# PUBLIC OPINION FORMATION IN POST-DISASTER RESILIENCE PROJECTS

A Study of Roombeek and the Hudson River Project

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#### Marie Helen Ferdelman

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1<sup>st</sup> supervisor: Tatiana Filatova

2<sup>nd</sup> supervisor: Rene Torenvlied

#### Abstract

This study explores the development of public opinion formation in the decision-making processes of post-disaster resilience projects. It aims to examine how established public opinion formation theories can be applied in two post-disaster reconstruction cases and whether they are relevant in varying contexts based on the logic of realist explanation. The cases analyzed in this study are the man-made, one-time disaster in the neighbourhood Roombeek in Enschede (Netherlands) after it was largely destroyed by the explosion of a firework depot and the natural disaster that is likely to recur in Hoboken, New Jersey (USA) after Hurricane Sandy struck. The study finds that early involvement of citizens in the decision-making process, effective expectation management and a comprehensive communication strategy support development of positive public opinion in both projects.

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#### 1. Introduction

Urban areas around the world are regularly threatened by disaster. The UNISDR (2009) defines a disaster as 'a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources' and classifies all disasters as man-made but differentiates between natural and man-made hazards that in turn cause disasters. Independent of their origin a disaster always means that the affected community has to cope with its effects, even after the initial shock of the disaster and when the attention shifts to newer stories and events in the world. However, for the region in which disaster has struck the process of reconstruction does not end here. Buildings may have to be rebuilt, people relocated, insurance claims dealt with, precautions taken to prevent a recurrence of the disaster and many other steps have to be taken. In order to do so physical resources are necessary, financial resources have to be made available, and many other steps have to be taken. None of this can happen though without the involvement of the political process. In a liberal democracy this implies that the public is involved, making public opinion an important factor for effective decision-making (Visser et al, 2008)

Next to the need for support from political representatives and private stakeholders, any project that is to be carried out by a government in the public space will come under public scrutiny. Including stakeholders in the process will enhance decision-making and reduce tensions and possible opposition to the decisions (Edelenbos & Klein, 2006). Active citizens are an important part of a well-functioning democracy and politicians have to take them into account when taking decisions. If citizens' opinions are disregarded this could have disastrous effects on the ability of the government to implement the project. An example for this is Stuttgart21 in Germany, a project, designed to modernize the train station and build new railroad route in the Southern German state capital Stuttgart. After citizens had been largely excluded in the initial decision-making process, they organized large protests, which made an arbitration process necessary. Conflict between involved parties and the unwillingness of governmental actors to take into account public opinion complicated the decision-making process and prolonged it over years (Böhm, 2011).

The events in Stuttgart of course do not constitute a satisfactory process, particularly after a disaster has struck and a response has to be rapid. In this context the concept of resilience plays a large role. It is defined as the ability to return to the pre-disaster state rapidly and effectively (Leichenko, 2011). In order to avoid a situation as the one in Stuttgart, and being able to respond efficiently decision-makers have to take into account public opinion. However, it is not always clear what public opinion is (Patterson, 2008).

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This study aims to analyze some key features and characteristics of public opinion formation concerning two post-disaster resilience projects. The first project studied is the Roombeek neighborhood in Enschede, the Netherlands between May 2000 and November 2001, which was destroyed by the explosion of a fireworks depot in 2000 (Rosenthal et al., 2004). The second project is the ongoing Hudson River Project in Hoboken, New Jersey in the USA between June 2013 and June 2016, which was introduced after the town was severely damaged by hurricane Sandy in 2012 (RBD, n.d.). The goal is to find the underlying mechanisms, which drive public opinion formation in the Roombeek project and to analyse how these mechanisms apply to the Hudson River Project. As a final result, lessons might be drawn that could be applied to the ongoing project in Hoboken.

#### The research question can be formulated as follows:

Which underlying mechanisms drove public opinion formation in the post-disaster resilience project of Roombeek between May 2000 and November 2001 that are also applicable to the Hudson River Project between June 2014 and June 2016? Which lessons can be learned from this for the future management of public opinion in the Hudson River Project in Hoboken?

#### With the following sub-questions:

- 1. Which mechanisms can be attributed to driving public opinion formation?
- 2. What are the main features of the Roombeek and the Hudson River Project?
- 3. How did public opinion develop throughout the decision-making process of the two projects?
- 4. Which mechanisms led to positive or negative public opinion in Roombeek?
- 5. Which mechanisms led to positive or negative public opinion in the Hudson River Project?
- 6. Which differences and similarities in mechanisms can be observed between the two projects and how can these be explained?
- 7. Which lessons might be learned from this study and applied to the Hudson River Project to ensure its success in the future?
- 8. How do the two cases relate to and support established theory on public opinion formation?

The first sub-question is addressed in section two, which describes established theory on public opinion formation and establishes the hypotheses that are addressed in this study. The second question is dealt with in section three under the case description. Section four on the analysis of the two projects focuses on answering questions three to six. Finally the last two questions are answered in the conclusion.

Understanding public opinion formation in post-disaster resilience projects can be helpful for authorities to overcome structural problems in decision-making processes. Adjusting and learning from the events, the 'adaptive capacity' (Keck & Sakdapolrak, 2013) is a valuable quality. This is especially relevant after a disaster has struck, as in the two cases that are studied here. The lessons about public opinion formation that can be learned from studying Roombeek and Hoboken can provide beneficial insights for the future of the Hudson River project and other similar projects. Mechanisms observed in both contexts might also apply to similar projects in the future and help public administrators to foster supportive public-opinion formation.

The analysis of these two cases is based on established theories of public opinion research. It will therefore illustrate to which extent these theories hold in two local contexts in different parts of the world and how they might have to be adapted to varying circumstances. Parts of this study are based on previous work on participatory politics that was done in collaboration with two other students.

