only government, but also investors. This last group is mostly interested in short-term benefits, projects with a start and an end and a clear business case."

(translation) - H. Ovink, Principal 'Rebuild by Design'

"In Sunset Park there is a lot of open space, and we could see possibilities for a comprehensive, integrated area-wide flood protection system."

- E. Di Girolamo, NYC Department of City Planning

However, for the overall alignment and the realization of some of the projects the collaboration of actors may still be necessary. To achieve this, issues of trust between the different actors may need to be overwon. For example, the skepticism of some local community organizations regarding the intentions of the developers currently flocking to the area could stand in the way of open communication and realizing projects that could bring benefits for both parties.

"The general question when it comes to resiliency is whether or not big, top-down controlled projects are the best solution. This, versus distributing money at a more local level and letting smaller initiatives bubble up. But the second approach would be as for a paradigm shift in current resiliency thinking. We think multiple smaller investments would be more effective. Ultimately this would lead to more tailor-made solutions, that fit the local community and its challenges. Then the larger investment should be used to stitch these solutions together. "

-M. Rowe, Municipal Art Society (MAS)

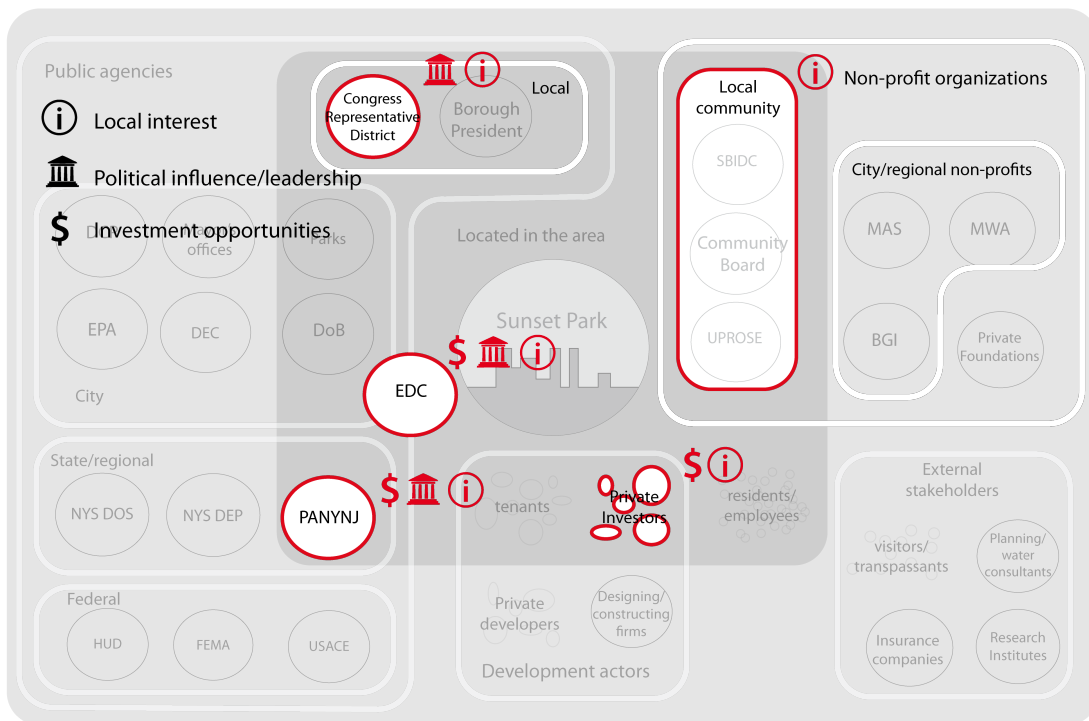


Figure 61. Selected key actors and their main forces for area development in NYC

4. RECOMMENDATIONS FOR FURTHER RESEARCH

Besides the recommendations for city authorities, also some suggestions for scholars can be made. The following paragraph features some propositions for topics of further research.

A. THE EFFECT OF RISK AWARENESS ON ACTOR BEHAVIOR

In general, the study finds that to build local flood resiliency, the involvement of various actors needs to be ensured. However, typically the primary concern of these actors does not lie in the domain of water management. To achieve involvement, first awareness is necessary. Next step for realization of resiliency building projects is to obtain a sense of urgency. The link between the sense of urgency and cooperation of actors is clearly described by the receptivity model of Jeffrey & Seaton (2004). This model describes the transitioning process that actors need to go through to embrace the goals of the adaptation strategies and implement them in their own practice.

"The property owners of this building would of course be willing to look into actions to safeguard their investment. However, the benefits should be clear and a good business case should be provided. They wouldn't take the initiative in an area-wide plan since our building wasn't severely damaged during Sandy."

- I. Siegel, Salmar Properties

In the case of flood resiliency and urban development, it would be interesting to examine this relation between actors' awareness and their involvement in building resiliency. Some more context to this issue is provided in Appendix 3; Urban flood resiliency from a private actor perspective. Further research to the perceptiveness of private actors could provide new insights in the possibilities for actor involvement of resiliency and the extent to which city authorities need to stress this aspect in their policies.

B. THE EFFECT OF THE INSTITUTIONAL LANDSCAPE ON APPROACH TO RESILIENCY

This study found two main approaches to make a distinction between Rotterdam's and NYC's approach to flood resiliency. The analogy of the spring and the material's stiffness are believed to also provide a

This study concluded that local preference for either a mitigating and responsive approach is based on characteristics of the institutional landscape. To determine the local preference, the study predominantly looked at the norms and values. However, it is likely that also the other aspects of the institutional landscape determine the focus of the local approach. To study the relation between the institutional landscape and a city's or country's approach to resiliency, either mitigating or responding.

C. INSTITUTIONAL LANDSCAPE AND THE ADAPTIVE CAPACITY OF PUBLIC AGENCIES

This study has provided guidelines for city authorities to modify their policy instruments to make them more effective. The next step in the learning process of these public agencies is implementing the lessons into policy practice. This needs some changes in the current ways of working. Professionals and scholars stress the need for adaptive capacity amongst institutions to answer to the challenges of building resiliency. For example, Zevenbergen (in Timmermans *et al*, 2013) has indicated that organizational flexibility is a key factor in realizing sustainable measures for flood resiliency. This flexibility is needed to respond to changes in culture and society as well as answer to the uncertainties in long-term planning regarding the effects of climate change.

In addition to the anticipated effects of climate change, also the rise of the network society poses challenges to the traditional focus of urban planning and spatial development. The physical development of areas needs to find more alignment with other social and economic processes and trends in the city. Other forms of collaborations need to be sought and the roles of actors are constantly changing. This asks for more adaptable forms of policy and matching instruments.

Further research could look at the question as to what extent city authorities actually change their current instruments and ways of working to raise effectiveness of (flood resiliency) policy instruments? In congruence with

the focus of this study, the effect of the institutional landscape on this adaptive capacity would be an interesting topic for further research. One could imagine how certain aspects of the institutional landscape, like structure and arrangements, could predict or provide insight in the adaptive capacity of institutions.

D. THE RELATION BETWEEN POLICY WINDOWS AND FLOOD RESILIENCY POLICY

What this study found is that both NYC as well as the Netherlands have been drawn up their current flood resiliency programs as a reaction to recent events. In NYC water management received little attention before the floodings of Irene in 2011 and Sandy in 2012. As a response, the Sandy-rebuilding task force was established and the SIRR-studies were carried out.

Surprisingly, the development of the Dutch Deltaprogram is also based on a flooding event; hurricane Katrina, striking New Orleans in 2005. While Dutch water management expertise was flown in to help New Orleans in setting up a comprehensive protection system, various international businesses started to question the safety of the low-lying areas of the Netherlands. They indicated this might limit their future investment in the Netherlands. When national government became aware of this trend, flood safety was immediately raised to the top of the political agenda.

Concluding, extreme weather events could directly and indirectly provide opportunities to raise the issue of flood resiliency on the political agenda; they provide 'policy windows'. Questions for further research could focus on the apparently rather complex relation between these policy windows and actual disasters. Furthermore, we have seen that these policy windows, if not crucial, are at least largely accelerating the process of policy adaptation for building resiliency. Follow-up studies could look at the workings of these policy windows, and their role in the process of implementation of the adapted policies.

"Within the organizations we're working with it [flood resiliency] is still very much an issue, but elected officials and the public in general don't have it high on their agenda anymore. Communication and messaging is therefore very important. We have to make sure flood resiliency stays in the minds of the public as well as policy makers."

- M. Porto, MWA



"What we need is a disaster!"; "A DISASTER! But I'm not going to invest in it" (source: Helpdesk Water, 2008)

E. ADDITIONAL & EXTENDED CASE STUDIES

Longer-term studies could provide findings on how resiliency approaches work in the actual event of an external disturbance. These studies could for example compare the restorative capacity of areas that either emphasizes the responsive or mitigating approach to flood resiliency. Longer-term studies could of course also provide insight in the further process of policy implementation and the realization of flood resiliency.

Also, to further test the findings of this research, more vulnerable areas could be studied. This could also extend to other cities and countries. The addition of cities in non-Western or developing countries in studying the relation between the institutional landscape and policy effectiveness would also be very interesting.

VII. REFLECTION

This chapter reflects upon the study in considering the extent to which the adopted methods applied to the research topics and variables to be measured. Also the wider social context and relationship to the research laboratory and wider academic domain in which the study took place are discussed.

A. RESEARCH SUBJECT AND DESIGN

THE PROJECT AND THE WIDER SOCIAL CONTEXT

The relevance of the comparison between NYC and Rotterdam has been elaborated upon in previous chapters. It was established on expert consultations, media publications and academic literature. The relevance of this selection was confirmed throughout the study by various urban planning and water management experts. The limitations of the generalizability of the findings were anticipated and covered in the chapter on research methodology.

RESEARCH APPROACH

The choice for qualitative, rather than quantitative research approach is based on the nature of the studied concepts and in reflection is still holds. As mentioned, this study examines the effectiveness of public policy on achieving the goal of increased flood resiliency of urban areas. To measure if this goal is reached, the study examines to what extent local actors perceive these aspect as being realized in the area. This approach is consciously taken rather than quantitative assessment of for example reduced flooding risks or a decrease of assets in vulnerable areas. This, firstly because there is no set of objective measures for flood resiliency. It is a cultural concept, which means that for example generally accepted safety levels and the emphasis on either preparedness or response can vary between countries and regions. The resiliency of urban areas is a local concept, and thus best defined by local actors.

Furthermore, the choice for a qualitative approach is backed by the supposition that urban areas and change processes can be explained by the characteristics of the actor-network theory. Actor-network theory is based on the notion that communication and decision-making in a project's process is shaped by individuals or groups of individuals, each of which is tied to particular networks of relationship (Crane & Livesey, 2003). In line with the concept of the network society and the emergence of strategic planning, Albrechts (2006) points out that in political decision-making, spatial plan-making and project implementation efforts the actors involved tend to be organized in separate 'networks' and 'arenas' (Daamen, 2010). Hence, this research is based on the supposition that actor-network theories indeed are most applicable in describing the process of urban development.

ADOPTED MODELS

The models adopted to measure the variables of institutional landscape, flood resiliency and policy instruments were selected after a thorough examination of available literature in the respective field of research.

The data collection is carried out in line with the adopted model of institutional analysis as described by Inam (2013). The study analyzes the situation and characteristics on the specific level of policy 'output'. Inam's model of this kind of analysis prescribes the studying of a specific policy or programme (in our case: building urban flood resiliency) and collection of data by drawing on information from interviews with officials, observations of institutional behavior and analysis of institutional documents. This study fully reflects this approach in using the research methods of document analysis and semi-structured interviews with both experts as well as case actors.

The characteristics to measure flood resiliency as proposed by Lu (2014) were chosen as they are developed especially for the field of urban planning and international comparison. As mentioned, one of the main challenges of comparing flood resiliency lies in the definition of resiliency as it is understood as a capacity of a society to absorb and bounce back from external disturbances. This makes it a social, cultural and local concept.

Even if a model would be found to assess flood safety on physical aspects, it would be very unlikely that the requirements when it comes to obtained safety levels differ between countries. For example, the multi-layered safety model of Rijkswaterstaat is considered as a model to assess flood resiliency in this research. However, as

became clear throughout the study, this model may work well in the Dutch approach of preparing and protecting areas to make them resilient while US practice may score low as culture here stipulates a more responsive approach, emphasizing a systems capacity to bounce back from disturbances. This understanding directly validates the study's focus on institutional landscape, including stakeholder interests and norms and values to explain the differences to explain the realization of flood resiliency.

The study's approach to measure the effectiveness of policy instruments is by comparing the issued policies with the ones that are experienced by local actors of the studied areas. Discrepancies are then set out against the interventions that local actors indicate would stimulate the building of flood resiliency. Here the choice for a qualitative model of research, based on perception, again pays off. While certain policy instruments may be not experienced by local actors, they may not be crucial for increasing flood resiliency of the area. The findings of the institutional landscape enabled the interpretation of these differences. This allowed us to make the international comparison and formulate recommendations on policy instruments that would work in urban area developments, given their specific setting.

CASE SELECTION

The case areas within the cities were chosen on their assumed similarities in scale, function and situation with regard to flood safety. This was also linked to their representation of a specific type of urban area developments, inner-city former port areas at the waterfront. As explained, the choice was guided by local planners and experts. There were some crucial differences between the case areas that were not anticipated and made comparison more difficult. For one, the risks of flooding and possible damages are found to be very different. This, because of differences in the areas' elevation and according base level of protection of the Merwe-Vierhavens area and Sunset Park.

Also, in Rotterdam actors can easily compare the development of the Merwe-Vierhavens area to the other Stadshavens locations. Actors in Sunset Park do not consider their district to be show many similarities to other waterfront areas of the city. However, the extent to which this should be taken as a problem for the selection of this area is limited. This, because the actors also indicate that there are chances to learn from each other's methods and experiences and no area in the city is really very comparable to another.

In retrospect these differences are understood to be reflecting the cultural characteristics, making the study's focus on the institutional landscape all the more valid.

RESULT PROCESSING

Document analysis was carried out by selecting relevant literature and marking specific parts that are especially relevant for the research's focus. Both academic literature as well as case documents was widely available. In the beginning of the study it was therefore hard to get an overview and make an informed decision on which pieces to select. However, as the research focus became more definite this selection process became more easy. The findings of the document analysis are tested in the semi-structured interviews with experts. This combination of methods allowed for triangulation, or double-checking, of the results and thus adds to the validity of the conclusions.

The expert interviews were fully transcribed in the language in which they took place. This, to prevent any misinterpretation of the sometimes rather specific concepts that were talked about. The actor interviews were all transcribed in English for processing reasons. All interviews were well prepared, providing general question-schemes for the actor-interviews and specially formulated questions for the experts. Also, all interviewees consented to the conversation to be recorded. This allowed for more detailed transcription.

The process transcription of the actor interviews could have been better anticipated upon. These interviews were sometimes a very structured question-answer form of dialogue and sometimes more free-flowing conversations. It was hard to decide on an approach as how to process both kinds in a singular manner. In the end it was decided not to try to fit the transcripts into one format, but rather make a differentiation according to the nature of the records. This results in some transcripts that follow the questions-scheme rather strictly and others, where the questions were only secondary in steering the conversation that are based solely on the interviewees' statements.

This treatment of the recordings also allows the reader to better follow the line of interpretation of the transcripts to the application of scorings. The recorded answers were interpreted by the researcher into a scoring of 1-10 on the variables to be measured. This process is also described in the chapter on methodology and is illustrated by a section

of the Excel-document in which this process was carried out. This interpretation by the researcher can lead to results that are open for discussion. The risk of biasing is limited as the interviewing, transcription and interpretation works were all carried out by the same researcher. This made that to some extent also notes of non-verbal communication could be featured in the scorings. Also, the interpretations the researcher made were well informed in the sense that they were made against thorough knowledge of the backgrounds of studied literature and documentation. Besides, the scorings that resulted from the interpretations have been used to visualize findings rather than quantify them. As shown in the figure below, the diagrams are intentionally left scale-less to illustrate emphasis fields rather than exact measurements. Lastly, transcripts of both expert as well as actor interviews are checked with the interviewees before publication of the final report. This confirmation strengthens the validation of the interpretation of their answers into the scorings.

As can be concluded from the lists in appendices 1 and 2, a vast number of interviews have been conducted for the study. However, over half of the interviews were with planning or water management experts or city officials. To make the results of the perceived flood resiliency and experienced policy instruments more accurate, more local actors could be interviewed.

It would have been helpful, especially if the research would have taken longer, to develop a topic-labeling framework to place findings of the interviews and documents into. However, the understanding that this perhaps more structured way of working could have helped in retracing some rationalizations came to late in the study's process to be adopted without significant investments in time.

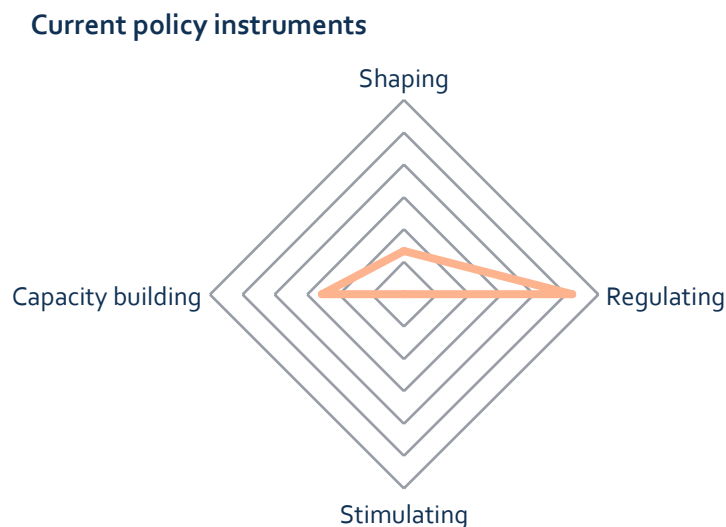


Figure 62. Example of visualized scoring interpretation

B. THE STUDY WITHIN THE RESEARCH LAB OF URBAN ADAPTATION STRATEGIES

The study took place within the TU Delft Real Estate graduation laboratory of Urban Adaptation Strategies (UAS). Here studies focus on management challenges in how cities act and react on external, as well as internal change. The effects of climate change, and cities' strategies and actions on these issues clearly fit into this field of research. However, climate adaptation and more specifically flood resiliency has not been the subject of many graduation or PhD research within this academic group.

This study first focused on the implementation of climate adaptation strategies in urban planning practice. However, this proved a very broad subject and over the course of the research emphasis was narrowed down to the realization

of flood resiliency in urban area developments. This more demarcated subject allowed for specific research questions and more insightful findings rather than obvious conclusions.

INTERNATIONAL COMPARISON

Studies in the research lab of UAS often evaluate Dutch practice with respect to other approaches around the globe. In particular comparisons to other European or Anglo-Saxon countries are common. This can on the one hand be explained by the high level of similarities, which makes for more easy and valid comparison. On the other hand the contrast of the Dutch controlled planning system with more liberal social system are often the reason for the comparison with Anglo-Saxon countries. This is strengthened because of the renewed public interest in reduced public interference, moving towards a more facilitating practice of governance.

In the emphasis on institutional landscape this study aims to provide more insight in the difficulties when it comes to translating effective policy between countries. Findings are also intended to inform other researchers in this field working on international urban policy comparisons. The concept of the institutional landscape thus gives a perspective on the generalizability of findings of the UAS lab in general.

METHODOLOGY

Where in some other research fields within the Real Estate & Housing department a quantitative approach may be more obvious, qualitative studies are especially applicable when it comes to the examination of urban strategies and change processes. As elaborated upon in the report's description of the theoretical framework, the study is conducted in the paradigm in which most of the research in the field of urban planning nowadays takes place. This is based on institutions theory and the concept of the network society. The connectedness of processes and actions within a certain domain is understood to shape outcomes in the urban environment. Therefore, like other studies in the UAS laboratory, the research focuses on actors perceptions, relationships and communication processes and rather than project or strategy outcomes.

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APPENDICES

1. EXPERT INTERVIEWS & ATTENDED EVENTS

Events

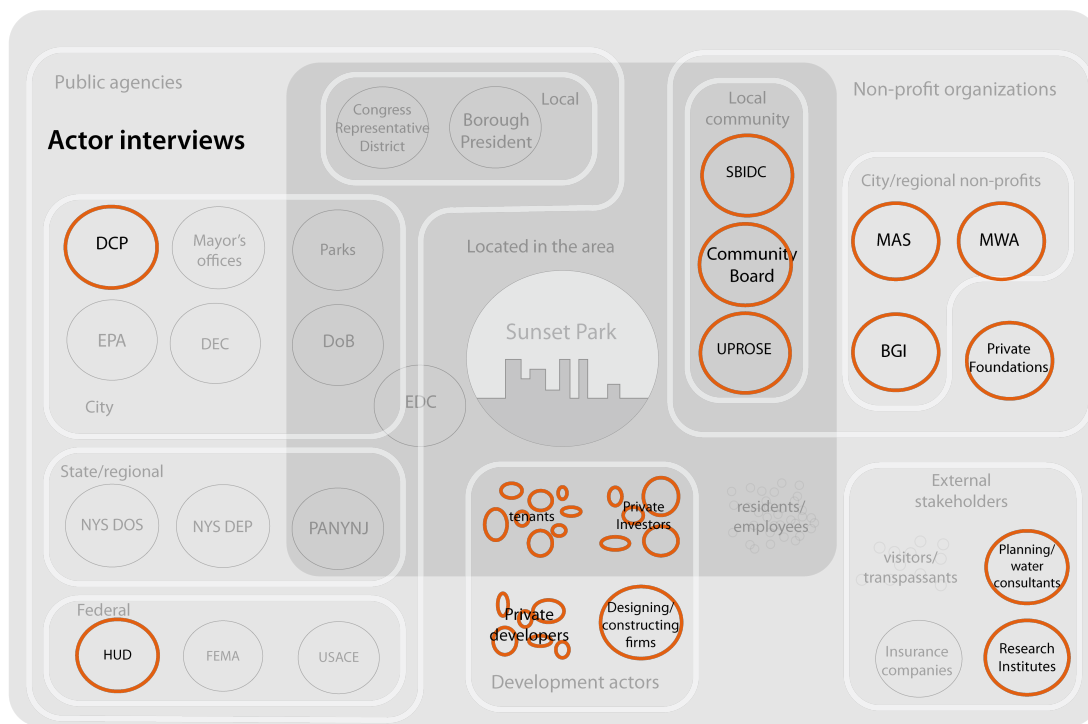
Date	Event	Relevance for study	Location
01/29/14	Conference 'Delta cities battling with climate change' by Museum of flood disaster	Progress of Rotterdam efforts in climate adaptation. Strategy Delta Commission & program. Integrated approach by f.e. Room for the River project.	Ouwekerk (NL)
02/14/14	PhD Defences J. Rijke and S. van Herk Inspiration and Network Event	Urgency plans and strategies building flood resilience. Difficulty now to be found in implementation through governance rather than technical solutions.	Delft (NL)
03/06/14	Symposium 'De Klimaatbestendige Stad' (English: The Climate Resilient City) by	Comparison advancement and public plans NYC and the Netherlands.	Gouda (NL)
09/25/14	Delta's in times of climate change conference		Rotterdam (NL)

Date	Consulted	Function	Location
03/21/14	J. Rijke	Researcher Flood Resilience Group Unesco-IHE	Delft (NL)
03/27/14, 05/21/14	J. Jacobs	Water management department Rotterdam, Program manager Climate adaptation Office Rotterdam	Delft (NL)
03/27/14	F. van der Ven		Delft (NL)
03/28/14, 03/21/14	P. van Veelen		Delft (NL)
04/28/14, 10/06/14	E. Westerhof	Senior Planner Water Management, Arcadis US	NYC/The Hague NYC
8/28/14	J. Aerts	Professor Department of Spatial analysis and decision support	Amsterdam
09/17/14	P. Lu		Taiwan/The Hague
9/9/14	H. Ovink	Principal 'Rebuild by Design'	The Hague
9/17/14 10/3/14	J. Keenan	Research Director Center for Urban Real Estate	Delft NYC
9/23/14	H. de Jong		Amsterdam
9/26/14	A. Braamskamp		NYC/The Hague
9/19/14	J. van Buuren		Rotterdam
09/30/14	A. Chester	Rebuild by Design	NYC
10/1/14	H. Cohen	Chief administration and financial officer Battery Park Conservatory, former director Regional Plan Association, New York City Charter Revision Commission, Manhattan Institute for Policy Research	NYC
04/28/14	M. Rowe	Municipal Art Society (MAS)	NYC
11/4/14	S. Carter	Rockefeller foundation	NYC/The Hague

2. ACTOR INTERVIEWS

NYC/Sunset Park

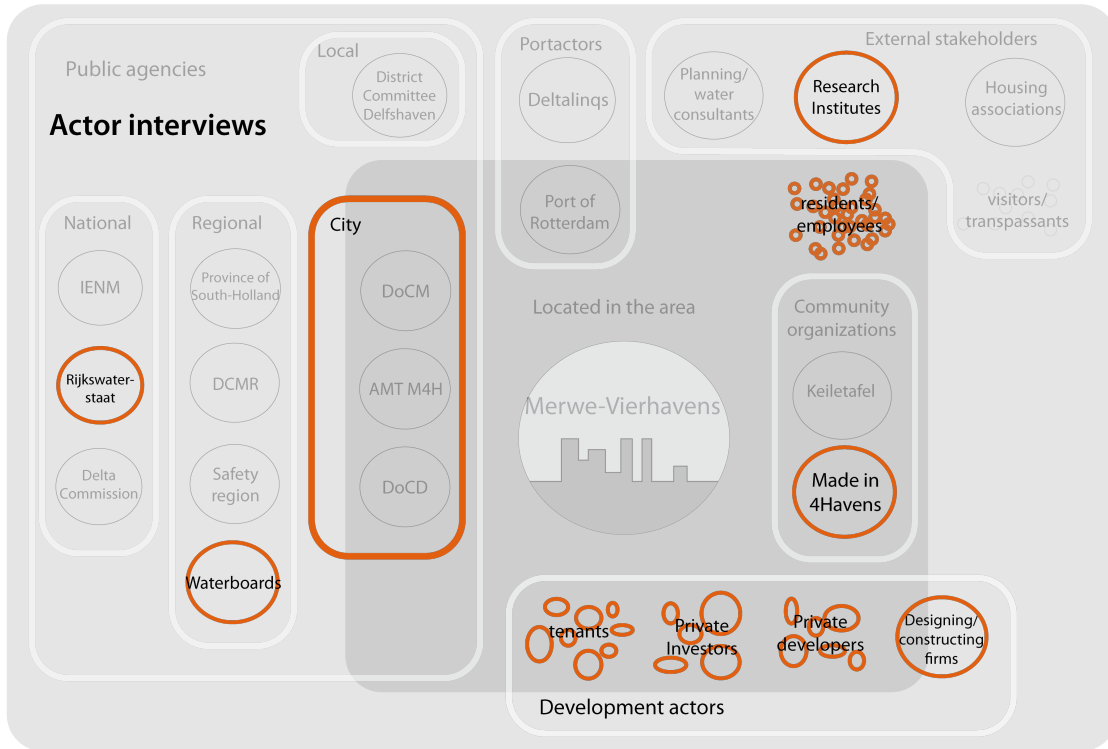
Date	Policy issuing/responding	Organization	Person	Function
10/6/14	Responding	Selldorf Architects		
10/1/14	Responding	Sims Municipal Recycling Facility	T. Outerbridge	Property owner/tenant/local business
9/30/14	Issuing	Community Board 07	J. Laufer	Community organization
10/1/14	Responding	Salmar Properties	I. Siegel	Developer/local business
03/28/14	Responding	Southwest Brooklyn Industrial Development Corporation (SBIDC)	A. Devening	Local non-profit
10/6/14	Responding	Brooklyn Greenway Initiative (BGI)	M. Puryear	Local non-profit
10/1/14	Issuing	Metropolitan Waterfront Alliance (MWA)	M. Porter & R. Lewis	Regional non-profit
10/20/14	Issuing	Department of City Planning	E. Di Girolamo	City Government



Rotterdam/Merwe-Vierhavens

Date	Policy issuing/responding	Organization	Person	Function
03/27/14, 05/21/14	Issuing	Rotterdam Climate Initiative (RCI) & City of Rotterdam water management/city development department	J. Jacobs	Government
10/6/14	Issuing	City of Rotterdam city development department	C. Andriessen	Government
10/1/14	Responding	Rotterdams Collectief	H. Pum	Local business
9/30/14	Responding	Vervat Vastgoed	R. Borst	Property owner/developer/local business

10/1/14 Responding Made in 4Havens, Panoptic Architects E. Tom Community organization/local business/future investor



3. BACKGROUND THEORY

THE NETWORK SOCIETY

Over the last couple of decades, technological, economic and environmental developments have changed the structure of society (Florida, 2002; Castells, *The rise of the network society: The information age: Economy, society, and culture* (Vol. 1), 1996). One of the theoretical strands on the newly evolved societal structure is based on the concept of the 'network society', as introduced by Castells (1996). He described a network society as "...a social structure based on networks operated by information and communication technologies based in microelectronics and digital computer networks that generate, process, and distribute information on the basis of the knowledge accumulated in the nodes of the networks." (Castells, 2006, p. 7).

This shift has considerable implications for various social structures and processes, not in the least affecting the usage and perception of space (Castells, 2006). In a network society physical proximity is considered less important for social organization and economic structures. Furthermore, stimulated by a positive economic climate and general social emancipation, patterns in space consumption have evolved from a quantitative focus to the search for high-quality location (Urry, 1995). Therefore, also the practice of spatial planning has changed dramatically (Hajer & Zonneveld, 2000). Important contributors to the academic discussion of relating the network society to the goals and principles of planning practice are for instance Healey (1997) and Hall (1993).

As a result of this changing society, spatial planning finds not only its task changing, but also its tools, partners and working environment. Existing institutional arrangements are no longer capable to accommodate the intensified exchange between actors (Kickert, Klijn, & Koppenjan, 1997). As a result, planning authorities often found themselves not addressing the right actors on applicable topics in the right context (Kickert, Klijn, & Koppenjan, 1997). Therefore, planning parties in most Western countries are reconsidering their approaches to intervention in the development process. Common in recent experiments is the tendency towards more collaboration between public and private parties (Kickert, Klijn, & Koppenjan, 1997). As we will see further on, this is also perceived in both Dutch and Northern American spatial planning practice.

To translate this societal shift to urban planning in order to gain understanding of the development process, a network can be described as a formal structural system of interconnected nodes. Networks are open structures that evolve by adding or removing nodes according to the changing requirements of the programs that assign performance goals to the networks. In this respect, these programs are decided socially from outside the network (Castells, 2006). As described by Castells (2006, p.7), once programs are inscribed in the logic of a network, the network will "...follow the instructions, adding, deleting, and reconfiguring, until a new program replaces or modifies the codes that command its operational system.". It is exactly in this inscription, or implementation, of the planning policies and its according interaction with the development network where this study focuses on. This study takes the standpoint in that it interpretes flood resiliency policies as these programs and the development process as a network to examine. The consideration of the development process as the interaction of network-actors has been formulated as the "actor-network approach" by Koppenjan & Klijn (2005).

ACTOR-NETWORK THEORY

Actor-network theory is based on the notion that communication and decision-making in a project's process is shaped by individuals or groups of individuals, each of which is tied to particular networks of relationship (Crane & Livesey, 2003). In line with the concept of the network society and the emergence of strategic planning, Albrechts (2006) points out that in political decision-making, spatial plan-making and project implementation efforts the actors involved tend to be organized in separate 'networks' and 'arenas' (Daamen, 2010). Hence, this research is based on the supposition that actor-network theories indeed are most applicable in describing the process of urban development.

To structure the examination of the case processes (the level of specific episodes in the model of Healey) the actor-network approach, as developed by Koppenjan & Klijn (2004), is adopted. The network approach provides theoretical background and a normative basis for analysing and assessing complex processes of problem solving in network settings or so-called 'wicked problems'. Actors' perceptions,

interactions and institutions play the leading part in this approach, rather than the process content or outcome (Koppenjan & Klijn, 2004, p. 9). This network conception of actor relationship decenters the project as the central node of interaction, since the network can be entered simultaneously from many different perspectives.

Whilst the actor-network approach is mainly a tool for designing and guiding the development process, it can similarly be used as a framework for evaluating processes in describing actor behaviour, strategies and relations (Koppenjan & Klijn, 2004). The mutual dependency of actors for their goal achievement is the starting point of the network approach. Over the course of the process, patterns in actor interaction will evolve, building and solidifying sub-networks within the larger process network (Koppenjan & Klijn, 2004).

First step of the network-approach is the mapping of stakeholders, their interests, characteristics and position in the project. This is to identify actors' problems, perceptions and dependencies (Koppenjan & Klijn, 2004). This provides a basis for an impression of their relations. The actor analysis thus results in an overview of means and dependencies that provides a basis for the next step, defining mutual challenges and goals. Following step is a game analysis. Here sub-groups of actors, or decision-making arena's are set. An arena can be defined as collectivity of actors with a common intent (Daamen, 2010, p. 32). The topics to come to a development plan (for instance, parking and housing typology) typically overlap several arenas. This analysis also features the definition of stagnation issues within the network. Last is the network analysis, which considers the relations of the different actors, their behaviour and influence on the process and outcome. The findings of these analyses provide valuable insight in the typology of actors and their behaviour regarding power and influence. This in turn uncovers the underlying forces and strategies during negotiations (Koppenjan & Klijn, 2004).

ECONOMIC MARKET THEORIES

In order to get an overview and compare interventions as a result of the currently adopted policies, these planning instruments need to be categorized. An appropriate framework is developed by Tiesdell and Allmendinger (2005). This model is based on the notion that a strict separation of market and state is often not achievable, in practice as well as theory (Alexander, 2001). Even though at first sight this seems contradictory with the urban planning definition of Adams (1994), the model is considered useful in classifying the intervening behaviour of public actors. This, because the model is based on the underlying notion that agencies, whether public or private, can actively shape the structure of the markets (Tiesdell & Allmendinger, 2005). Thus, although not the focus of this research, also corporate strategies could be considered a form of urban planning if they entail interventions in the development market. Congruently, Tiesdell and Allmendinger (2005) define *public urban planning* as "...the set of intentional government interventions in the land and property development process intended to achieve desirable societal objectives.". The model of Tiesdell and Allmendinger will be further explained in this chapter's section on planning instrument typology.

Academic discourse on the economic interpretation of the relationship between development markets and planning policy is dominated by three main approaches: neo-classical economics, welfare economics, and increasingly new institutional economics (Adams, Dunse, & White, 2005). Neoclassical economics regards planning policy as directly affecting the overall quantity of market supply and demand, where welfare economics considers the extent to which planning policy is effective in overcoming failure of this market (Adams & Tiesdell, 2010). New institutional economics focuses on the capacity of planning policy to influence (reduce or increase) market transaction costs (Adams, Croudace, & Tiesdell, 2009), essentially changing the market environment. The approaches have in common to consider the dichotomous position of the market to planning. On the one hand the market is open to influence, while on the other hand profit is its main driver and, implying a limitation to external influence (Adams & Tiesdell, 2010).

INSTITUTIONAL MARKET THEORY

In explaining the intervention and outcomes of policy decisions on markets, the market theory on which this research is based is rooted in the new institutional strand of the economics market theories (Tiesdell & Allmendinger, 2005).

According to this perspective, institutions, which can be either relationships, organisations and/or rules, reduce transaction costs of production and exchange and thus lower the costs of voluntary cooperation. Within the reasoning of new institutional economics, the following theories can be distinguished:

- Transaction costs theory
- Property rights theory
- Public choice economics
- Game theory

A supplementary perspective explaining the market is the 'political economy of institutionalism' (Adams, et al., 2003). In this approach, institutions are more broadly defined as shared and reinforced habits within a society of group (Hodgson, 1997, p. 679). This implies that markets can be seen as social constructs, in which the understanding of context, process and social relations is essential in explaining market operations (Tiesdell & Allmendinger, 2005, p. 62).

In development markets a structural framework can be defined, shaping agents actions while simultaneously being shaped by their behaviour. This framework is composed by actors'

- resources (for instance, knowledge, information, land, labour and capital)
- rules (agents' awareness of the framework's guidelines for socially acceptable behaviour)
- and ideas (background knowledge, used for strategy development) (Healey & Barrett, 1990).