#### 2. Public Opinion Formation

One of the basic principles of democracy is that a government listens to its people and puts into effect those measures that are favoured by the population. This gives the government legitimacy and in theory should also lead to sustained support of the government through the people (Prothro and Grigg, 1960). However, it brings to the forefront the question: What do people want? The answer to this question is usually quite complicated. The question of public opinion is therefore central to any decision-making process in a liberal democracy (Visser et al, 2008). Particularly disasters can undermine trust in the government. Carlin et al (2013) argue that disasters have the power to change attitudes towards the political establishment and reduce support for it. They describe the destabilizing effects of natural disasters on new democracies but to a lesser extent this decreasing support mainly for individual politicians or projects and less so for the entire political system can also be found in well-established democracies. In order to understand what public opinion is, it is important to examine how it is formed and how it changes.

One of the fundamental assumptions that has to be made when discussing public opinion formation is whether public opinion is rational or not. Fatas-Villafranca et al (2011) argue that this is not the case. Firstly citizens do not have all the facts and information available that are necessary to make an independent and rational decision. Secondly, their opinions are often called into question but because there is no feedback on these interactions there is no learning effect. Thirdly, citizens do not have an incentive or the means to collect the necessary information to make an informed and objective decision. Instead of rational factors influencing the opinion of individuals they argue that deeply held societal values and information flow from the environment, which can be media, interactions between individuals or passing on of information through hear-say, have the largest influence on public opinion formation. Individual citizens therefore gather their information with relatively little effort and form their opinions mainly based on what the authors call 'intuition' and to a lesser extent by methodical consideration of the available arguments and positions. Fatas-Villafranca et al also point out the importance of public deliberation in the process of decicision-making. Citizens may hold one opinion at the beginning of the decision-making process but may be swayed to take a different stance by end of the decision-making process. Page and Shapiro (1992) on the other hand argues in favour of rational choice theory. Although individual opinions may be irrational, collective public opinion will represent a rational choice. The aggregation of individual attitudes will diminish individual bias and lead to an average opinion that is well-informed. Since the goal of this study is to analyse public opinion as a whole and not as an expression of individuals rational choice theory is better applicable here. It thereby allows disregarding the level of information and knowledge of individuals, that plays a large role in Fatas-Villafranca's and other authors' (e.g. Stoutenborough et al, 2013) theory of public opinion formation.

Since deeply held societal values that influence public opinion, as described by Fatas-Villafranca et al (2011) are unlikely to change within the short period of time of a decision-making process for the two projects examined in this study, the role that variables that do change more frequently in the development of public opinion are analyzed. Based on theory of public opinion formation three aspects of public opinion formation that are best applicable are discussed and their underlying mechanisms analyzed. These three aspects are the role of timing, opinion leaders and risk.

## 2.1. The Effect of Timing

Any project that spans several months, as the two cases of this study do, will be expected to experience some fluctuations in attitudes towards it often set of by decisions and their timing in the decisionmaking process. This section explores the mechanisms that are connected this.

Deteriorating Public Opinion over Time. In the beginning, directly after the disaster, there is a 'honeymoon' phase, during which there is a consensus that taking steps towards reconstruction is necessary (Denters and Klok, 2010). The reconstruction issue is framed as the only issue at hand, while the number of different solutions that will have to be discussed is disregarded. However, once it becomes clear what the new plan is, there will be more discussion and disagreement, as any plan will

affect some groups differently from others. This means that public opinion towards the reconstruction project becomes less positive over time. Although this does not necessarily mean that there will be a generally negative attitude towards the project in the community, public opinion will deteriorate.

Hypothesis 1: It is hypothesized that *passage of time leads to a deterioration in public opinion*.

*Earliness of Citizen Participation.* In their framework for evaluating the effectiveness of citizen participation in technology policy Rowe and Frewer (2000) stress the importance of early involvement of citizens in decision-making processes. The community should have the opportunity to engage in the process beginning at an early stage in order to allow them to become informed about the issue at hand and provide their own input. Although Rowe and Frewer discuss public participation early involvement of citizens is also applicable to fostering positive public opinion. The two authors argue that one of the bases for effective citizen participation is acceptance of the decisions which is directly dependent on public opinion. Research by Berner et al. (2011) has also shown that a frequent source of dissatisfaction with a decision-making process is the late involvement of the community in the process.

Early involvement of citizens allows them to express their ideas and concerns, which can then be incorporated into the design for the construction plan. Additionally the authorities have the opportunity to more effectively inform citizens about the project at an early stage. It can therefore be expected that early citizen participation will lead to a more positive public opinion of the project.

Hypothesis 2: It is hypothesized that early involvement of citizens leads to positive public opinion.

#### 2.2. The Impact of Opinion leaders

Opinion leaders are not necessarily leaders in the traditional sense but those individuals or entities that strongly inform public discourse (Watts & Dodds, 2016). Framing and priming play a role in the formation of public opinion through opinion leaders and have to be taken into account when analysing the latters' role. Framing refers to certain aspects of an issue being discussed in a certain light or viewed in a specific way. An issue is not discussed objectively but the way in which it is discussed already implicitly is a judgement or leads citizens to perceive it in a positive or negative light. Framing can be utilized by political actors as well as media in order to advance their own agenda and make their position look more favourable. Priming is closely connected to this and is a form of agenda-setting within an issue. Some aspects are brought to the forefront while others are ignored or discussed significantly less. Due to the convenience of accessibility of information on some aspects citizens will tend to evaluate a complete issue based on a subset of aspects (Roessler, 2008).

*Homogeneity through Opinion Leaders.* It can already be inferred by their name that opinion leaders are the ones who informally lead a community. Individuals seek input from whom they perceive as well-informed leaders on a subject in order to form their own opinion. These opinion leaders act as gatekeepers for ideas and opinions. Therefore, they can be highly influential in a debate (Rogers & Cartano, 1962).

It is to be expected that if there is a strong opinion leader in a community, that person will able to influence public opinion according to their preferences and create a more homogeneous public opinion.

Hypothesis 3: It is hypothesized that a strong opinion leader can create homogeneous public opinion in a community.

*Expectation Management.* Projects in spatial planning, such as the Roombeek and the Hudson River Project are, are inherently flawed in their outcomes due to their *complexity, uncertainty* and *normativity* (Hartmann, 2012). According to Hartmann there is never a perfect outcome that adequately addresses all aspects of a problem and satisfies all stakeholders in these types of projects. Since not everyone can be satisfied with the same solution the only way to deal with this problem is to manage expectations of what the outcome will be. This is particularly important in a context with a high level of public participation. The opportunity to become involved in the decision-making process may create an exaggerated illusion of power over decisions among the community, which is disappointed if not all ideas and suggestions can be incorporated (Pearce, 2001). The interaction between early and deep citizen participation and high expectation can create a dilemma for public administrators. An important mechanism for positive public opinion may therefore be the ability of the authorities to manage expectations. Especially, since the negative effect of inflated expectations may be caused by and mitigate the positive effect of early citizen participation.

Hypothesis 4: It is hypothesized that *managing citizens' expectations prevents deterioration of public opinion.* 

*Communication Strategy.* The central role of an opinion leader is communicating with the public and trying to convince them of their position. Therefore it seems only natural to examine how opinion leaders communicate. According to Grunig and Dozier (2002) a successful communication strategy requires building relationships with those who are being addressed. These relationships are symmetrical, meaning that they benefit both sides and both sides are heard by the other, which requires participative environment. Examining this mechanism is useful since it is central to the way information flows and is received.

Hypothesis 5: It is hypothesized that *a comprehensive communication strategy fosters positive public opinion formation.* 

#### 2.3. The Effect of Risk

Risk is defined as 'the combination of the probability of an event and its negative consequences' by the UNISDR.

*Risk of disaster recurrence.* Citizens will be more likely to have a positive opinion and show support for a project if there is a risk connected to not taking action. Public opinion is influenced by the fear that the unwillingness or inability to act would incur higher costs in the future than the measure itself (Stoutenborough et al, 2013). A higher risk of recurrence would therefore lead to more favorable public opinion towards a project.

This means that it is to be expected that in Roombeek public opinion will be less favorable than in Hoboken since it is not to be expected that a similar disaster to the explosion of the fireworks depot in Roombeek will happen again. However, it is likely that another hurricane will hit Hoboken.

Hypothesis 6: It is hypothesized that a higher risk of disaster recurrence leads to a lower contentiousness of a project.

#### 3. Methodology

This section describes the research design used in this study, the features of the two projects and compares the two contexts. Furthermore it addresses the collection of data and includes the operationalization of the main concepts.

#### 3.1. Research Design

Pawson and Tilley argue in their book 'Realistic evaluation' (1997) that despite its many merits the experimental research design has significant limitations when studying reality. It is not applicable to

case studies and it does not make an explanation of the underlying mechanisms possible. As alternative they suggest the 'logic of realist explanation' as a measure to be able to explain the mechanisms that underlie a specific phenomenon. The authors argue that mechanisms and the context in which they take place lead to regularities, which can be observed as effects. They formulate this as 'Regularity = Mechanism + Context'. However, this formula disregards that a regularity is more than the sum of mechanism and context because of their interconnection and synergy effects. Nonetheless, this is a helpful basis for logical argumentation. Pawson and Tilley describe the context as consisting of a combination of structure, which is the set-up of society and environment in a specific case and agency, which are the context-related decisions that actors take. The interplay between these two lead to underlying mechanisms, which in turn lead to the aforementioned regularities.



#### Context

Figure 1: Logic of realist explanation based on Pawson and Tilley (1997)

The type of realist argumentation described above, is used to be able to analyze two cases, the resilience projects in Roombeek and Hoboken. In this case the regularities will for instance be the extent to which intervention by (non-)governmental actors was able to influence public opinion. The structure will include the type of hazard next to demographics, history, legal context etc. and agency consists of public opinion related decisions made by citizens, media and (non-)governmental actors involved in the process. The mechanisms that are observed are based on qualitative data and it is therefore not possible to assign relative weights to them.

This gualitative study of public opinion formation is divided into three steps. Firstly, the reconstruction project in Roombeek is discussed as an example in which public opinion was primarily positive throughout the project (Klok et al, 2004). In a second step the Hudson River project is analyzed based on the mechanisms that have been observed in Roombeek. Thirdly, conclusions about lessons for the future of the Hudson River Project and possibly generalizable findings are drawn.

Since this study is based on only two projects it has limited external validity. The mechanisms that are observed are not necessarily applicable to other contexts and hence other post-disaster resilience projects. The lessons that are drawn may therefore be used as indications of how public opinion formation functions in similar cases but are not necessarily accurate in every case. Because of this issue the goal of this study is not to disprove or support established theory on public opinion formation but to examine how well these theories are applicable to the two specific contexts discussed in this study.

#### 3.2. Selection and Description of the two Cases

This section explains why the Roombeek and the Hudson River Project were selected for this study and describes their main features. Following the selection of the projects the projects are individually described. This description focuses on contextual and organizational features and excludes a description of the development of public opinion throughout the two projects. This will be addressed in section four. This section concludes with a comparison of the two projects' contexts, since understanding the similarities and differences between the projects are necessary to explain why mechanisms may be applicable in one context but not the other or applicable in both.