The strands of theory from both the perspective of new institutional economics as well as political economy of institutionalism form the basis for the planning tool typology as developed by Tiesdell and Allmendinger (2005).

URBAN PLANNING

In current scientific discourse urban planning is interpreted differently by various authors. For instance, Healey *et al.* (1988) describe urban planning as "*an explicit program for the management of land-use and environmental change*". This first description seems fitting and applicable in describing a predominantly state-controlled spatial planning policy, an approach predominant in for example the Netherlands up to the 1990-ies. Adams (1994, p.2) on the other hand emphasizes the central role of the market process in development, referring to a more neoliberal approach to public planning policy. He defines urban planning as "*a form of state intervention in a development process dominated by the private sector*" (Adams, 1994, p. 2). Both perspectives however imply that in practice, urban planning is concerned with the drawing up plans and creation of visions for the future physical arrangement and condition of a community. In this study urban planning is defined as follows:

The determination and formulation of a set of explicit interventions by governmental parties in the land and property development market of a demarcated city region, intended at changing the future physical, economic and social environment. Based on Adams (1994, p. 2), Healey, McNamara, Elson, & Doak, (1988) and Tiesdell & Allmendinger (2005).

NEOLIBERALIZATION

In the Netherlands, a shift towards the neoliberalization of public planning since the 1990-ies has been noted (Heurkens, 2012; Hajer & Zonneveld, 2000). This is understood as the direct effect of the rise of the network society together with (partial) departure from welfarist ideology towards a more liberal political inclination. This development can also be understood in response to the former rigid and all-comprehensive approach, ever since the late 1970s academic discourse has emphasized the need for greater flexibility and the loosening of rigid rules in spatial planning (Healey & Williams, 1993). This, to allow for more initiative and influence of private market parties in the development process. Some scholars (Hajer & Zonneveld, 2000) argue that therefore the system of planning in the Netherlands needs to be fundamentally rethought. This, to ensure continued legitimacy and reasonable effectiveness of spatial policies.

This shift explains how planning responds to processes like globalization and an increase in the mobility of capital, resulting in large-scale capital investments in cities, often taking the form of large-scale property-development projects (Healey & Williams, 1993). The process of neoliberalization not only took place in spatial planning and can in general be described as a "*...prevailing pattern of market-oriented, market-disciplinary regulatory restructuring...*" (Peck,

Theodore, & Brenner, 2009, p. 51). Since the 1980-ies, the neoliberalization of social, economic and political systems in the Netherlands has pervaded also urban planning and development.

Neoliberal planning however, is marked by an internal contradiction. Where liberal conviction is based on limiting governmental intervention as much as possible, planning as mentioned is exactly the practice of this intervention. Especially in urban development, mainly driven by market dynamics, this contradiction is problematic as in the Netherlands it is generally understood that regulation is necessary for proper functioning of the urban environment. In the absence of control, private developers, builders and property owners are free in transforming the spatial environment, which in the urban context has a direct influence on other areas and buildings. Concluding, planning is a prerequisite for the sustained practice of neoliberal urban development (Peck, Theodore, & Brenner, 2009). Neoliberal planning therefore finds its legitimacy in encouraging and stimulating market dynamics by providing flexible and negotiable strategic planning (Peck, Theodore, & Brenner, 2009) as opposed to rigid and regulatory policies.

Moreover, since the 1980-ies urban planning is increasingly marked by the active involvement of a diverse group of stakeholders. Next to private organizations and (semi-)public bodies now also advocacy groups, individual residents and public-private partnerships take part the process of development. All these actors are at the same time growing increasingly dependent on the neoliberal debt-oriented economy, in being responsible for their own actions and investments. This trend has accelerated tendencies of entrepreneurialism, consumerism and property-led development. This in turn has further emphasized the position and influence of private market actors on urban (Peck & Tickel, Neoliberalizing space, 2002).

As an effect of the need for a more local and interactive approach we can also see a shift towards more flexible, short- and middle-range planning (Tasan-Kok T. , 2012). Furthermore, the focus of planning practices shifted to development processes and projects (Albrechts, 2004; Healey & Williams, 1993). However, this raised the need for overarching projects in bridging the gap between spatial policies, plans, and projects (Albrechts, 2006). To find this coherence, 'strategic spatial planning' is proposed by planning scholars since the early 1990-ies (Albrechts, 2004; Healey, 1997). As a solution for the growing complexity and otherwise unguided development practice, coordinating strategies would form the umbrella of individual projects (Tasan-Kok T. , 2012).

FACILITATING POLICY

Important definitions as adopted for concepts in this field of urban planning in this research are:

- Facilitate

The public policy of actively stimulating socially wanted spatial developments while limiting public spending, by enhancing market actors' development opportunities and abilities to invest. Based on Heurkens, (2012) and Heurkens, De Hoog, & Daamen (2014).

- Private sector-led urban development projects

An urban development project in which private actors take a leading role and public actors adopt a facilitating role to manage the development of an urban area, based on a formal public-private organizational role division. Adopted from Heurkens (2012, p. 57).

According to the notion of the network society and theories on social institutions contemporary urban development is characterized by the interplay of influences and interests. The realization of projects relies on various process outcomes, rather than the actions of one actor (Heurkens, 2012). This as a result from recent developments in society and according impacts on spatial planning. In realizing this, planning parties in most Western countries are reconsidering their approach to interventions in the development process. Common in the policy shift and recent planning experiments in the Netherlands as well as the United States (US) is the tendency towards more collaboration between public and private parties (Kickert, Klijn, & Koppenjan, 1997). In the Dutch practice this new balance entails limiting public control and investment, whereas in the US an increase of public intervention is perceivable.

Public planning policy in urban area development of both of the studied cities is moving towards a more *facilitating* approach (Schaller & Novy, 2010). This trend is the reason for the focus of this research on private-led urban

development. In planning, 'leading' and 'facilitating' are relative terms. In essence, 'leading' indicates providing a main direction for projects and taking according actions whereas 'facilitating' then involves complementing and supporting these tasks (Heurkens, 2012, p. 57). In line with the respective national trends, for New York the shift to facilitating means a departing from former neoliberal policy, taking on a more active role in development projects while for Rotterdam it entails a reduction of public involvement and its dominating role. In practice, both shifts result in the cities' governments considering their responsibilities to lie in *actively stimulating socially wanted spatial developments while limiting public spending by enhancing market actors' abilities to invest*.

STRATEGY IMPLEMENTATION

This study could provide a basis for actors involved in urban planning and development projects to reflect on climate adaptation strategies and make their implementation more effective. The aim is to give a more complete view of the decisions and actor behavior that shape this process of realization of these goals. To get a better understanding of the relation between public plans and their realization the concepts of strategy and implementation are studied, particularly in the context of urban planning and development projects.

- **Strategy**
A plan providing a certain system with a direction, a guide or course of action into the future and according propositions for adjustments to its current structure, expressed in words and images in distinctive documents. Based on Daamen (2010).
- **Implementation**
The controlled operationalization of proposed changes in a system.

The effective implementation of plans or strategies in urban planning policy often depends on the contribution of other planning tools. The implementation can be through voluntary action, compulsion by state or contractual regulation and/or through other forms of encouragement like financial incentives (Tiesdell & Allmendinger, 2005). Moreover, if the objectives as proposed in a climate adaptation strategy are likely to contradict with current market trends and behaviour. This implies a transformation in public policy may be necessary for effective implementation and embedding in local urban planning practice.

STRATEGY IMPLEMENTATION IN ORGANIZATIONS

In the field of project and organization management, much attention is spent on the development and content of strategies. However, less attention is given to the issue of implementation of these strategies (Pellegrinelli & Bowman, 1994). This, even though new strategies are known to encounter the following problems in their implementation in organizational environments (Pellegrinelli & Bowman, 1994; Argyris, 1985; Lindblom, 1979):

- Disruption of continuous operations
- Deviation from focus on efficiency current operations
- Risks regarding future practices
- Risks regarding redistribution of power

Through direct communication strategy implementation in organizations is generally entrusted to internal systems and procedures. However, this private market or project management approach is not directly applicable to public parties (Bryson & Roering, 1987). Typically project management (for example Hrebiniak & Joyce, 1984) approaches to strategy implementation thus imply:

- Clear internal communication, organizational structure and protocols
- Consistent understanding of the strategy throughout this organization
- Willingness of organization members to cooperate on proposed plans
- Ability of organization members to act on the proposed changes.

STRATEGY IMPLEMENTATION IN URBAN PLANNING

Once this organizational approach to strategy implementation is understood, it is clear how these conditions enabling implementation are not applicable in the case of urban planning or climate adaptation. Firstly, the 'organization' which is referred to in these prerequisites is hard to define. As we have seen in earlier sections of this chapter, current practice of urban planning as well as climate adaptation have no clear organizational structure or

boundaries. Both processes are shaped by the process of interaction within continuously changing and evolving actor networks. The structure, relations and according protocols are therefore also subject of constant change. To bypass this objection in order to make the organizational implementation approach applicable in this study, the 'organization' is for now interpreted as 'all parties active in the urban system'³. For now we disregard that with this interpretation obviously questions could be raised on the applicability of earlier used terms like structure and procedure.

Since there is no singular communication channel between the city governments and urban actors, it is not likely the strategy is communicated throughout all layers of the various urban systems. Moreover, as explained in the preceding section, the contents and effects of climate change are still under discussion. This calls into question the definition of the problem to be tackled as well as the proposed strategic plans. Thus, thorough understanding of the strategies amongst all urban system actors is improbable to say the least.

Besides, even though in gaining receptivity (Jeffrey & Seaton (2004), see figure 9) the willingness of private actors to cooperate in sustainable initiatives may increase, their dedication is often limited and bounded by financial aspects. Collaboration needs to be stimulated, and links to social and economic benefits are crucial. This is also connected to the ability of the organization-or system actors to act on achieving strategic goals. As mentioned, the outcome of an area development project is shaped by the interaction process of various actors and not a simple translation of a design in physical entities. Therefore, to influence the outcome of area development it is not merely the plans that need to be aligned with strategic objectives, but also the actor relations and interactions or in general process design. As explained, usually in urban planning as well as climate adaptation not one actor has the capacity and competence to design and realize a significant change, let alone dominate the process and other actors' behaviour.

This touches upon the last, and perhaps most important reason why this typical approach to strategy implementation is not applicable for climate adaptation strategies in urban planning. When we look at all proposed conditions, we can see that they are based on the assumption that the party developing the strategy is in the position to impose actions on the actors in the organization or system. As explained earlier, city governments (at least in western countries) are not in this position. As actor, they are part of the urban system, but do not have the power nor desire to enforce extensive changes in the behavior of system actors. However, as public body they have certain legislative and procedural tools to guide actions and stimulate certain behavior of the other parties. This also explains how strategies in this context should be seen as providing guidelines and setting intentions rather than directing plans.

Now the project management approach to strategy implementation is explained not to be appropriate, question remains what approach is considered more viable.

IMPLEMENTATION THROUGH CHANGING PARADIGM

The approach to strategy implementation as described above is also often found to fail in organizational settings (Pellegrinelli & Bowman, 1994) when the new strategy entails a substantial shift. The use of existing structures and procedures in the implementation process is understood to be the main cause of this hampering. This, because the structures and procedures themselves need to be subjected to change. This fundamental change in approach is considered necessary to solve the underlying problems the strategy aims to tackle (Pellegrinelli & Bowman, 1994; Lindblom, 1979).

In this light, the recent shift of role of public intervention in urban development combined with can be interpreted as exactly this change in approach. By the adoption of the new facilitating role the long-standing convictions of a directing and controlling municipality in the Netherlands on the one hand, as well as private market actors providing socially wanted and sustainable solutions in New York City on the other hand are simultaneously rejected. As we

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³ This interpretation is linked to the theory of institutionalism in that the term 'institution' is often associated with 'organization'. This can be explained by considering organizations as social entities that are capable of purposeful action (Scharpf, 1997). Formal organizations can be distinguished from a random collection of people by the presence of some system of authority and administration, guided by a managing body (Mintzberg, 1989).

have seen in the previous section, this new way of working in area development is directly applicable to new forms of collaboration needed for adaptation and building resilience.

Implementation of the strategies in by public organizations and/or in complex environments are most likely to take place through the process of incremental or emergent change (Bryson & Roering, 1987; Lindblom, 1979; Quinn, 1980; Mintzberg & Waters, 1985). This change is to take place at the boundaries of the existing paradigm, defined as 'the set of beliefs and assumptions held in common and taken for granted in an organization' (Johnson, 1987). In our case organization can again be interpreted as all actors active in the urban system. In implementing the strategy thus lies the challenge to stretch the current convictions and perceptions of these actors. To stimulate the implementation of strategies the developing party thus needs to build incentives and stimulate the other parties to depart from current behavior and look beyond the existing paradigm (Argyris, 1985).

CLIMATE CHANGE

Climate change can be described as shifts in the state of the global climate and according alterations in the mean and/or the variability of its properties, persisting over an extended period, typically decades or longer (IPCC, 2014). The Convention on Climate Change (UNFCCC) specifies the influence of human activity and defines climate change as: 'a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.' (UNFCCC, 2014).

Regardless of their cause, the effects of climate change are currently observed and are expected to grow significantly in the future. These effects are affecting our spatial environment, bringing risks for social and economic systems. However, uncertainty about the severity and time frame of the effects still persist (IPCC, 2014). Furthermore, continued discussion about the effectiveness of proposed responses hampers action to be taken. To which extent the risks of climate change for social and economic systems are accepted is revealed by society's wish pay for precautionary measures. This is reflected by major differences between countries' response actions (IPCC, 2014). Nevertheless, it is generally understood that we should start making changes to the spatial environment regarding these impacts. Following the predominant academic view in this field, this research makes the distinction between adaptation, mitigation and coping as responses to climate change.

ADAPTATION

The IPCC (2014) defines climate adaptation as actions seeking "...to moderate or avoid harm [resulting from the process of climate change] or exploit beneficial opportunities.". These actions may come from human behavior or from natural systems. Keenan (2014a; 2014b, p.51) describes adaptation with regard to climate change as "a framework for proactively addressing a series of accelerated challenges in the human, built, and natural environments which have little to no historical precedent in their degree or pace of relevancy.". The common interpretation of adaptation thus implies working towards a *progressive* state wherein the future state is improved beyond its predicate state. In this research adaptation entails both *building capacity to respond to anticipated effects of external change as well as limiting the impact these effects*.

- Adaptation
Building resilience by proactively adjusting the current structure of a system in order to enhance its capacity to respond to anticipated effects of external change as well as limiting the impact these effects on the system's operations.

Besides adaptation, mitigation is the other major form of responding to climate change. Mitigation is concerned with preventing effects on the current state in limiting the external stimuli of change. Mitigation thus intends to solve the underlying problem or at least aims to limit the possibilities of it getting worse. However, there is still debate on the causes and driving forces of climate change. Besides, as there is little uncertainty regarding the occurrence of climate change, a sole focus on it's causes, neglecting reaction to the effects, seems too limited (Keenan, 2014b). Furthermore, mitigation strategies work on the long-term and their beneficial effects are hard to predict and measure. Therefore, adaptation investments can be considered to allow for more economic arguments in their decision-making. This explains why even though mitigation actions are essential in an integrated response to climate change, these are not the focus of this research. Nevertheless, many projects feature both mitigation as well as adaptation measures. For example, a green roof might help the building and its surroundings in dealing with increased rainfall but might congruently decrease environmental pollution.

Lastly, inaction or coping can be named as a response to climate change. This approach might be uninformed or can be rooted in a different perception of the problem or its effects. Inaction is not considered a sustainable strategy when it comes to public response climate change (OECD, 2009; Keenan, 2014b).

- **Climate adaptation strategy**

A document, used as a planning instrument, formulating a strategy regarding the adaptation to the anticipated effects of climate change, with the intention to stimulate actors in taking action on achieving these goals.

In line with the concept of adaptation, according to IPCC (2014) *planned* adaptation implies "...decisions and measures within society that help to reduce the adverse impacts of climate change..." as well as acting on "...the potential to realise new economic opportunities."

ADAPTATION COMPARED

Monitoring, comparing and learning are important components of adaptation initiatives, especially considering the complexity of adaptation challenges across scales and in different contexts (IPCC, 2014, p. 27). The establishment of networks, alliances and collaborations between various cities reflects this need for learning and comparison of practices. However, a thorough understanding of each city's specific context, its systems and patterns of both urban development and water management is crucial for the proper application of practices that have been found successful in other regions. This stresses the relevance of this research in comparing international approaches and drawing lessons regarding their effectiveness. The implementation of adaptive strategies in general, building resilience of the urban fabric for the widespread effects of climate change is considered parallel with the particular focus on water management as addressed in this research. The conclusions of this research thus may also prove valuable for urban regions developing effective implementation procedures.

In the United States (US), active government response is primarily carried out on municipal level, which traditionally has relatively high autonomy within the country's political organization. Adaptation planning here mainly involves incremental adaptation assessment and planning. Proactive adaptation is occurring in energy and public infrastructure to protect long-term investments (IPCC, 2014, p. 22). National response mostly has resulted in strategies and visions, stimulating local government activities, and reconsideration of public emergency insurance schemes⁴. However, with the striking of Hurricane Katrina, Hurricane Sandy and several other extreme weather events, the need for a more comprehensive response has become apparent. On the other hand, in Europe, adaptation policy has been developed across all levels of government. Adaptation planning initiatives are being integrated into coastal and water management, into environmental policy, spatial planning and also into disaster risk management (IPCC, 2014, p. 19). This is also why the US has started several initiatives in importing European expertise to set up adaptation programs (see f.e. Rebuild by Design, 2014; Dutch Dialogues, 2014).

CITIES AND CLIMATE ADAPTATION

With regard to increased globalization and the anticipated effects of climate change the need for improving of flood resiliency in urban planning is widely acknowledged. Thus, various cities have developed or are in the process of drafting strategies aimed at climate adaptation. More specifically, many delta cities acknowledge the chance of improving flood resilience while simultaneously providing added quality to the urban fabric and enhancing their global competitive position.

Historically, the success of settlements is mainly determined by their capacity to adapt to changing physical, economic and social circumstances. In a globalized world, with cities competing for social, industrial and economic activity, disadvantaged areas, not able to adapt will inevitably struggle (White, 2010). Over recent decades, cities are facing increasing global competition for the settlement of residents, industries and businesses and attraction of economic activity and trade (Castells, 1996; Florida, 2005). These notions result in the necessity for cities to consider the effects climate change can have on their operations and, thus, position in the global market. Key lies in understanding that the significance of the effects of climate change is on not only found in the physical urban form, but also in its social and economic systems. Thus, anticipating climate change, cities are now facing huge challenges, as well as opportunities, to sustain and possibly enhance their competitiveness.

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⁴ Further elaborated upon in chapter 4.

Several specific characteristics of urban areas makes their adaptation particularly relevant (Birkmann, Garschagen, Kraas, & Quang, 2010):

- Their location is often prone to natural hazards. It is no coincidence that two-thirds of all major cities worldwide are located in coastal areas with less than 10 m elevation (McGranahan, Balk, & Anderson, 2007). The strategic characteristics that stimulated the settlement of people and enabled economic activity in the first place now impose a threat.
- Cities form the center of socio-economic systems and host a large number of people and assets in a relatively small area.
- Urban areas are often marked by an increased vulnerability and instability, due to the density of space-usage and interconnectedness of processes.

Furthermore, cities shape social, spatial and economic development on local, regional and global scales. Urban regions form nodes of economic activity, decision-making and power and their dynamics are both the driver as well as the result of innovation, creativity and wealth (White, 2010). On the other hand, as a result of the multitude of human activities, cities are also the main source of environmental pollution. One can conclude that adapting cities is essential not only because of their vulnerability and global dependency of their performance, but also because of the opportunity to counter the process of climate change simultaneously by linking also mitigation responses.

However, the characteristics of urbanity not only change the consequences and risks of the anticipated effects but, perhaps more importantly, influence the ways these can be dealt with. Characteristics like density and the connectedness and interdependency of various systems pose several difficulties for the realization of climate adaptation. These characteristics for example hamper the direct application of national climate adaptation policies. Especially since up until recently strategies for climate change adaptation were foremost focused on rural areas (Birkmann, Garschagen, Kraas, & Quang, 2010). However, while many of the aspects of urban settlements imply the challenge of adaptation to be magnified and make finding solutions less simple, some might also provide increased opportunities for integrative solutions.

ADAPTATION STRATEGIES

As mentioned, the capacity of urban regions in adapting to changes in the social, economical and physical environment is crucial for their sustained existence (White, 2010). Often instigated by natural disasters, over the last couple of years practitioners in the water and environmental sector, relevancy of adaptation has been raised on the agenda of scientific advisors as well as city authorities. General understanding is that this adaptation challenge should be approached from an integrative perspective, combining changes in social and economic processes with adjustments to the physical urban fabric. This has led to the development of climate adaptation strategies by various cities around the globe. With the formulation of these strategies the city has the opportunity to develop policies that enable both public and private actors to respond to a variety of interrelated challenges (Keenan, 2014b), for example increasing flood resilience while enhancing the urban environment and bringing back social segregation.

The strategies differ in the direct and indirect consequences of climate change they deal with as well as the proposed responses. However, typically a large part of the content of these strategies is focused on general goals and visions and thus is not city-specific. The next step of translating these ambitious statements to more concrete measures is often lacking (Birkmann, Garschagen, Kraas, & Quang, 2010). However, some cities *have* translated these general goals to the creation of new or adjustments of current policies. These cities, including NYC and Rotterdam, are leading examples for other adapting cities. The specific measures are often treated in a separate document and focus on one more-or-less demarcated effect of climate change, for example energy supply, food provision or water management. These reports mainly focus on responsibilities for public parties, but can also provide guidelines for private actors.

URBAN FLOOD RESILIENCY

One of the most prevalent effects of climate change delta cities are faced with lies in water management problems. Particularly the issue of increasing water excess and flooding, as examined in this study, is expected to form one of the most pressing challenges for cities located near the water. The IPCC lists flooding and its effects as both first and second key risk factor of climate change (see text box below). A multitude of reports are written on the increase of flood risks and its physical, social and economic (Shardul & Samuel, 2008; OECD, 2009) effects. Several studies

correspondingly focus on propositions to concur these anticipated effects (OECD, 2009; Rijke, Mainstreaming innovations in urban water management - Case studies in Melbourne and the Netherlands, 2007).

The challenge imposed by flooding is most apparent in cities located in delta regions. Besides more frequent periods of extreme weather, bringing peak-loads of rainwater to disperse, deltas are confronted with both the gradual process of rising sea levels as well as the seasonal fluvial added water load. Moreover, most delta regions deal with the issue of land subsidence (OECD, 2009). However, the impact of flooding of cities is increased not only by the rising chances of these events, but also by the aggravation of the effects resulting from urbanization and concurring densification. This is aggravated by the expectation of cities located in delta regions to grow especially fast. More than 2/3 of all cities worldwide with a population of more than 5 million are located within coastal areas of less than 10 m elevation (McGranahan, Balk, & Anderson, 2007). This of course increases the number of people and assets exposed, and with that, the damage flooding events can impose (OECD, 2009). These developments imply that deltas' main advantageous characteristic; water, is now is seen as a threat for cities located in these areas. Quite a change considering that up until recently just this connection of water systems was the main driver for settlement and prosperity in these areas (Meyer, City and port: Urban planning as a cultural venture in London, Barcelona, New York, and Rotterdam: Changing relations between public urban space and large-scale infrastructure., 1999). Thus, the challenge for delta cities lies in re-establishing the beneficial relationship between the domains of land, water and climate (White, 2010).

Global key risk factors climate change according to IPCC (2014):

- i. Risk of death, injury, ill-health, or disrupted livelihoods in low-lying coastal zones and small island developing states and other small islands, due to storm surges, coastal flooding, and sea-level rise.
- ii. Risk of severe ill-health and disrupted livelihoods for large urban populations due to inland flooding in some regions.
- iii. Systemic risks due to extreme weather events leading to breakdown of infrastructure networks and critical services such as electricity, water supply, and health and emergency services.
- iv. Risk of mortality and morbidity during periods of extreme heat, particularly for vulnerable urban populations and those working outdoors in urban or rural areas.
- v. Risk of food insecurity and the breakdown of food systems linked to warming, drought, flooding, and precipitation variability and extremes, particularly for poorer populations in urban and rural settings.
- vi. Risk of loss of rural livelihoods and income due to insufficient access to drinking and irrigation water and reduced agricultural productivity, particularly for farmers and pastoralists with minimal capital in semi-arid regions.
- vii. Risk of loss of marine and coastal ecosystems, biodiversity, and the ecosystem goods, functions, and services they provide for coastal livelihoods, especially for fishing communities in the tropics and the Arctic.
- viii. Risk of loss of terrestrial and inland water ecosystems, biodiversity, and the ecosystem goods, functions, and services they provide for livelihoods.

Moreover, delta regions are traditionally places for import, export and commerce and often form crucial nodes for international trade (Meyer [1999], Daamen [2010], Aarts, Daamen, Huijs, & de Vries [2012]). Therefore the impacts of their systems failing are expected to be extensive and more widespread than of inland cities (OECD, 2009).

Together, these developments make that not only the probability, but also the consequences of flooding are rising rapidly. In port cities, by 2070 the value of assets exposed to a 1:100 year flooding event is projected to amount to roughly 9% of global GDP (Nicholls, 2008). As shown by previous projects of increasing flood resilience like the Thames Barrier and the Dutch Delta Project, implementation of protection programs takes 30 years or more (Nicholls, 2008). This indicates the level of urgency to take action in order to prevent major disasters in the coming century.

INTEGRATED ADAPTATION STRATEGIES

The congruent processes of climate adaptation and urbanization both impose the need for change of the urban fabric. In most cities these processes are currently being carried out separately, both competing for scarce space. This approach is considered to be no longer sustainable in cities where increasing pressure is put on function and quality of the living environment. In recent years extensive investigation has been done on the potential benefits of the integration of water management and spatial planning to assist development of more resilient cities has been extensively investigated. The opportunities found to capture additional benefits are ample and indicate that integration of climate adaptation measures with spatial planning is indeed the way forward (Teeuw & Luising (2005), Van Hal, Diepenmaat, & Ettekoven (2011), Davoudi, Crawford, & Mehmood (2009)). The principle of this integration is illustrated in figure 8.

In order to achieve this integration, comprehensive approaches for development policies at national, sectorial and project levels need to be set up (OECD, 2009). In some regions and cities a sense of urgency, often caused by recent extreme weather events, has started this process. This is currently resulting in the development of urban climate adaptation strategies. These strategies aim at improving climate resilience in general by means of urban planning and policy. This implies that not only spatial but also social, economic and political interventions are envisioned. The content of these strategies varies according to the issues the respective cities are dealing with. The strategies thus encompass a broad long-term vision for future city development as well as more specific adaptation measures. In some of these strategies also proposals for legislative embedding, organizational structure and available funding schemes are featured. As mentioned, most of the strategies are initiated as a direct response to recent disasters, however, some are purely preventive.

With the formulation of these strategies cities have the opportunity to develop policies that enable both public and private actors to respond to a variety of interrelated challenges (Keenan, 2014b). For example, as focused on this research, increasing flood resilience and the urban area development.

Currently, Western countries are considered to have the technical and economic capacity to carry out the proposals of these strategies (Veerbeek, Ashley, Zevenbergen, Rijke, & Gersonius, Building adaptive capacity for flood proofing in urban areas through synergistic interventions, 2010). However, realization seems to be hampered. Several professionals, as well as scientific studies⁵ conclude that the current challenge for implementation lies in the development of new forms of urban governance. They express the need for a paradigm shift in (urban) water management towards the improvement of planning processes, rather than the focus on the adjustment of physical structures (Birkmann, Garschagen, Kraas, & Quang, 2010). This implies the strategic linking of different spatial and temporal scales in adaptation planning. Another prerequisite is the acknowledgement of and communication between the various fields of knowledge and stakeholders involved in this challenge is crucial. Lastly, the integration of adaptation measures, translated in policies, tools and norm systems in the current urban planning structure is crucial (Birkmann, Garschagen, Kraas, & Quang, 2010).

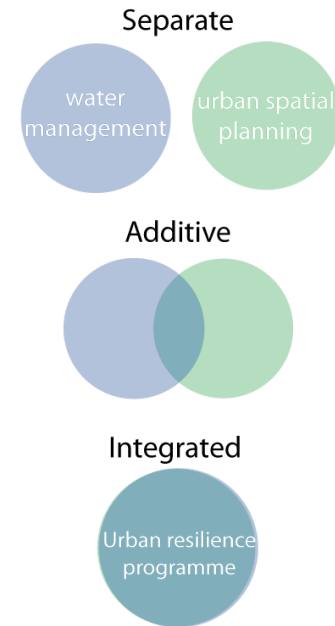


Figure 8. Integration of water management and spatial planning domain (own illustration)



“Digging and raising” (source: Helpdesk Water [2008])

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⁵ a.o. Birkmann, Garschagen, Kraas, & Quang, 2010; Rijke, 2007; Keenan, 2014; Timmermans, Vercauteren, Hasman, Gonzales, & Papenborg, 2013 and Veerbeek, Ashley, Zevenbergen, Rijke, & Gersonius, 2010

URBAN FLOOD RESILIENCY FROM A PRIVATE ACTOR PERSPECTIVE

Private market actors are starting to realize the increasing need for adaptation (Jones Lang LaSalle, 2014). Effects of flooding for them is not only that their buildings suffer from physical damages, but also that business operations may be stopped for a certain amount of time. For now, owners and tenants in the USA rely on flood risk insurance for potential damages. Keenan (2014a) observes that most firms only adopt climate adaptive strategies when faced with known and immediate risks for their financial bottom line. Boardroom decisions of property firms predominantly rely on financial tools and metrics, typically targeted at return on investment within a three-year time horizon (Jones Lang LaSalle, 2014). Thus, most investors and developers are still reluctant in making investments to prevent future losses that have a high uncertainty and are expected on the longer term. However, insurance generally cover not all losses. For example, the total economic damage of hurricane Sandy is estimated at \$65 billion, of which only \$30 billion was covered by insurance (Munich Re, 2013). Besides, insurance premiums are expected to rise in the coming years (Jones Lang LaSalle, 2014). Some private actors are departing from the short-term perspective to make their investment-decisions in property. They are taking initiative in identifying the long-term costs and benefits by using a broader set of metrics and leveraging commercial benefits and opportunities (Jones Lang LaSalle, 2014).

An obvious answer from private actors to flooding risks would be to relocate and leave the area. However, even though property prices may (temporarily) drop in affected areas, often occupiers choose to stay. For example, in Brisbane waterfront sites remain desirable premium locations for commercial office users despite recent floodings (Jones Lang LaSalle, 2014). Another example is provided by New York, where in the months after hurricane Sandy, an affected district of lower Manhattan experienced an *influx* of new tenants (The Alliance for Downtown New York, 2013). One can conclude that considerations on flood-resilience are not leading in the housing and locating decisions of commercial tenants. This is explained by limited options for alternative space, advantages of the location, the anticipation of price-level recovery and the reliance on insurance (Jones Lang LaSalle, 2014).

Where the benefits of adaptation measures to concur many other effects of climate change might be hard to identify, let alone quantify, financial impact of enhancing flood resilience is more clear. This, because private parties can make an estimation of future losses, based on property value, business operations and flood-risk maps (Jones Lang LaSalle, 2014). This information should be added to an estimation of future developments of insurance premiums as well as their damage coverage. Even though, as we saw, flood resiliency is not yet one of the main drivers of property development and strategic business location, as risks are increasing, insurance costs are expected to rise and coverage to be limited correspondingly. This may lead to higher costs in case of flooding for the firm or building owner, which in turn could be transferred to tenants (Jones Lang LaSalle, 2014) but can congruently harm business operations. Keenan (2014a) notes that firms with more robust climate adaptive strategies are often those that are most vulnerable to immediate damage and are *aware* of this vulnerability. Therefore, private actors, developing and investing firms as well as individuals and tenants, are advised to start taking flood risks and adaptation measures into consideration in the assessment of the location and vulnerability of their buildings (Jones Lang LaSalle, 2014).

A. WATERFRONT REGENERATION

Urban waterfronts are essentially the places where the challenges of urban flooding and increased urbanization meet. Many of these areas were former port facilities, now abandoned as a result of the containerization of trade since the 1960-ies. As a result, most of these areas now lie vacant and deal with a bad image. This image is caused by the fast decline of open space as well as the state of the buildings and strengthened by the lack of social control, which makes for an ideal location to carry out illegal activities. Furthermore, economic as well as social sustainability of the areas are further endangered by environmental issues of contamination and, with regard to climate change, the increased risk of flooding. Reflecting on these issues, while considering the opportunities of the locations being near the waterfront and often nearby the city-center, huge chances lie in the redevelopment of these of these areas. Possibilities to mainstream and integrate adaptive measures with the economic social enhancement of these areas seem apparent. However, by adding these objectives the complexity of the development of these locations increases.

Waterfront regeneration are in this study defined as:

Urban development projects located in abandoned ports and industrial 'brownfields' along waterways, aimed at enhancing the social, economic and environmental environment of these areas. Based on Hoyle & Pinder (1992) and Daamen (2010, p. 19).

Over the last decades many cities have put considerable effort in these derelict waterfront areas. This has lead to many success stories, giving rise to the observation of the 'renaissance of the urban waterfront' (Breen & Rigby, 1996). Many of the projects are successful in that they turn the neglected port areas into attractive urban locations. However, the projects often failed to contribute to solving the wider problems port cities are coping with (Daamen, Strategy as force. Towards effective strategies for urban development projects: the case of Rotterdam CityPorts, 2010). This is explained by the understanding that many of these projects taking place through property-led development, which is mainly focused on physical outcome and economic gains of projects (Harvey, 1990). Specific common qualities of these kinds of projects, like the feature of cultural heritage, symbolic architecture, and high quality urban design ensured their attractiveness in terms of return on investment. The success of early waterfront redevelopments has thus lead to the copying of this concept throughout the western world and on a global scale (Harvey, 1990, p. 92). The social and cultural sides of these projects however are often underexposed. This, even though these aspects are considered crucial in responding to the disrupted urban systems at hand, given the intensive former usage and history of the locations (Harvey, 1990). This aspect depicts what furthermore makes urban waterfronts an interesting subject for this study. Their high visibility, which makes them 'magnified intersections of a number of urban forces' (Marshall, 2001, p. 7) that drive up political and economic stakes (Daamen, Strategy as force. Towards effective strategies for urban development projects: the case of Rotterdam CityPorts, 2010). As described above, financial mechanisms as well as public intervention is fundamental in the processes of these projects (Malone, 1996). This notion, that public intervention largely determines forces behind these projects sets them aside from 'regular' urban developments, especially in the United States. This, together with increased market interest limiting public intervention in these projects in the Netherlands, makes their processes and forces especially fit for comparison.



Hafencity; waterfront regeneration in Hamburg (own illustration)

4. BACKGROUND MATERIAL NYC CASE

Waterfront Redevelopment Opportunities in Brooklyn, NYC (source: DCP, Vision 2020: New York City



Waterfront Redevelopment Opportunities: Brooklyn

- 2010 Proposed Redevelopment Opportunities
- 1992 – 2010 Reasonings and Redevelopments
- Proposed 1992 CWP Redevelopment Opportunities



comprehensive waterfront plan, 2011).

REACH 14 S. -BROOKLYN UPPER BAY SOUTH



Waterfront Redevelopment Opportunities map in Brooklyn Upper Bay South, NYC (source: DCP, Vision 2020: New York City comprehensive waterfront plan, 2011).

REACH 14 S.-BROOKLYN UPPER BAY SOUTH

Location: Buttermilk Channel and New York Upper Bay from Atlantic Ave. to Owls Head

Upland Neighborhoods: Cobble Hill, Red Hook, Gowanus, Sunset Park, Carroll Gardens, Columbia Street Waterfront, Park Slope, Boerum Hill

Neighborhood Strategies

Reachwide

- Facilitate open space improvements at streetlands in coordination with approved plans and zoning regulations for adjacent sites.
- Release Brooklyn Waterfront Greenway Master Plan, guiding the creation of a 14-mile waterfront path between Newtown Creek and the Shore Parkway Greenway.