*Selection of the two cases.* The two post-disaster resilience projects selected for this study are the case of the neighbourhood Roombeek in Enschede in the Netherlands after the explosion of a fireworks depot in 2000 destroyed the entire neighbourhood and secondly the case of Hoboken, New Jersey in the USA that was flooded after Hurricane Sandy hit the East coast of the United States in 2012. The selection of the two cases for this study is based on both relevance and convenience.

Studying these two cases allows direct contact with those involved in the reconstruction project, which is a great advantage over most other cases. The combination of these two projects is relevant for a number of reasons. The Roombeek Project very successfully created and maintained a positive attitude towards the project in the community. This makes it interesting to investigate which mechanisms are at work in this case and apply them to the Hudson River Project in Hoboken. Comparing these two cases can give an insight into how the mechanisms work in different contexts. The first case is a manmade disaster that will not recur in this form in the affected community the latter case on the other hand is a natural disaster that is likely to repeat itself. Despite their different contexts there are four main features that make the two cases comparable. First of all in both cases there was a disaster to

which citizens and local government had to respond rapidly and which was used as an opportunity to improve the quality of life. Secondly, the local government holds the responsibility for the decision-making on and the implementation of the project with financial support from higher levels of government. Thirdly, both projects have or had the goal of broad citizen participation and since this will allow more deliberation among citizens it may have similar effects on the formation of public opinion in both cases (Denters and Klok, 2010; RbD, n.d.). Both projects display innovative approaches to participatory decision-making in the Netherlands and in the USA. The case of Roombeek was generally hailed as being greatly successful and cited repeatedly as an example for good policy practices (Denters and Klok, 2010; Noordegraaf and Newman, 2011). The idea of Rebuild by Design (RBD) has also been spread across the country to other cities. San Francisco has adopted the approach under the name of Resilient by Design in order to promote projects that protect the Bay Area from climate change and earthquake hazards (San Francisco Planning Department, n.d.). RBD has also entered a partnership with the 100 Resilient Cities Challenge to spread its practices to other participating cities across the globe (100RC, 2015).

Case description of the Roombeek Project. On May 13, 2000 a fireworks depot exploded in the socially deprived Roombeek neighbourhood in the city of Enschede in the Netherlands. The explosion devastated a large part of the surrounding area. 22 residents died due to the explosion and the houses of approximately 1,500 residents were so badly damaged or destroyed that they were uninhabitable (Denters and Klok, 2010). This large scale destruction made it necessary for the responsible authorities to step in and organize the reconstruction of the neighbourhood. Since there was limited trust in the authorities after the disaster the municipality set up a committee called Project Bureau Reconstruction that was responsible for the entire reconstruction process. This process was divided into three separate phases. Phase 0 began almost immediately after the explosion of the fireworks depot. From the beginning the Project Bureau Reconstruction aimed for a high level of citizen participation. Therefore, their first step was to inform former residents of their willingness to meet and discuss concerns and ideas for the future of the neighbourhood. These meetings were primarily held at citizens' homes with small groups of people on the initiative of the hosts themselves. After these meetings at the 'kitchen table' the general guidelines for the procedures in the decision-making process were determined and in February 2001 phase 1 began. The first major decision that was made by the residents in this phase was to select Pi de Bruin as the chief architect. In the following months the Project Bureau Reconstruction organized a large number of workshops and meetings for different groups of citizens. These invitations for specific groups ranged from the entire citizenry of Enschede over stakeholder groups, such as the artists of the area, to specific minorities or school children. During these meetings ideas for reconstruction were collected and important issues discussed. The input collected during this period was used by Pi de Bruin to create a draft reconstruction plan. In phase 2, beginning in July 2001, the draft reconstruction plan was made publicly available and citizens had the opportunity to give criticism in the form of letters and during public meetings. The feedback that was received was taken into consideration and the reconstruction plan was adjusted accordingly. During a final public meeting in this phase the attending citizens approved the final design proposal with a large majority in a non-binding vote. Following that the reconstruction plan was approved by the city council on November 19<sup>th</sup>, 2001 after which the construction phase began (Roombeek project manager, personal communication, 28.04.2016) (see appendix A). Since this study examines public opinion formation in decision-making processes the years following the approval of the final plan are not considered here.

*Case description of the Hudson River Project.* When Hurricane Sandy hit the Eastern coast of the US on October 29<sup>th</sup>, 2012 the city of Hoboken, New Jersey was not sufficiently prepared for a storm of this size. The combination of rain and a storm surge coming up the Hudson from the Atlantic Ocean led to severe flooding in large parts of the city. The waterfront was breached at two points, one in the North on the border to Weehawken Township and the other in the South near the train station. Due to Hoboken's topography large amounts of water became trapped on the Western side of Hoboken and could not flow back into the river even after the surge subsided. The flooding severely impacted strategic infrastructure such as firehouses, the hospital, power stations and the train station and threatened the water treatment plant. The storm also left much of the city without electricity for approximately a week and in some cases even longer (CAG member, personal communication, 2016).

After the devastation that Sandy had caused on the US East coast became evident President Obama signed an executive order that established the *Hurricane Sandy Rebuilding Task Force* (U.S. Department of Housing and Urban Development, n.d. [1]). In June 2013 the Task Force initiated the Rebuild by Design (RBD) competition, which had the objective of finding new innovative solutions that would protect the New York metropolitan area from future hurricanes (U.S Department of Housing and Urban Development, n.d. [2]). The RBD competition was set up in four phases. During the first phase, called *Talent*, the organizers encouraged qualified professionals from different backgrounds and disciplines to apply and create interdisciplinary teams that would be able to tackle the challenges facing the region. Out of the applicants ten teams were selected to continue the process. In the second, *Research*, step the teams were familiarized with the topic and the context. This included meeting stakeholders and citizens and visiting the most affected areas during a three month-long period. In the following *Design* phase the teams worked together with the U.S. Department of Housing and Urban Development (HUD) on proposals for the most vulnerable communities. In June 2014 the competition

entered its final *Implementation* phase. Six of the ten designs were chosen as winners and federal funds were allocated to each of them (RBD, 2015).

The Hudson River Project located in Hoboken and its adjoining cities was one of the winners and was pledged 230 million dollars of federal funds for implementing the project (RBD, 2015). The proposed design consists of the four main elements *Resist, Delay, Store, Discharge. Resist* refers to building barriers such as floodwalls and berms along the coastline that prevent flooding through a storm surge. *Delay* means incorporating green infrastructure into the city that can slow down the speed with which storm water enters the sewer system, preventing overflows. *Store* is the construction of infrastructure that holds storm water, as for instance bio-retention basins, which store storm water until there is sufficient capacity in the sewer system. Finally, *Discharge* means constructing pumps that can pump flood water back to the Hudson or to the water treatment plant. The design proposal protects Hoboken and Weehawken Township and would be partially located in Jersey city (RBD, 2015).

Winning the competition meant that the responsibility for the project was transferred to the New Jersey Department of Environmental Protection (NJDEP). The Hudson River Project has a much more complex organizational structure than the Roombeek project (see appendix B). The NJDEP put a project team in charge, which is the central entity in the organizational structure and carries the responsibility for the planning the process that leads up to a final decision on a construction design. It also provides information to the other bodies that are involved. One of these are the Citizen Advisory Groups (CAG)/Outreach Committees, of which there is one for each city and that consist of citizens that were selected and agreed to participate. Their role is to be a mediator between citizens and the Outreach Subcommittee and channel information between the two. The Outreach Subcommittee is formed by representatives of local and New Jersey government. Its role is to enable contact between the community and the project team and ensure that every voice can be heard throughout the decisionmaking process. The strategy for doing this was formulated in an outreach plan, which was presented to the Executive Steering Committee. It is the advisory body for all involved committees and works as a channel of communication between all committee members. The mayors of the three cities work together closely with the NJDEP. They also do outreach work and host the CAG's and public meetings (NJDEP, n.d.).

Before a final decision on the design proposal can be taken, which is planned for April 2017 the project has to complete a number of steps. Firstly, there is a planning and data gathering phase, which runs until the second quarter of 2017. In this time the project team has to study the area regarding its topography and be able to incorporate this into the design plans. Running at the same time but already completed in the second quarter of 2016 is the Feasibility Study, which estimated whether the

timeframe and deadlines will be achievable. The National Environmental Policy Act requires the project team to complete the NEPA process. This process will result in an Environmental Impact Statement, which examines how the proposed design would impact its environment (third quarter of 2015 – first quarter of 2017). The final process before construction can begin has not started yet and will begin in the fourth quarter of 2016. This is the design, permitting and site development phase. Construction is due to begin in 2019 and end in the first half of 2022 after, which the final closeout phase begins (RBD Hudson River, 2015). The federal funds for the project will only be available in 2022, which means that this is the projected end date of the project (RBD, 2015). During this time the design proposal has been further developed and rendered in more detail. On December 3<sup>rd</sup>, 2015 five design concepts were made publicly available to be discussed by the community. On February 18<sup>th</sup>, 2016 these were narrowed down to three design alternatives. Beginning in November 2015 the project team has held 12 public meetings for the purpose of informing the public (NJDEP, n.d.) (see appendix C).

Since the Hudson River Project was not very visible in the Hoboken community before it was declared a winner of the RBD competition (CAG co-chair, personal communication, 08.06.2016) it is not useful to incorporate the competition stage into this analysis. The study will therefore examine the project in the two-year period between June 2014 and June 2016, treating the success in the competition stage as the first major decision-making point for the project.

*Comparison of the two projects.* The projects in Roombeek and Hoboken were or are being implemented in very different contexts. Roombeek was a disadvantaged, urban neighbourhood in a medium-sized Dutch town (Denters and Klok, 2010), while Hoboken with its 50,000 predominantly high-income residents, is situated in the densely populated New York metropolitan area (city of Hoboken, n.d.). This also makes a difference in the institutional and stakeholder structure. In Roombeek the federal government provided funding, but the entire decision-making process took place at the municipal level (Denters and Klok, 2010). In the Hudson River project the federal government does not only provide the funds but also is involved in the decision-making process through a number of its departments. Additionally the state of New Jersey plays a large role via its Department of Environmental Protection. At the local level there are three municipalities involved: Hoboken, Weehawken, and Jersey City (NJDEP, 2016).

A crucial difference between the two cases is the type of disaster. In Roombeek the disaster was caused by a man-made, non-recurring hazard while in Hoboken it was a natural hazard, which poses a continuing threat to the region. Thereby, the two cases are also located in different stages of the risk management cycle. Roombeek finds itself in the recovery and rebuilding stage while Hoboken is in the prevention and mitigation phase (Floodsite, 2007).

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Nonetheless, Roombeek and the Hudson River project have a number of features in common. Both projects were initiated in response to a disaster that struck the community and are being used as an opportunity to improve the quality of life. Thereby they go beyond the basic concept of resilience of returning to the pre-disaster state (Carlin et al, 2014) but instead aim to improve on the situation in which the community was before the disaster. From the perspective of wanting to study public opinion formation in the decision-making process in these two cases they are striking, since both projects value the importance of public participation and stakeholder participation greatly and have or had a plan that formally acknowledged the importance of participation is operationalized in different ways by the authorities in the two projects.