Piers 7-12

- Support continuation of industrial uses.
- Build a multi-use path to connect Atlantic Basin to the Brooklyn waterfront greenway.
- Explore preservation of historic properties and creation of waterfront interpretive center focused on history of working waterfront.
- Support use of green port technology, such as shore power, clean energy, and use of waterborne freight transport.
- Minimize traffic conflicts between trucks and pedestrians/bicyclists.
- Pursue development of a "hub" for maritime support services in Atlantic Basin.
- Support opportunities for active publicly accessible use of cruise terminal on days when ship is not in port.
- Study opportunities for active water-related public uses in Atlantic Basin, such as recreation and educational programming.
- Market the Container Terminal as a distribution hub for containerized cargo destined for East of Hudson businesses.
- Provide additional berthing locations to commercial vessels along the north side of Atlantic Basin.

Valentino Pier

- Explore creation of boathouse and other amenities.

280 Richards St.

- Support development compatible with adjacent water-dependent industry and explore public access opportunities.

Gowanus Canal

- Complete pump station, force main and flushing tunnel upgrade to improve water quality.
- Participate in ongoing reviews of remedial investigation results and feasibility study for EPA's clean up.
- Design and begin construction of the first phase of high-level storm sewers within to reduce CSOs in the canal as well as street flooding and sewer backups in adjacent neighborhoods.
- Support rezoning in underutilized areas, continuous public waterfront access, and cleanup of contaminated sites consistent with city, state, and federal standards.
- Explore opportunities for safe indirect-contact in-water recreation, in consultation with State and Federal regulators.
- Support continued industrial activities and preservation of historic properties.
- Support plans to use street-end parks and pervious surfaces to capture stormwater and provide education to the public.

3rd Ave./3rd St. Site

- Continue ongoing remediation efforts.
- Explore options for reuse along with providing public and visual access to waterfront.

Public Place Site

- Support site remediation in cooperation with responsible parties and State and Federal regulators, and pursue planned housing development with public waterfront open space.

Hamilton Avenue Marine Transfer Station

- Support development of planned marine waste transfer station.

Sunset Park

- Support appropriate alignment of Brooklyn Waterfront Greenway, with point access to the waterfront where feasible and a safe, defined corridor to the new park that minimizes conflicts with uses in the Industrial Business Zone.
- Support recommendations of EDC's Sunset Park Vision Plan for future infrastructure improvements to maximize efficient movement of goods, including Brooklyn Waterfront Rail Improvement project, reactivation of the South Brooklyn Marine Terminal, and activation of rail yard and marine transload facility at the 65th and 51st street rail yards.
- Relocate NYPD tow-pound at South Brooklyn Marine Terminal.
- Explore rehabilitation of Pier 6 for possible dry bulk/liquid operations, and maritime support operations.
- Explore locations for a maritime support services "hub," where workboats can receive services such as provisioning, crew changes, wastewater removal, and fuel.
- Actively market marine transport as a option for local distribution and manufacturing businesses to reduce overall truck vehicle miles travelled (create a "Freight Village" around green transportation).
- Improve cross-harbor freight transportation, including reactivation of 65th Street float bridges and expanded use of rail freight via the "Southern Corridor" to the national rail freight network.
- Explore long-term opportunities for a deepwater container port in coordination with key stakeholders.
- Commence first phase of Brooklyn Army Terminal commercial life sciences and technology center, and support workforce development and training programs.
- Issue RFP for the lease and development of an approximately 130,000-square-foot property at the Bush Terminal Complex.

Bush Terminal Piers Park

- Advance plans for park including remediation, and explore opportunities for enhanced upland connections.
- Explore opportunities for boat launch based on the criteria described in the Citywide Strategy.
- Explore funding for planned environmental education center.
- Design park access to minimize pedestrian and industrial business conflicts.
- Explore options for preservation of deteriorating piers.

Waterfront Redevelopment Opportunities map in Brooklyn Upper Bay South, NYC (source: DCP, Vision 2020: New York City comprehensive waterfront plan, 2011).

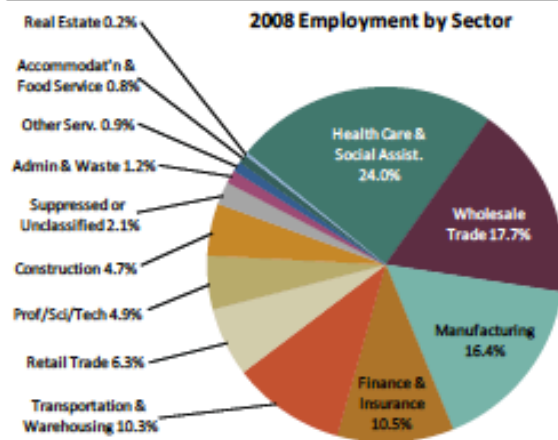
Sunset Park Significant Maritime and Industrial Area, Brooklyn



Source: NYS Department of Labor, Quarterly Census of Employment and Wages, 2000 & 2008

Private firms and jobs located in the Sunset Park SMIA: 2000 and 2008

	2000		2008		Δ 2008-2000	
	Firms	Employees	Firms	Employees	Firms	Employees
Sunset Park Total	551	12972	534	14362	-17	1390
Industrial Firms	437	8211	375	7290	-62	-921
Non-Industrial Firms	114	4761	159	7072	45	2311



Nearly 600 acres, the Sunset Park SMIA extends from Erie Basin to Owls Head, an area characterized by water-dependent facilities, concentrations of industrial activity, well-buffered manufacturing districts, and vacant sites and brownfields of significant size. A small portion of the SMIA abuts the Gowanus Canal, a waterway that was designated a Superfund Site in 2010.

Sunset Park has some of the largest vacant sites but also the highest job density of all of the SMIA's. From 2000 to 2008, this SMIA's employment grew by 10 percent to reach a total of over 14,000 employees (although this marks a 20 percent reduction in employment from 1992). Sunset Park's well-diversified base, with commanding growth in non-industrial sectors, is one of the significant factors contributing to the high employment density.

Sunset Park as Significant Maritime and Industrial Area (source: DCP, Vision 2020: New York City comprehensive waterfront plan, 2011).

5. ACTOR LIST NYC

National level Actors	Actor type	Main focus flood resiliency policy intentions
a) Federal Emergency Management Agency (FEMA)	Government	Shaping, Regulatory, stimulating
b) U.S. Army Corps of Engineers (USACE)	Government	Stimulating
c) U.S. Department of Housing and Urban Development (HUD)	Government	Regulatory, stimulating
a. Sandy Rebuilding Task Force (SRTF)	Government	Shaping, capacity building
d) US Department of Transportation (DOT)	Government	Responding
e) U.S. Commerce Department's U.S. Economic Development Administration (EDA)	Government	Stimulating
f) U.S. Environmental Protection Agency (EPA)	Government	Regulatory, stimulating, shaping
a. Federal Climate Change Adaptation Task Force (falls under EPA)	Government	Shaping
g) U.S. Global Change Research Program (USGCRP)	Government	Shaping, capacity building
h) National Institute of Standards and Technology (NIST) (Part of US Department of Commerce)	Government	Responding
i) Occupational Safety & Health Administration (OSHA) (Part of US Department of Labor)	Government	Responding
j) US Green Building Council	NGO	Shaping
k) Sierra Club	NGO	Shaping, stimulating, capacity building
l) Rockefeller Foundation	NGO	Shaping, capacity building
m) League of Conservation Voters (LCV)	NGO	Shaping, capacity building
n) American Society of Heating and Air-Conditioning Engineers (ASHAE)	NGO	Shaping, stimulating
o) National Oceanic and Atmospheric Administration (NOAA)	Research institute	Shaping, stimulating
p) National Science Foundation (NSF)	Research institute	Responding
q) U.S. Global Change Research Program (USGCRP)	Research institute	Shaping

State/Regional level

Actor	Actor type	Flood resiliency policy intentions (main focus)
a) New York State	Government	Regulatory, Stimulating
a. NYS Department of Environmental Conservation (NYSDEC)	Government	Regulatory, Responding
b. NYS Office of Emergency Management (NYC OEM)	Government	Capacity building, Responding
c. NYS Agency of Homes and Community Renewal (HCR)	Government	Responding

d.	NYS Empire State Development (ESD)	Government	Stimulating, Capacity building
b)	New Jersey State	Government	Regulatory, Responding
c)	New York State Floodplain and Stormwater Managers Association (NYSFSMA)	Government	Shaping, capacity building
d)	Port Authority of New York and New Jersey (PANYNJ)	Government	Stimulating, Responding
e)	Regional Plan Association (RPA)	Semi-Government	Shaping, capacity building
f)	Hudson River Foundation (HRF)	NGO	Stimulating, Capacity building
g)	Metropolitan Waterfront Alliance (MWA)	NGO/Professional-Public Partnership	Stimulating, Capacity building
h)	New York-Connecticut Sustainable Communities Consortium (NYCT SCC)	Professional-Public Partnership	Shaping, stimulating, capacity building
i)	Consortium for Climate Risk in the Urban Northeast (CCRUN)	Research institute/ professional-public Partnership	Capacity Building
j)	American Planning Association (APA) – New York Metro Chapter	Research institute	Responding

City level			
Actor	Actor type	Flood resiliency policy intentions (main focus)	
a)	City Council Office	Government	Regulatory Responding
b)	New York City Department of City Planning (NYC DCP)	Government	Shaping, regulatory, capacity building
c)	New York City Department of Buildings (NYC DoB)	Government	Regulatory
d)	New York City Department of Environmental Protection (NYC DEP)	Government	Regulatory, stimulating, Responding
e)	New York City Department of Small Businesses Services (SYC SBS)	Government	Regulatory Responding
f)	New York City Housing Development Corporation (NYCHDC)	Government	Responding Capacity Building
g)	New York City Department of Parks and Recreation (NYC Parks)	Government	Regulatory, Responding
h)	New York City's Economic Development Corporation (NYC EDC)	Government	Stimulating, capacity building
i)	New York City Housing Authority (NYCHA)	Government	Responding
j)	Mayor's Office of Recovery and Resiliency (ORR)	Government	Shaping
k)	Mayor's Office of Long Term Planning and Sustainability	Government	Shaping, capacity building

l)	Mayor's Office of Housing Recovery Operations	Government	Responding
m)	New York's 7th Congressional District	Government	Responding
n)	New York City Environmental Justice Alliance (NYC EJA)	Government	Capacity building
o)	Special Initiative for Rebuilding and Resiliency (SIRR)	Government/ Research institute	Shaping, stimulating
p)	New York City Panel on Climate Change (NPCC) & Climate Change Adaptation Task Force	Government/ Research institute	Shaping, capacity building
q)	Urban Green Council/NYC Building Resiliency Task Force	Government/ Research institute	Shaping
r)	Design for Risk and Reconstruction (DfRR), part of American Institute of Architects New York chapter (AIANY)	Government/ Research institute	Shaping, capacity building
s)	New York City Energy Efficiency Corporation (NYCEEC)	NGO	Stimulating Responding
t)	The Municipal Art Society of New York (MAS NYC)	NGO	Shaping, capacity building
u)	City Parks Foundation (CPF)	NGO	Stimulating, Capacity building
v)	Center for Urban Real Estate (CURE.) at Columbia University	Research institute	Shaping, capacity building
w)	Earth Institute at Columbia University	Research institute	Shaping, capacity building
x)	Recovery Adaptation Mitigation Planning (RAMP) at Pratt Institute	Research institute	Shaping, capacity building
y)	Institute for Public Knowledge (IPK), Superstorm Sandy Research Initiative at New York University	Research institute	Shaping Responding
z)	Center for Urban Science and Progress (CUSP) at New York University	Research institute	Responding
aa)	Institute for Sustainable Cities (SICS), City University of New York (CUNY)	Research institute	Responding
bb)	Science and Resilience Institute at Jamaica Bay (SRI@JB)	Research institute	Capacity building

Local/Neighborhood level (Sunset Park Case)	Actor type	Main focus flood resiliency policy intentions
a) City Council district representative	Government	Regulatory, Shaping
b) Brooklyn Borough Presidents' Office	Government	Responding

c)	<u>Brooklyn Community Board no.7; Sunset Park and Windsor Terrace (CB07)</u>	Semi-Government	<u>Shaping, capacity building</u>
d)	Salmar Properties	Investor/building owner	Responding
e)	<u>Southwest Brooklyn Industrial Development Corporation (SBIDC)</u>	NGO	<u>Capacity building</u>
f)	Brooklyn Community Foundation (representing surrounding residents)	NGO	Capacity building
g)	Brooklyn Chamber of Commerce (BCoC) (representing housed and future businesses)	NGO	Responding
h)	<u>UPROSE</u>	NGO	<u>Capacity building</u>
i)	<u>Sunset Park Working Group</u>	Professional-Public Partnership	<u>Shaping, capacity building</u>
j)	Jamestown	Developer	
k)	Belvedere Capital	Developer	
l)	Angelo, Gordon & Co	Developer	
m)	WE WORK	Resident / housed firm	
n)	General Assembly	Resident / housed firm	
o)	Industry City Distillery	Resident / housed firm	

6. POLICY LIST NYC

National level

Policy	Issuing party	Policy intention	Description
National Flood Insurance Program (NFIP)	FEMA	Stimulating	In 1968, Congress created the National Flood Insurance Program (NFIP) to help provide a means for property owners to financially protect themselves. The NFIP offers flood insurance to homeowners, renters, and business owners if their community participates in the NFIP. Participating communities agree to adopt and enforce ordinances that meet or exceed FEMA requirements to reduce the risk of flooding.
Community Development Block Grant-Disaster Recovery program	HUD	Stimulating	Through this federal program, funds have been made available to help businesses recover and ensure long-term economic growth in areas impacted by Sandy. (http://www.nycedc.com/service/programs-business-recovery-resiliency)
Disaster Relief Appropriations Act (2013) and the Sandy Recovery Improvement Act of 2013 (SRIA)	HUD&FEMA	Stimulating	
National Environmental Policy Act (NEPA)	US Congress	Regulatory	
Coastal Zone Management Act (CZMA)	US Congress	Regulatory	
Climate Change Adaptation Plan and Regional Adaptation Implementation Plans (2013)	EPA	Shaping	In this plan, EPA examines the ways its programs are vulnerable to a changing climate and how the Agency can adapt to continue meeting its mission of protecting human health and the environment. In early November, 2013 EPA released <i>17 DRAFT Program and Regional Adaptation Implementation Plans</i> for a 60 day public comment period. The public may provide comments on the documents through the Agency's docket system at www.regulations.gov (Docket Number EPA-HQ-OA-2013-0568). These draft Implementation Plans were developed by the EPA's Program and Regional offices and describe how each will address the impacts of climate change on its mission, operations, and programs, in response to the Agency-wide plan.
National Disaster Resilience Competition		Shaping, stimulating, capacity building	Responding to demand from state, local and tribal leaders who are working to increase the safety and security of their communities, the nearly \$1 billion competition will invite communities that have experienced natural

disasters to compete for funds to help them rebuild and increase their resilience to future disasters. The competition announced today will support innovative resilience projects at the local level while encouraging communities to adopt policy changes and activities that plan for the impacts of extreme weather and climate change and rebuild affected areas to be better prepared for the future. The competition underscores the ability communities have to not only recover from recent disasters but also rebuild better and stronger for the future. It will allow them to engage local stakeholders, nongovernmental organizations and the philanthropic sector to protect their own communities from the impacts of climate change by enhancing resilient infrastructure, building on sound science, and deploying innovative approaches to investments. These funds will enable eligible communities to access resources that help both recover from the previous disaster and make plans, decisions, and investments that make them more resilient to the next disaster.

Public Assistance (PA) FEMA Stimulating

National Disaster Recovery Framework FEMA Capacity building

The National Disaster Recovery Framework is a guide designed to ensure coordination and recovery planning at all levels of government before a disaster, and defines how we will work together, following a disaster, to best meet the needs of states and communities in their recoveries. This guide is the product of efforts to meet requirements from two key directives: first, the Post-Katrina Emergency Management Reform Act of 2006 requires FEMA to develop a National Disaster Recovery Strategy. Additionally, Presidential Policy Directive (PPD)-8, National Preparedness directs FEMA to work with interagency partners to publish a National Disaster Recovery Framework and supporting operational plans as an integral element of a National Preparedness System. The National Disaster Recovery Framework, for the first time, defines how, as a nation, we will approach recovery. The National Disaster Recovery Framework establishes coordination structures, leadership roles and responsibilities, and guides recovery planning at all levels of government before a disaster happens. The National Disaster Recovery Framework introduces recovery support functions that are led by designated federal coordinating agencies. These coordinating federal agencies support state, local, tribal and private sector groups with community planning and capacity building, regaining economic stability, rebuilding

			<p>infrastructure, restoring health and social services, and natural and cultural resources and meeting the housing needs of residents displaced by disasters. In addition, the National Disaster Recovery Framework recommends and identifies key recovery leadership positions designed to allow for more concentrated focus on community recovery. These include State/Tribal disaster recovery coordinators and local disaster recovery managers, as well as a Federal Disaster Recovery Coordinator when needed for large-scale and catastrophic disasters. The National Disaster Recovery Framework presents three positions that provide focal points for incorporating recovery considerations into the decision making process and monitoring the need for adjustments in assistance where necessary and feasible throughout the recovery process. Those positions are Federal Disaster Recovery Coordinator (FDRC), State or Tribal Disaster Recovery Coordinators (SDRC or TDRC) and Local Disaster Recovery Managers (LDRM).</p>
Sandy Recovery Improvement Act (SRIA)	FEMA	Stimulating	<p>SRIA gives FEMA the authority to provide up to 25 percent of the amount of estimated Hazard Mitigation Grant Program (HMGP) costs to States and Tribes in advance of incurring eligible costs. The purpose of Advance Assistance is to provide States and Tribes resources to develop mitigation strategies and obtain data to prioritize, select and develop complete HMGP applications in a timely manner.</p>
Hazard Mitigation Grants Program (HMPG)	FEMA	Stimulating	<p>The Hazard Mitigation Grant Program (HMGP) provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Applicants are State and Local governments, as well as Private non-profit organizations.</p>
Pre-Disaster Mitigation Grants (PDM)	FEMA	Stimulating	<p>The Pre-Disaster Mitigation (PDM) program provides funds for hazard mitigation planning and projects on an annual basis. The PDM program was set in place to reduce overall risk to people and structures, while at the same time, also reducing reliance on federal funding if an actual disaster were to occur. Applicants are State and Local governments.</p>
Flood Mitigation Assistance (FMA)	FEMA	Stimulating	<p>This program provides funds for projects to reduce or eliminate risk of flood damage to buildings that are insured under the National Flood Insurance Program (NFIP) on an annual basis. There are three types of FMA grants</p>

			available to Applicants: (1) Planning Grants - to prepare flood mitigation plans, (2) Project Grants - to implement measures to reduce flood losses, such as elevation, acquisition or relocation of NFIP-insured structures and (3) Management Cost Grants - for the grantee to help administer the FMA program and activities. Eligible applicants are governmental bodies from State to local/community level.
Severe Repetitive Loss Grants (SRL)	FEMA	Stimulating	The Severe Repetitive Loss (SRL) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004, which amended the National Flood Insurance Act of 1968 to provide funding to reduce or eliminate the long-term risk of flood damage to severe repetitive loss structures insured under the National Flood Insurance Program.
Repetitive Flood Claims Grants	FEMA	Stimulating	RFC provides funding to reduce or eliminate the long-term risk of flood damage to structures insured under the National Flood Insurance Program (NFIP) that have had one or more claim payments for flood damages.

State level

Policy	Issuing agency	Policy intention	
New York State Community Development Block Grant Disaster Recovery (CDBG-DR) Program		Stimulating	New York State’s recovery action plan is helping struggling homeowners and businesses devastated by Superstorm Sandy, Hurricane Irene, and Tropical Storm Lee. Funded through HUD’s Community Development Block Grant Disaster Recovery (CDBG – DR) program, New York State’s recovery action plan calls for a combined \$1.7 billion investment in a variety of housing, infrastructure and business recovery activities.
Sustainable Communities Regional Planning Grant Program	NYCT SCC (HUD, US Department of Transportation, EPA)	Simulating	The Sustainable Communities Regional Planning Grant Program supports metropolitan and multijurisdictional planning efforts that promote coordinated housing, land use, economic and workforce development, transportation and infrastructure investments in a manner that empowers jurisdictions to consider the interdependent challenges of these issues specific to their region. The regional plans being created or updated in this and 44 other regions will address these policy issues and illustrate how federal resources will be aligned to mirror local and regional strategies for achieving inclusive, sustainable communities. Grant recipients and other high-scoring regions have also achieved access to federal funding for implementation in the future.

Sandy Regional Recovery Agenda	SIRR, HUD, federal Sandy Rebuilding Task Force, the federal Joint Field Office established under the National Disaster Recovery Framework and headed by FEMA and NYS Governor Cuomo's office	Shaping, capacity building	The Sandy Regional Assembly convened by nearly 200 participants from community, labor and civic groups from communities most impacted by Superstorm Sandy (and most vulnerable to future storm surges) – issued a <i>Sandy Regional Recovery Agenda</i> in April, a mix of suggested capital projects and policy recommendations to advance adaptation and community resiliency strategies for the region's most vulnerable communities.
ClimAID	NYS	Shaping	ClimAID a study funded by New York State that assesses the potential impacts of climate change statewide, and identifies ways to mitigate them.
NYS Environmental Quality Review Act (SEQRA)	NYS Legislature	Regulatory	
Tidal Wetlands Act	NYS Legislature	Regulatory	

City level

Policy	Issuing agency	Policy intention	
Rebuild by Design	Hurricane Sandy Rebuilding Task Force, HUD, Institute for Public Knowledge at New York University, MASNYC, RPA and the Van Alen Institute	Shaping, capacity building	Founded as a response to Superstorm Sandy's devastation in the region, Rebuild by Design is dedicated to creating innovative community- and policy-based solutions to protect U.S. cities that are most vulnerable to increasingly intense weather events and future uncertainties. Initiated by the US Department of Housing and Urban Development and the Presidential Hurricane Sandy Rebuilding Task Force, Rebuild by Design's aim has been to connect the world's most talented researchers and designers with the Sandy-affected area's active businesses, policymakers and local groups to better understand how to redevelop their communities in environmentally- and economically-healthier ways and to be better prepared.
Build it Back Program	NYC Mayor's Office of Housing Recovery Operations		
New York City Waterfront Revitalization Program	NYCDCP, MWA	Shaping, capacity building	New York City's Waterfront Revitalization Program (WRP) establishes the city's policies for development and use of the waterfront and provides the framework for evaluating the

			consistency of all discretionary actions in the coastal zone with those policies. In 2012 the NYC Department of City Planning will be working with communities to revise the WRP. Classifies waterfronts in natural, recreational, working, redeveloping and industrial (SMIA) areas.
Green Infrastructure Program	NYCDEP	Legislative, Stimulating, capacity building	New York City's Green Infrastructure Program is a multiagency effort led by the Department of Environmental Protection. DEP and agency partners design, construct and maintain a variety of sustainable green infrastructure practices such as green roofs, rain gardens, and Right-of-way Bioswales on City owned property such as streets, sidewalks, schools, and public housing. Green infrastructure promotes the natural movement of water by collecting and managing stormwater runoff from streets, sidewalks, parking lots and rooftops and directing it to engineered systems that typically feature soils, stones, and vegetation. This process prevents stormwater runoff from entering the combined sewer system. DEP is building green infrastructure in compliance with NYS Department of Environmental Conservation (DEC) requirements to reduce combined sewer overflow (CSO) discharges into New York City's waterbodies. Green Infrastructure also beautifies City streets and neighborhoods while improving air and water quality. Grant projects in the Bronx, Brooklyn and Manhattan, worked with other City agencies to initiate Area-wide design and construction contracts, launched the BioswaleCare Program to support community stewardship of green infrastructure, accepted a NYC Public Design Commission Award for Excellence in Design for the first green infrastructure design standards, worked to support the extension of the NYC Green Roof Tax Abatement
Grant Program for Private Property Owners		Stimulating	The New York City Department of Environmental Protection offers a grant program for private property owners in combined sewer areas of New York City. The minimum requirement is to manage 1" of stormwater runoff from the contributing impervious area. If selected, DEP will provide funds for the design and construction of the green infrastructure system. Eligible projects include blue roofs, rain gardens, green roofs, porous pavement and rainwater harvesting on private property in combined sewer areas.
The NYC Business Recovery & Resiliency programs	NYCEDC	Stimulating	These include low-interest loans and expedited grants, funding opportunities for flood protection measures and innovative technologies that improve resiliency, and other critical community and development efforts to foster economic growth.
Regulations comming fort from SEQRA stature (DEC SEQRA)	NYC DEC	Regulatory	

City Environmental Quality Review (CEQR)	NYC Council and Office of Environmental Coordination	Regulatory	
Business Recovery Loan and Grant Program	NYCEDC	Stimulating	As part of the City of New York's ongoing effort to assist New York City businesses damaged by Hurricane Sandy, a new loan and grant program has been made available. The Hurricane Sandy Business Loan & Grant program is one of four business recovery programs included in the City's Community Development Block Grant Disaster Recovery Action Plan approved by the U.S. Department of Housing and Urban Development (HUD). NYC Department of Small Business Services will be administering the program with assistance from the New York Business Development Corporation-Local Development Corporation (NYBDC-LDC).
NYC Zoning Resolution	NYCDPC/ NYC City Council	Regulatory	Zoning text amendment of september 2013 encourages flood-resilient building construction throughout designated flood zones. The changes are needed in order to remove regulatory barriers that would hinder or prevent the reconstruction of storm-damaged properties. The amendment enables new and existing buildings to comply with new, higher flood elevations issued by the Federal Emergency Management Agency (FEMA), and to new requirements in Building Code. Building to these new standards will reduce vulnerability to future floods, as well as help avoid higher flood insurance premiums.
Climate Risk Information 2013: Observations, Climate Change Projections, and Maps	NYC CCPC	Shaping	The report presents the latest climate science information and analyses of the risks facing New York City, and includes significant contributions by several CCRUN scientists.
Neighborhood Game-changer Investment Competition (http://www.nycdc.com/sites/default/files/filemanager/Services/Business_Recovery/Neighborhood_Game_Changer_Flyer_FINAL_3.pdf)	NYCEDC	Stimulating, capacity building,	The Neighborhood Game-Changer Investment Competition aims to identify and fund transformational projects. \$90,000,000 is available to fund "game-changing" projects that will enhance the vitality, connectivity, and economic strength of selected areas impacted by Hurricane Sandy.
RISE : NYC, Resiliency Innovations for a Stronger Economy	NYCEDC	Stimulating, capacity building,	RISE : NYC is a competition designed to identify and deploy creative new technologies and solutions to make New York City businesses more resilient to the impacts of future storms, sea level rise and other effects of climate change. Through the competition, up to \$30 million is available to fund projects that use innovative measures to make the city's buildings and infrastructure networks in areas impacted by Hurricane Sandy and/or vulnerable to future storms more resilient. The 37 finalists are currently refining their project proposals and identifying local small businesses

<p>Waterfront Edge Design Guidelines (WEDG)</p>	<p>MWA</p>	<p>Shaping, capacity building</p>	<p>that were impacted by Hurricane Sandy to include as project sites. As a project site, small businesses may receive a technology or solution installed at their business or building for free – ensuring that they are better prepared for the impacts of future storms, sea level rise and other effects of climate change.</p> <p>Waterfront edge design guidelines were a recommendation from MWA’s Aquatecture and Green Harbor task forces in 2010, informed by discussions about the update of the New York City Comprehensive Waterfront Plan. Design guidelines became a major recommendation within the Comprehensive Waterfront Plan and MWA began discussions to start the waterfront design guidelines project with key members of both task forces in July of 2012, effectively beginning the project. It is now a post-Sandy priority reflected in New York City’s post-Superstorm Sandy report, Special Initiative for Rebuilding and Resiliency, A Stronger, More Resilient New York. Since its inception, MWA has advocated for better waterfront edge design through its Design the Edge program. MWA is leading a process to develop design guidelines for the water’s edge for new and retrofitted waterfront development within the New York/New Jersey metropolitan region (the “NY/NJ Region”). The WEDG project is a unique collaboration between government agencies, non-profit groups, consultants and other interested stakeholders, that will result in a comprehensive, user-friendly set of guidelines. As a tool to guide and enhance new projects on an elective basis, waterfront edge design guidelines will feature design concepts and best practices that are beneficial, permittable, feasible, and understandable. In a similar fashion to Leadership in Energy and Environmental Design (LEED), a ratings system that encourages developers to build energy efficient buildings, the MWA plans to establish a Waterfront Edge Design Guidelines Council and a rating system in order to encourage and incentivize edge designs that are resilient, accessible to the public, and ecologically healthy, as well as economically feasible. MWA anticipates version 1.0 of the design guidelines will be completed by September 2014. With input from a multi-disciplinary task force and technical working group, MWA has created Guiding Principles for WEDG: to enhance Ecology, encourage Maritime Use, Use a Science-Based, Evaluative Proce, Enhance Public Access, Especially for Boats for Restoration, Commit to Equity and Community Input, Promote Resiliency, Encourage Cost Effective Solutions.</p>
<p>Waterfront Justice Project</p>	<p>NYC EJA</p>	<p>Shaping, capacity building</p>	<p>New York City’s first citywide community resiliency campaign. When the City of New York initiated its overhaul of the Comprehensive Waterfront Plan</p>

			<p>(Vision 2020) in 2010, NYC-EJA began an advocacy campaign to convince the Bloomberg Administration to reform waterfront designations called Significant Maritime Industrial Areas, or SMIA's. SMIA's are zones designed to encourage the clustering/concentration of heavy industrial and polluting infrastructure uses. There are only six SMIA's in the City – all classic "environmental justice" communities (i.e. – the South Bronx, Sunset Park, Red Hook, Newtown Creek, Brooklyn Navy Yard & North Shore of Staten Island) – predominantly low-income communities of color. Development applications in SMIA's are treated differently – and to a lower review standard – than other waterfront areas, thereby easing the siting and clustering of polluting infrastructure. (NYC-EJA discovered the six SMIA's are all in storm surge zones, and that the City of New York had not analyzed the cumulative contamination exposure risks associated with clusters of heavy industrial use in such vulnerable locations. In collaboration with Pratt Institute, NYC-EJA prepared GIS maps showing the SMIA's with storm surge zone overlays (see attached 2 of several maps. Following months of public testimony and media education by NYC-EJA and its members and allies, Bloomberg Administration officials agreed to work with stakeholders on a reform agenda to increase climate adaptation and community resiliency strategies for SMIA community designations. In their March 2011 announcement of Vision 2020, the City officially announced its intention to reform SMIA's and address related community resiliency/climate adaptation issues.)</p>
Building Resiliency Task Force Report	Urban Green Council	Shaping, capacity building	<p>The Building Resiliency Task Force Report provides 33 actionable proposals for making New York buildings and residents better prepared for the next extreme weather event.</p> <p>Convened at the request of the City of New York following Superstorm Sandy, 200-plus task force members led by Urban Green were charged with making recommendations to improve building resiliency and maximize preparedness for future weather emergencies.</p>

Neighborhood level

Policy	Issuing agency		Policy intention
Brooklyn Greenway Initiative (Part of NYC's Green Infrastructure Plan)	NYC Department of Transportation, NYC Department of Parks & Recreation, PA NY&NJ, NYCEDC Brooklyn Navy Yard Development	Brooklyn Greenway Initiative (BGI) is the non-profit organization committed to the establishment, development and long-term stewardship of the Brooklyn Waterfront Greenway. The Brooklyn Waterfront Greenway is a 14-mile landscaped route for pedestrians, runners and cyclists that will connect neighborhood parks and open spaces from Greenpoint to Bay Ridge. It will incorporate green infrastructure elements and function as a commuter	Shaping, stimulating

	<p>Corporation, Brooklyn Bridge Park, Federal Bureau of Prisons, NYCDEP, RPA</p>	<p>and recreation route for Brooklyn residents and tourists alike. Brooklyn Greenway Initiative seeks to make the Brooklyn Waterfront Greenway a key component in the city’s stormwater infrastructure network by preventing the release of raw sewage into the East River and New York Harbor after storms.</p> <p>The route is situated along the lowest contours of Brooklyn’s East River watershed and presents a unique opportunity to implement green infrastructure cost-effectively by including it in the 23 capital projects that make up the 14-mile route of the Greenway.</p> <p>NYC is under a federal mandate to improve water quality by reducing the negative impact of the city’s combined sewer overflows (CSO) on its water bodies. In 2010, the city released the NYC Green Infrastructure Plan based on a determination that, in many instances, its return on investment in “green” infrastructure, such as swales and green roofs, would be greater than an alternate investment in traditional “grey” infrastructure. In Red Hook and Sunset Park, BGI is pursuing the implementation of the Greenway as a hurricane flood barrier. Regional Plan Association (RPA), a regional nonprofit planning and advocacy organization, contributed planning assistance.</p> <p>Financial investment from the NYS Department of State and the Brooklyn Borough President’s Office allowed the team to undertake a Phase 1 Conceptual Plan.</p> <p>Congresswoman Nydia M. Velazquez sponsored \$14.6 million in federal TEA-LU funding for design and construction of the greenway.</p> <p>Initial commitments for greenway right-of-way were secured from the Port Authority of NY&NJ, NYC Department of Transportation (DOT), and the Brooklyn Navy Yard Development Corporation.</p>
<p>Brooklyn/Queens Waterfront chapter of SIRR</p>	<p>SIRR</p>	<p>SIRR conducted ongoing briefings with elected officials, community boards, and community-based organizations along the Brooklyn/Queens Waterfront and surrounding areas and held public workshops in the area, designed to acquire feedback directly from the residents. The Brooklyn/Queens Waterfront, which stretches from Sunset Park to Long Island City, and inland along the Gowanus Canal and Newtown Creek, is a compilation of nine distinct and diverse neighborhoods that are home to nearly 100,000 residents. The built environment is a mix of commercial, residential, and industrial uses. The residential units are concentrated in multi-family and mixed use buildings. The Brooklyn/Queens Waterfront also houses critical infrastructure for transportation and wastewater treatment.</p>

Sunset Park public workshop – April 24, 2013	UPROSE	Residents attended to provide on-the-ground insight that helped our Community Rebuilding and Resiliency Team develop a deeper understanding of the priorities and challenges of Sunset Park. Several collective priorities clearly emerged: the importance of mitigating flooding of industrial buildings to protect against spillage of hazardous materials; The importance of improving communication and protocol around disaster preparedness and recovery; and The importance of creating more green infrastructure (to aid water run-off and absorb storm impacts) and: Add more community rain barrels, more green roofs; and Revitalize brownfields.	Capacity building
Brooklyn Recovery Fund	BCF	Established by the Brooklyn Community Foundation in partnership with the Office of the Brooklyn Borough President and Brooklyn Chamber of Commerce, over a 15-month period, the Fund provided three rounds of grants, fostered the creation of six Community Collaboratives, and advocated city-wide on behalf of impacted Brooklynites. With over \$3.5 million deployed to more than 100 community-based organizations to address recovery and rebuilding in the aftermath of Superstorm Sandy, the Brooklyn Recovery Fund has finalized its grantmaking operations as of January 31, 2014.	Stimulating
Brooklyn Communities Speak: An Action Guide for Local Decision-Makers Post Sandy	BCF	A final report, Brooklyn Communities Speak: An Action Guide for Local Decision-Makers Post Sandy, documents the extensive lessons learned by the Fund and its community-based partners, and offers specific recommendations to elected officials and government agencies for achieving a holistic recovery while building local resiliency.	Shaping, Capacity building
Sunset Park Climate Justice and Community Resiliency Center & Climate Justice Policy & Program Coordinator	UPROSE, NYCEJA	The SPCJCRC has a fourfold goal; (1) To build the capacity of Sunset Park’s indigenous leaders and local businesses to effectively respond to future severe weather events, coordinate the allocation of community resources, and mitigate the impacts of future severe weather, including the possible release of harmful chemicals; such capacity will enable the community to care for itself and to enter the future not as passive victim, but as active designer and agent. (2) To engage community members and local businesses in leadership development and in a block-by-block, building-by-building assessment, mapping and relationship-building process to create, implement and manage a truly grassroots-led climate adaptation and community resiliency plan. (3) To develop the tools and partnerships needed to transition the Sunset Park Industrial area from a traditional 20th Century industrial operations model into a 21st Century climate resilient and sustainable industrial area adapted to climate change; such a transition will ensure the long term availability of business development and employment opportunities for NYC’s largest walk-to-work community, Sunset Park. (4) To engage community residents and local businesses in the public processes	Capacity building