#### 3.3. Data Collection

This study uses secondary data for the analysis of the two projects and also primary data for the Hudson River Project in a qualitative way. Since the Roombeek project lies more than a decade in the past and the Hudson River Project is ongoing there are different data sources available. For this reason this section is divided into two parts. The semi-structured interviews were all conducted jointly with two other students.

*Data Collection for the Roombeek Project.* For the project in Roombeek two semi-structured interviews with project managers were conducted. The first interview partner was the project manager between 2006 and 2010. The second interviewee was the project manager between 2000 and 2006. In addition a report with the results of a public opinion study is used as well as several academic articles.

*Data collection for the Hudson River Project.* To gather data on the Hudson River Project five semistructured interviews were conducted. The first interview partner was a researcher for RBD. The other four interview partners are residents of Hoboken but are also involved in the project in additional functions: a resilience coordinator who works in Mayor Dawn Zimmer's office, two are members of the CAG and an employee of RBD. Additionally, observations of a public meeting on June 16<sup>th</sup>, 2016 that informed citizens of project updates and information material, such as flyers, for citizens developed by the project team are used.

To further gage public opinion 236 letters, which were sent to the project team between December 10<sup>th</sup>, 2015 and December 31<sup>st</sup>, 2015 were analyzed and coded based on a coding scheme that incorporates the most important issues that are mentioned (see appendix C). Since no letters mention all issues and some issues are only mentioned in a very small number of letters some categories cannot be used for this analysis.

# 3.4. Operationalization of Main Concepts

*Public Opinion.* Since there is no available opinion poll data for either project that maps the development of public opinion over time other measures have to be used to indicate public opinion at a certain point in time. First of all, descriptions by interview partners of general trends in public opinion are used. Since the projects are implemented in small scale environments and the interview partners are all deeply involved in the projects these estimations are likely to come close to the truth but are nonetheless not free of bias. In addition the contentiousness of the project is used as an indicator for public opinion. If the project is controversial it is likely to be unpopular in the community, however it has to be taken into account that a loud minority could disproportionately influence this indicator. Trust in authorities and satisfaction with the project are also regarded as indicators for public opinion.

Positive or negative public opinion is not used as a normative description of attitudes. It is founded on the view of the authorities that want to implement the respective project.

*Citizen Participation.* The differentiation between citizen participation and non-participation is based on Arnstein's ladder of citizen participation (1969). This means that measures such as information at the lowest level ranging up to citizen control at the highest level are considered as citizen participation.

*Opinion Leaders.* Opinion leaders are considered to be those individuals or entities that are the actors with the most influence on the community as identified by the interview partners.

*Cohesion and Fragmentation of Public Opinion.* This concept is first of all measured based on whether there is an observable conflict between two or more parties that affects the public. Secondly, the level of fragmentation is based on the assessment of the interview partners and in the case of the Hudson River project on results of the analysis of letters to the project team.

*Expectation Management.* Expectation management is conceptualized as the ability of the authorities to communicate to the public what a reasonable outcome would. It is measured based on the assessment by the interview partners.

*Communication Strategy.* Communication strategy is based on the type of information the project team provides and the form in which it is communicated. It is measured based on the assessment of interview partners, observations of a public meeting and information materials produced by the project team.

*Risk of disaster recurrence.* Risk is evaluated on the combination of the likelihood of a recurrence of a similar disaster and the damage that would be caused. The data for this assessment is derived from the interviews as well as risk assessments produced by NJDEP in the case of Hoboken.

#### 4. Analysis of the two Cases

The following section analyzes the mechanisms, which drive public opinion formation first in the Roombeek Project and then in the Hudson River Project based on the theory and hypotheses formulated in section two. It concludes with a comparison of the observed mechanisms

#### 4.1. Roombeek

#### 4.1.1. The Effect of Timing

*Deteriorating Public Opinion over Time.* Hypothesis 1 states that public opinion will deteriorate over time.

After the incisive event of the explosion of the fireworks depot many residents lost trust in the authorities, which was however regained over time (Roombeek project manager, personal communication, 28.04.2016). Klok et al. (2004) conducted a study in which they found that between the end of Phase 1 and the end of Phase 2 there were no significant shifts in the level of trust anymore. They interviewed 690 residents after Phase 1 was completed and attempted to interview the same group of people after the completion of Phase 2, out of which 640 responded. The changes in level of trust in the process and level of trust in the municipality were nearly insignificant, though. Klok et al. also found that trust is strongly correlated with satisfaction with the project. At least in the case of Roombeek it can therefore be used as a good indicator for public opinion.

Although there is no data available that quantifies public opinion or trust at the very beginning of the process there is no indication that public opinion deteriorated over time. If anything the opposite is true. Contrary to theory there was no downturn of public opinion once the first design proposal was introduced. This mechanism is therefore clearly not applicable in this case.

*Earliness of Citizen Participation.* In Roombeek citizen participation began at a very early stage, before any important decision had been taken. Shortly after the explosion of the firework depot the Project Bureau Reconstruction began meeting with citizens in their homes to allow them to share their ideas about the future of the neighbourhood. The feedback that was received during these meetings was later incorporated in the process and the design proposal (Roombeek project manager, personal communication, 28.04.2016). According to hypothesis 2 a low level of contentiousness is expected.

This can indeed be observed, since there was a very low level of contentiousness in Roombeek. As described above there were no significant changes in trust once Phase 1 had been completed. Klok et al. (2004) also found that their survey participants graded the preliminary design proposal with a 6.9 and only 8.7% gave it a failing grade. However, they also discovered that there was no relationship

between participating in the meetings etc. and satisfaction with the project. During a final citizen meeting before the vote on the final proposal in the city council a large majority of the community supported the design in a non-binding vote on the issue (Roombeek project manager, personal communication, 28.04.2016).