		(land use planning, infrastructure design, permitting, etc.) required to adapt the community's infrastructure to climate change. UPROSE seeks a Climate Justice Policy & Programs Coordinator to facilitate this new project and manage work plan implementation. This is an exciting opportunity for a self-motivated, creative and experienced team player to engage in innovative grassroots work with national significance.	
Community-based research project	UPROSE, National Institute of Occupational Safety and Health (NIOSH), RAND, Lifeline group, NYCEJA	In this project, UPROSE helps in creating activity profiles of recovery workers in the aftermath of Superstorm Sandy. These profiles are used to estimate the workers' potential exposure to dislodged chemicals during cleanup, and will assist in the development of best practices in the face of climate change.	Shaping

7. ACTOR LIST ROTTERDAM

EU/National level actor	Actor type	Main focus flood resiliency policy intentions
a) European Environment Agency (EEA)	Government/Research institute	Shaping/capacity building
b) European Commissions Joint Research Centre (JRC)	Government/Research institute	Shaping
c) Institute for Environment and Sustainability (IES)	Government/Research institute	Shaping
d) Ministry of the Interior and Kingdom Relations (BZK)	Government	Regulating
e) Ministry of Economic affairs (EZ)	Government	Stimulating
f) Ministry of Infrastructure and Environment (IENM)	Government	Shaping, regulating, stimulating
g) Rijkswaterstaat	Government	Shaping, regulating, stimulating
h) Delta Programme Commissioner	Government	Shaping, stimulating, capacity building
i) Netherlands Environmental Assessment Agency (Planbureau voor de leefomgeving [PBL])	Government/Research institute	Shaping
j) Dutch Waterboards Bank (Nederlandse Waterschaps Bank [NWB])	Government	Stimulating
k) Interprovinciaal Overleg (IPO)	Government	Shaping, capacity building
l) Deltares	Research institute	Shaping
m) Water Governance Center	Professional-Public Partnership	Stimulating, Capacity building

State/regional actors	Actor type	Main focus flood resiliency policy intentions
a) Provincie Zuid-Holland	Government	Regulating
b) Provinciale Adviescommissie Leefomgevingskwaliteit (PAL)	Government/Research institute	Shaping
c) Association of Regional Dutch Water Authorities (Unie van Waterschappen [UvW])	Government	Regulating, stimulating
d) Vereniging Nederlandse Gemeenten (english: Council of Dutch Municipalities [VNG])	Government	Responding
e) Veiligheidsregio Rotterdam-Rijnmond	Government	Responding

City level actors	Actor type	Main focus flood resiliency policy intentions
b) Municipality of Rotterdam	Government	
a. Stadsontwikkeling (Department of city development)		Shaping, stimulating
b. Stadsbeheer (Department of city maintenance)		Stimulating, regulating
c. Gebiedsteam inM4H		Shaping, Capacity building
c) Rotterdam Stadshavens department	Government	Shaping,
d) Port of Rotterdam (Havenbedrijf Rotterdam)	Government	Responding
e) Deltalinqs	Professional-Public Partnership	Shaping, stimulating
f) Rotterdam Climate Initiative (RCI)	Professional-Public Partnership	Shaping, capacity building
g) Hoogheemraadschap van Delfland (local Waterboard)	Government	Regulating, Stimulating
h) Hoogheemraadschap van Schieland en de Krimpenerwaard (local Waterboard)	Government	Regulating, Stimulating
i) Waterschap Hollandse Delta (local Waterboard)	Government	Regulating, Stimulating
j) Environmental Protection Agency Rijnmond (DCMR)	Government	Regulating, Stimulating

Neighborhood level actors	Actor type	Main focus flood resiliency policy intentions
a) Gebiedscommissie Delfshaven (Municipal district committee)	Government	Responding
b) Made in 4Havens	Professional-Public Partnership	Responding
c) Keiletafel		Responding
d) De Vertrekhal (Event location in the Port of Rotterdam)	Building owner/developer/tenant firm	Responding
e) Rotterdams Collectief	Tenant firm	Responding
f) David Hart Group (DHG)	Building owner	Responding
g) Design Dock Rotterdam (DDR)	Developer/broker	Responding
h) Current transshipment businesses	Resident/tenant firm	Responding

- No policy on local level; responding but unaware; nothing happens

8. POLICY LIST ROTTERDAM

National/EU level

Policy	Issuing agency	Policy intention	Description
EU Flood Directive, as part of EU Water Framework Directive	European Commission	Regulatory	Directive 2007/60/EC on the assessment and management of flood risks entered into force on 26 November 2007. This Directive now requires Member States to assess if all water courses and coast lines are at risk from flooding, to map the flood extent and assets and humans at risk in these areas and to take adequate and coordinated measures to reduce this flood risk. With this Directive also reinforces the rights of the public to access this information and to have a say in the planning process. Flood risk management is an integral part of integrated river basin management, and the Floods Directive shall therefore be coordinated with the Water Framework Directive.
European Water Framework Directive (EWFD).	European Commission	Regulatory	<p>The goal of this directive is to ensure that the quality of surface water and groundwater in Europe meets high standards (sound ecological status) by the year 2015.</p> <p>The EWFD is based on a river basin district approach to make sure that neighbouring member states assume joint responsibility for managing the rivers and other bodies of water they share. To meet the 2015 deadline, water authorities in each river basin district in Europe must have agreed on a coherent programme of measures by 2009. Where a river basin district includes more than one member state, a trans-boundary management plan must be drawn up. The Netherlands is involved in management plans for four trans-boundary river basin districts: Rhine, Meuse, Scheldt and Ems.</p>
Water Information System for Europe (WISE)	European Commission (DG Environment, Joint Research Centre and Eurostat) and the European Environment Agency, known as "the Group of Four" (Go4)	Shaping	WISE was launched for public use as a web-based service on 22 March (World Water Day) 2007 providing a web-portal entry to water related information ranging from inland waters to marine. For users from EU institutions or other environmental administrations WISE provides input to thematic assessments in the context of EU water related policies. For water professionals and scientists WISE facilitates access to reference documents and thematic data, which can be downloaded for further analyses. For the general public, WISE illustrates a wide span of water related information by visualisations on interactive maps, graphs and indicators.

Monitoring Land Use / Cover Dynamics (MOLAND) model	JRC/IES	Shaping	This model is the component of the framework that contributes to the definition of scenarios of land use evolution at regional, national and continental scales. This allows the evaluation of spatial planning options in the context of adaptation to extreme weather events and sustainable development in urban and regional areas. MOLAND has been so far used in the following application urban development and urban sprawl, regional development following policy oriented scenarios and analysis of impact and exposure to natural hazards.
Land-Use-based Integrated Sustainability Assessment Modelling Platform (LUISA – formerly referred to as LUMP)	JRC/IES	Shaping	LUISA has been developed by the Institute for Environment and Sustainability (IES) of the Joint Research Centre (JRC) to support the policy needs of different services of the European Commission, such as the exploration of future policies and impact assessments of specific proposals. LUISA aims to provide a comprehensive, consistent and harmonised analysis of the impacts of, and responses to, environmental and socio-economic changes in Europe. The Land-Use-Based Integrated Sustainability Assessment (LUISA) modelling platform supports the policy design of different services of the European Commission and provides a comprehensive, consistent and harmonised analysis of the impacts of policies and/or specific proposals. LUISA is based upon the notion of land function – a new concept for cross-sector integration and for representing complex system dynamics. LUISA aims to contribute to the understanding, modelling and assessment of the impacts of land functions dynamics as they interact from local to global scales in the context of multiple and changing drivers.
FloodResilienCity (FRC)	EU	Capacity building	FRC is an EU-funded project which has enabled responsible public authorities in eight cities in North West Europe to better cope with floods in urban areas. This has been done through a combination of transnational cooperation and regional investments. Partners of the FRC project have learned from each others' approaches to flood management and urban planning, not only at the level of technical experts but even more importantly at the level of the political decision makers and the general public. FRC is about developing urban areas that are able to be resilient to changes that would otherwise cause an increasing likelihood of flooding.
SIC adapt!	EU	Capacity building	SIC adapt! is a Strategic Initiative Cluster (SIC) of the INTERREG IV B North West Europe (NWE) Programme dealing with adaptation to the impacts of climate change. The cluster involved around 100 partner organisations in eight transnational projects originating from seven Member States of the NWE Programme. The partners included joining public authorities from all levels of government, scientific institutions, non profit and private organisations. They all deal with the effects of climate change, possible adaptation strategies and look for sustainable, cost-efficient, good-practice solutions in

			the four main sectors: urban areas, water / river / coasts, nature / forest / agriculture, social aspects.
INTERREG IV B North West Europe (NWE) Programme	EU	Stimulating, capacity building	<p>INTERREG North-West Europe (NWE) is a Programme of the European Union to promote the economic, environmental, social and territorial future of the North-West Europe area.</p> <p>It invests EUR 355 million of European Regional Development Fund (ERDF) in activities based on the cooperation of organisations from eight countries: Belgium, France, Germany, Ireland, Luxembourg, The Netherlands, Switzerland and the United Kingdom.</p>
SAWA	22 partners of all administrative levels, universities and scientific research institutes from: Norway, Sweden, UK, the Netherlands and Germany. In the Netherlands the Waterboard of Delfland is one of the partner organizations	Shaping, capacity building	<p>Within the SAWA-project the five riparian member states of the North Sea region, Norway, Sweden, UK, the Netherlands and Germany are building a strategic alliance of partners in the North Sea region in order to develop successful strategies, methods and measures for an innovative water management system. SAWA is an acronym for Strategic Alliance for Integrated Water Management Actions.</p> <p>Together we will develop a strategy which will adhere to the European Water Frame Directive (WFD) and which will also meet the requirements of the existing Flood Directive (FD).</p> <p>This will enable us to act flexibly on challenges arising from climate change issues.</p> <p>The Flood Directive (FD) focuses on quantitative aspects of flood risks whereas in the case of the European Water Frame Directive (WFD) water quality and good water conditions are pivotal. Each directive deals with water management and it is necessary to consider both aspects even though this might precipitate a conflict of interests. Nonetheless we all have to understand that the changing climate is an issue and therefore we need an adaptive strategy. identify and initiate projects that will focus on three key areas:</p> <ul style="list-style-type: none"> Develop and testing of adaptive flood risk management plans Identification and deployment of cost-effective local scale adaptive measures Communication: Information and education. <p>Knowledge enhancement concerning flood risk management will play a vital role in building capabilities and involving stake holders at all levels. We intend to set up a series of fully functional locally run measures which not only mediate flood risks but furthermore have no negative effect on water quality.</p> <p>SAWA seeks to create an educational programme focussing on:</p> <ul style="list-style-type: none"> An information campaign around flood risk which will enhance public awareness and integrate stake holders at all levels; Set up a university training programme for integrated flood risk management;

			Develop a European student's exchange system on a secondary school level.
MARE		Capacity building	MARE stands for Managing Adaptive Responses to changing flood risk in the North Sea region. MARE is about managing adaptive responses and in particular adaptive responses within urban environments to changing flood risks. But although the examples we give are related to flooding, the approaches that we have used are also relevant to managing changing risks within many aspects of the built, natural, water and social environments. MARE has set up alliances of professional stakeholders in urban design and flood management to promote collaborative learning and actions. These alliances can include local, regional or national scale organisations, knowledge institutes and private enterprises. They may even bring together the departments within organisations. The 'LAAs' have explored how to promote cooperation between and within organisations to design and implement urban design and flood management practices and solutions beneficial to communities and the built, natural and water environments. In the Netherlands, Dordrecht is one of the locations where an LAA is established.
Water Act	IENM	Regulatory	<p>The purpose of the Act is to</p> <ul style="list-style-type: none"> a. prevent and, where necessary, limit flooding, swamping and water shortage; while simultaneously b. protecting and improving the chemical and ecological status of water systems; and allowing water systems to fulfil societal functions; and c. allowing water systems to fulfil societal functions. <p>The new Water Act has created a framework for the modernisation of Dutch water management required for the coming decades. The integration of a number of authorisations will reduce administrative burden for citizens and businesses. The Water Act links up well with the new Spatial Planning Act, which will enhance the relationship with spatial environmental policy.</p> <p>One integrated act simplifies the implementation of the European Water Directives. This applies, among other things, to the Water Framework Directive, which is based on the management of international transboundary river basins (rivers, lakes and deltas), the Directive on the Assessment and Management of Flood Risks and the Marine Strategy Framework Directive.</p>
Water Boards Act	IENM	Regulatory	

Administrative Agreement on Water Affairs (Bestuursakkoord Water)		Capacity building	The national government, the provincial authorities, the municipalities, the district water boards and the water companies concluded the Administrative Agreement on Water Affairs (Bestuursakkoord Water) in the spring of 2011.
			In this document, agreements were set down on the financing of the High Water Protection Programme and structural efficiency gains to the sum of 750 million euros by 2020 for the water system and the water chain. Thus, we will continue to invest in good water management and ensure that the expense for citizens and businesses alike does not increase more than moderately.
Structuurvisie Infrastructuur en Ruimte (Structure vision Infrastructure and Spatial planning)	IENM	Shaping	In de definitieve Structuurvisie Infrastructuur en Ruimte schetst het Rijk ambities van het ruimtelijk en mobiliteitsbeleid voor Nederland in 2040.
Algemene Maatregel van Bestuur (AMvB) accompanying Structuurvisie Infrastructuur en Ruimte (2011)	IENM	Regulatory	
Nationaal Waterplan 2009-2015	IENM	Shaping	
Delta Programme	Delta Programme Commissioner	Shaping, stimulating	<p>The goal of the Delta Programme is to ensure that our water safety and freshwater supply are sustainable and robust by 2050, so that our country will be prepared for the bigger extremes that nature throws at us. This time around we will try to prevent a disaster, rather than come up with solutions after the event. The government will be focusing on three key areas in its new approach to working on the delta:</p> <p>New water safety standards will be set up on the basis of a risk approach, in which the risk of flooding and its possible consequences are the decisive factors;</p> <p>The availability of fresh water for agriculture, industry and nature will become more predictable;</p> <p>Spatial planning will become more climate-proof and water-robust.</p> <p>Adaptive delta management</p> <p>The national government ensures that the Netherlands is prepared for various scenarios. We choose strategies and measures that enable us to come up with a flexible response to new measurements taken and insights gained.</p> <p>Alternative measures are ready should we need them in the future. All parties view adaptive delta management as a level-headed solution for dealing with developments whose direction is clear, but</p>

			whose speed is uncertain.
Programma Hoogwaterbescherming (Program High Water Defense, part of the Delta Programme)	Delta Programme Commissioner	Shaping, stimulating	De waterschappen en het ministerie van Infrastructuur en Milieu (Rijkswaterstaat) voeren in het Hoogwaterbeschermingsprogramma maatregelen uit om de primaire waterkeringen aan de veiligheidsnorm te laten voldoen, nu en in de toekomst. Het Hoogwaterbeschermingsprogramma is onderdeel van het nationale Deltaprogramma.
Delta Act	Rijkswaterstaat/IENM		The Delta Commissioner and his authority and duties are legally embedded in the Delta Act. The bill was submitted to the House of Representatives on 1 February 2010 and debated on 20 June 2011. On 28 June 2011, the House of Representatives adopted the bill for the Delta Act. On 29 November 2011, the Senate unanimously approved the Delta Act. This meant that the Delta Programme, the Delta Fund and the position of Delta Commissioner have legal status. The Delta Act has become effective on 1 January 2012.
Modelkeur (Model Waterboard Standards) (2013)	UVW, IENM	Regulating	Integrale en geactualiseerde modelkeur gebaseerd op de Waterwet, de Waterschapswet en op nieuw relevant beleid (Bestuursakkoord Water).
National Programme for Spatial Adaptation to Climate Change (ARK)	VROM, EZ, V&W, LNV		In an effort to facilitate the climate proofing process, the State has taken the initiative to draft a National programme for Spatial Adaptation to Climate Change (ARK). This programme not only involves the State, but is also intended for and being developed in part by parties whose commitment to the cause is both necessary and desired. The State wants to work out the further details of this programme in cooperation with all relevant parties and monitor its implementation. All parties, i.e. government bodies, the business community, scientists, and civil-society organisations, will share in the responsibility for developing and implementing the programme activities. The task of climate proofing the Netherlands is a challenge which will be tackled collectively.
Climate Agenda	IENM	Shaping	The Climate Agenda outlines an approach focused on assembling a broadly-based coalition for climate measures and on a combined approach to climate adaptation (by designing a resilient physical environment and preparing society for the consequences of climate change) and mitigation (by reducing greenhouse gas emissions). It incorporates concrete goals and ambitions for 2030 and explores and paves the way for the next steps towards 2030 and 2050.
Water Innovation Programme (WINN)	Rijkswaterstaat, Deltares	Stimulating	WINN komt voort uit het innovatieprogramma "Kerend Tijn". Vanaf 2008 is het waterinnovatieprogramma WINN een samenwerking tussen RWS en Deltares. WINN-projecten zijn altijd met veel partijen zoals regionale

<p>Spoedwet €100 miljoen (Urgency Act €100 million)</p>	<p>IENM</p>	<p>Stimulating</p>	<p>diensten van RWS, gemeenten, provincies, waterschappen, ingenieursbureaus en bedrijfsleven uitgevoerd.</p> <p>The program was carried out between 2002 and the end of 2010. Binnen het thema Gebiedsontwikkeling is daarom vanuit het perspectief van de waterbeheerder onderzocht en getest in de praktijk hoe de verschillende functies van water duurzaam gecombineerd kunnen worden. In samenwerking met experts en ervaringsdeskundigen zijn hier concrete tools voor ontwikkeld, zoals juridische handreikingen, participatieve werkwijzen voor projectleiders en kosteneffectieve tools. Deze tools helpen publieke en private partijen om de diverse functies van water beter te benutten in een gebied.</p> <p>Op 1 juli 2011 is de «Spoedwet € 100 mln.» in werking getreden¹. In de wet is bepaald dat de Tweede Kamer binnen 15 maanden na inwerkingtreding wordt geïnformeerd over de doeltreffendheid en de effecten van de wet. De Spoedwet € 100 mln. regelt dat de waterschappen € 81. mln. bijdragen aan de kosten van het Hoogwaterbeschermingsprogramma en dat de verantwoordelijkheid voor de muskusrattenbestrijding verschuift van de provincies naar de waterschappen (waarmee de rijksbegroting voor € 19 mln. wordt ontlast). De extra lasten voor de waterschappen worden via doelmatigheidswinsten bekostigd. De afspraken hierover zijn gemaakt in het Bestuursakkoord Water. In dit Bestuursakkoord is afgesproken dat de waterschappen additioneel € 100 mln. aan doelmatigheidsmaatregelen treffen, zodat de bijdrage aan de kosten van het Hoogwaterbeschermingsprogramma via € 131 mln. in 2014, vanaf 2015 structureel € 181 mln. kan bedragen. Om uitspraken te kunnen doen over de doeltreffendheid en de effecten is 15 maanden relatief kort. Toch lijkt het erop dat op beide onderdelen de wet voldoet aan de verwachtingen wat betreft doeltreffendheid en effecten. Wat betreft de bijdrage van de waterschappen aan de kosten van het HWBP zijn de bijdragen van de individuele waterschappen aan de rijksbegroting in 2011 en 2012 in goede orde ontvangen. Dit levert een directe besparing op voor de rijksbegroting ter grootte van 81 miljoen euro. De jaarlijkse bijdrage betekent een extra druk op de lokale tarieven. In de meeste gevallen leidt deze druk tot extra besparingsinspanningen. Voor de totale stijging van de lastendruk in 2011 geldt in zijn algemeenheid dat voor de meerderheid van burgers en bedrijven de stijging zich gemiddeld rond het voor 2012 verwachte inflatieniveau van ca. 2% bevond². In het wetsvoorstel «doelmatigheid en bekostiging hoogwaterbescherming», dat momenteel bij uw Kamer in behandeling is, is de systematiek voor de verdeling van de bijdrage over de individuele</p>
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			waterschappen uit de Spoedwet € 100 mln. grotendeels gehandhaafd, onder toevoeging van de projectgebonden bijdrage.
NWB Fund	NWB Bank	Stimulating	Het NWB Fonds is op 22 december 2006 opgericht. Het is een geschenk van de Nederlandse Waterschapsbank N.V. (NWB Bank) aan de waterschappen, als blijk van maatschappelijk verantwoord ondernemen.
Green Bond	NWB Bank	Stimulating	This first green bond issue of NWB Bank underpins its role as robust and sustainable finance partner to the Dutch public sector. With this issue, the Bank continues to attract new investors and broaden the market span for Green Bonds. In addition to the traditional investment considerations such as safety of investment and risk-adjusted returns, 69% of the issue was bought by investors who purchased the bonds due to their interest in supporting climate-friendly projects within their investment mandates. Proceeds from the Green Bonds will be earmarked to an internal account at NWB Bank dedicated for lending to the Dutch water authorities ("Water Authorities"). The Water Authorities are governmental bodies, employing around 11,000 people, responsible for flood protection, water management and water quality. Climate change adaptation is an integrated part of their tasks. Projects financed by the Water Authorities will be according to the mandate given to the Water Authorities and managed by the Water Authorities and defined through the Dutch Water Act. In accordance with the Water Act, proceeds will be used to fund eligible projects that target (a) mitigation of climate change, being waterway management, (b) adaptation to climate change, meaning investments in climate-resilient growth (flood protection, other flood defenses and pumping stations) or (c) biodiversity projects which are related to water related biodiversity projects rather than directly climate related (i.e. sanitation and dredging of waterbeds, water treatment, transport and cleaning of wastewater and disposal of sewage sludge).
Knowledge for Climate	Wageningen University and Research Centre, the University of Utrecht, the VU University, KNMI and TNO/Deltares together with other academic institutes, the business community and the government	Shaping, capacity building	Knowledge for Climate is an ambitious research programme that aims to develop applied knowledge, through cooperation between the Dutch government, the business community and scientific research institutes, in order to ensure that long term decision making takes into account the impacts of climate change.

	(central government, provinces, municipalities and water boards)		
Ons Water	Ministerie van Infrastructuur en Milieu, Rijkswaterstaat, Unie van Waterschappen, VNG, IPO, Vewin, waterschappen, provincies, gemeenten en waterbedrijven	Capacity building	Met ons water willen we Nederlanders bewust maken van het feit dat schoon, veilig en voldoende water niet vanzelfsprekend is. We zullen de komende jaren meer moeten doen en meer moeten investeren om Nederland te beschermen tegen water. Maar ook om te kunnen blijven genieten van water. En om onze watervoorraad op orde te houden.
Meerwaardescan	Rijkswaterstaat, Deltares, AT Osborne	Capacity building	De Meerwaardescan is een procesinstrument dat 'meekoppelen' mogelijk maakt door verschillende partijen bewust te maken van mogelijke meerwaarde in aanleg, beheer en onderhoud van infrastructuur. Meerwaarde is in dit geval het resultaat van combinaties van belangen en functies. De Meerwaardescan bestaat uit drie fasen: Fase 1: het genereren van mogelijke combinaties Fase 2: het selecteren en uitwerken van kansrijke combinaties Fase 3: het creëren van commitment om combinaties uit te voeren
Room for the river	A total of 17 partners - the provinces, municipalities, water boards and Rijkswaterstaat are cooperating in the implementation of the Room for the River Programme. The Minister of Infrastructure and the Environment bears the overall responsibility for the Programme.	Shaping, stimulating	The rivers in the Dutch delta are sometimes required to process huge amounts of water in very little time. In order to limit the risk of flooding, Rijkswaterstaat (the Dutch department for Public Works and Water Management) is working on the 'Room for the River' programme. Dutch government approved the Room for the River Plan in 2007. Room for the River is lead partner for two EU projects, subsidized in the INTERREG IVB NWE programme. These are FloodResilienCity (FRC) and Adaptive Land Use for Flood Allevation (ALFA). By participating in these EU projects, Room for the River hopes to learn from the experience and knowledge of European Partners with similar problems.
Besluit algemene regels ruimtelijke ordening (Decree on general rules spatial planning [barro])	VROM/IENM	Regulating	The national decree on spatial planning also provides a section specifically dedicated to land used for watermanagement purposes.
Bouwbesluit (Building resolution)		Regulating	In het Bouwbesluit 2012 zijn voorschriften voor veiligheid, gezondheid, bruikbaarheid, energiezuinigheid en milieu vastgelegd. Een bouwwerk moet altijd voldoen aan die voorschriften.

Schadevergoeding
(legislation providing
Damage
Compensation, art.
7.14 of Water Act)

Regional level

Bestuurlijke adviescommissie	IPO	Shaping	De bestuurlijke adviescommissie Duurzame ruimtelijke ontwikkeling en waterbeheer onder voorzitterschap van het lid van het IPO-bestuur, de heer Y. de Boer behartigt de taken van het IPO. De bestuurlijke adviescommissie wordt gevormd door de "vakgedeputeerden" uit de provincies . Provincies werken op het gebied van waterbeheer veel samen met het rijk, de waterschappen en drinkwaterbedrijven. Ook is het IPO partner in het Deltaprogramma. Het IPO zorgt ervoor dat de relaties met deze partners goed, maar ook helder zijn. Daarbij richt het IPO zich de komende tijd op: heldere toezichtrelaties met de waterschappen; een integratie van het regionaal waterbeheer in beleid fysieke leefomgeving; en een borging van de provinciale belangen bij: grondwater, zwemwater, vaarwegbeheer, waterveiligheid en het toezicht op de primaire en regionale keringen.
PlanMER water(beheer)plannen 2010 - 2015	Provincie Zuid-Holland, Hoogheemraadschap van Delfland, Hoogheemraadschap van Rijnland, Hoogheemraadschap van Schieland en Krimpenerwaard, Waterschap Hollandse Delta	Shaping	
Provinciaal waterplan 2010-2015	Provincie Zuid-Holland	Shaping	In het Provinciaal Waterplan Zuid-Holland 2010-2015 staat uitgebreid beschreven hoe de provincie, samen met waterschappen en andere partners, een duurzame en klimaatbestendige delta zal realiseren en behouden, waar het veilig en aangenaam wonen, werken en recreëren is. In het Provinciaal Waterplan zijn de opgaven van de Europese Kaderrichtlijn Water, het Nationaal Bestuursakkoord Water en het Nationale waterplan vertaald naar strategische doelstellingen voor Zuid-Holland. Het Waterplan heeft vier hoofdogaven: Waarborgen waterveiligheid; Zorgen voor mooi en schoon water Ontwikkelen duurzame zoetwatervoorziening; Realiseren robuust en veerkrachtig watersysteem. In het plan zijn deze opgaven verder uitgewerkt in 19

			thema's én voor drie gebieden, in samenhang met economische, milieu- en maatschappelijke opgaven. Dit leidt tot een integrale visie op de ontwikkeling van de Zuid-Hollandse Delta, het Groene Hart en de Zuidvleugel van de Randstad.
Structuurvisie Provincie Zuid-Holland		Shaping	
Randstad Vision 2040		Shaping	Summary of the vision Randstad 2040 sets the course for our long-term spatial development in terms of building and planning and relationship between spatial development and nature, leisure activities, education, health and labour market participation.
Keur/legger (Waterboard standards)	Waterboards	Regulating	
Rijnmond Veilig		Shaping	<p>Informereren</p> <p>Op rijmondveilig.nl vind je actuele informatie en updates over grote en kleine incidenten. Denk daarbij bijvoorbeeld aan een brand in uw woonwijk, een stroomstoring, asbestverontreiniging of een groot verkeersongeval. Naast incidenten kun je hier informatie vinden over veiligheid in de regio Rotterdam-Rijnmond. Zo kun je de politie helpen bij het opsporen van verdachten, zijn er preventietips te vinden en bijvoorbeeld ook informatie van andere alarmerings- en informatiediensten van de nationale overheid zoals Burgernet, AMBER Alert en NL Alert.</p> <p>Alarmeren</p> <p>Bij grote incidenten of rampen waarbij er direct gevaar is voor de omgeving alarmeert rijmondveilig.nl iedereen die zich heeft aangemeld. Denk hierbij bijvoorbeeld aan een wolk met giftige stoffen, een dreigende overstrooming of een besmetting van het drinkwater. In de alarmberichten lees je de instructies van de hulpdiensten, bijvoorbeeld 'sluit deuren en ramen' of 'drink geen water uit de kraan'. Bij het aanmelden kunt u kiezen of u alleen berichten over uw eigen postcodegebied wil ontvangen, of berichten over de hele regio.</p>

City level

Policy	Issuing agency	Policy intention	Description
Delta City Rotterdam App	RCI	Capacity building	With the Rotterdam Delta City App citizens and visitors can easily locate and visit the places and constructions that keep Rotterdam safe, dry and attractive. Additional information in the hotspots give insight on how and why these measures work and how they are part of an integrated strategy for the entire city.

Rotterdam Climate Change Adaptation Strategy; Rotterdam Climate Proof (RCP)	RCI	Shaping	This strategy provides the framework and the starting point for a future proof development of Rotterdam and ensures that, in the future, topics such as water safety, accessibility and the robustness of the city are included as the basis for each (spatial) development right from the start of the process. The Rotterdam adaptation strategy is one of the results of the Rotterdam climate proof programme. The Rotterdam adaptation strategy sets the course that should enable Rotterdam to adapt to the climate changes and shows how residents, businesses and the city can also achieve maximum benefit.
Rotterdam Climate Campus	RCI, partnering with national and local government bodies, companies, knowledge institutes and NGOs.	Shaping, capacity building	Starting from 2009, a high-tech science and business community will be set up in Stadshavens in an open environment of cooperation and knowledge exchange. A cluster of knowledge institutes and (innovative) companies in the area of energy transition, climate change mitigation, water management and climate adaptation in the Rotterdam Climate Campus expresses the joint ambition to position Rotterdam as an (international) testing ground for sustainable and climate proof delta development. The campus offers mental and physical space for innovative thought processes and is an international showcase for the concepts and (export) products developed.
Connecting Delta Cities		Shaping, capacity building	The City of Rotterdam founded the Connecting Delta Cities knowledge network in 2009. Connecting Delta Cities combines the knowledge, experiences and connections of Rotterdam, Tokyo, Jakarta, Hong Kong, New York, New Orleans, London, Ho Chi Minh City, Melbourne, Copenhagen and others. The goal of Connecting Delta Cities is to develop a network of delta cities that are active in the field of climate change related spatial development, water management, and adaptation, in order to exchange knowledge on climate adaptation and share best practices that can support cities in developing their adaptation strategies.
International Delta conference	City of Rotterdam, Knowledge for Climate, Dutch Ministry of Infrastructure and Environment	Shaping	Politicians, scientists, policy makers, practitioners, entrepreneurs - all those wishing to know how deltas can adapt to climate change are invited to contribute. Internationally known scientists, senior government officials, mayors of big delta cities and CEO's of big companies will present and share their views, innovations and practices in the field of adaptation to climate change. Goals are to exchange of up-to-date top science on climate change and delta planning; explore and strengthen the links between science, policy and practice and strengthen the international cooperation between deltas and delta cities.
Port Vision 2030 (Port Compass)	Port of Rotterdam	Shaping	Port of Rotterdam in this report sees climate change as an opportunity rather than a threat: " <i>The Port Vision 2030 sets out the ambitions for the future of the port of Rotterdam. The Port Vision is like a compass: ambitions are a spot on the horizon, even when circumstances change. The keyword is flexibility. In the future, climate change will lead to extreme weather events such as</i>

storms, droughts, floods and heat waves. This may result in longer periods of low water in the rivers. Sustainability becomes increasingly important, not only from a climatic point of view: more and more consumers are taking this into account when choosing products. More and more companies use sustainability to distinguish themselves from their rivals. *Implications for Rotterdam* This trend offers opportunities for the port of Rotterdam to distinguish itself as a sustainable port. But port industry and all modes of transport must first become more sustainable. Periods of very low water in the rivers can lead to problems transporting freight by inland waterway. The development of a hinterland transport system enabling rapid switching between rail, road and inland waterway through intermodal hubs offers a solution. Environmental regulation becomes more comprehensive and more stringent. Economic incentives are introduced to support the greening of the economy. As global energy consumption continues to grow, energy efficiency becomes a necessity rather than a choice. The same applies to the use of sustainable energy technologies and the development of bio-based chemicals. Sustainable and carbon-neutral production becomes an attractive criterion when choosing a business location." In the part of the port which the Port of Rotterdam calls 'City Ports' they envision the Realisation of urban functions, Maritime service cluster & business services, Development of the short sea cluster and the Realisation of Coolport.

Sustainability Guide for Rotterdam (2010)			
Watertoets (Water Test)	Local Waterboard	Regulatory	
Omgevingswet	Municipality	Regulatory	
Land-use/zoning plan	Municipality	Regulatory	
Rotterdam Climate Change Adaptation Strategy (RAS)	Municipality, Deltalinqs	Shaping	The relation between climate change and the city.
Rotterdamse adaptatiestrategie	Municipality	Shaping	Translating overall climate adaptation guidelines of the RAS to the specific focus of water safety, both quantity as well as quality.
Themarapport waterveiligheid	Municipality	Shaping	
Waterplan II (2007), with reassessment report in 2013	Municipality, local waterboards, DCMR	Shaping	Working on water for an attractive and climate resilient city.
Rotterdam Stadsvisie 2020	Municipality	Shaping	Housing & development agenda for attracting businesses, visitors and residents

Stadshavens Rotterdam 1600 ha. – Creating on the edge	Municipality, local waterboards, DCMR, Port of Rotterdam	Shaping	Defining former port areas to be redeveloped with a focus on innovative solutions in energy and water management.
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Local level

Policy	Issuing agency	Policy intention	Description
Keiletafel	Stadshavens	Capacity building	
Dakpark	City of Rotterdam	Stimulating	
Local elevation studies	City of Rotterdam, Waterboards, research institutes	Shaping	
Sophie	Stichting Stimuleringsfonds Volkshuisvesting Nederlandse gemeenten	Stimulating	<p>De Rotterdamse stadshavens bieden plek voor bedrijvigheid waarbij innovatie en duurzaamheid belangrijke pijlers zijn. In het huidige economische klimaat kan het echter voor (startende) ondernemers lastig zijn om hun financiering rond te krijgen. Daarom is het Investeringsfonds SOFIE opgericht. SOFIE biedt (deel-) financiering voor uitdagende projecten die aantoonbaar bijdragen aan de ontwikkeling van de Rotterdamse stadshavens. In de kas zit een bedrag van € 6,5 miljoen voor de aanvragen in 2014 en 2015.</p> <p>Geen subsidiepot SOFIE is nadrukkelijk geen subsidiepot, maar een revolverend fonds: de leningen worden terugbetaald, zodat het geld weer voor nieuwe projecten gebruikt kan worden. Dit betekent dat het geleende bedrag met marktconforme rente, maandelijks wordt afgelost. De gemiddelde looptijd van een lening is vijftien jaar. Het beheer van SOFIE is in handen van de stichting Stimulering Volkshuisvesting Nederland (SVn).</p>

9. ACTOR INTERVIEWS TRANSCRIPTIONS

NYC ACTORS

Actor	Organization	Person	Function
Architect Sims facility	Selldorf Architects	L. Green/S. Martin	Architect

1. Do you believe in climate change and, more specific, increased flood risk for NYC due to severe weather events and sea-level rise?	Yes, we do believe in climate change.
2. Do you have a clear view on the current flood risk in Sunset Park?	Yes, we do have a clear view on current flood risks, FEMA has done studies that help.
5. When it comes to building flood resiliency, do you think clear goals have been set in the development of Sunset Park?	The client provided us with clear goals and standards for the building's elevation/flood resiliency.
7. Is the public/local community involved in building flood resiliency of the area?	Yes, see q 15
8. Is your organization concerned with or affected by the effects of increased chance of flooding in Sunset Park?	No, only indirectly involved
9. Are there any flood resiliency measures taken in the specific development project your organization is involved with?	Elevation of building/site
11. Are you aware of the city's ambitions in climate adaptation and building flood resiliency?	Yes
12. Have the public campaigns, plans and/or strategies (f.e. the SIRR report, FEMA risk studies or PlaNYC) shaped your perspective on flood resiliency?	By providing the Sims facility as case project we actually added to the content of PlaNYC and Vision 2020.
<ul style="list-style-type: none"> • Has this lead to any action within the area? Location/financial/social planning? 	Not that we are aware of but we are not actively working in the Sunset Park area at the moment.
<ul style="list-style-type: none"> • Has this lead to any action within the organization? Location/financial/social planning? 	Not that we are aware of but we are not actively working in Sunset Park area at the moement.
13. Currently, adjustments are being made to building codes, zoning plans and NFIP floodplain zoning to increase flood resiliency of vulnerable areas. Have changes in legislation influence your organization's connection to Sunset Park?	Yes, however, the clients wishes were leading in incorporating flood resilient measures in the design
<ul style="list-style-type: none"> • Why (not)? 	Thanks to our practice in other projects, for example in west-Chelsea, we were already experienced in designing for flood resiliency
<ul style="list-style-type: none"> • Has it stimulated or hampered building flood resiliency? 	Yes, legislation plays a role, but also the focus of a developer/client. For example in the residential developments near Brooklyn Bridge Park resiliency is very much an issue. This is mostly stimulated by the developers as well as the organisation of the park.

15. Has your organization been involved in any workshops, partnerships or collaborative networks aimed at building flood resiliency?	No		
18. Have you been in contact with other urban or local organizations (either public or private) with regard to building flood resiliency of the area?	No		
20. Do you think flood resiliency would best be achieved by individual action or by a collaboration of organizations with interests in the area?	Long term flood resiliency is best handled by a comprehensive plan that would be driven by regulatory authorities not individual actions, however, we have no insight in to what kind of plans are available. That said, any individual property/land owner should do whatever he or she can.		
Property manager/tenant/local business	Sims Municipal Recycling Facility	T. Outerbridge	Manager
1. Do you believe in climate change and, more specific, increased flood risk for NYC due to severe weather events and sea-level rise?	Yes, we do believe in climate change.		
2. Do you have a clear view on the current flood risk in Sunset Park?	Yes, as far as possible we do have a clear view on current flood risks for our facility.		
· Do you think this has improved?	Yes		
· How and why?	We were aware of risks prior to Sandy, but Sandy increased attention on the issue and lead to release of new reports that we can use as guidelines. Prior to Sandy, it was hard to get the right data, so we used some draft estimates of of sea-level rise (over 50 years) in setting the elevation of the buildings.		
3. Do you think there's a good understanding of future threats for Sunset Park?	Yes, as far as possible. Reports are available. However, I doubt if individual business owners who weren't much affected are aware.		
· Do you think this has improved?	Yes, somewhat, for as much as you can understand these risks.		
· How and why?	After Sandy several studies have been conducted reports were made. Also updated FEMA maps.		
4. In the development of Sunset Park, have lessons from previous flooding experiences been taken into consideration?	No, our plans were already made		
· If so, what lessons?	Although we now know what to prioritize, especially in terms of making sure equipment is installed at safe elevations.		
· What flooding experiences?	Sandy		
· What kind of results?	Equipment is now safe from another Sandy-style storm surge.		

	The facility itself is located on land that we elevated.
5. When it comes to building flood resiliency, do you think clear goals have been set in the development of Sunset Park?	More or less, there are some guidelines, but nothing comprehensive that I am aware of.
· What goals?	The things talked about in the area revolve around relocation of vulnerable and dangerous materials and activities (like the storage of chemicals) that are now located near the waterfront.
· By whom? Who's responsible for realization?	Business/building owners are meant to take their own initiative, and there are some community-driven programs going on.
· How are these determined and recorded?	I am not familiar with specific goals that have been set for Sunset Park as a whole.
6. Are you aware of any action being taken on realizing flood resiliency in the area?	Apart from SIMS, , there is a community outreach effort to businesses in the area, and there is discussion of using a new bikeway as flood protection. These are discussions at this point, and not actions, to my knowledge.
· What kind of actions?	Maybe in conjuncture with the Brooklyn Greenway?
· What kind of measures?	Also, some workshops have been organized
· By whom?	UPROSE, SBIDC
7. Is the public/local community involved in building flood resiliency of the area?	They are involved in building awareness.
· How and to what extent?	There are several community groups, of which UPROSE is very much involved with this subject. Also the community board is concerned with this. There have been workshops with local businesses and UPROSE provides grants.
8. Is your organization concerned with or affected by the effects of increased chance of flooding in Sunset Park?	Yes
· To what extent did it play a role in the choice for this location?	Some adjustments (elevation) to the pier had to be made to reach the level of safety from sea level rise that we wanted.
· Long-term/short term?	50 years
· Level; building or area?	Buildings and electrical stations.
9. Are there any flood resiliency measures taken in the specific development project your organization is involved with?	Yes

· What measures?	Elevation of large portions of the site, elevation of specific equipment, evacuation plans, insurance
· Why?	Economics and practical operating considerations. It is very expensive for us to be flooded and out of business for a time.
· By which party?	EDC (prime owner of the land) and Sims shared the cost of elevation of select portions of the the pier.
10. Is your organization taking action in building flood resiliency?	Yes
· In what way?	Elevation of buildings and equipment, evacuation plans.
· Long-term/short term?	Long term
· Level; building or area?	Buildings
11. Are you aware of the city's ambitions in climate adaptation and building flood resiliency?	Yes
12. Have the public campaigns, plans and/or strategies (f.e. the SIRR report, FEMA risk studies or PlaNYC) shaped your perspective on flood resiliency?	No, our plans were made before Sandy.
· Has this lead to any action within the area? Location/financial/social planning?	It has led to a variety of planning and awareness programs.
· Has this lead to any action within the organization? Location/financial/social planning?	No
13. Currently, adjustments are being made to building codes, zoning plans and NFIP floodplain zoning to increase flood resiliency of vulnerable areas. Have changes in legislation influence your organization's connection to Sunset Park?	Building exceeds standards
· Why (not)?	No, but if anything changes we would have to comply to new regulations
14. Have financial public programmes (f.e. tax cuts, fines, subsidies or grant programs) stimulated your organization to implement flood resilient measures in the building or area?	Yes, indirectly
· What level of government?	EDC helped to pay for elevation of site.
· If not, do you think this could work? How? Stimulating	Yes, stimulating

or penalizing?

15. Has your organization been involved in any workshops, partnerships or collaborative networks aimed at building flood resiliency? Yes
- What other actors were involved? Other businesses
 - Who took initiative? UPROSE
 - What was the outcome? Businesses are better informed
16. If Sunset Park would be faced with flood damages, what would be your reaction? Assess the damage, try to obtain insurance compensation, repair facilities, try to see if there are further lessons to be learned.
- Whom would you hold responsible? Own responsibility.
 - Physical/financial/social measures? Operations would have to stop for some time; not sure if this is covered by insurance (probably only physical damages).
17. To what extent is your organization willing to take action in realizing flood resiliency in Sunset Park? We are willing to help and/or share our experiences with local business owners.
- Building level? Building; has been done.
 - Area level? **Area; we are willing to help with information but are not in a position to finance measures outside of our site. .**
 - What term? **We would be willing to make a modest contribution to something like the Brooklyn Greenway, but substantial amount of financing would have to come from DOT, the Parks Department and others. Also, benefits would have to be made clear.**
18. Have you been in contact with other urban or local organizations (either public or private) with regard to building flood resiliency of the area? Yes
- Which ones? MWA, on the WEDG program. Also been approached by UPROSE to help in workshops. A number of agencies used our site after Sandy because we had elevated it, including FEMA and EDC.
 - What party took initiative? **Other parties took the initiative**
 - If not, would you consider this in the future? Under what circumstances? (changed policy or changed perception of threat?) Possibly other local actors to inform and educate.
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19. What party is (or which parties are) in your opinion responsible for flood resiliency of Sunset Park?	Every organization for own parcel.
<ul style="list-style-type: none"> Is there a party that should get more involved? How could this be achieved? 	City government could take more initiative in terms of analysing risks on parcel/facility level and communication with the businesses in the area.
20. Do you think flood resiliency would best be achieved by individual action or by a collaboration of organizations with interests in the area?	Right now individual action seems most effective on the short term.
<ul style="list-style-type: none"> Why? 	Collaboration is hard to accomplish, it would take a lot of time and joint effort. Unaware business owners don't have that time and in short term i think you will see more prorgess if people safeguard their own businesses, while these longer term, wider scale planning programs are underway..
<ul style="list-style-type: none"> What parties should collaborate? 	Community organizations with local businesses
21. Do you think increased flood resiliency of Sunset Park as a whole would benefit the local (business) community?	Maybe
<ul style="list-style-type: none"> If so, how? 	If it reduces hazards of contamination from other businesses or if it helps buisnesses avoid disruption to their operations.
22. Do you think current developments of Sunset Park ultimately lead to an increase in flood resiliency of the area?	Yes
<ul style="list-style-type: none"> If so, how? 	As buildings are renovated owners are probably making them flood-proof
<ul style="list-style-type: none"> What could be improved? 	Make sure that the businesses that are already located in the area also become resilient. This would imply awareness, adequate overview of specific risks and adaptation.
23. Do you think the approach of Sunset Park is representative for other NYC waterfront developments?	Although we could learn from each other, every neighborhood deals with own flood risks as well as community characteristics.
24. Could public policy be improved to stimulate flood resiliency of urban areas?	Yes, Education and communication. Other businesses should be made aware of WEDG guidelines. Also capital investment.
Issuing	Community Board 07
1. Do you believe in climate change and, more specific, increased flood risk for NYC due to severe weather events and sea-level rise?	We certainly believe in climate change, we've seen it in action.
2. Do you have a clear view on the current flood risk in Sunset Park?	While there was greater recognition from NYC, being a coastal city, to climate change than most other places in the country, Sandy definetely raised awareness and sense of urgency.
<ul style="list-style-type: none"> Do you think this has improved? How and why? 	This is really the first time over the last years that we see everyone developing a floodplan and are incorporating measures in their buildings

3. Do you think there's a good understanding of future threats for Sunset Park?	<p>when it comes to design.</p> <p>We've seen change in public awareness in the area towards flood risks. We have a very old port area, which deteriorated for a long time. However, over the last 20, but certainly the last couple of years we've seen lots of large investments in our waterfront. There are also some city-agencies that are funding some of the projects. Also private companies are preparing for increased flood risk and the effects of climate change.</p>
<ul style="list-style-type: none"> • Do you think this has improved? • How and why? 	<p>Most of our residential community lives on the hill and wasn't hit. However, the industrial waterfront was significantly damaged. That gave us a good understanding of the risks.</p> <p>Interesting is that most of the flooded areas are actually landfill sites, reclaimed around the 1890-ies.</p>
4. In the development of Sunset Park, have lessons from previous flooding experiences been taken into consideration?	<p>A good example is how the Sims recycling facility, which was actually planned before Sandy, has an education centre.</p>
<ul style="list-style-type: none"> • If so, what lessons? • What flooding experiences? • What kind of results? 	<p>What we've seen from the weeks following Sandy is that the transportation system of the area needs improvement. We advocate for a ferry connection, to reduce pressure on the tunnel and metro-system and of course could continue operations in times of flooding.</p> <p>We also have improved the waterfront with the completion of the new park. This is finished, but for it to open we're waiting on legislation procedures. A lot of the developers, especially when they design new buildings, are really taking flood risks into account. When properties are redesigned, developers are taking measures so that the vulnerable portions of their buildings are protected.</p>
6. Are you aware of any action being taken on realizing flood resiliency in the area?	<p>Investors who are buying up old warehouses are investing in making their buildings flood-proof, moving up mechanical systems and equipment from the first floor. Other measures are businesses that build a wall, in order to seal off their property in case of flooding.</p> <p>Also some City investments are being made. Recently they announced \$100 mln dollars to be invested in the Brooklyn Army Terminal. Some of that is for resiliency issues for that site.</p> <p>In awarding contracts to facilities like Sims, the City now pays more attention to aspects like resiliency in future designs. These are probably even included in the Request for Proposals (RFP's) on a contract.</p>
<ul style="list-style-type: none"> • What kind of actions? • What kind of measures? • By whom? 	<p>Most of our waterfront land is owned by the EDC. They generally lease it through long-term contracts to businesses or facilities like Sims.</p> <p>EDC and the Port Authority have been discussing flood risks for longer than the last five years, but the discussion is much more in the public now.</p>
7. Is the public/local community involved in building flood resiliency of the area?	<p>We're advocating for community involvement and are discussing these resiliency issues with public as well as private parties. We're discussing plans of future businesses and facilities to make sure they incorporate resiliency in their buildings. We might not have a vote in these developments, but certainly have a voice. We're advocating for keeping our waterfront as a manufacturing and industrial business zone. Whatever is on our waterfront should really only be for waterfront activities like port businesses or public recreation. And also moving facilities that have no direct link to the waterfront, like the garbage facility and the salt storage. We want to make sure to also protect the ecosystems in the water. Besides, we want to improve the connection between the community and the waterfront. The new park would certainly improve this, but currently the only connection we have is a pier which is used as parking and the EDC wants to make into a fuel storage.</p>
8. Is your organization concerned with or affected by the effects of increased chance of flooding in Sunset Park?	<p>We're advocating for community involvement and are discussing these resiliency issues with public as well as private parties. We're discussing plans of future businesses and facilities to make sure they incorporate resiliency in their buildings. We might not have a vote in these developments, but certainly have a voice. We're advocating for keeping our waterfront as a manufacturing and industrial business zone. Whatever is on our waterfront should really only be for waterfront activities like port businesses or public recreation. And also moving facilities that have no direct link to the waterfront, like the garbage facility and the salt storage. We want to make sure to also protect the ecosystems in the water. Besides, we want to improve the connection between the community and the waterfront. The new park would certainly improve this, but currently the only connection we have is a pier which is used as parking and the EDC wants to make into a fuel storage.</p>
9. Are there any flood resiliency measures taken in the specific development project your organization is involved with?	<p>An example is a school in the area that had flooding issues and needed renovation. We invited them for a workshop to help them incorporate flood mitigation measures. Now they have incorporated permeable pavement, lots of green spaces, sewerage systems under the playground and slowly timed downspouts.</p>
10. Is your organization taking action in building flood resiliency?	<p>The community board has very limited formal influence. The one thing we have a say on are land-use issues. If there is something involved with changing the zoning plan we do have a vote. It can be overruled on various levels, but we can provide input. However, most of the developers do work with us because they want to make sure that the vision of the community is in line with their actions.</p>

<ul style="list-style-type: none"> • In what way? 	<p>The community board is no funding organization, we have an advocacy role to an between ity agencies. You'd be surprised that they don't speak to each other.</p> <p>We are very much aware of the City's plans and ambitions.</p>
<p>11. Are you aware of the city's ambitions in climate adaptation and building flood resiliency?</p>	<p>Reports and plans like PlaNYC have influence on leadership but don't come down to the general community. The specific projects that are mentioned in these reports are hard to translate to concrete action within the community. Also, we've even had trouble getting the community heard from this area, as they wanted us to go to a meeting in Red Hook. However, our issues are different and we made a point about getting the SIRR-report to hear us seperately. However, this community wasn't the highest priority.</p> <p>The Vision plan for Sunset Park is more of an conceptual plan for the area, but not a concrete construction strategy.</p> <p>We definately see the effect of changed zoning and adjusted building codes.</p>
<p>12. Have the public campaigns, plans and/or strategies (f.e. the SIRR report, FEMA risk studies or PlaNYC) shaped your perspective on flood resiliency?</p>	<p>I know the City has taken advantage of some federal programmes. For example, for the waterfront park they have received state and federal funding as well.</p>
<ul style="list-style-type: none"> • Has this lead to any action within the area? Location/financial/social planning? 	<p>Also Red Hook has received a federal grant for a BOAP study. UPROSE did a BOA study here in Sunset Park and looked t specific properties in how they would be affected by floodings.</p> <p>There are also grants that are available to organizations or businesses to take measures on their building site or conduct studies.</p> <p>The SBICD and UPROSE form community networks that also act on this topic.</p>
<p>13. Currently, adjustments are being made to building codes, zoning plans and NFIP floodplain zoning to increase flood resiliency of vulnerable areas. Have changes in legislation influence your organization's connection to Sunset Park?</p>	<p>Besides the City we have a very strong local organization; UPROSE, which is also been involved with this issue since well before Sandy. They are very active, also in educating folks and raising awareness about risks and solutions.</p> <p>Despite the fact that we have such a diverse community, we're able to get information out thanks to organizations like UPROSE.</p> <p>We would very much like to see more initiatives for workshops and collaboration in this neighborhood. Maybe these should be organized by more local parties like elected officials and non-governmental organizations like UPROSE. This would be much more beneficial than plans just dropped into our community. Funding should of course still come from City agencies, but these kinds of projects should really be carried out in close collaboration with local partners. These workshops could be run by those with the expertise, but have buy-in from people within this community.</p> <p>A recent project to improve traffic safety on 4th Avenue has shown that City funds and expertise, collaborating with local input and knowledge can work very well. That could work as a model for how the City should work with the community to achieve the common goal of improving the area. I like these workshops because they work two ways, they provide buy-in for the project of the local community as well as educate people on measures they can take themselves.</p>
<p>14. Have financial public programmes (f.e. tax cuts, fines, subsidies or grant programs) stimulated your organization to implement flood resilient measures in the building or area?</p>	<p>In case of a next flooding it depends of what happens, but if there are sewerage explosions again I think people would be very angry at the City for the maintenance and infrastructure issues that have marked this area for so long now. Also, this area is still dependend on copperwire cables for communication, so if those would be damaged during a flooding event the cable company would have a problem. They are responsible for this infrastructure, but they probably have insurance for this.</p> <p>Businesses in the area are often insured. However, this doesn't mean they can go back to doing business after such an event. The insurance often doesn't cover lost business and secondary costs, only physical damages.</p> <p>Also, we're experiencing flooding problems with water running down from the hill and actual sewer-explosions. The EDC together with DEP would</p>
<ul style="list-style-type: none"> • What level of government? 	<p>What level of government?</p>
<ul style="list-style-type: none"> • What programme? 	<p>What programme?</p>
<p>15. Has your organization been involved in any workshops, partnerships or collaborative networks aimed at building flood resiliency?</p>	<p>Who should take initiative?</p>
<ul style="list-style-type: none"> • What other actors were involved? 	<p>Who should take initiative?</p>
<ul style="list-style-type: none"> • Who took initiative? 	<p>Who should take initiative?</p>
<ul style="list-style-type: none"> • What was the outcome? 	<p>Who should take initiative?</p>
<ul style="list-style-type: none"> • If not, do you think this would work? How? Who should take initiative? 	<p>Who should take initiative?</p>
<p>16. If Sunset Park would be faced with flood damages, what would be your reaction?</p>	<p>Who should take initiative?</p>
<ul style="list-style-type: none"> • Whom would you hold responsible? 	<p>Who should take initiative?</p>
<p>18. Have you been in contact with other urban or local organizations (either public or</p>	<p>Who should take initiative?</p>

<p>private) with regard to building flood resiliency of the area?</p> <ul style="list-style-type: none"> • Which ones? <p>19. What party is (or which parties are) in your opinion responsible for flood resiliency of Sunset Park?</p> <ul style="list-style-type: none"> • Is there a party that should get more involved? How could this be achieved? <p>20. Do you think flood resiliency would best be achieved by individual action or by a collaboration of organizations with interests in the area?</p> <ul style="list-style-type: none"> • Why? <ul style="list-style-type: none"> • What parties should collaborate? <p>21. Do you think increased flood resiliency of Sunset Park as a whole would benefit the local (business) community?</p> <ul style="list-style-type: none"> • If so, how? <p>22. Do you think current developments of Sunset Park ultimately lead to an increase in flood resiliency of the area?</p> <ul style="list-style-type: none"> • If so, how? <ul style="list-style-type: none"> • What could be improved? 	<p>replace our sewerage system, which is 100 years old. However, the money was being taken away from that project so we still have that problem. EDC had a rail-project in this area and the DEP joint that project to tackle the sewerage-problem at the same time. Except that they pulled the money out of it so the sewer lines weren't replaced. We have a history in this community of a lot of infrastructure projects taking forever or eventually not being carried through.</p> <p>UPROSE is certainly most influential in the area for advocating flood resiliency. The Community Board is also quite influential. Then the Sims facility is a wonderful example for other businesses. Industry City is on its way to be a strong example for readapting older buildings.</p> <p>The Port Authority isn't much involved in our community. This because they don't own that much land and don't have much of their operations in the area. Most of the public land is owned by the EDC.</p> <p>The Port Authority is I believe working on a regional transportation plan, which also includes plans for Sunset Park's waterfront, so we're waiting for that to be present d.</p> <p>The fact that there isn't a masterplan for our section of the waterfront is really a problem.</p> <p>I believe some of the developers have suggested that the Greenway could provide some sort of integrated barrier, with a bike-lane on top, like the one in Rotterdam. This part of the Greenway is still in design phase and also still has to be funded, which is the main issue right now. The City has only funded portions of it with the idea that this would leverage additional public and private funding of the remaining parts. This is quite a lengthy process.</p> <p>There have been talks in creating manufacturing BIDs (Business Improvement Districts), the SBIDC could probably tell more about that. But I'm not aware of any being implemented in NYC. EDC could take initiative in developing an area-wide plan. But I think it would be better if an agency that is directly related to the City council maybe in collaboration with State agencies like the department of environmental conservation.</p> <p>Perhaps there needs to be a new agency that just deals with resiliency and flooding issues, but I haven't studied that. There are some Mayor's offices, but there isn't any oversight through the City council. They could take initiative, but I think there is more weight held by an agency.</p> <p>Businesses are now taking their own measures, but that leaves the others vulnerable and also doesn't cover the problems of transportation and operations, which will still have to stop in case of flooding. An integrated infrastructure protection system would really be necessary to safeguard that. An area-wide plan like for example the elevated greenway plan would definitely be beneficial for the area. Right now no coordinated action on these kinds of plans is taken as all businesses are more or less on their own.</p> <p>On individual parcel level actions are taken to raise flood resiliency. However, we still have some problems for area as a whole. There is a power plant, which is build on barges, so it's protected from flooding. But it is connected to the electrical system by transmission stations which aren't protected. So there is a chance that we will be able to produce electricity, but not send it out. There are some plans to build walls to protect these stations. These actions are to be carried out by the quasi-governmental agency that is responsible for the power facility.</p> <p>Also, there is a hospital with trauma centre really close to the waterfront that needs to be protected. There are sites that store chemicals like bio-technology centres, garbage facilities, a petroleum storage and a giant pile of salt next to an estuary pond. So there are a number of vulnerabilities that also mean threats for the larger community in case of flooding. A comprehensive plan for the whole area would need to take all of these into account.</p> <p>The problem is now recognized, but the pace of realization and comprehensiveness of the plans could certainly be improved. It's finding the construction dollars that proves to be most difficult. The City, and other levels of government should maybe make the decision to either invest in larger scale (regional) flood protection or implement smaller scale measures. Protecting the collective is a difficult problem. Problems lie both in funding</p>
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Developer/local business	Salmar Properties	I. Siegel	Manager
23. Do you think the approach of Sunset Park is representative for other NYC waterfront developments?	as well as communication and coordination between government agencies.	All neighborhoods are different. We have different types of businesses and different relationships with the local residential community and different connection to the water.	
24. Could public policy be improved to stimulate flood resiliency of urban areas?		One of the issues we have with the City is that the developers and local communities are on their own in taking these measures. They do the design themselves, there isn't an overall strategy between properties. Water might not penetrate one particular property, but might go past it and harm others. Also, because resources are scarce, many good plans are competing against each other for the limited amount of dollars. I think budget is the main hampering factor in government right now. It's a lot harder to come by public investment nowadays. You're forced to prioritize.	
1. Do you believe in climate change and, more specific, increased flood risk for NYC due to severe weather events and sea-level rise?	Yes, we believe 100% in climate change and increased flood risks.		
2. Do you have a clear view on the current flood risk in Sunset Park?	I think there is a clear view of risks today, Sandy was a huge wake-up call.		
3. Do you think there's a good understanding of future threats for Sunset Park?	It is always hard to forecast what would happen in a flood. If something worse than Sandy would happen, I don't know how well prepared the whole community is.		
4. In the development of Sunset Park, have lessons from previous flooding experiences been taken into consideration? • If so, what lessons?	Sandy was a real eye-opener and really taught us what to do for the future.	The flooding did not come in to this building. But it taught us that we shouldn't have any mechanical equipment or systems on the first floor. Everything should be as high up as possible.	
• What flooding experiences?			
• What kind of results?	If Sandy happened again today, I think we would have zero flooding issues.		
5. When it comes to building flood resiliency, do you think clear goals have been set in the development of Sunset Park?	Businesses and property-owners are probably taking actions themselves to prepare.		
9. Are there any flood resiliency measures taken in the specific development project your organization is involved with?	We've moved all the equipment and installations up from the first floor. We, as the building owner, have flood insurance.		
12. Have the public campaigns, plans and/or strategies (f.e. the SIRR report, FEMA risk studies or PlaNYC) shaped your perspective on flood resiliency?	No, public plans etc. Didn't have great influence on our operations or works on this building. It was mainly Sandy. That was really an eye-opener.		
13. Currently, adjustments are being made to building codes, zoning plans and NFIP floodplain zoning to increase flood resiliency of vulnerable areas. Have changes in legislation influence your organization's connection to Sunset Park? • Why (not)?	We haven't really been looking into regulations and legislation regarding this specific topic since our building wasn't really damaged during Sandy. We got our building permits, so we assume everything is up to standards.		
• What legislation?	If there are new rules we would of course make sure we comply. But right now we took our own steps based on our experience. We're not aware of the WEDG-programme.		
14. Have financial public programmes (f.e. tax cuts, fines, subsidies or grant programs) stimulated your organization to implement flood resilient measures in the building or area?			
15. Has your organization been involved in any workshops, partnerships or collaborative networks aimed at building flood resiliency? • If not, do you think this would work? How? Who should take initiative?	We haven't been involved in any workshops or partnerships connected to flood resiliency. We also haven't been involved in the making of the local Sunset Park Vision Plan.		
17. To what extent is your organization willing to take action in realizing flood resiliency in Sunset Park?	We think a collaborative approach could be beneficial for the area. It is always good to have a dialogue. If there would be any area-wide plans for raising resiliency it would be very dependend on content and costs of the plans if the property owner of this building would be willing to invest in it. The benefit should be really clear. We financially contribute to the chambers of commerce, community groups etc. because we want to see the area flourish. However, a new initiative would have to prove its benefits.		
18. Have you been in contact with other urban or local organizations (either public or	There has been contact with the community board and the SBIDC.		

<p>private) with regard to building flood resiliency of the area?</p>	<p>I think everyone is responsible for themselves and should take their own measures. The city is responsible for keeping us informed and more macro-type plans. The city has done studies to map the risks, they should now make plans to evade that risk. Those plans need to be implemented in 5, 10 20 years and will probably be funded with public money.</p>
<p>19. What party is (or which parties are) in your opinion responsible for flood resiliency of Sunset Park?</p> <ul style="list-style-type: none"> Is there a party that should get more involved? How could this be achieved? 	<p>I don't know what the involvement of the Port Authority is at this moment, but it is their responsibility to be involved. I know they maintain the bridges and the tunnels, so they need to make sure they take steps to safeguard their assets.</p>
<p>21. Do you think increased flood resiliency of Sunset Park as a whole would benefit the local (business) community?</p>	<p>The property owners of this building would of course be willing to look into actions to safeguard their investment. However, the benefits should be clear and a good business case should be provided. They wouldn't take the initiative in an area-wide plan since our building wasn't severely damaged during Sandy.</p>
<p>22. Do you think current developments of Sunset Park ultimately lead to an increase in flood resiliency of the area?</p>	<p>Flood resiliency has certainly improved. It is always hard to forecast what would happen in a flood.</p>
<p>23. Do you think the approach of Sunset Park is representative for other NYC waterfront developments?</p>	<p>Red Hook, and probably other areas had more severe damages so those would have more priority.</p>

<p>NGO/non-profit community organization</p>	<p>UPROSE</p>	<p>E. Yeampierre</p>	<p>President/Program Director</p>
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- Yes, we do believe in climate change.
- **We think that the path to resiliency is through the local community; from the ground up. People that live in the area and work in the area need to be part of the planning effort, decision-making and visioning. You need the personal involvement of the local community to make any of these plans work.**
- Yesterday we had a workshop with small local businesses how to apply for public support in taking climate adaptation measures. A lot of them don't know what measures they could or should take. We want to help them in making them more resilient. The measures need to be easy, accessible and practical.
- Also, one of our important tasks is building the capacity of the individuals in the community by connecting them. Most of the measures we propose are at building level.
- **At the advocacy side we're working on a local, city-wide and even national level to advocate for social justice and resiliency. This is where we're advocating the more larger-scale measures. Like for example the establishment of a working group for resiliency in industrial workingfront communities. This was something we spoke for already before Sandy, but we got it after Sandy. And yesterday we presented our plan in Washington. This plan includes our vision on adaptation, mitigation and resiliency of these communities.**
- On the State level the current governor has been somewhat more difficult to work with. On a City level we're proposing the implementation of solar-panel programs into the neighborhood. On the local level we are working on engaging the people.
- We have different area-wide projects like the Brooklyn Greenway and the Brownfield Adaptation program that really need the input of all stakeholders in the area, also of developers who have just recently come here. We organize workshops and committees that provide recommendation and build support for these plans.
- **The waterfront park that is about to be opened was actually planned for another area, which was more of a privileged community. And we got it here after we've advocated for it with the City. We also had to convince environmental groups not to make it a bird-watching area. And then EDC, who owns the land, wanted it to have a more regional recreative function like a hockey-rink. We've also stopped this, as it wouldn't contribute to the local community as much as a park.**

- The EDC makes it very hard for the local community to engage in these projects. They don't reach out and use different language. Also they are very old-fashioned in their way of thinking about economic development. They're thinking about Italian restaurants at the waterfront here, while in this area it would be much more suitable to have a local dim-sum restaurant over there. The EDC is constantly ignoring and blocking our ideas because they underestimate the power and capacity of the people in the community. Therefore we see ourselves forced to go over their heads and talk to the Mayor's office to get our ideas realized and eventually get the EDC working along.
- It is of course very important that if you have such a diverse group of people working on adaptation and resiliency there is some sort of advisory board with lots of specialist and engineers. An interdisciplinary, holistic approach is really necessary when it comes to acting on these issues of climate change. Therefore we talk to EPA, the department of energy, city planning, the Mayor's office and the EDC. They still think in these functional silos, but climate change addresses all of that. That's why we're also talking with other NGO's and local groups that work on more social issues how to integrate climate resiliency in their operations.
- We've managed to make climate change part of the discussion, placing it on the agenda of elected official. The way to do this is to make people they can make change happen, immediate results of local efforts makes the young people feel very powerful.
- **Currently I think that collaboration with some of these new developers that have come to the area will be very difficult. They have surpassed us in trying to collaborate with other local groups and social service organizations by promising new job opportunities. However, we think that these jobs are not sustainable in a natural, economical or social way. They are not thinking about resiliency of the community in the long run. We have the feeling that they are trying to gentrify the area, pushing us out with these high-end boutique shops. We're an industrial, not a commercial waterfront.**
- **We see ourselves as partners for public agencies since none of them has the complete authority in the decision-making. They should see us as partners that add assets to decision-making. They see us as people they need to manage. This, while we have so much local expertise and our support is really necessary to make any of their plans happen. What is needed in government is a shift of culture. We both have resources that, when combined, can make real change in these communities.**
- You really see a change in the way the Mayor's approach organizations like us. De Blasio is taking much more distance and is more thin-skinned than Bloomberg.

Local non-profit	Southwest Brooklyn Industrial Development Corporation (SBIDC)	A. Devening	Planning & Revitalization Manager
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- Although we are primarily a long-standing business organization, we have a progressive outlook and certainly pay consideration to topics like climate change.
- **We, as an organization do, but we have our backgrounds in planning. Since Sandy hit the businesses in the area have a greater awareness of being located in a flood zone, but that doesn't say all businesses fully realize it.**
- We would be interested in making sure businesses become more aware of being located in a flood zone and the according risks. In Red Hook awareness is better, but **Sandy really opened peoples eyes.**
- Since we are a small non-profit organization, we didn't have any special programming on climate adaptation before Sandy. However, when it comes up in meetings with public authorities on city as well as State levels we certainly try to advocate it.
- **We often act as a consulting partner for public agencies in the perspective of the local businesses.**
- We are in contact with public agencies like NYC's department of Small Business Services, DEC, the EDC and State officials.

With the department of State we have contact with the regional economic development council and are involved in the brownfield opportunity area program (BOA). And of course the community boards, congresswoman Velazquez and various other local organizations.

- Local representatives in congress can have influence by advocating for topics on challenges in their district.
 - Congresswoman Velazquez is really a powerful figure, also on the local level.
 - **DCP contacts SBIDC for consultation on waterfront planning issues when businesses in the area could be concerned. DEC asked for advise on certain specific plans for the SIRR report.**
 - We think some pretty significant measures need to be taken to prepare for climate change, however, as of now we see only small steps taken by businesses as well as public agencies.
 - In 2013 we got funding from the PANYNJ for a stand-alone project in Red Hook. This involved three types of businesses to look at the effects of Sandy and what kind of damages they had after the storm. Then we put together plans for how they can prepare in the event of another storm. This included some flood mitigation measures on their building. The idea was of course to get other businesses to follow this example. Before, we also did a local assistance project together with PANYNJ, but after Sandy we switched the scope to resiliency. Thanks to PANYNJ funding we could bring in some great engineers and consulting firms.
 - A lot of these kinds of projects work like this, bring in a community organization, local businesses or residents and a consulting firm and fund it with public money from federal, state or city level or a foundation.
 - **Since a lot of the businesses that were harmed during Sandy are in recovery mode, they dont have the capacity right now to make plans to prepare themselves or enhance their buildings.**
 - The lack of capacity to invest is a problem for local business owners. There is still only talk wether the disaster funding from the federal government could be used either in the form of a grant or a loan. We have talked of options like a revolving fund on a local level to investment of banks
 - The federal grants for business recovery are hard to access for a lot of the affected businesses here in the area. Especially the smaller and younger businesses have a hard time providing necessary documentation to show they are eligible for the grants. We try to help businesses in this process. We are also working with the city to ensure that businesses get those grants and loans. However, these are only intended for damaged equipment and business lost and we have been talking about trying to get funding for more forward-thinking grants for individual businesses to invest in building their resiliency rather than getting back to where they were before Sandy.
 - A lot of businesses are interested in thinking forward and look at the broader picture of building resiliency rather than focus on just recovery.
 - **The idea with the Brooklyn Greenway was to let it run trough the area and make it as a protective measure as well as a park.**
 - The integrated Greenway design was part of the Game Changer proposal, but eventually the City decided not to go through with it. There was this large coalition of the BGI, the Brooklyn Chamber of Commerce, Industry City and possibly UPROSE. We put together this huge proposal to try to look at transportation as well as flood resiliency and protecting the industrial business zone and access to the waterfront. All these things were integrated in a solid proposal which was presented to EDC and we were one of the finalists of the competition. However, then the federal government decided they didn't want the funding to go in that direction. This was a huge dissapointment.
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- Like numerous non-profits in NYC, our organization flipped upside-down after Sandy. We shifted resources so we could help with the loans and grants. We were on the ground after Sandy and the office was a base for volunteers in immediate cleanup and the PANYNJ workshops took up a lot of time last year. We would like to keep on going with those projects, but right now there is no funding to continue.
 - **We would want to help businesses in setting up emergency-preparedness plans.**
 - **In the non-profit organizations we've seen a true mission-shift after Sandy. Also, now actions are shifting from direct response measures to more adaptation and building resiliency.**
 - What we've learned from Sandy is that there wasn't any structure (evacuation plans etc) in place for these kinds of events.
 - The City does as much as it can, but it can't provide help on the ground as quickly as much of the local organizations can.
 - The community has got to start pushing to make really concrete things happen. This is happening in Red Hook a lot, but in Sunset Park not so much. UPROSE is doing a lot of course, but they also have more of an advocacy role rather than executing physical plans.
 - When you look at other areas in NYC, you see that the integrated flood protection plan in Red Hook is just in a pre-design, RFP process. It will be at least two more years before we can get past that design phase. Then we can start talking about implementation, which will take another ten years.
 - Our work in Red Hook maybe seems double as we work on individual building level for raising flood resiliency, but also on an integrated flood protection system that protects the whole area. However, there will probably be gaps in that plan so measures on property level are very well needed to support this.
 - **What we think is that measures should be taken on individual building level, district level and even a larger, city or regional level.**
 - We're not sure if an integrated protection system on district level is necessary in Sunset Park. The newer businesses that are located near the waterfront are taking measures to protect their buildings and resiliency is on the minds of every government agency.
 - Appendix G of the building code is applicable to any waterfront developments. Any new construction or renovation works need to comply to these quite strict rules.
 - There are definitely some discussions about how to incorporate flood resiliency in zoning plans too, but the building code is almost as important.
 - We haven't heard about the WEDG programme of the MWA, but will definitely look into it.
 - When it comes to the SIRR report and PlaNYC, we have looked mostly into the design ideas and how these would influence local businesses.
 - City plans like the SIRR report and PlaNYC are nice, but then comes the State and Rebuild by Design, which is a federal programme, with a different idea. So we're waiting for when they are moving towards implementation of their plans before we're going to assess the effects on local businesses more in detail.
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- **As to what would be most needed right now to take action is more in the field of loans or grants or other kind of investment rather than plans or regulations, as these are mostly already provided.**
- Also the bigger industrial businesses have just as much difficulty in taking measures as the small mom-and-pop-shops. Also time for getting permits and making design complying to regulations takes a lot of time and money.
- There is such a lot of bureaucracy to go through to get these measures actually realized that this may hamper the process.
- For example the Sandy loan and grant programme there were some major faults in how that programme was run. Congresswoman Velazquez actually tried to get federal, state and local agencies to form coalitions to work together in actually making these grants available for the businesses that were hit. Another example is the New York Rising programme to get the community-based projects implemented. However, the State can't get these projects realized without the federal CDBG fundings. The State had to hire a consultant to provide insight in how these funds could be spend, as there are so much regulations to comply to.
- **The City, State and federal government can sometimes argue about funding and planning responsibilities.**
- **However, all levels of government are focussing a lot more on climate adaptation and resiliency. Also now Sandy is maybe not so fresh in peoples minds anymore, resiliency is part of the conversation now. The political will is in a place where acting on resiliency measures is a lot more feasible than it was maybe ten years ago.**
- **Historically, local community organizations are very strong in NYC. What you see right now is that these organizations are now starting to collaborate on a city-wide scale. Especially after Sandy, people get the idea that they don't have to fight anymore for an individual part, but there can be some collaborative community-based city wide policy changes.**
- **In City government right now there is more of a mandate to involve the public and get input from the public. With DeBlasio, there is more of a socially progressive feeling than with the Bloomberg administration for example.**
- We have good faith in this City administration to carry forward larger projects that should help in this issue.
- **Communication with local stakeholders, as well as integration of resiliency in regulations and zoning are the most important aspects of current City policy that could be improved.**
- **The SIRR report mentions that there needs to be multi-layered collaborative effort of all stakeholders, but in current practice this could still be improved.**
- **The City has reached out to the communities in drafting the SIRR-report, but it was such a hasty process that this could have been done more thoroughly.**
- **A lot of the measures that federal policy proposes can't be realized either because businesses are just tenants and can't change anything to the building itself or because the policy requires the building to be raised, which is often not possible for these industrial buildings. Also, often the elevation of these buildings is actually prohibited by City zoning laws. The City was going to advocate on federal level so that dry-proofing or other resiliency measures, other than raising the building would be included in resiliency policy.**

Local non-profit

Brooklyn Greenway Initiative
(BGI)

M. Puryear

Co-founder, Director of
Development

- Right now we've made plans for the still to be realized parts of the Brooklyn Greenway (BG) and we're working with the DOT to make an implementation plan that would feel as their own, the master implementation plan. It consists of 23

capital projects of which DOT is responsible for the implementation and we're working with them to find funding and working out the strategies. So we drive the scope of the project, but the realization is done by the city agencies. However, we're also implementing some work ourselves like maintenance and landscaping. We want to keep our parks in a certain condition, that the Parks Department couldn't achieve on their limited budget.