The relationship between earliness of citizen participation and contentiousness of the project can be observed in in this case. In Roombeek the extremely early involvement of the community in the decision-making process allowed the project team and the community to learn from each other and prevent serious conflicts. The project team was able to identify those issues that were most salient and possibly contentious to citizens and address them accordingly. At the same time the team was able to inform and educate the community extensively, which also allowed them to frame their own decisions in a favorable light. However, it does not seem necessary for an individual to participate in this process to be satisfied with it. Possibly, it is sufficient if citizens' interests are represented by smaller group of the community as long as concerns and ideas are taken into account.

#### 4.1.2. The Impact of Opinion Leaders

*Homogeneity through Opinion Leaders.* Hypothesis three states that a strong opinion leader is able to create homogeneity within a community's public opinion.

Since the explosion of the fireworks depot had led to loss of trust in the authorities, it was decided shortly afterwards that the mayor and the city council would play a minor role in the decision-making process. This also meant that they did not function as opinion leaders since they were not very visible throughout the process. The project manager of Roombeek identified himself, other members of the Project Bureau Reconstruction and Pi de Bruin, the chief architect, as the main opinion leaders in the decision-making process. They used this power to promote the process and involve people in it. However, the Roombeek project mamager and his colleagues from the project team were careful not take a position on the content of the discussion in order to remain independent from any standpoint (Roombeek project mamager, personal communication, 28.04.2016).

Because there were no opinion leaders that took a strong position on issues in the Roombeek project and it is difficult to judge based on the statement of one involved person, it is impossible to make a statement about whether this relationship is observable. However this does not mean that the mechanism was not applicable in Roombeek. *Expectation Management.* The section above describes the early citizen participation in Roombeek, which leads to the dilemma between high expectations and citizen participation. Based on hypothesis 4 expectation management can prevent public opinion from turning negative.

In the Roombeek the Project Bureau Reconstruction emphasized the importance of transparency strongly. This included making the community aware of what a realistic outcome of the process was. The project managers and their team let the community know that their feedback and ideas were welcome but that at the same time not all ideas could be incorporated into the design (Roombeek project manager, personal communication, 28.04.2016; Roombeek project manager, 16.03.2016). The project manager stated that he told citizens at community meetings that he wanted to hear their ideas but probably only a fraction of them would eventually be realized.

As described above there was little controversy about the project. The high level of citizen participation might have led to high expectations by citizens that could never be fulfilled. However, the project team seemingly managed expectations effectively from the beginning of the process and avoided large conflicts.

*Communication Strategy.* According to hypothesis 5 a good communication strategy is key to successfully maintaining positive public opinion.

The Project Bureau Reconstruction comprehensive strategy that included a number of measures, which made their communication with the community effective. Firstly, they ensured that there was a steady and reliable flow of information from the project team to the community. Every Wednesday the local newspaper, *Tubantia*, printed one page with information on the Roombeek project. These pages included information about past and upcoming meetings, comments by citizens and any other information that was relevant that week. Secondly, the project team set being honest and transparent in their communications as one of their central guidelines. The project manager emphasized in his interview that this also referred to those issues that might provoke a conflict. Thirdly, the team framed the project as a community effort. For instance, Pi de Bruin who is originally from Twente made use of his knowledge of the region and the dialect to show citizens that he was 'one of them' and 'on their side' (Roombeek project manager, 28.04.2016).

In Roombeek the relationship between an effective communication strategy and positive public opinion is observable.

#### 4.1.3. The Effect of Risk

*Risk of disaster recurrence.* According to hypothesis 6 the low level of risk of disaster recurrence should lead to higher contentiousness of the project.

Shortly after the fireworks depot exploded it was evident that allowing this type of industry in a residential area would not be acceptable anymore. The probability of recurrence was zero. According to the definition used in this study there was no risk in not acting. Nonetheless, the decision-making process ran smoothly with little dissent.

The mechanism that is predicted cannot be observed and it calls into question whether it is applicable in the way it is formulated. The theory formulates that a more favorable attitude towards implementation is induced by the possible damages in the case of non-action and only indirectly through risk. The costs of non-action on the other hand are applicable to Roombeek. If no action to rebuild had been taken this would have meant the definite loss of their homes for many of those former inhabitants who wanted to return to the neighbourhood. An effective decision-making process was therefore in their favour. The mechanism can be applied in in Roombeek if risk is not strictly applied to the disaster that happened but the risk of any costs incurred by not acting to solve the issue.

#### 4.2. Hudson River Project

#### 4.2.1. The Effect of Timing

*Deteriorating Public Opinion over Time.* As in Roombeek hypothesis 1 predicts that public opinion deteriorates over time.

The Hudson River Project has seen a high level of controversy. A RBD employee (Personal communication, 23.06.2016) described the initial attitude of the community towards the project as 'cautious acceptance'. However, with the release of the five concepts in early December 2015 the attitude among many community members changed drastically. As people were becoming aware of what the implementation would mean in practice, especially those impacted by the construction of floodwalls began fighting the project. The dissatisfaction with the project became particularly visible during a community meeting on December 10th, 2015 in the Hoboken Historical Museum. This meeting has since been dubbed the 'pitchfork meeting' in the community (RBD employee, personal communication, 23.06.2016). The debate between enraged citizens and representatives of the project team became so heated that the Mayor Dawn Zimmer had to stand on a ladder to be heard and restore order (RBD employee, personal communication, 23.06.2016). In addition to this meeting the project team received 237 letters from citizens in the month of December alone, which almost all expressed rejection or criticism of the project, a small number of them even threatening legal action if the project went forward (NJDEP, 2016). Since then efforts have been made to improve public opinion and attitudes towards the project have improved (CAG co-chair, personal communication, 08.06.2016).

Nonetheless, the Hudson River Project has been significantly more contentious than the Roombeek Project as the events of December and the continuing scepticism towards the project, which could be observed during the public meeting on June 16<sup>th</sup>, 2016, show.