- **The storm water management measures are mainly our initiative. We've organized a technical advisory meeting, where we've invited all the City agencies to get funding to hire consultants. We got funding from NY State, a fund from the department of State. Then we matched that funding 1:1 with private funding that we raised.**
 - We're trying to make as many open spaces along the route as possible and reintegrate native species in this area. We try to restore the original natural environment as much as possible.
 - Yes, we do believe in climate change and increased flood risks.
 - **Among policy makers I think there is a clear understanding that there are major risks. But I think there is not a clear view on what measures should be taken and where money to take these measures should come from. I think there is not enough conversation about possible retreat from the edge, giving back to nature.**
 - The thing with Sunset Park is that the industrial community is at risk, rather than the residential community. What I would propose for Sunset Park is to protect the industrial businesses, maybe in an area-wide plan, but also with measures on building level. We talked to several parties, developers as well as local businesses, about possibilities to integrate flood protection in the BG to be realized there. We've also approached the EDC because they have complexes in the area and we think that the plan could provide protection for these assets. However, there is no funding for it. Neither the City nor the State is committed to take action.
 - There were no stories of houses or families being hit by Sandy in Sunset Park, so there is no political imperative to get involved over there. However, the area has got lots of potential and is currently underused.
 - **I wouldn't speak for others in the sense that I don't know if lessons have been learned from Sandy. As far as I see, there is no comprehensive solution. There is no vision that steps into the opportunity for economic development in collaborating with local business owners to invest in that area. It's not high on the City's priority list. They focus on the topics that they get either political or social pressure from. What we're fighting for is priority, and I would think trying to work with the City in the end gets more done than fighting against it.**
 - What I think needs to happen in this area is first of all ensure some funding. The State together with the City could release federal money. But the State has announced money for flood protection in Red Hook, but not in Sunset Park.
 - UPROSE is pushing the City on a lot of different fronts, and because of that a lot has happened. Just like us. So there is clearly a place for these local groups to bring forward the vision of the community. But we don't have the financial capacity. Sometimes we got some City help in the form of land that's made free for the park.
 - We've got a comprehensive plan and a set of design guidelines for the greenway that would help absorb more of the rain and in that way adding to stormwater management. We're getting traction with the City on that and gradually we're getting more support from them to work with us on making this happen. However, there is currently nothing happening in Sunset Park.
 - We design the parks so that it can sustain floods and storms, so in that way it gives back to nature and forms a natural barrier.
 - The Port Authority is more impervious to outside influence than City or State governments. The Port Authority has a singular mission, purpose in its entity and anything that is not in this purpose is not part of their operations. In managing the waterfront of NYC and NJ flood protection is part of their responsibility and we're going to have a conversation with them about Red Hook. However, because they are so big and don't have to listen we'll first make sure to have more
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support.

- In Red Hook the strategy is getting all the private waterfront owners to support and then get the State to follow and eventually get the Port Authority involved. The City isn't very much involved here because they don't own a lot of property in Red Hook. This is different from Sunset Park, where a lot of the land and property is City, or EDC, owned. Then there is more involvement. However, also in Red Hook the City is now talking with the State on developing plans for the area.
- **We've worked with UPROSE on workshops that we did with DOT and we shared our stormwater strategies. We also talked with the local businesses as we think that the BG is an economic benefit for them, and most of them agree. We're constantly networking. Because that's it with the greenway, you have to make people want it. That's really necessary to start getting any political support and public funding. These projects need elected officials to get behind the idea and champion it.**
- **I see it like this; there are two levels of flood protection. There is the perimeter level, at the coast and the building level. The building level should be taken on by property owners individually, but anything beyond that point**
- I think it's necessary to gain the political support and funding if these areas want to reduce their flood risk. However, they can also choose to do nothing and don't change. Then they will get flooded the next time. But you can wonder if this is problem. Sometimes retreat may be a viable solution. I think that in the long run this may prove necessary.
- **I think public policy could be improved on realizing these projects by getting the politics out. Because after Sandy the flood insurance rates were about to be raised, but this eventually didn't happen because a lot of people then wouldn't be able to afford it anymore. This is how elected officials directly answer to their voters, making political rather than logical decisions. In a way it is of course weird that the government is subsidizing this living in high-risk areas. At some point they will have to draw a line. You're paying people not to make good decisions this way. There should be a movement away from subsidizing risks.**
- **The government could help in building a comprehensive flood protection system in these areas so that the local communities don't need insurance anymore. The government should either protect the area or not, but stop subsidizing the individuals in these areas.**

NGO/Regional non-profit

Metropolitan Waterfront Alliance (MWA)

M. Porto, R. Lewis

Director of Outreach & Planning, President & CEO

- RL - We've just recently launched the WEDG (waterfront edge design guidelines) programme, which is basically a LEED for the waterfront. We've initiated the programme and the City government is looking into adopting it in their legislation. We had to make sure that all the different agencies participated in the process of putting together a new waterfront plan. This meant Federal, State and local agencies and closely working with the City planning department. One of the outcomes was the need for a set of waterfront design guidelines. There were a lot of guidelines of what you couldn't build on the water's edge, but not what you could build there, and how. Some sort of best practices. **They put the need for these guidelines in this waterfront plan, but they didn't implement it. That's where we stepped in.**
- MP - After Sandy we decided as MWA to take the design guidelines idea, get funding for it, and make them ourselves. Of course we partnered with City government, but it was primarily our project. They gave mandate, but they didn't fund it. And now they're helping us implement it in legislation. That's how government here often works, with the specialists' help of NGO's. Rebuild by Design is sort of a hybrid form of this, where the organization is part of government, but has strong partnerships with the private sector.
- MP - The guidelines are focussed on measures on parcel level and are divided into park, industrial and residential sites. It reaches out to developers, but also local communities by providing very practical steps to raise their resiliency. It is also focussed on building marine heads, building soft shorelines. We do get into the freeboard etc. but are more focussing especially on the area around the buildings. In that way it complements LEED.

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- RL - Besides public agencies, businesses and local community there are also organizations like ConEdison and the MTA (Metropolitan Transit Association) that provide power and transportation that have a stake in these waterfront areas. We also depend on these areas for waterfront access and for protection if there is a storm. **However, there is no one organization that controls the entire waterfront.** There are thousands of stakeholders, and the guidelines we've developed is an attempt to influence them, to structure their thinking and behavior when it comes to flood resiliency.
 - MP - It's already successful in that businesses and property owners at the waterfront want WEDG certification, in a way it is a kind of marketing.
 - MP - We want to move further, when the guidelines are implemented in legislation, probably insurance policies will follow.
 - RL – In putting the WEDG programme together, there were three legs to the stool; we had to work closely with expertise, specialists and consultancy firms, local community and public agencies. It will help the public agencies in that they will have better applications when people do their permitting. It shows people what is allowable, which makes the permit procedure a lot easier.
 - RL – We work most closely with USACE on federal level. Then the Department of Environmental Conservation on State level in planning.
 - MP - The City Parks department is of course involved when it comes to the guidelines for waterfront parkland. But in regulation and legislation issues we're mostly working with the DEC on the City's side.
 - RL – Our practice changed after Sandy. We had meetings with consultancy and engineering firms before the storm, and also we already had a meeting planned for ten days after the storm hit. This really helped in taking a step back in thinking about resiliency, but in a long-term perspective. We talked about a research that needed to be done and not closing ourselves off from the water while obviously improving levels of protection.
 - EG – Do you think your position towards public and private city organizations has changed?
 - RL – No, we were already working on this and just continued to proceed. Yes, it changed the urgency of the other agencies, but if you look at the SIRR report, it includes a lot of the aspects we already discussed in the very beginning. We helped in providing a framework for this report. We were recognized in talking about the dangers, because we were already in contact with specialists, provided a platform and advocated for these issues.
- [RL leaves]
- EG – So, now you have provided guidelines, what do you think would be the next step in raising flood resiliency in NYC?
 - MP – There are different actors and City agencies that have really taken an active role in making plans. However, it is tough, also with the new administration. There needs to be a substantial amount of funding to continue the work and implement the plans, like the SIRR-report, that were made over the last few years. The environmental groups, NGO's, in NYC, are very aggressive. They will certainly keep an eye on the progress and how federal money is allocated.
 - MP – **The City has made some decent policy changes, like building back in a better way, not to the same state that it used to be. This is to be implemented according to the SIRR-report's suggestions, which focus on specific projects but also express the need for guidelines, changed regulations. It's a lot of actions that need to be taken, but it's mostly about influencing others. This is very important because we have a really decentralized City government, but also a very strong Non-government sector and other stakeholders like ConEdison that provides power that are to play a big part in the implementation of these plan.**
 - MP – **The way in that the process is different from that in Europe I think is that it is more top-down. We get our money from the Federal government, then it goes to the State and the City, and you really need a political champion within the community, an elected official. That is one point that is crucial in NYC, you really need a champion, someone voted into office to bring everyone together and carry the project forward through realization. Often these kinds of projects are so large and long-term that they tend to get stuck and put on the shelf.**
 - MP – With the new administration of De Blasio it is still hard to say how they will incorporate issues like resiliency in their policy. However, it is clear that from an environmental view and the perspective of public health sustainability has become a common aspect in planning and more or less agreed upon issue in NYC, that
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they will have to continue Bloomberg's programs in some way or another. However, it is not their main focus.

- EG – How do you think public policy could be improved to stimulate waterfront actors in taking measures? Do opportunities lie in subsidies and grants or more in regulations or plans, strategies?
 - MP – **The permitting review process with the whole public review aspect is really extensive. We think that by providing information on permitting procedures and making them easier, design guidelines and insight in risks we can certainly help actors in taking their own measures. The regulatory process is really tough in NYC. Regulations have to be opened up to allow for more innovative solutions to be implemented. This also has to do with the different layers of bureaucracy and legislation. There are about fifteen different entities that provide legislation for waterfront construction. There should be one agency that incorporates all these and just administers the waterfront areas of the region, that would be great. In a NGO's way that's actually the role the MWA is taking on right now.**
 - MP - **Since there are so many layers of government involved with these issues, it is really hard to actually get anything done. The environmental review process in America to build something is extremely laborious and stringent. This leads to situations where you need to show that for example a flood protection construction in the water is not going to harm the ecological system in place, even when this might historically not have been the natural habitat of the species that live there now. In addition to having a leader or champion for these kinds of projects, a change in these strict regulations is really necessary for the larger projects to actually get realized.**
 - MP – I don't think that a regional waterfront authority is feasible at this point. We of course have the PANYNJ, but it is politically limited in taking any action. Politics are a great deal in America, it is the nature of our democracy. This also is connected to the fact that government is so decentralized. For example, places like New York or New Jersey have a multitude of jurisdictions. It is so localized that it becomes hard to build anything that transcends any of these boundaries.
 - EG – But people here are very involved with their local environment, look for example at the strong influence of community boards and other non-profit community organizations.
 - MP – **Yes, although a centralized model would have the benefit of having more clear responsibilities. In our system some groups take advantage of the multitude of agencies by not taking their responsibilities.**
 - EG – Your guidelines provide actors with measures they can take on parcel-level, but what do you think about plans that would protect entire waterfront areas in a more comprehensive way?
 - MP – **A more regional approach is certainly needed. But then that creates problems like who's going to manage that. That complexity is what stops it in the first place. There lies a responsibility for the City to facilitate these kind of projects. The City is trying to balance these problems and do the ramifications, but it is just such a complex process of getting these projects realized. Because there are so much stakeholders involved; the public, but also the different levels of government. There could lie a chance for the new City administration for linking these environmental resiliency issues to social equity in for example providing green jobs for the community in these, often disadvantaged, areas.**
 - Also, when you think about it, it isn't necessarily fair that there is a public insurance program for home-owners, but not for businesses. The governor [of NY State] has an office of storm recovery.
 - EG – And what kind of Federal agencies are you in contact with?
 - MP – Well, besides Rebuild by Design, which is HUD, and FEMA you have Army Corps [USACE]. This is another entity that gives out permits and maintains parts of the waterfront. If we are successful with WEDG, we can provide best practices for them to incorporate in their regulations. When you build along the waterfront you have to get a permit from DEC, the Army Corps and other various entities. But those are the main ones. Projects have to comply to the local coastal zone management plan. NYC has its own, the WRP, the DCP oversees that. **The DCP looks at planning and zoning of the sites, where DEC is focused on environmental issues and the Army Corps makes sure the water is clear for navigation and, to a lesser extent, considers environmental implications in their permitting. It is a really laborious process when you want to build something along the waterfront. We're working on making this easier. The WEDG certification could provide a starting point for some sort of one-stop-shop for permits for these waterfront projects.**
 - EG – How do you think actors could be helped in raising flood resiliency in these areas?
 - MP – We hope that the WEDG program helps, by providing some tools and practices for them to use. Some people need to adopt a whole new vernacular. The SIRR report is written very understandably, I think that that helps. As the community boards are basically local groups of non-paid volunteers, but do weigh in in zoning issues of sometimes multi million dollar projects, it is very important that they are provided with some sort of basic knowledge of how resiliency could be realized. They can negotiate for more sustainable solutions.
 - **Developers are always going to act to protect their bottom line. That's just the way it is, certainly in NYC. As these kinds of larger, more regional projects are protecting the area from something that didn't happen, it is very hard to mark the benefits.**
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- **I think that workshops or collaborative networks could help in these areas. In the areas affected by Sandy we have a lot of talk about social resiliency. The Mayor's office of Storm Recovery created the New York Rising program, where committees come together on a regular basis, to come up with plans that would be best for their particular community.**
 - EG – The Mayor's offices of recovery and resiliency and long term planning and sustainability, do you think these help in opening up conversation between the different City departments that are involved in these resiliency issues?
 - MP – Well, yes. **The way that collaboration and conversation can be started between the City departments is often through the Mayor's office.**
 - EG – What is the constituency of the MWA? Where does your funding come from?
 - MP – Our constituency is the wider public and everyone that is concerned with the waterfront. The funding and support is mainly foundation money. And we lobby for City Council money for various little projects. Foundations are a big deal in NYC. Philanthropy programs and organizations are playing a large part in funding these kinds of projects and research. And we organize fund-raising events like the Waterfront Gala that is coming up next week.
 - EG – As Sandy is now two years ago, do you think urgency may be slipping?
 - MP – I think so, yes. Anyone who was affected by Sandy directly is of course still very much involved, but for others there are different issues that they are dealing with. Within the organizations we're working with it is still very much an issue, but elected officials and the public in general don't have it high on their agenda anymore. Communication and messaging is therefore very important. We have to make sure flood resiliency stays in the minds of the public as well as policy makers.

Public Agency

Department of City Planning

E. Di Girolamo

Urban Planner

- Yes, we do believe in climate change.
 - **Yes, we do think we have a clear view on flood risks in the area, however, it is still hard to assess risks on building level. This has certainly improved since Sandy. DCP was working on flood safety before, but attention has definitely raised after Sandy. However, we're not sure to what extent the local community is aware of the risks.**
 - We could take some lessons from Sandy and incorporate them in flood policies we were already developing. It allowed us to get insight in the vulnerability of certain areas. Irene was of course also a learning experience in that sense.
 - **DCP has set no specific goals for flood resilience of the area. Existing goals are building codes and zoning plans.**
 - We're trying to make stimulate changes in the area by collaboration between local community and city agencies.
 - **Partly there is some action being taken in the area to raise flood resiliency. This is mainly by individual business owners. What we mostly see are Building adaptations in congruence with renovations taking place. Currently there are no measures being taken on area level.**
 - We're building awareness by hosting workshops and engage in close collaboration with (business) community groups. The local community is certainly being involved in the whole process.
 - **The buildings that where to be resilient and comply to the building code of 1983 can in theory resist floodings.**
 - DCP focuses on adjusting building codes and zoning plans. Our other main task is to communicate, provide information to professionals as well as residents. For example, we provide retrofitting guides and resiliency guidelines.
 - We also have conversations about the zoning plans with local community boards.
 - **The main problems that stand in the way of realizing flood resiliency in vulnerable areas are financial constraints, site, business or building constraints and individual oppositions of the local community. We can try to stimulate**
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collaboration but we can't force it. We see it as our job as to make that there is nothing preventing people from taking action. If they then decide not to do it, it's up to them.

- There is the 'Build it Back' program that offers public grants to individuals that were hit by Sandy. However, there are very strict requirements as to whom is eligible for this kind of support. And often people are not aware that they could apply for aid or don't know how to do this.
 - In Sunset Park there is a lot of open space, and we could see possibilities for a comprehensive, integrated area-wide flood protection system.
 - We work closely with the NY Environmental Justice Alliance. The main government agencies working with us on flood resiliency are DOT, DOB, DEP, DEC on State level and the EDC. The Mayor's office on ORR of course coordinates the whole resiliency plan for the City.
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ROTTERDAM ACTORS

Policy issuing/responding	Organization	Person	Function
Business located in the area/tenant/NGO	Panoptic Architecten / Made in 4Havens	E. Tom	Head architect/founding partner Made in 4Havens
<ul style="list-style-type: none"> • The idea behind the collaboration of Made in 4Havens is to start and stimulate the integrated development of the area with the local manufacturing industry. It is a platform of architects, urban designers and other creative businesses in the area. It's based on the philosophy of Richard Florida and Jane Jacobs of linking the creative sector to local social context the to enhance the economical strength of the city. In recent years a lot of pioneering creative businesses have settled in this area and we wanted to use that as a strength for further development of the area. Besides, the adjacent neighborhood of Delfshaven is marked by a high unemployment rate. So by creating jobs in the creative/manufacturing sector here, we also enhance the wider region. • Over the past couple of years we've developed this vision and presented it in festivals. Now we're actually realizing it with a cooperation at a location in the area. Together we're transforming a building to production labs to scale up the production of designers in Rotterdam. There will also be room for design studios and the headquarters of the Made in 4Havens organization. • We expect that over 10-15 years the area will transform to a more mixed-use urban district. Plan is to program the area with industrial designers and other creative businesses to really establish this small-scale manufacturing sector. Eventually, this could then be linked to the new residents and businesses. • Yes, we have a lot of contact with the Delfshaven area committee, the district management team inM4H of the municipality but also the Stadshavens organization. • Yes, as an organization we do believe in climate change and rising sea-levels. We've heard that there are predictions that in the future water levels could rise about half a meter, which could have consequences for this area. We're aware that we're located in an outer-dike area. • If measures would be taken we think these would be focussed more on the places where the river meets the sea rather than in the urban/inland environment. • I think at this point the overview of the risks is insufficient. There are concepts being developed for building on the water, we've actually made some plans for that as well. This could provide a solution for this issue, but if you look at existing piers and quaysides I don't see any strategies being developed. Also we see no strategy in how the municipality takes measures, for example in zoning-plans, to prevent flood damage in future area developments. 			

- **No, so far we haven't experienced any flood damages in this area.**
- We're not aware of any goals or plans specific for this area to raise flood resiliency. Discussions on development of the area are more focussed on functional programming rather than risk mitigation. What is currently a prevalent topic of discussion is the goals that the Port of Rotterdam has set for the reduction of CO₂ emissions. This is also presented in the CleanTech ambitions. We're looking into how we could equip our production facilities as to connect with this vision. This is also important if more residential functions would be located in the waterfront areas.
- We as Made in 4Havens haven't considered flood safety in our operations since we don't think this will become an issue in this area in the next 10-15 years. We could start thinking about development strategies of building to anticipate increased risks on the longer term, but as of now this is not part of the discussion.
- In the research for building on the water we've come across the Waterplan and the Rotterdam Climate Initiative, but in our current operations this plays no part.
- **If the area would be flooded we would look at the possibility for insurance repayments. The building we're transforming for the new manufacturing centre has a basement that gets flooded from time to time. When we become building manager we will ask the owner to take measures in preventing water damage.**
- We consider water safety in the area the responsibility of the municipality. They should take measures in preventing damages and reducing risks. There are also probably national agencies involved like the waterboards, but in first place I would hold the municipality responsible.
- I think building on the water is more used as a chance to make use of the qualities of living on the waterfront rather than for flood safety reasons.
- We see possibilities in the linking of improving water safety in this area to our goals of creating jobs. It could work as a test site for pilot projects or educational programs.
- **We always see the added value of approaching these kinds of issues in a collaborative manner. If flood resiliency for the area would be improved I think some sort of public private partnership could prove a solution. Maybe by establishing some sort of water-safety fund, where we can also tap into the expertise of the businesses that are already located in the area.**
- The most important policy instruments of the municipality to increase flood resiliency in these areas would be land-lease contracts. One could think of linking price levels to whether lessees are taking preventive or protective measures. The other way would be setting up area funds. At the basis would be information and communication through for example a central point where all information on a specific topic is provided. This could maybe be linked to other current topics in the area like CO₂ reduction and decentralization.
- The problem itself could prove to work as a binding factor for local actors. It could be a reason for public agencies to emphasize this topic in order to create this community in the area.
- What we see in area development is that there is a shift in strategy from 'divide and conquer' to a more connecting and collaborative approach. By connecting actors in an area they could gain power to carry forward larger projects, since they have a lot of shared interests.

Investor-developer/Business located in the area

Vervat Vastgoed

R. Borst

Portfolio manager

- As a company we see that there are a lot of models available to predict the effects of climate change. However, that makes it hard to really assess the consequences. There are always fluctuations in the environment. That we should care for the natural environment and that policy should be aimed at protecting it is obvious. However, since there is so much uncertainty, we think it's dangerous to make decisions now on long-term predictions.
- **We do not consider this area particularly vulnerable for floodings in the near future.**
- Yes, we do have contact with the municipality and Stadshavens organization. Although not very frequently and the topic

of flood resiliency is not discussed.

- **There is the Keiletafel collaboration of local businesses. We've been to one of their meetings so far, but I don't have the impression that flood resiliency is really discussed there. The goal is more to see what can be done to improve the area as a business location.**
- We already see a lot of activity and developments, and we think this area will certainly be a more vital part of Rotterdam. However, that will take some time, about 40, 50 years to fully develop.
- This night I got a text message of Rijnmond Veilig that the Noordereiland in Rotterdam was about to be flooded and that residents were advised to take measures in for example emptying their basements. That's how I know that water safety is an issue in Rotterdam. We're also familiar with the van Benthemplein [Waterplein]. So we see that Rotterdam is considering its relation to water.
- We see that the City is certainly also looking at the future. Think about the Rotterdam Climate Initiative. We have a green roof on this building, and we're looking if we could get a subsidy for this.
- **We as developing owners of this property have incorporated some sustainable design solutions in our building. The green roof is in the first place for the view, but of course also helps in rainwater retention.**
- We do not see any other developers taking measures to enhance flood resiliency in the area. We also don't see reason, for example a plan or study, to start taking these measures now. However, I assume this is incorporated in future public plans for further development of the area.
- We do not have any contact with other businesses or organizations in the area about flood resiliency.
- **We have no plans for if there would be a flood and our building would be damaged. This is probably not covered by insurance. We also never discussed it within our organization.**
- We also own other properties in the area, but we don't consider the risk of floodings severe enough to take further actions on this.
- No, we were not aware that this area is outer-dike. Right now we also wouldn't now where the dikes are situated. As far as I know we've never received a letter from the municipality to make us aware of this or inform us about the risks. I also can't recall this being told when we bought this property, but it was probably featured in the land-lease contract.
- We assume that there are a lot of risk analyses available. We consider the municipality or maybe the Port of Rotterdam responsible for taking action on risks for the area. Especially if they want to transform the area from a port area to a mixed-use area a different level of safety may be necessary. For the future it would be good if they assess the required safety level for new functions in the area. Then, if measures are necessary the municipality or maybe Rijkswaterstaat or the Port of Rotterdam need to take action on this. In the end you could also look at the current property owners, but first responsible would certainly be the municipality.
- **We have meetings with the municipality and other parties in the area to look at how to improve the public space around some of our buildings. What you see is that since there are a lot of property owners, there are of course a lot of shared and conflicting interests in this public space. It is a very good initiative of the municipality to facilitate the development of the area in this manner. The Port of Rotterdam is also sometimes part of these conversations.**

Business located in the area

Rotterdams Collectief

H. Pum

Founding partner

- We have no insight in the current or future risks in the area, but we assume the government carries out
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studies and would take measures if areas weren't safe.

- **We came to this area because its in full development. You see that over the last couple of years such a lot has happened and the area has really began to come alive. There is a lot more of pedestrian traffic and the area gets opened up to the neighboring districts.**
 - We do believe in climate change, the effects are already visible. However, I think it's very hard to make adequate predictions about effects on the longer term. I think that the information that is currently available is inadequate to make proper predictions.
 - The Netherlands, when it comes to water, is one of the best protected countries in the world. I certainly don't feel unsafe. Also, if there would be an event of flooding, I think communication would be fast enough for us to take the necessary actions. Water management is so deeply rooted in our culture that we're even exporting our knowledge to other contries.
 - **No, we have no experience with floodings in the area.**
 - We know the municipality is making plans to develop the area, but we have not seen any concrete plans or visions for making this area more flood resilient. Of course, if this is to be partly residential the area needs to be safe. There also lie chances certainly in these former port areas, for building and living on the water.
 - Stadshavens now takes the lead in development of the area, but they also reach out to businesses that are already located here. They have initiated and are facilitating the Keiletafel, a platform for business owners in the area were durrent developments and plans are discussed.
 - **We're not aware of any measures being taken to increase flood resiliency. We haven't been contacted about this by the municipality and it is also not discussed at the Keiletafel.**
 - We're not familiar with the city's Waterplan or any visions or plans regarding water safety in this area.
 - If the area would be hit by severe floodings I assume something would be arranged to help the affected businesses. However, I think businesses do have a responsibility in being aware of the risks of the areas they are located in.
 - I can imagine it would be possible or even necessary for the local businesses to get involved if an integrated plan for the area is to be developed. What kind of form this involvement should take, for example in knowledge or investment could later be determined.
 - **The former port areas of Rotterdam have a huge potential for future city development. However, Merwe-Vierhavens is still a bit behind in development, if you look at the RDM-campus for example.**
 - At the one hand you see the older port businesses gradually leave the area, but at the other there are facilities that have land-lease contracts for the coming twenty years and will stay. The power plant has recently been closed. We've heard that this property is destined to house innovative companies and technical manufacturing businesses.
 - The Stadshavens organization is very much involved in the development of the area. For example, if these
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older port businesses leave the area, they look at the property they leave behind and assess if it could be transformed.

- One of the most important tasks and responsibilities of the government is to inform about real and relevant risks. Instruments like the Keiletafel or other participations with local businesses then could play an important role in actions that need to be taken. Because these businesses obviously have a stake in keeping the area safe and improving it. The government shouldn't approach such tasks all by themselves, that's not efficient and there is no need for it.

City of Rotterdam	Engineering/city development department	C. Andriessen	Adaptation manager Merwevierhavens
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- Stadshavens is looking at how to make a climate adaptation strategy and development strategy for the area. These are about to be approved by the Stadshavens direction. The adaptation strategy currently proposes some projects, but is more about the approach. We're looking at what's already present in the area, what scenarios are anticipated and what do we want with the area. When it comes to flood resiliency, the base level of land issuance is set at +3.60m above sea-level for basis components and +3.95m for vital infrastructure. This applies to all of Rotterdam's outer dike areas.
 - **What we concluded is that almost all of the infrastructure is already constructed at +3.60m when the area was laid out in the beginning. However, there are some lower lying areas and we have to consider the safety of electricity distribution points and communication networks. We've mapped the problem areas and will eventually take measures in elevating these. However, we're waiting for moments that specific parts of the areas will come to development. Then we can mainstream these elevation works to other construction or enhancement of public space.**
 - We're still looking at how exactly we will issue the land, maybe at parcel-level or in larger bulks, but this also depends on how the development market will evolve over the coming years.
 - Certainly since the area is elevated up to a safe level, we don't see the municipality to carry responsibility for flood damages in this area. This is also the general national guideline on outer-dike areas. Residents or property owners are themselves responsible for any damages if they decide to live there. There lies a responsibility of the municipality to inform them of the situation and the risks.
 - **If we would want to integrally protect the area and elevate all the quaysides that would cost a tremendous amount of money. What we're planning on doing is to give our own requirements for water safety, the +3.60/+3.90 elevation, to private developers and let them deal with it. If they want to invest here, they should take the risks.**
 - Our department is not responsible for the informing and communication so we don't have insight in how actors in the area are currently informed.
 - The Port of Rotterdam (PoR) and the department of city development are collaborating in the Stadshavens organization. In this organization there are several sub-committees for the separate areas. In the Merwevierhaven area up until 2040 we have a lot of shared interest with the PoR, as we both own large portions of the land. The PoR is as far as I know not very concerned with climate adaptation, at least not in their current operations. I doubt if they consider themselves responsible for informing the businesses that are leasing their land about the situation and risks.
 - **There has been some discussion about the +3.60 issuance level, when the province demanded a higher level of +3.90 a few years ago. However, this was deemed not feasible as all outer-dike areas would have to be elevated, including underground infrastructure.**
 - Starting points in the development of the area is linking to the demands of the real estate market and facilitating initiatives.
 - There have been very few events of flooding in this area. Of course, if sea-levels are about to rise etc. this could happen more often, but we don't think it will become a serious problem in the coming decades. However, we're making sure that when we're doing any maintenance works on streets and the sewerage system the new constructions will be at the level of +3.60m.
 - We're looking at how the sewerage system altogether. The current system is really inefficient; we would like to keep the treatment more local in the future. This would also have implications for the groundwater level.
 - **Yes, we do collaborate with the waterboard. This is mostly about the main flood defences that bound the area. There is a new legger being developed, which also takes into consideration the foreland of the dikes as part of their strength. Therefore, what happens in the area is also important for the flood defences. And from our point of view it is of course important to keep the dikes as low as possible for**
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urban design reasons.

- We do collaborate with Rijkswaterstaat, but that is more on the level of strategy formulation for the Rijnmond-Drechtsteden program rather than specifically for this area. However, there are several icon-projects in this program and their considering this area also as a focus area.
- We're looking at how to shift of building with and on the water from ensuring safety for 1:10000 floodings, to allowing for increased chances but adapt our buildings to prevent severe damages.
- We've done some workshops with urban designers and water managers of the municipality and we've come to the conclusion that right now there is no need to take large-scale water safety measures.
- **On the one hand smaller measures will be mainstreamed with maintenance programs. On the other we're adjusting these maintenance programs to area development, which is linked to the market situation.**
- The only contact with the DCMR (regional environmental agency) and the Veiligheidsregio about water safety is that we present these area strategies to them. This, because there may be some critical facilities located in these areas that are currently not adequately protected. The Veiligheidsregio may need this information for evacuation plans. However, they are not involved in the process of drafting these strategies.
- Like the Rijnhaven tender, we're thinking about incorporating flood safety as some sort of requirements in awarding criteria.
- We do have contact with local businesses through the Keiletafel, but we've never discussed flood safety there. It could however provide a platform to inform them about this topic.
- **If certain properties are to be redeveloped we would have to look into how we could make sure the new design could incorporate flood resilient measures, may this prove necessary. However, this is not yet worked out in actual guidelines.**
- There is a lot of collaboration with private parties, investors as well as creative industries that have ideas for this area.
- The area could very well function as a test site for educational and engineering pilots for water management projects. We have already been contacted by several interested parties and see a lot of possibilities to also link these initiatives and create a centre of technological innovation.
- **In the end, if the area gets flooded and there are severe damages the government will probably provide help to the affected parties.**
- **I think that the more we allow for building in these outer-dike areas the more likely the involvement of insurance companies will be. However, to collaborate with them would be the responsibility of the private developers.**
- Through students research we've been in contact with the community in the surrounding neighborhoods. From the municipality we have conversations with the district organization of Delfshaven, but there is no direct contact with the residents themselves.

Regional public agency

Hoogheemraadschap
Delfland

R. Ammerlaan

Senior Policy Consultant

- There has been a shift in our approach, where formerly we carried out our operations solely by ourselves, we now try to work with other parties in the area as much as possible.
- **The safety of outer-dike areas is not part of our responsibility but in our jurisdiction parties located in these areas are just as much required to pay waterboard taxes. These areas are themselves not protected, but do play a part in the strength of the dikes that lie behind them. This means that these areas are included in our 'legger'. This means that there are functional restrictions and permits are required for any developments.**
- The legger is similar to a zoning plan. A legger states requirement for the profile and strength of the flood defences according to the local level of safety. The 'keur', the other instrument of the waterboards states the usage and allowable functions in an area according to the safety level. It also indicates where the maintenance responsibilities lie for the parts of the water management system.
- We're responsible for drafting the legger and keur. We do this according to national and local criteria and safety zonings. In this process we consult all involved public agencies and to capture new plans into fixed legislation local parties are also heard and asked for their feedback on local changes. To deviate from the legger, a permit can be requested at the local waterboard.

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- **We have a guidelines for third parties on how the Watertoets works and a special internal team to work on the execution. In zoning-plan changes we're very much involved in the process and take part in the discussions as early as possible. We have accountmanagers to keep track of all the developments in different areas and are included in administrative consultations. We want to be involved as early as possible, but we simply do not have the capacity to do this for all projects of course.**
 - We have made arrangements with the municipality on what is possible in the development of these outer-dike areas. Together we've made a list of criteria for changes or developments.
 - Lately we've been included in a workshop of Stadshavens and some municipal departments to look at the possibilities for making the Merwe-Vierhavens area climate neutral. The party I missed there was the Veiligheidsregio. They are currently not very visible in the field of water safety. We think they could play a more important role in raising awareness and providing information, especially in these outer-dike areas.
 - **We have improved on communication in the sense that we've made clear on our website that flooding of these outer-dike areas is not our responsibility and whom should be contacted. A few years ago when there were some floodings in Rotterdam we got approached by national media, now we think this is more clear. We see that municipalities also are starting to take more responsibility on this point. However, we still see that awareness of the local community in these areas of their situation is still very low.**
 - It is the responsibility of Rotterdam to assess the risks in these outer-dike areas. They've fixed the required elevation of these areas according to the functions and future development. This is also done in collaboration with the provincial authorities and the Rijkswaterstaat program Rijnmond-Drechtsteden.
 - We have studies about the strength and safety of the dikes but not about safety in these outer-dike areas. However, the municipality is really taking their responsibility on this point. There are 60000 people living in outer-dike areas in Rotterdam, so it is quite necessary. In recent years the municipality has become more aware of their role and are certainly taking action. This is also visible in the Rotterdam Climate Proof and the Adaptation Strategy. These initiatives gave a lot of insight in the risks and set the public agenda, on local as well as regional level. So knowledge has been build, but question is how deep this has penetrated into the organization. Because this of course has to be taken into consideration in other regulations and plans etc.
 - Experiences of former floodings is taken into consideration to the extent to which certain areas are hit. As Merwe-Vierhavens hasn't been hit that hard for as far as I know. I think more attention could be paid to the visibility of the water management measures. If we make water levels and risks more visible in for example parks or quays that would raise awareness of the risks for residents and local businesses.
 - **We've contributed to the Deltaprogramme in discussions, workshops and consultations. The Deltaprogramme has made it possible to come to a preferred strategy. It has marked the political urgency and opened up communication between all public parties on water management. The preferred strategy for Rijnmond-Drechtsteden is to take smaller adaptive measures like dike enforcements and keep a monitoring and controlling approach to future developments.**
 - There is a discussion about whether to take up the Watertoets in the new environmental permit process, but this is a battle that is fought on national level.
 - If you want to develop an area in an integrative manner, a dike has to feature other functions than just flood defence. However, we only see possibilities in funding these kinds of processes through larger-scale developments. In current spatial planning this is just not feasible and are municipalities glad to develop stamp-scale sites. This makes the clearing of substantial additional funds, needed for these integrated solutions like the 'dakpark' not feasible.
 - The most important instruments of the municipality are the required level of elevation for land issuance. And furthermore providing information and raising awareness. Also maybe they could take initiative in developing evacuation plans and
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making sure vulnerable functions and critical facilities are safe.

- **Only when the area gets flooded we could get good overview of the vulnerabilities. Also, I think parties like Stedin (regional network operator for gas and electricity) do not have a clear view of all of their assets and whether or not they are protected or not. There is still a lot to be gained in these areas but this has to be taken up by local as well as national government.**
 - There has been a lot of talk about flooding insurance, but in a sense you could consider waterboard taxes some sort of public insurance. Or municipal taxes when it comes to outer-dike areas.
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10. ACTOR INTERVIEW QUESTIONS & GUIDE

Effective governance for flood resiliency in urban development



SUNSET PARK ACTOR INTERVIEW

1. Do you believe in climate change and, more specific, increased flood risk for NYC due to severe weather events and sea-level rise?
2. Do you have a clear view on the current flood risk in Sunset Park?
3. Do you think there's a good understanding of future threats for Sunset Park?
4. In the development of Sunset Park, have lessons from previous flooding experiences been taken into consideration?
5. When it comes to building flood resiliency of Sunset Park, do you think clear goals have been set in the development of Sunset Park?
6. Are you aware of any action being taken on realizing flood resilient measures in the area?
7. Is the public/local community involved in building flood resiliency of the area?
8. Is your organization concerned with or affected by the effects of increased chance of flooding in Sunset Park?
9. What are there flood resilient measures taken in the specific development project your organization is involved with?
10. Is your organization taking action in building flood resiliency?
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11. Are you aware of the city's ambitions in climate adaptation and building flood resiliency?
12. Have the public campaigns, plans and/or strategies (f.e. the SIRR report, FEMA risk studies or PlaNYC) shaped your perspective on flood resiliency?
13. Currently, adjustments are being made to building codes, zoning plans and NFIP floodplain zoning to increase flood resiliency of vulnerable areas. Would changes in legislation influence your organization's connection to Sunset Park?
14. Have financial public programmes (f.e. tax cuts, fines, subsidies or grant programs) stimulated your organization to implement flood resilient measures in the building or area?
15. Has your organization been involved in any workshops, partnerships or collaborative networks aimed at building flood resiliency?
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16. If Sunset Park would be faced with flood damages, what would be your reaction?
17. To what extent is your organization willing to take action in realizing flood resiliency in Sunset Park?
18. Have you been in contact with other urban or local organizations (either public or private) with regard to building flood resiliency of the area?
19. What party is (or which parties are) in your opinion responsible for flood resiliency of Sunset Park?
20. Do you think flood resiliency would best be achieved by individual action or by a collaboration of organizations with interests in the area?
21. Do you think increased flood resiliency of Sunset Park would benefit your business?
22. Do you think the development of Sunset Park ultimately leads to an increase in flood resiliency of the area?
23. Do you think the approach of Sunset Park is representative for other NYC waterfront developments?
24. Could public policy be improved to stimulate flood resiliency of urban areas?

Graduation Research of Eva Gaaff
Urban Adaptation Strategies lab, Delft University of Technology

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SUNSET PARK ACTOR INTERVIEW GUIDE

1. Do you believe in climate change and, more specific, increased flood risk for NYC due to severe weather events and sea-level rise?
2. Do you have a clear view on the current flood risk in Sunset Park?
 - Do you think this has improved?
 - How and why?
3. Do you think there's a good understanding of future threats for Sunset Park?
 - Do you think this has improved?
 - How and why?
4. In the development of Sunset Park, have lessons from previous flooding experiences been taken into consideration?
 - If so, what lessons?
 - What flooding experiences?
 - What kind of results?
5. When it comes to building flood resiliency of Sunset Park, do you think clear goals have been set in the development of Sunset Park?
 - What goals?
 - By whom? Who's responsible for realization?
 - How are these determined and recorded?
6. Are you aware of any action being taken on realizing flood resilient measures in the area?
 - What kind of actions?
 - What kind of measures?
 - By whom?
7. Is the public/local community involved in building flood resiliency of the area?
 - How?
 - To what extent?
8. Is your organization concerned with or affected by the effects of increased chance of flooding in Sunset Park?
 - To what extent did it play a role in the choice for this location?
 - Long-term/short term?
 - Level; building or area?
9. What are there flood resilient measures taken in the specific development project your organization is involved with?
 - What measures?
 - Why?
 - By which party?
10. Is your organization taking action in building flood resiliency?
 - In what way?
 - Long-term/short term?
 - Level; building or area?
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11. Are you aware of the city's ambitions in climate adaptation and building flood resiliency?
12. Have the public campaigns, plans and/or strategies (f.e. the SIRR report, FEMA risk studies or PlaNYC) shaped your perspective on flood resiliency?
 - Has this lead to any action within the area? Location/financial/social planning?
 - Has this lead to any action within the organization? Location/financial/social planning?
13. Currently, adjustments are being made to building codes, zoning plans and NFIP floodplain zoning to increase flood resiliency of vulnerable areas. Would changes in legislation influence your organization's connection to Sunset Park?
 - Why (not)?
 - What legislation?
 - In what way? Physical/financial/social planning?
 - Has it stimulated or hampered building flood resiliency?
 - If not, how do you think this could work? What kind of legislation? How?
14. Have financial public programmes (f.e. tax cuts, fines, subsidies or grant programs) stimulated your organization to implement flood resilient measures in the building or area?

- What level of government?
 - What programme?
 - If not, do you think this could work? How? Stimulating or penalizing?
15. Has your organization been involved in any workshops, partnerships or collaborative networks aimed at building flood resiliency?
- What other actors were involved?
 - Who took initiative?
 - What was the outcome?
 - If not, do you think this would work? How? Who should take initiative?
-
16. If your Sunset Park would be faced with flood damages, what would be your reaction?
- Whom would you hold responsible?
 - Physical/financial/social measures?
17. To what extent is your organization willing to take action in realizing flood resiliency in Sunset Park?
- Building/area level?
 - What term?
 - Physical/financial/social?
18. Have you been in contact with other urban or local organizations (either public or private) with regard to building flood resiliency of the area?
- Which ones?
 - What party took initiative?
 - Frequency and outcome?
 - If not, would you consider this in the future? Under what circumstances? (changed policy or changed perception of threat?)
19. What party is (or which parties are) in your opinion responsible for flood resiliency of Sunset Park?
- How?
 - Is there a party that should get more involved? How could this be achieved?
20. Do you think flood resiliency would best be achieved by individual action or by a collaboration of organizations with interests in the area?
- Why?
 - What parties should collaborate?
21. Do you think increased flood resiliency of Sunset Park would benefit your business?
- If so, how?
22. Do you think the development of Sunset Park ultimately leads to an increase in flood resiliency of the area?
- If so, how?
 - What could be improved?
23. Do you think the approach of Sunset Park is representative for other NYC waterfront developments?
24. Could public policy be improved to stimulate flood resiliency of urban areas?
- How? (Shaping, regulating, stimulating, capacity building?)

11. EXAMPLE EXPERT INTERVIEW QUESTIONS

Flood resilience in urban planning and development

Graduation Research TU Delft

E Gaaff

09-09-201

INTERVIEW H. OVINK

1. Wat zijn volgens u de grootste verschillen in aanpak van de implementatie van overstromingsmaatregelen tussen Rotterdam en NYC?
2. Ziet u moeilijkheden in de ontwikkeling van overstromingsresistente stedelijke gebieden?
3. Denkt u dat (een deel van) het antwoord op deze moeilijkheden ligt in governance?
4. Wat ziet u als grootste verschil in governance (institutional frameworks) tussen de twee steden? Benadering nu; grove typering van top-down versus bottom-up flexibel model, past dit?
5. Hoe ziet u de samenwerking van actoren in NYC, op welk niveau speelt dit zich voornamelijk af? Wat is het verschil met Rotterdam/Nederland?
6. Hoe ziet u de verhouding/samenwerking tussen federale overheid en stedelijke instanties?
7. Hoe ziet u de positie van lokale overheden (boroughs) en community boards in NYC/Rotterdam?
8. Hoe ziet u de positie NGO's in NYC/Rotterdam?
9. Hoe ziet u de positie van Rijkswaterstaat/waterschappen in dit soort opgaven in Nederland?
10. Kunt u de rol van de Mayor's office of Long-Term Planning and Sustainability toelichten?
11. Hoe ziet u de toekomst van het beleid in NYC met het nieuwe bestuur van burgemeester De Blasio?
12. Hoe schat u de capaciteit tot adaptatie van beide steden in?

Typering policies; shaping, stimulating, regulating, capacity building (Tiesdell&Allmendinger/Adams)

13. Welke zijn nu sterker aanwezig in Rotterdam/NYC?
14. Welke werken volgens u goed in de praktijk van gebiedsontwikkeling?
15. Zit hier verschil in met het oog op de verschillen in governance/ institutional frameworks; werken bijvoorbeeld grants beter in NYC en legislation beter in NL?
16. Wat denkt u over de invloed van financiële stimulering van flood resiliency in NYC tov Rotterdam? Ziet u hier meer inleg van lokale betrokkenen/private partijen/NGO's?
17. Kunt u meer inzicht geven in een mogelijke deelname in het CRS-programma door NYC?
18. Wat denkt u over de invloed van regulerende maatregelen voor flood resiliency in NYC tov Rotterdam?
19. Wat denkt u over de invloed van financiële stimulering van flood resiliency in NYC tov Rotterdam?
20. Welk soort maatregelen denkt u dat effectiever is in NYC/Rotterdam?
21. Welke denkt u dat meer benadrukt moeten worden in NYC/Rotterdam?
22. Hoe ziet u de toekomst van het NFIP en private insurance in NYC? En in Rotterdam/Nederland?
23. Aerts geeft aan dat regelgeving en beleid in NYC wat betreft overstromingresistentie van de gebouwde omgeving voor Sandy onoverzichtelijk en tegenstrijdig was. Ziet u hier verandering in en zo ja, hoe?
24. Kunt u de invloed van strategieën als PlaNYC en Vision 2020 op de praktijk van gebiedsontwikkeling schetsen?
25. Hoe dragen prijsvragen als Rebuild by Design bij aan de realisatie van dergelijke projecten in NYC? Ziet u hier een kans voor NL?
26. Hoe verhouden deze steden/benaderingen zich tot de ontwikkelingen in andere steden wereldwijd?
27. Kunt u kort reageren op de selectie van belangrijkste actoren en policies in NYC/Rotterdam?

12. EXAMPLES TRANSCRIPTION EXPERT INTERVIEWS

MINUTES INTERVIEW H. OVINK

Ministerie IenM, 09-09-2014
 Interviewee: H. Ovink (HO)
 Interviewer: E. Gaaff (EG)

EG – Kunt u enige reflectie geven op de vergelijking tussen governance in Nederland en NYC/de VS op het gebied van water management

HO – Governance bureaucratie en wet en regelgeving lijken in de VS complex georganiseerd maar dat is wereldwijd niet anders. Ook in Nederland is dit heel ingewikkeld, maar wij zijn natuurlijk gewend aan onze eigen context. Niet voor niets hebben we in 2008 de Crisis en Herstel Wet geïnitieerd, gevolgd door de Omgevingswet die nu bij de Tweede Kamer ligt. En de huidige decentralisaties en vereenvoudiging van bestuur is ingegeven door de wens naar effectiviteit en efficiency bij de overheid. Die wens is wereldwijd. Ik heb lang geleden een analyse gemaakt van de hoeveel governance-structuren die we in de randstad hebben en dat zijn er oneindig veel. We hebben voor elk probleem weer een eigen task force, project of structuur opgezet. De veiligheidsregio is bijvoorbeeld niet dezelfde als een waterveiligheids of Europees programma regio. Provincies, een randstad overleg, inter-gemeentelijk overleg, metropoolregio Amsterdam, een veelheid aan structuren, voor elke vraag een 'thuis'. Dit kan en moet beter, maar we zijn eraan gewend.. Nederlanders zijn bovendien cultureel maar ook bestuurlijk in staat om systeemtechnisch te denken en te opereren. Wat niet wil zeggen dat de huidige complexiteit een goede situatie is. Teveel bureaucratie, teveel onoverzichtelijke organisaties, teveel van alles zit uiteindelijk het probleemoplossend vermogen in de weg.

Ons excuus dat alles ingewikkeld is, maakt ruimte voor nog meer complexiteit, en dat kan echt veel slimmer. Amerikanen doen dat anders, daardoor leidt dezelfde complexiteit aan opgaven tot een andere reactie, een andere wanorde. Geen bestuurlijke kluwen, maar eerder een gemis aan een volwassen bestuurlijke cultuur. Wat "wij" teveel hebben lijken "zij" daar te weinig te hebben.

In Nederland zijn we erop ingesteld dat ieder zijn eigen specialisme heeft en worden de onderlinge verbanden onderkend, dat betekent dat je elkaar opzoekt om het gezamenlijk over - die samenhang van de - problemen te hebben, die vaak in hun samenhang tot betere oplossingen kan leiden. Nederlanders zijn over het algemeen - en ik generaliseer nu enorm - veel beter in staat de complexiteit van een opgave in te zien en ook de samenhang met andere systemen. Systeemdenken is in de VS niet een onderdeel van de bestuurlijke of politieke cultuur wat betekent dat hoewel er misschien wel verschillende governance modellen prevaleren, dat er niet voldoende begrip achter - het besturen van een regio - zit. Niet in Nederland, niet in de USA.

Neem bijvoorbeeld de Port Authority (PA), dat is eigenlijk een waanzinnige autoriteit. Het is regionaal, wordt geleid door NY, NYC en New Jersey. Bovendien heeft het beslissingsbevoegdheid en geld. Het kan zijn eigen regels stellen en ook uitvoeren. Het is dus eigenlijk heel krachtig - zelfs machtig, maar onmachtig gemaakt doordat de politiek de PA de nek om heeft gedraaid. De politiek van NJ, NYS en NYC heet de PA 'gekaapt' voor haar eigen - niet synchrone - agenda's. Als het gaat om flood resiliency en adaptation in het algemeen dan heb je het toch over die regionale schaal. En dan heb je met zo'n PA als formeel regionaal overheidsorgaan toch een heel krachtige en interessante instantie te pakken. Het bestuur, de burgemeester van NYC en de twee Governors spelen eigenlijk een politiek spel met de PA waardoor deze nog maar heel weinig invloed heeft. En bovendien neemt de PA zelf - en dat vind ik fascinerend - te weinig eigen positie in om hier tegenwicht tegen te bieden. Robert Moses heeft natuurlijk een boel ellende veroorzaakt met zijn technocratische manier van denken en aanpak, maar er ligt nu wel een infrastructuur met bruggen en tunnels en een metrosysteem dat nog steeds een enorme toegevoegde waarde heeft voor de stad. Moses is niet de juiste referentie, zoals we met Rebuild by Design vertellen is de mix, of het huwelijk tussen Robert Moses en Jane Jacobs eigenlijk de beste aanpak. Hun 'lovebabies' zijn de werkelijke oplossing. Tegelijk laat de positie van de PA zien hoe relatief de macht is van verschillende overheidsinstanties in relatie tot de politiek. De PA zou een eigenstandige positie in kunnen nemen, zoals in NL met een Deltaprogramma gebeurt.

De Deltacommissaris heeft een eigen portefeuille, maar wel binnen de verantwoordelijk van de minister van IenM. Dat is een sterk fluide model, vanuit governance oogpunt natuurlijk zeer interessant. De positie van de Commissaris, het fonds en het programma zijn bij wet geregeld. Het is een eigenstandige positie, terwijl de begroting wel deel uit maakt van de rijksbegroting en de minister van IenM uiteindelijk verantwoordelijk is voor het programma op rijksniveau. Maar het nationale karakter, dus de samenwerking tussen alle betrokken overheden, tijdens de opstelling tot en met de uitvoering, maakt dit programma sterk en relatief onafhankelijk en afhankelijk tegelijkertijd. Dit governance 'spel spelen' zijn wij in Nederland gewend en benutten we.

De positie van de PA leent zich hier heel erg voor, maar het spel lijkt uitgespeeld en de PA is daardoor onmachtig geworden. Er ligt hier een enorme kans om een leidende organisatie te pakken, op de regionale schaal, met een werkelijke inhoudelijke, toekomstgerichte visie, een consortium waar op de regionale schaal alle overheden samen kunnen werken met de samenleving, het bedrijfsleven en de kenniswereld - federaal, regionaal en hyper-lokaal - vanuit inhoud en met de macht van de uitvoering, het geld en de besluitvorming over de grenzen van de politiek heen.

EG – En wat ziet u als grootste verschillen in implementatie van de ambities en plannen op het gebied van flood resiliency?

HO – Je ziet dat NY met het SIRR rapport, dat direct na orkaan Sandy door burgemeester Bloomberg is geïnitieerd, een hele waslijst aan concrete initiatieven en projecten voorstelt. En alhoewel er nog een financieel tekort is voor de uitvoering van al deze maatregelen, is meer dan de helft gedekt met middelen van de federale overheid uit het Sandy geld. Maar de Amerikaanse aanpak blijft gefragmenteerd, zowel tussen overheidslagen als binnen de verschillende overheden. Hoewel de Hurricane Sandy Rebuilding Strategy, het rapport dat we met de Task Force hebben opgesteld juist vanuit synergie is gemaakt en niet gefragmenteerd is in de uitvoering, worden de projecten die dan vervolgens worden gestart natuurlijk weer door die gefragmenteerde overheden uitgevoerd. De Amerikaanse samenleving zie je in de implementatie terugkomen. Zoals we dat in NL op gebiedsniveau en integraal aanpakken is daar echt onmogelijk. Hier in de US gaat alles vanaf de meest lokale schaal, het begint bij de kiezers, de communities.

De implementatie in NYC is dus wezenlijk anders dan de implementatie in NL. Dat wil niet direct zeggen dat de uitvoeringskracht beter of juist minder goed is, dat is lastig te vergelijken. Vanuit mijn ervaring zie je dat het realiseren van - complexe - infrastructuur in het algemeen over de hele wereld een ingewikkelde opgave is. Regelgeving als een Environmental Impact Assessment (EIA) of een MilieuEffect Rapportage (MER) zijn vergelijkbaar - hoewel de integraliteit van de MER veel groter is in vergelijking met het sectorale karakter van de EIA. Ze hebben wel min of meer dezelfde invloed. Er zijn regels bedacht die de effecten van dit soort ingrepen over de samenleving verdelen. Dus hoewel de macht van de politiek en het geld wellicht in de VS een grotere rol spelen betekent een negatieve EIA dat er toch echt dingen aan het plan moeten veranderen.

Senator Schumer vertelde laatst dat men in de VS niet in staat is bestaande regels te veranderen. Dit omdat het congres erg verdeeld is en iedere regel wel een eigenaar heeft. Net als overal is ook hier een regel tenslotte heel vaak een antwoord op een 'cry of pain' uit de samenleving. Het is dan gemakkelijker om iets nieuws te bedenken als omweg, dan het bestaande te veranderen. Zo wordt het systeem steeds complexer. Maar in NL is nu met de omgevingswet - en de voorloper de crisis- en herstelwet - toch een aantal vergaande veranderingen doorgevoerd, dat zou in de VS nooit zo kunnen gebeuren. Deze transitie is direct gekoppeld aan de uitvoering, we willen vasthouden aan de realisatie kracht en stroomlijnen onze belangenafweging in het licht van de toekomst. Natuurlijk met besef en respect voor het verleden, maar met het perspectief van ontwikkeling. Zo worden het gemakkelijker om projecten te realiseren. Het doel is dat de regels kloppen, aansluiten bij de vele verschillende situaties van de samenleving in een land, dus flexibel en adaptief zijn en tegelijkertijd helderheid en zekerheid bieden aan die samenleving. Dat is een ideale en ideële mix.

Versimpeld gezegd is in Nederland de aanpak integraal met eenvoudige regelgeving, en in de VS is de aanpak individualistisch en lokaal en onderhevig aan oude en complexe, vaak tegenstrijdige regelgeving. Hierin zit een - fascinerende - tegenstrijdigheid: de Amerikaanse "can-do" mentaliteit tegenover de totale versnippering van bureaucratie, politiek en wetgeving. Daardoor lopen vele projecten en processen gewoon vast.

EG – Heeft die regelgeving daar dan ook minder invloed?

HO – Nee, juist heel veel invloed. Amerika is een totaal verjuridificeerde samenleving, de macht ligt bij de juristen. Vanuit risicomijding wordt "alles" in regels geperst, de omgekeerde maakbare samenleving, "what-if" als negatief ontwikkelingsperspectief. Kijk naar het National Flood Insurance Program (NFIP) dat eendimensionaal zich alleen richt op suburbia, voor New York en Hoboken bijvoorbeeld totaal niet van toepassing te krijgen. Maar eigenlijk alle bestaande regelgeving belemmert - in principe - de uitvoering. Terwijl we zouden willen dat regelgeving juist de uitvoering geleidt. Wat je merkt is dat doordat de geleiding nu allemaal verschillende kanten op wijst er uiteindelijk niks van de grond kan komen.

EG – Ziet u ook net als Aerts dat hier het verschil en tegenspraak in regelgeving van de verschillende overheidslagen op federal, state- en city niveau een probleem is?

HO – Ja precies, waarbij je ook direct verschil tussen de Staten ziet. NY State heeft bijvoorbeeld een andere grondwet dan NJ. De governor van NJ heeft een andere positie en andere politieke kleur en de aansluiting op federale initiatieven ligt daarmee ook anders. En zeker met NYC als eigenstandige stad is dat voor deze regio - die ook echt als regio functioneert en het verschil maakt - een hele lastige situatie. Iedere instantie maakt beleid, doet onderzoek en opereert strikt voor het gebied van zijn eigen verantwoordelijk.

Bijvoorbeeld het rapport van NYS 2100, wat gaat over resiliency. Maar de cover alleen al staat symbool voor het denken: de Staat NY, als volledig geïsoleerd gebied. Dat werkt natuurlijk niet met al die afhankelijkheden op het gebied van infrastructuur, energienetwerken etc. op de regionale schaal. Zo'n regio is werkelijk verdeeld en cultureel bepaald. Deze versnippering is zelfs in de wetenschappelijke wereld terug te zien. In Nederland zijn we het integrale denken gewend en proberen we die ook in

Nederland bestaande versnippering van bestuur en verantwoordelijkheden te overbruggen. Daar zit soms een nadeel aan, we kunnen veel zaken onnodig complex en ingewikkeld maken waardoor de uitvoering er echt onder leidt. Maar over het algemeen kunnen we in onze projecten veel zaken meenemen.
Ons governance systeem, zowel juridisch, politiek als financieel is erop ingericht en kan die integraliteit en complexiteit aan. Dat is in NYC absoluut niet het geval. Daar worden de maatregelen opgebroken in de kleinst mogelijke brokjes zodat op ze op de kleinste schaal realiseerbaar zijn. Dit gaat door tot ingrepen op het niveau van straten en huizen. Zodra er verantwoordelijkheden worden samengepakt begint iedereen te stuiten; niet alleen de overheid, maar ook de investeerders. Die laatste zijn vooral geïnteresseerd in short-term benefits, projecten met een kop en een staart en duidelijke business cases. Dat is overigens niet uniek voor Amerika, projectontwikkeling heeft geen last van de lange termijn, en dat is jammer. Hoe groter de envelop van betrokkenen wordt, hoe meer onzekerheden, hoe langer de termijn en hoe complexer de opgaven, des te minder animo. Op programma niveau investeren gebeurt niet, wel op project niveau. Het delen van macht tussen private instanties en de overheid gebeurt eigenlijk nooit. Er is een enorme distrust in de samenleving tegenover de overheid. Zie ook het voorbeeld van Obama's infrastructure bank, die niet van de grond komt. Dit zorgt er ook voor dat de markt een excuus heeft om geen eigen verantwoordelijkheden te nemen.
 Na Sandy is er \$60 miljard federaal overheidsgeld ter beschikking gesteld voor de door Sandy getroffen regio. De reactie in de vorm van investeringen vanuit de markt bleef vervolgens uit. Een echt publiek-privaat partnership op programma niveau met een verdubbeling van het budget zou echt ongeëvenaard zijn, dan zouden er echt geweldige maatregelen getroffen kunnen worden. Maar dat denken dus, integraal, complex, lange termijn systeem denken zit gewoon niet in de samenleving.

EG – Maar hoe wordt dat geld nu besteedt dan? In projecten als Rebuild by Design?

HO – Ja, maar dat is maar 1 mrd. Voor de rest is het allemaal sectoraal, belegd per department. We zijn met de Task Force daarom bezig de ministeries te helpen bij de integrale organisatie en afweging van de afzonderlijke projecten en hun afhankelijkheden. Afhankelijkheden in plek, verantwoordelijkheden en tijd. Nu wordt bij projecten niet tussen de sectoren gepraat, waardoor er in het gunstigste geval kansen worden gemist. Dit wordt in Nederland bijvoorbeeld opgevangen door iets als het Meerjarenprogramma Infrastructuur Ruimte en Transport (MIRT). Dit kent een gebiedsgerichte benadering waarbij de sectorale investeringen integraal in de regio bij elkaar komen. Dit proberen we nu in de VS van de grond te krijgen. Rebuild by Design is hier een voorbeeld of overtreffende trap van, aangezien er ook een innovatieagenda aan is toegevoegd. Bovendien stond hier de samenwerking met externe partijen en communities centraal vanaf het begin, governance by collaboration, innovation by design. Natuurlijk gaat het ook hier om het bij elkaar halen van de gefragmenteerde geldstromen gericht op integrale projecten die de resilience van de regio versterken.
Dit zie je heel mooi in een samenwerking die door zo'n plan nu tot stand komt in Hoboken tussen NJ Transit, de staat NJ, de academische partners, projectontwikkelaar, verzekeraars en de burgemeesters van Hoboken, Jersey City en Weehawken. Dit is echt een verandering in manier van denken en werken. Deze instanties beseffen zich dat ze onderdeel zijn van een groter geheel en dat individuele inpassing hierin zo'n groot voordeel voor alle betrokkenen oplevert, dat het uiteindelijk ook ten goede komt aan elk van de instanties individueel.

Maar ja, er zijn dus zeer grote verschillen. En tegelijk wordt er echt wel naar andere manieren van werken gezocht.

EG – En hoe ziet u de inspraak van communities en lokale partijen op publieke planvorming? Is deze zoals Aerts aangeeft sterker in NYC dan in NL? Is NL inderdaad meer top-down en NYC meer bottom-up?

HO – Nou, er worden daar natuurlijk ook plannen gemaakt door de staat en de stad. Niet alles gebeurt daar community gedreven. Daar wordt ook gewoon een pijpleiding, een energienetwerk en een weg aangelegd. De door jou geschetste tegenstelling maakt het verschil tussen de twee landen overzichtelijk, maar het is ook een beeld dat enigszins overdreven is, een karikatuur. Maar wel deels waar. Ik zeg altijd dat het in Nederland bestuurlijker is en in Amerika politieker. De markt heeft ook daar een hele sterke positie. Die drijft uiteindelijk iedere vorm van ontwikkeling, nog veel sterker dan in Nederland. De overheid moet de problemen oplossen maar van echte publiek-private samenwerking is weinig sprake.

EG – Zoals je bij waterfront developments ook ziet dat het in eerste instantie marktpartijen zijn die de ontwikkeling van zo'n gebied drijven. Heeft u dan ook het idee dat deze partijen zich bewust zijn van zaken als flood resiliency of hier enige verantwoordelijkheid in willen nemen?

HO – Ja inderdaad, dat denken dat moet nu worden gestimuleerd. Wat je ziet is dat voor dit soort gebieden de EDC goed samenwerkt met het Resiliency Office. In de plannenmakerij neemt de stad zo een heldere rol t.o.v. de markt. Er wordt aangegeven dat als er ontwikkeld wordt de partijen rekening moeten houden met waterberging en zeespiegelstijging. Dat is goed om te zien, dat gebeurt nu veel meer, mede door Sandy, maar ook al door PlaNYC. De stad stelt de regels op, sluit de deals met de marktpartijen en stelt eisen aan investeringen in een gebied. Het mooie is dat dit dan ook direct als kans wordt gezien, heel erg Amerikaans!
Bloomberg was natuurlijk aan de ene kant heel marktgericht, en koppelde hieraan de verduurzaming- en later resiliency ambities. Daardoor is dit onderwerp wel veel meer op de agenda gekomen, ook van marktpartijen. De Blasio wil nu meer de

sociale duurzaamheid en gelijkheid aanpakken, waarbij het streven is dit in het beleid te koppelen aan de opgebouwde economische en natuurlijke sustainability.

EG - Verder is er nu een wirwar aan task-forces en Mayor's offices die zich met resiliency bezig houden, kunt u hier de structuur in uitleggen?

HO – Het begon met Bloomberg die heeft voor PlaNYC het Office of Long Term Planning and Sustainability (OLTPS) opgericht. Dit gaf leiding aan een programma waarbij alle agencies op het gebied van sustainability werden betrokken. Hier stonden in het begin de departementen niet open voor, maar het heeft uiteindelijk wel geleid tot een integraal plan en integrale uitvoering en de verankering van sustainability bij alle diensten van de stad. Deze integratie vanuit een horizontale structuur, direct onder een sterke burgemeester in een verticale structuur van verdeel en heers gaf natuurlijk wel spanningen en vroeg - blijvend - leiderschap. Dit is ook in Nederland een voorwaarde voor succes van integratie. Gebrek aan sterk leiderschap leidt vaak tot een bureaucratische loopgravenoorlog.

EDC is voornamelijk verantwoordelijk voor de uitvoering van projecten. Het is een vrij zelfstandige organisatie, maar is officieel wel deel van de city. Seth Pinsky was daar de baas en werd na Sandy door Bloomberg gevraagd een aanvalsplan te maken. Hij heeft toen een mix gemaakt tussen het OLTPS en het EDC en vanuit een aparte rol het SIRR rapport geleverd. Dit was dus een verlengstuk van PlaNYC, maar wel met EDC er als instantie erbij betrokken. Hiermee werd de ontwikkelkant met de sustainability agenda verbonden. Toen Pinsky wegging nam Dan Zarrilli de leiding over de uitvoering over, maar die moest ondertussen ook tijdelijk leiding geven aan OLTPS. De Blasio heeft toen het resiliency office gestart, waar Dan weer onderdeel van is. Inmiddels is Nilda Mesa door de Blasio als directeur benoemd van het nieuwe Office of Sustainability. De Blasio wil dus aan de bestaande sustainability-, resiliency- en marktagenda van Bloomberg ambities op het vlak van sociale gelijkheid koppelen. En zo een werkelijk integrale strategie voor de toekomst van de stad maken. Dat is met de komst van Mesa een heel krachtige aanpak. Het Capital Plan en de Capital Budget die in het voorjaar worden vastgesteld leggen met deze vier speerpunten de basis voor een werkelijk duurzame toekomst.

EG - Dit zou ook voor dat soort waterfront gebieden natuurlijk een kans vormen.

HO – Ook de positie van het Planning Department (DCP) is hierbij cruciaal. Die hield zich voornamelijk bezig met zoning en stedelijke kwaliteit, maar Carl Weisbrod, de nieuwe Officer, heeft een positie direct onder de burgemeester waardoor DCP naar boven is geschoven in de hiërarchie van de administratie. Bovendien heeft DCP nu weer een actieve rol in het opstellen van het volgende 10-year capital plan, wat het integraal investeringsplan is voor de hele stad. Dit is dus een initiatief tot integraliteit vanuit de bestaande organisatie. Daarmee breidt het takenpakket van DCP zich uit naar de echte ruimtelijke ordening.

Dus nu zitten OLTPS (nu Office of Sustainability) (met daarbij verweven EDC), het resiliency office en DCP aan tafel om het te hebben over de toekomst van de stad, wat precies de hoekpunten van het beleid verbindt. Dit is de basis voor een heel sterke strategie, met een achterliggende dienstenstructuur die er vervolgens uitvoering aan kan geven.

EG – Aerts gaf aan dat in NL een veel sterkere top-down structuur heeft in watermanagement en planning, terwijl in NYC de positie van de stad veel autonomer is.

HO – Ja, zeker. Maar vergeet niet dat New York een heel grote stad is, niet te vergelijken met de Nederlandse situatie. In NL worden dit soort zaken in principe geregeld door het Ministerie van IenM, de Waterschappen en Rijkswaterstaat. In de VS heeft de Army Corps (USACE) een eigen rol. Dat is eigenlijk de genie in NL. Het Rijkswaterstaat van de VS valt onder het ministerie van Defensie, en huist in het Pentagon. Terwijl het in NL onder IenM valt, wat natuurlijk een wezenlijk ander uitgangspunt is.

Het tweede echt grote verschil is dat USACE projecten via het congres worden geïnitieerd en goedgekeurd. De lokale invloed is dus enorm groot. Dit zou je bottom-up kunnen noemen, het beleid en de projecten van USACE wordt zo bepaald door meer dan 500 lokale vertegenwoordigers. Hierdoor kunnen ze niet ontsnappen aan een gefragmenteerde aanpak en ouderwetse oplossingen. Wel zijn er ook hier ambities en zijn er veranderingen gaande (Feingold/McCain). USACE werkt nu aan een integraal plan voor de hele oostkust. Senator Schumer vertelde dat hoewel de rol en positie van het USACE heel sterk is, verandering daardoor ook erg moeilijk is. Daarom gebruiken ze initiatieven als Rebuild by Design om succesvolle nieuwe werkwijzen als standaarden te adopteren. In de VS zijn trage, conservatieve overheidsinstanties en policies geaccepteerd, maar worden er nieuwe initiatieven naast geplaatst. Deze kunnen zorgen voor een dynamische realiteit, die wel antwoord geeft op de huidige vraagstukken. Deze kunnen uiteindelijk door uitwisseling van resultaten het trage/logge framework enigszins aanpassen. Instanties als USACE staan dus heel erg open voor samenwerking en willen nieuwe methoden leren en onderzoeken, maar ze zijn gebonden aan oude regels.

EG – En kunnen we het dan tot slot nog even hebben over de rol van NGO's?

HO – Ja, er zijn natuurlijk verschillende categorieën.

1. Er zijn de community boards, dat zijn geen overheidsinstanties, die zijn vaak erg goed georganiseerd en zijn een

- soort vakbonden van de buurt. Dat is dus lokaal, dicht op de mensen, vooral belangenorganisaties. Voorbeelden zijn The Point, GOLES en LES Ready.
2. Dan zijn er de kleinere stichtingen die ideële belangen hebben op het gebied van bijvoorbeeld community- en ecologische belangen. Dit zijn meer activistische clubs die vaak iets losser zijn, bijvoorbeeld Occupy Sandy.
 3. Ook zijn er de grotere lobby organisaties op elk denkbaar gebied positie hebben tot en met de hoogste lagen van de politiek, denk aan de Sierra Club.
 4. En dan zijn er de grote geld organisaties, de financiële fondsen, als de Rockefeller Foundation, Clinton Global Initiative, the Ford Foundation etc. Deze hebben echt enorme hoeveelheden geld en invloed. Fascinerend is de manier waarop deze stichtingen het beleid mede bepalen met hun onderzoeken en frames van denken, die vaak 1:1 worden overgenomen door de overheden waarmee of waarvoor ze werken. De democratische legitimatie van deze vorm van beleidsontwikkeling is een grijs gebied. De ideële kant van deze invloed is niet te controleren en naar mijn mening vaak flinterdun. Het is uiteindelijk allemaal een uitwisseling van politieke invloed, macht en geld.

Dat is dus nogal een palet.

In Nederland is dit anders. Ons systeem is hier ook niet op ingericht. We hebben onze verantwoordelijkheid min of meer afgekocht met het betalen van belasting. In de VS wil de samenleving niet zo gebonden zijn aan de overheid, zij betalen op een andere manier, individueel, voor hun zekerheden. Waar Nederland in de grondwet collectiviteit heeft geborgd, wordt de overheid in de grondwet van Amerika gereduceerd en staat in de VS het individueel belang voorop. Dat is een wezenlijk verschil in perspectief.

EG – En hoe ziet u de uitvoering en realisatie nu in NYC en Rotterdam?

HO – In New York en New Jersey wordt er hard gewerkt aan de uitvoering, een deel van de 60 miljard is al uitgegeven, een deel is al belegd in programma's en projecten en een deel wordt nu bestemd voor de ontwikkeling. 60 miljard besteden is een hele grote klus, dat gaat niet zomaar, zeker niet als je dat goed wilt doen. Maar met de plannen van New Jersey, de Staat New York en New York City samen met de uitvoering van de USACE aanpak en het Rebuild by Design programma werkt de regio keihard aan haar resilience en toekomstbestendigheid.

In Nederland hebben we straks natuurlijk de omgevingswet, die processen echt beter en eenvoudiger, inzichtelijker maakt. Ook het Deltaprogramma is enorm gericht op de uitvoering. En projecten als 'Sneller en Beter', waarbij beleidsmakers direct samenwerken met de praktijk partners, waar natuurlijk veel meer ervaring is met de daadwerkelijke uitvoering. Zo wordt de samenwerking tussen overheid en het bedrijfsleven steeds actiever gezocht. De overheid is hier dus echt hard bezig zich aan te passen en probeert echt een andere rol te pakken. Dit doen we aan de ene kant door zelf op een andere manier te handelen, coalities aan te gaan, maar ook door wetgeving aan te passen, slimme investeringsprogramma's als het MIRT op te zetten en het Deltafonds in te zetten. De overheid stelt zich hier dus zeer actief en progressief in op. Maar Nederland houdt een bestuurscultuur en heeft niet een politiek activistische cultuur. In die zin blijft iets als het Deltaprogramma een programma waarbij bestuurders, beleidsmakers en wetenschappers de inhoud bepalen, terwijl de bevolking redelijk onbewust blijft van de inhoud, de opgaven en de consequenties. Die kans is er nu overigens wel met de uitvoering, en die mogen we niet laten liggen.

Internationaal worden we geroemd om ons watermanagement, en terecht. Alleen de culturele betekenis en het belang zijn soms ver te zoeken in Nederland, alsof we onze geschiedenis en ons bestaansrecht vergeten zijn, en dat is heel erg jammer. Water en onze aanpak en toepassing zijn zo vanzelfsprekend geworden dat het soms gemakkelijk van de agenda verdwijnt. Bij de gemeenteraadsverkiezingen in 2014 speelde het geen rol van betekenis. Met het Deltaprogramma, de afronding van Ruimte voor de Rivier met dus echt heel mooie voorbeelden, echte feiten en met de Waterschapsverkiezingen in 2015 zie ik allemaal kansen om dat culturele verhaal weer enorm te versterken.

We vergeten soms de kracht van water, en dat is onterecht maar gelukkig niet onoverkomelijk. Bovendien, Nederland is land van water, nu en in de toekomst!

MINUTES INTERVIEW E. WESTERHOF

Arcadis US (NYC), 06-10-2014
 Interviewee: Edgar Westerhof (EW)
 Interviewer: E. Gaaff (EG)

EG – Kunt u de belangrijkste problemen benoemen die zich afspelen in het verwezenlijken van doelen en het uitvoeren van beleidsmaatregelen op het gebied van water management in NYC?

EW – De grootste uitdaging is waarschijnlijk dat er zoveel betrokken partijen zijn dat het onduidelijk is wie het voortouw moet nemen. Er zijn ongelooflijk veel actoren. Bijvoorbeeld de MWA (metropolitan waterfront association) alleen al vertegenwoordigd 800 kleinere organisaties. En de MWA is een belangrijke stakeholder, maar een van de vele betrokkenen.

Foundations zijn natuurlijk gelieerd aan dit financiële aspect, maar ook federaal geld, dat via diverse kanalen naar NYC komt speelt hier een belangrijke rol. Als je kijkt naar hoe dit federaal geld, nu een pot van \$10-15 mrd voor NYC, uitgegeven moet worden dan is hier ook weer een aparte strategie voor nodig. Uitgaven moeten voldoen aan uitgebreide regelgeving. Dus aan de ene kant is het belangrijk te onderkennen wie de leiding neemt en aan de andere kant bestaat er nog veel onzekerheid over de financiering.

NYC heeft de afgelopen jaren zeker grote stappen gemaakt, vooral onder leiding van de ORR (Office of Recovery and Resiliency). Rebuild by Design is hierin een soort mediator, een project dat processen bij elkaar brengt en ook probeert versnelling hieraan te geven. De inpassing van RBD projecten kan hiermee onderdeel worden van een totaalpakket en heeft ook zeker het bewustzijn aangewakkerd. Ook heeft het privaat-publieke partijen en gemeenschappen betrokken in het proces. De grootste uitdaging is nu hoe de winnende plannen die er nu liggen te vertalen in een tweede fase. Nu moet de stad aan het werk om het federale geld dat hiervoor is vrij gemaakt ook daadwerkelijk gependend te krijgen op de uitvoering van deze projecten. Hiervoor moet gezorgd worden dat de lokale politieke urgentie, ook op federaal niveau wordt gesteund.

EG – Welke partij denkt u dat hierin het voortouw zou moeten nemen? Is dat EDC, of de burgemeester, of het planning department?

EW – EDC heeft natuurlijk een aparte positie in de overheid van NYC. Het is in wezen een geld genererende partij. Na Sandy hebben ze wel veel meer de planvormingskant aangehaald, maar het is niet zoals de DDC (Department of Development and Construction) een partij die geld uitgeeft en zich toespitst op het vormgeven van de publieke ruimte. Het is een uitdaging voor NY om de planvorming bij ORR te vertalen naar concrete maatregelen, door DDC of anderen. Hierbij moet het nieuwe denken waar een initiatief als Rebuild van Design een mooi voorbeeld van is natuurlijk wel worden meegenomen. Gevaar is dat men nu voor de uitvoering bijvoorbeeld vasthoudt aan oude regelgeving en niet de mogelijkheden van samenwerking zoekt.

Het is nu zaak voor NY een weloverwogen stap naar de uitvoering te maken, studeren maar tegelijkertijd zorgen voor implementatie van zg. “no-regret” maatregelen. Natuurlijk is deze fase belangrijk, om het denken en beleidsvorming op gang te brengen, maar nu moeten de wielen op de grond komen. NYC heeft wel tijd, de omstandigheden zijn hier anders dan voor Katrina in 2005 bijvoorbeeld in New Orleans, maar die tijd moet wel goed worden benut. En juist om die uitvoering spelen in NYC ongelooflijk veel processen, vooral politiek omheen die de situatie erg lastig maken. Als je kijkt naar hoe in Nederland dingen van de grond komen dan gaat dat natuurlijk ook niet altijd van een leien dakje. Maar het goede is dat er in NL een heleboel mensen aan dit soort opgaven werken met systeemkennis die heel goed weten hoe plannen moeten worden vertaald naar projecten. Ook daarin heeft NYC een grote inhaalslag gemaakt: Het SIRR report is in vier maanden tijd in elkaar gezet. Er wordt nog steeds nieuwe systeemkennis opgedaan. NYC moet daarom ook flexibel zijn in de plannen die komende decennia worden uitgevoerd. PlaNYC is in die zin een momentopname geweest; naar aanleiding van de kennis die wordt opgedaan uit nieuwe studies moeten de plannen bijgesteld worden. Maar op een gegeven moment moeten er wel besluiten worden genomen over de besteding van grote hoeveelheden geld. En daarvoor moeten de plannen dan weer heel concreet zijn.

Daarnaast heb je natuurlijk de omgeving die verandert, coalities die veranderen. Dat bouwen van coalities is in NYC ontzettend belangrijk was eigenlijk een van de belangrijkste doelen van Rebuild by Design.

NYC heeft alle kaarten in handen om een van de besten op het gebied van adaptatie te zijn, om een voorbeeld voor andere steden te vormen. Maar je ziet ook dat de politiek een andere agenda heeft en dat er hier verschrikkelijk veel andere zaken ook nog spelen, op sociaaleconomisch gebied bijvoorbeeld. Maar dit zijn ook vragen die je in Nederland kan stellen. In Nederland is er de Deltacommissie die meehelpt de waterveiligheid politiek op de agenda te houden. Maar ook in NL zijn economische afwegingen en toenemende mate van belang. Hoeveel is waterveiligheid ons waard? Is de 1:10.000 norm wel doelmatig, of is flexibeler wellicht doelmatiger?

Een groot verschil is dat NYC 520 mijl aan onbeschermd kustlijn heeft, dus zodra je een beslissing neemt over een deel van dat gebied kan dat sociaal en politiek invloed hebben op de andere delen.

EG – Wat ik nu heb ondervonden in Sunset Park is dat daar nu voornamelijk maatregelen worden getroffen op gebouw en perceel niveau. Maar daarmee is het gebied als geheel nog niet beschermd. Er lijkt ook weinig animo te zijn onder de lokale stakeholders om hiertoe actie te ondernemen.

EW – Dit is een van de kernpunten die hier nu spelen. De vertaalslag van maatregelen voor de korte termijn naar de grotere

ingrepen die zaken met elkaar gaan verbinnen moet nog gemaakt worden. Zo kunnen beschermingsmaatregelen van diverse "kritieke voorzieningen", zoals telecommunicatie bedrijven maar ook ziekenhuizen en waterzuiveringsinstallaties op termijn op sommige locaties met elkaar worden verbonden.

MINUTES INTERVIEW PROF. J. KEENAN

Columbia University (NYC), 03-10-2014

Interviewee: Prof. J. Keenan (JK)

Interviewer: E. Gaaff (EG)

EG – What do you think are the main objectives in NYC's policies in real estate and urban development?

JK – Right now the main objective is housing. Promoting housing that is affordable for various lower to middle range income groups. We have very limited amounts of land that is well accessible by mass transit so now the City is going through a process of creating high density districts and zones.

EG – Do you think this has changed in recent years, or with the change of City administration?

JK – De Blasio is riding a progressive political wave, but the underlying core economic problem of a highly constrained middle class has stayed the same. In general, people are spending 40% of their income on housing. There is also a fair amount of consistency between the Bloomberg and the De Blasio administration when it comes to the core people who are executing the policies. So the policies may resonate differently, but largely the problems and goals have stayed the same.

EG – What would you say is the main driver for NYC in urban planning and development. Is it for example plain economic growth or more distribution of wealth?

JK - I think it's a combination of taxation and redistribution. For example, there is now a surcharge tax on extremely expensive properties. This revenue would be used for the development of affordable housing.

EG – Bloomberg is understood to have taken a more pro-active role in urban development, how do you see this?

JK – I think Bloomberg was engaged in the notion of urban development as a means to buttress and reinforce the financing of public infrastructure. Using the private mechanisms to promote the public provision of services like infrastructure. When you look at these development projects like Hudson Yards, the West side and Atlantic Yards in Brooklyn, ultimately the government, either the State or City government remained the creditors. It was a different public-private relationship than we've seen here before, but it was also just taking advantage of the strong real estate market.

EG – What is your opinion on public policy in NYC on flood resiliency?

JK – There is no real policy dedicated to flood resiliency. There is a huge disconnect between public policies and practices on spatial planning and land-use and building codes. So yes, the national flood insurance program (NFIP) assesses different levels of risk and assigns standards according to these risks, but these standards are not performative, they are generally responsive. In general they relate to the maintenance of these structures as a life safety issue, but not consider optimal location or whether the structure gets flooded, if at all.

Even assuming that you would have the right connection between spatial planning and land-use and building codes, there are tough decisions to make in choosing the right location for urban development. For example, in a lot of the areas that were flooded by Sandy there is the issue of environmental justice. A lot of these areas had a lot of public, lower and middle-class housing. This means that the approach of not intervening in these areas and let them, for example, retreat from the waterfront would put too much pressure on the local communities. Because of the tight housing market here, these people would have nowhere to go.

The thing about Sandy is that it highlights some of these issues. When we talk about mainstreaming for example, there is a sort of reverse effect in a disaster situation. The number of households that were living in illegally subdivided units. The problem is now that you can't subsidize these households for the damages they've incurred and you certainly can't

subsidize them to rebuild their homes illegally. So this raises a larger political question of what are the consequences of your actions in the long term against the immediate ramification of certain policies in your own administrative term. Naturally, you would say that long-term effects should be driving decision-making, but our political system is not set-up that way. The NFIP is in some way the institutionalization of protection of longer-term social goals. But there are two main problems with that. One; most of the structures are grandfathered-in. This means that structures if they are older than 50 years, they only need to be updated to the new codes if they are renovated for more than 50% of their current value. The other underlying problem lies in digitalization of risk mapping. This was grossly inaccurate before Sandy. The digital elevation maps were plus or minus several feet. This has tremendous impact on engineering, the flow, forces and power of water, and the ability to understand risk. These problems underscore the larger effectiveness of NFIP.

EG – Do you also think that the structure of government in this domain also plays a role in the difficulties arising in the realization of flood resiliency?

JK – Yes, actually the plurality of City departments is a larger problem within all policy domains. We’re largely bound by a certain complexity of regulatory barriers on some level. This has a political origin that is fairly understandable. However, these barriers have a certain conservativeness and in reality bring a lot of frictions. When you look at the environmental regulations alone, they really don’t serve to advance innovation. If for example you would try to build an innovative flood defense structure, you’re most likely being thwarted by rigid application of federal environmental laws. This top-down influence that the federal government has over State and City projects limits the power of local government, specifically in terms of physical development.

EG – Would you describe the City’s policies as more pragmatic or ideological?

JK – I think that the complexity is largely driven by pragmatics of execution. There is very little role for ideology, particularly if there is a disproportionate role of environmental regulation. So ideology comes into play when you talk about discretionary acts. There is very little room for discretion or interpretation in Federal and State level laws. There are various levels of discretion within federal and state level agencies about their regulations and it is made even more complicated by the very litigious character of our society and civic domain. A lot of the laws and regulations leave loopholes in them, for people to take private legal action. For example, if the US government is the developer of a building project, a private party who is potentially at risk can’t sue. They don’t have the possibility to stop the project or change plans. The USA is one of the places in the world where you don’t have that cause of action. There is deference given to the authorities. So everyone is subject to this very costly litigious society.

EG – Would you say that more integration or collaboration between these public bodies would improve the effectiveness of these policies?

JK – A number of years ago president Obama issued an executive order which forced the agencies to work together, to get a commonality of integration across their regulatory platforms relating to resiliency and adaptation. And there had been previous attempts when it comes to adaptation and mitigation. But it didn’t really work, because there was no incentive for them to do this. There was no real mechanism that forced them to do it. The reason for this lack of collaboration is partially a protection of one owns legal dominion. And then there is also a lot of uncertainty; who mediates the conflicts? In theory the executive of the president or mayor would, but in practice it doesn’t work out that way because they have very limited power in the organization. That’s also the challenge of resiliency officers of for example the office of long term planning and resiliency. In theory their position is high enough to enforce some action, but the legal and political implications of their policies is not backed within the system. There is simply no capacity of these executives, whatever their title may be, to mediate between the departments. In practice, these conflicts get mediated on a project-by-project basis. So on a practical level in these issues the mayor will ultimately get involved. But this brings a lot of uncertainty. Ultimately this way of working is based on relational theory where you’re working on negotiating contracts for both sides.

In the end you need leadership. When you examine all the organizational structures, at the end of the day it’s all about leadership and especially the kind of leadership in connection to the kind of problem we’re dealing with. A different kind of leadership is needed to deal in a post-disaster situation than in a normal day-to-day functioning of society.

EG – Do you think that flood risk in NYC is currently adequately assessed?

JK – Yes, the one advantage that NYC does have is that it has a very varied topology. There is a fair amount of elevation, risk modeling has been updated and vulnerabilities have largely been assessed. Also, lessons have been learned. What was not anticipated upon in the aftermath of Sandy was the heavy impact on business continuity. If the

whole urban system is shut down, who is responsible and accountable for delays? The impact of the shutdown of infrastructure and power systems is also felt by communities and businesses that are not located near the waterfront.

EG – The general approach now in Sunset Park is that businesses take their own, individual, measures in preparing their properties for future flooding. However, there are not adjustments made to the roads to protect the area in a more integral way. This means operations will still be stopped in such an event. Do you think a comprehensive plan for these vulnerable areas as a whole would be beneficial? And who would be responsible for such a project, would this work in a system like NYC?

JK – The idea of partitioning infrastructure to zones is something that has been a novelty to NYC. BID's for example are mostly about soft infrastructure like services. They don't have the functional capacity to come up with the capital investment needed for physical infrastructure. Also, there is a risk that if you start partitioning in zones and districts that you run the risk of exclusion and favoritism. Questions will be raised as to why certain measures aren't taken for everybody. There is no legal basis, or basis in policy for this kind of district-level planning. The question is also; who pays for it? You could of course ask all members of the community to invest in it, but they are not going to do that. Basically it is a larger problem that people who live in non-flood zones currently pay taxes that subsidize people that live in floodzones. That's a political problem, you have to convince people to chip in for the common good. The dangerous part about thinking on a district level is to assess the true capacities of the people to collectively work together. Communitarism can be dangerous.

EG – But don't you think that there lies a responsibility for the DCP or other city departments to ensure functioning and safety of at least public space in these areas? It is in the end in the interest of the city that the economic and social functioning of these areas stays intact.

JK – Well, the question is; are you preparing for the risk of storm surge, flooding by precipitation or sea-level rise? More specifically; what's the return? If you elevate the roads, how high do you elevate them? This problem has come up over and over again. To what extent do you capitalize that? To what risk are you mitigating, responding? And how much capital should you put in based on the occurrence of these risks? The policy regime isn't build to interpret the vulnerabilities and risks and position those risks into existing development and construction projects. Even in infrastructure. So in practice what we do is we're mitigating against catastrophic risk.

EG – And how does the City look at areas being left if the flooding problems will get worse?

JK – Well there is also a City Council system, which is build up of representatives of these areas. These representatives have varying levels of power, so here it is about the political power dynamics too. There is not an equal view across the landscape. The allocation of public resources between these districts is largely determined by political power of the representatives. There is no provision that guarantees equal outcome. That's a very strong difference with the Netherlands. Your system is basically build on equal representation. At least when it relates to the Waterboards. Equal people, equal risk, and standardization. We don't have any standardization when it comes to risk and response. And benefits.

EG – What kind of action in raising flood resiliency is the City taking right now?

JK – It is still reactionary. They are in the process of response, of the allocation of federal funding; the community development block grants. The SIRR-report acts the larger framing mechanism for this, it provides a platform for distributing the money. But the projects proposed by the SIRR-report are well beyond the City's capacity to implement. But it's a start. In a way, this allocation is a play within a policy. It is mostly in reaction to federal funding.

Also building codes have been updated, to make them more consistent with the International Code Council's. And there are different urban design propositions, giving flexibility about elevation and access. And if you look at our Building Resiliency Task Force, it provides clear goals and accessible plans. Those things are happening, but are again mostly reactionary to storm surge events like Sandy. They are responding to the risk that we're biased to respond to because we know it. But the policies aren't focused on probabilistic risks like sea-level rise and increased precipitation. Timing is critical here. If there would be some common solutions developed for these different flooding risks means amplifying them, which makes it difficult for people to disaggregate the cause again, as a matter of policy. We're biased to respond to events, rather than long-term processes. This plays out on individual decision-making levels, but also on policy. The incorporation of science ultimately reduces this bias but doesn't take it away.

MINUTES INTERVIEW M. ROWE

Municipal Art Society (NYC), 06-10-2014
Interviewee: Mary Rowe (MR)
Interviewer: E. Gaaff (EG)

EG – There are a lot of ambitious plans on City level, but on the other hand there are a lot of local initiatives that can't come to realization.

MR – Yes, what we see is that local parties like the Council representative and organizations like UPROSE are very active. We agree with you that there is a big gulf between Rebuild by Design and its ambitious plans like the BigU on the one hand, and the hyper-local initiatives on the other. The problem with these vulnerable areas is that there are pre-existing conditions that just get aggravated when a storm comes. There were already sewerage, health and transit issues before Sandy, but these have been exacerbated. The question is now if and how we can use this money that comes in as a response to Sandy for these longer-term challenges.

EG – I found your remark at the conference in Rotterdam especially interesting. You said that maybe the approach to flood resiliency of Rotterdam just wouldn't work in NYC. Could you please elaborate on this?

MR – Yes, because you're a welfare state.

EG – Yes, but maybe we also have different expectations of our environment.

MR – One of the main problems is how money comes down through our government structure. For example, how the federal community development block grant money comes through our system. It can only be allocated through City agencies. So it has to rest in City agencies and then there has to be some political or bureaucratic process where it then gets disseminated down.

Also, we have to deal with animosity towards City agencies, and there are community groups that are trying to lobby funding of their projects. It's hard to answer to the Federal regulations for how this money could be spent. In fact this creates barriers between the vision of the City, the agencies that also need money for their individual policies and community organizations and their initiatives.

Another big issue is that the communities that have been hit by Sandy have actually been community-processed to death by City agencies and research institutions. They have brought all the stakeholders together, and they have done all the visioning and planning, but there is no actual ability for a community organization to take leadership in carrying these projects forward. That again forms the perception of the community; they have no power, are not respected and are not listened to.

Another vicious cycle is that there are a tremendous amount of organizations and individuals being asked for input in these resiliency plans, but that there is simply no funding to implement them.

The general question when it comes to resiliency is whether or not big, top-down controlled projects are the best solution. This, versus distributing money at a more local level and letting smaller initiatives bubble up. But the second approach would be as for a paradigm shift in current resiliency thinking. We think multiple smaller investments would be more effective. Ultimately this would lead to more tailor-made solutions, that fit the local community and its challenges. Then the larger investment should be used to stitch these solutions together.

In the Netherlands, the situation is different. You're denser and have a strong tradition in government alignment. We're not that dense, and our government certainly isn't dense. As a result everything is packed in multiple jurisdictions. It is such a layered system here that makes it also complex. That makes the challenge of sea-level rise especially difficult as there is no real regional plan, this would be a question of governance, rather than government.

EG – Yes, I have the idea that your government isn't structured according to spatial boundaries.

MR – Correct. In issues like water management this becomes particularly clear.

The Dutch model, I think, is more of a unitary model. Government, well-respected and trusted. Seen as the protector of the society. Here, government is not seen that way, which is too bad. Also it is very difficult to get coordination across jurisdictions.

Another aspect of culture is consciousness, which is a huge issue in the USA. Only in NYC, there is a slowly growing consciousness of these communities in vulnerable areas to disasters and their environment in general. Since Sandy, only in the affected communities consciousness has been raised, not the majority of the population. Also, most of the communities that were hit were lower-income and have little political influence. Also a collective awareness and attention to environmental justice has only been growing over the last couple of years.

13. PROCESSING ACTOR INTERVIEWS

The following table illustrates how actor’s answers were interpreted and scorings were assigned.

Measured Aspect	Interview Question	Actor	Scoring
		Salmar Properties (Ian Siegel) Developer/tenant	
1a	1. Do you believe in climate change and, more specific, increased flood risk for NYC due to severe weather events and sea-level rise?	Yes, we believe 100% in climate change and increased flood risks.	10
	2. Do you have a clear view on the current flood risk in Sunset Park?	I think there is a clear view of risks today, Sandy was a huge wake-up call.	9
1b	<ul style="list-style-type: none"> Do you think this has improved? How and why? 		9
	3. Do you think there’s a good understanding of future threats for Sunset Park?	It is always hard to forecast what would happen in a flood. If something worse than Sandy would happen, I don't know how well prepared the whole community is.	7
1c	<ul style="list-style-type: none"> Do you think this has improved? How and why? 		7
	4. In the development of Sunset Park, have lessons from previous flooding experiences been taken into consideration?	Sandy was a real eye-opener and really taught us what to do for the future.	9
1c	<ul style="list-style-type: none"> If so, what lessons? What flooding experiences? What kind of results? 	The flooding did not come in to this building. But it taught us that we shouldn't have any mechanical equipment or systems on the first floor. Everything should be as high up as possible.	-
	5. When it comes to building flood resiliency, do you think clear goals have been set in the development of Sunset Park?	Businesses and property-owners are probably taking actions themselves to prepare.	6
1c	<ul style="list-style-type: none"> What goals? By whom? Who’s responsible for realization? How are these determined and recorded? 	If Sandy happened again today, I think we would have zero flooding issues.	-
			-
			-

1e	6. Are you aware of any action being taken on realizing flood resiliency in the area?	3
	<ul style="list-style-type: none"> • What kind of actions? 	-
	<ul style="list-style-type: none"> • What kind of measures? 	-
	<ul style="list-style-type: none"> • By whom? 	-
1f	7. Is the public/local community involved in building flood resiliency of the area?	-
	<ul style="list-style-type: none"> • How and to what extent? 	-
	8. Is your organization concerned with or affected by the effects of increased chance of flooding in Sunset Park?	9
	<ul style="list-style-type: none"> • To what extent did it play a role in the choice for this location? 	-
	<ul style="list-style-type: none"> • Long-term/short term? 	4
	<ul style="list-style-type: none"> • Level; building or area? 	8
	9. Are there any flood resiliency measures taken in the specific development project your organization is involved with?	8
	<ul style="list-style-type: none"> • What measures? 	-
	<ul style="list-style-type: none"> • Why? 	-
	<ul style="list-style-type: none"> • By which party? 	-
	10. Is your organization taking action in building flood resiliency?	7
	<ul style="list-style-type: none"> • In what way? 	-
	<ul style="list-style-type: none"> • Long-term/short term? 	-
	<ul style="list-style-type: none"> • Level; building or area? 	-
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3a	11. Are you aware of the city's ambitions in climate adaptation and building flood resiliency?	6
	12. Have the public campaigns, plans and/or strategies (f.e. the SIRR report, FEMA risk studies or PlaNYC) shaped your perspective on flood resiliency?	1
	<ul style="list-style-type: none"> • Has this lead to any action within the area? 	-
	Location/financial/social planning?	-
	<ul style="list-style-type: none"> • Has this lead to any action within the organization? 	-

3b	<p>Location/financial/social planning?</p> <p>13. Currently, adjustments are being made to building codes, zoning plans and NFIP floodplain zoning to increase flood resiliency of vulnerable areas. Have changes in legislation influence your organization's connection to Sunset Park?</p>	<p>We haven't really been looking into regulations and legislation regarding this specific topic since our building wasn't really damaged during Sandy. We got our building permits, so we assume everything is up to standards.</p>	2
	<ul style="list-style-type: none"> • Why (not)? 	<p>If there are new rules we would of course make sure we comply. But right now we took our own steps based on our experience.</p>	-
	<ul style="list-style-type: none"> • What legislation? 	<p>We're not aware of the WEDG-programme.</p>	-
	<ul style="list-style-type: none"> • In what way? 		-
	<p>Physical/financial/social planning?</p> <ul style="list-style-type: none"> • Has it stimulated or hampered building flood resiliency? 		-
	<ul style="list-style-type: none"> • If not, how do you think this could work? What kind of legislation? How? 		-
3c	<p>14. Have financial public programmes (f.e. tax cuts, fines, subsidies or grant programs) stimulated your organization to implement flood resilient measures in the building or area?</p>		1
	<ul style="list-style-type: none"> • What level of government? 		-
	<ul style="list-style-type: none"> • What programme? 		-
4c	<ul style="list-style-type: none"> • If not, do you think this could work? How? Stimulating or penalizing? 		-
3d	<p>15. Has your organization been involved in any workshops, partnerships or collaborative networks aimed at building flood resiliency?</p>	<p>We haven't been involved in any workshops or partnerships connected to flood resiliency. We also haven't been involved in the making of the local Sunset Park Vision Plan.</p>	1
	<ul style="list-style-type: none"> • What other actors were involved? 		-
	<ul style="list-style-type: none"> • Who took initiative? 		-
	<ul style="list-style-type: none"> • What was the outcome? 		-
	<ul style="list-style-type: none"> • If not, do you think this would work? How? Who should take initiative? 	<p>We think a collaborative approach could be beneficial for the area. It is always good to have a dialogue.</p>	-
	<p>--</p>		
	<p>16. If Sunset Park would be faced with flood damages, what would be your reaction?</p>		-

<ul style="list-style-type: none"> • Whom would you hold responsible? 	-
<ul style="list-style-type: none"> • Physical/financial/social measures? 	-
<p>17. To what extent is your organization willing to take action in realizing flood resiliency in Sunset Park?</p>	<p>If there would be any area-wide plans for raising resiliency it would be very dependend on content and costs of the plans if the property owner of this building would be willing to invest in it. The benefit should be really clear. We financially contribute to the chambers of commerce, community groups etc. because we want to see the area flourish. However, a new initiative would have to prove its benefits.</p> <p>4</p>
<ul style="list-style-type: none"> • Building level? 	8
<ul style="list-style-type: none"> • Area level? 	2
<ul style="list-style-type: none"> • What term? 	-
<p>18. Have you been in contact with other urban or local organizations (either public or private) with regard to building flood resiliency of the area?</p>	<p>There has been contact with the community board and the SBIDC.</p> <p>4</p>
<ul style="list-style-type: none"> • Which ones? 	-
<ul style="list-style-type: none"> • What party took initiative? 	-
<ul style="list-style-type: none"> • If not, would you consider this in the future? Under what circumstances? (changed policy or changed perception of threat?) 	-
<p>19. What party is (or which parties are) in your opinion responsible for flood resiliency of Sunset Park?</p>	<p>I think everyone is responsible for themselves and should take their own measures. The city is responsible for keeping us informed and more macro-type plans. The city has done studies to map the risks, they should now make plans to evade that risk. Those plans need to be implemented in 5, 10 20 years and will probably be funded with public money.</p> <p>-</p>
<ul style="list-style-type: none"> • Is there a party that should get more involved? How could this be achieved? 	<p>I don't know what the involvement of the Port Authority is at this moment, but it is their responsibility to be involved. I know they maintain the bridges and the tunnels, so they need to make sure they take steps to safeguard their assets.</p> <p>-</p>
<p>20. Do you think flood resiliency would best be achieved by individual action or by a collaboration of organizations with</p>	<p>The fact that there isn't a masterplan for our section of the waterfront is really a problem.</p> <p>8</p>

	interests in the area?		
	<ul style="list-style-type: none"> • Why? • What parties should collaborate? 	-	
	21. Do you think increased flood resiliency of Sunset Park as a whole would benefit the local (business) community?		3
	<ul style="list-style-type: none"> • If so, how? 	-	
	22. Do you think current developments of Sunset Park ultimately lead to an increase in flood resiliency of the area?	Flood resiliency has certainly improved. It is always hard to forecast what would happen in a flood.	6
	<ul style="list-style-type: none"> • If so, how? • What could be improved? 		-
	23. Do you think the approach of Sunset Park is representative for other NYC waterfront developments?	Red Hook, and probably other areas had more severe damages so those would have more priority.	4
	24. Could public policy be improved to stimulate flood resiliency of urban areas?		5
4a	<ul style="list-style-type: none"> • Shaping? 		6
4b	<ul style="list-style-type: none"> • Regulating? 		2
4c	<ul style="list-style-type: none"> • Stimulating? 		6
4d	<ul style="list-style-type: none"> • Capacity building? 		2
	Remarkables		

Policy issuing

1

1. Do you believe in climate change and, more specific, increased flood risk for NYC due to severe weather events and sea-level rise?

2. **Do you have a clear view on the current flood risk in Sunset Park?**

- Do you think this has improved?

- How and why?

3. **Do you think there's a good understanding of future threats for Sunset Park?**

- Do you think this has improved?

- How and why?

4. **In the development of Sunset Park, have lessons from previous flooding experiences been taken into consideration?**

- If so, what lessons?

- What flooding experiences?

- What kind of results?

5. **When it comes to building flood resiliency, do you think clear goals have been set in the development of Sunset Park?**

- What goals?

- By whom? Who's responsible for realization?

- How are these determined and recorded?

6. **Are you aware of any action being taken on realizing flood resilient measures in the area?**

- What kind of actions?

- What kind of measures?

- By whom?

7. **Is the public/local community involved in building flood resiliency of the area?**

- How and to what extent?

17. To what extent is your organization willing to take action in realizing flood resiliency in Sunset

Park?

- Building level?
- Area level?
- What term?

18. Have you been in contact with other urban or local organizations (either public or private) with regard to building flood resiliency of the area?

- Which ones?
- What party took initiative?
- If not, would you consider this in the future? Under what circumstances? (changed policy or changed perception of threat?)

19. What party is (or which parties are) in your opinion responsible for flood resiliency of Sunset Park?

- Is there a party that should get more involved? How could this be achieved?

20. Do you think flood resiliency would best be achieved by individual action or by a collaboration of organizations with interests in the area?

- Why?
- What parties should collaborate?

22. Do you think current developments of Sunset Park ultimately lead to an increase in flood resiliency of the area?

- If so, how?
- What could be improved?

23. Do you think the approach of Sunset Park is representative for other NYC waterfront developments?

24. Could public policy be improved to stimulate flood resiliency of urban areas?

- Shaping?
- Regulating?
- Stimulating?
- Capacity building?

4

2	10. Is your organization taking action in building flood resiliency?
	• Long-term/short term?
	• Level; building or area?
2	• Shaping?
2	• Regulating?
2	• Stimulating?
2	• Capacity building?
	Remarkables

GRADUATION REPORT

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1st mentor: dr. Ir. T. Daamen, Assistant Professor Urban area Development & Programme Manager
Master city Developer (MCD), Department Real Estate and Housing, Faculty of Architecture
2nd mentor: dr. T. Tasan-Kok, Associate Professor and lecturer sustainable urban development and multi-
level governance, University of Utrecht, Roosevelt Academy, Delft University of Technology
Supervisor NYC: Prof. dr. Jesse M. Keenan, Research Director Center for Urban Real Estate (CURE.),
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20th of January 2015, Delft