The development of public opinion in the Hudson River projects is almost perfectly modelled by theory. As the theory predicts the community in Hoboken is generally in favour of flood protection meaning they support the project. However, once the specifics of the design proposal and their impact is known public opinion shifts dramatically and the NIMBY phenomenon appears

*Earliness of Citizen Participation.* In the case of the Hudson River Project the first time the citizens of Hoboken were directly involved in the project was after the 'Resist, Delay, Store, Discharge' design was selected as one of the winning proposals of the RBD competition. Although this decision was taken by others than the authorities later responsible in the Hudson River project it had a significant impact on the future of the project. It set out the design framework and secured funding. The design was introduced to and discussed with the citizen advisory group after this decision. These meetings were open to the general public but no initiative was taken by the municipality to invite citizens. This meant that the majority of Hoboken's community only became acquainted with the design and involved in the process when five concepts were introduced in the beginning of December 2015 (CAG co-chair, personal communication, 08.06.2016). Hypothesis 2, therefore predicts a higher level of contentiousness for the project.

The mechanisms that were responsible for causing conflicts between citizens and the project team were the lack of input on the design and a failed communication strategy. Citizens had little to no opportunity to influence the initial design of the concept and felt locked into it. Discussing possible alignments of flood walls might have prevented misconceptions about the design as well as learn about the preferences of the community. The late involvement of citizens also led to a slow flow of information, which allowed misinformation to spread and led to confusion within the community.

#### 4.2.2. The Impact of Opinion Leaders

Homogeneity through Opinion Leaders. The central opinion leader in the Hudson River Project, as identified by the CAG co-chair, Hoboken's resilience coordinator and an RBD employee is Mayor Dawn Zimmer. She has been involved in the projected since it was still at the competition stage and is its most vocal supporter. According to Hypothesis 3 she should be able to rally the community around her and ensure their support of the project. The reality however is different. As already discussed the Hudson River Project has experienced a relatively high level of contentiousness, which escalated when the five design concepts were first published in December 2015. The initial outcry came from the

residents of Garden Street(CAG co-chair, personal communication, 08.06.2016) . Garden Street is a residential street that runs parallel to the Hudson, six blocks from the waterfront and perpendicular to the inlet Weehawken Bay. One of the designs, concept A, proposed to build a floodwall through the street to protect the lower lying part of town from flooding (NJDEP, n.d.). A new opinion leader who emerged at this point for a short period of time was Natalie Morales who is a resident of Garden Street and co-anchor of the Today Show on the TV network NBC. She made use of her connections in media to draw attention to the proposals. This showed success. The mayor distanced herself from Concept A during a public meeting shortly after(RBD employee, personal communication, 24.06.2016). This spiked outrage from another group of citizens. The residents on the waterfront in the North of Hoboken felt that if concept A was taken of the table this would make it more likely that Concept C or D would be implemented, which would block their view and waterfront access (NJDEP, n.d.). This development can also be retraced in the letters that were sent to the project team as the graph below shows. Out of every time Concept A or C were mentioned, Concept A was referred to in a negative context 87.7% of the time and Concept C was referred to negatively in 91.7% of letters.



Figure 2: References of Concept A and C in letters to the project team in December

This shows that opinion leaders do not necessarily foster cohesion. On the contrary, they may even cause stronger fragmentation within the community. However, the opposite can also be observed in Hoboken. Since December the mayor and her staff have made changes in the way they approach the project, which will be discussed in the following parts. This has led to an improvement in attitudes towards the project (Hoboken resilience coordinator, personal communication, 07.06.2015). Having a strong opinion leader alone clearly does not explain cohesion within a community.

*Expectation Management.* The conflicts in Hoboken illustrate perfectly the problems that Hartmann (2012) describes in spatial planning. According to hypothesis 4 this makes expectation management through authorities necessary to prevent a downturn of public opinion.

Although there was general support for the project initially this did not last since the community favoured flood protection but many citizens did not understand what this meant in practice. The project team might have prevented the severity of the conflict if they had prepared those residents who would be directly affected by a floodwall in any of the five design concepts and explained the details to them. In retrospect the mayor's office acknowledges this (Hoboken resilience coordinator, personal communication, 07.06.2015), showing that although so far the project team has not been very successful in managing expectations this might change in the future.

*Communication Strategy.* According to Hypothesis 5 a comprehensive communication strategy fosters positive public opinion formation.

When the five design concepts were first proposed in December there was no comprehensive communication strategy for the Hudson River Project. This lack of coordination led to miscommunications and misunderstandings between the project team and the citizens. For instance, while giving a presentation during a public meeting representatives of the engineering company involved showed pictures of the Berlin Wall and walls dividing the city in Belfast as examples of walls, which scared many of those present. These types of communication problems largely contributed to the problems the project has faced (CAG co-chair, personal communication, 08.06.2016).

Since December there have been changes and a communication strategy that includes all involved parties has been developed (Hoboken resilience coordinator, personal communication, 07.06.2015). The team has developed information materials that explain the different aspects of the project in detail and make it more approachable and understandable. These materials are flyers, posters and materials to be used during public meetings. One example is a 3D model of a small part of town that shows how a berm could be incorporated into the city without being a disturbance. Additionally, Mayor Zimmer has increased her outreach work. She meets with residents of those areas of town that would be most affected and takes groups of interested citizens on walking tours during which she explains what implementing the project would mean in practice (Hoboken resilience coordinator, personal communication, 07.06.2015). This change in the communication strategy has shown effect and resistance to the project has been reduced (CAG co-chair, personal communication, 08.06.2016). This illustrates how effective an improved communication strategy can be.

#### 4.2.3. The Effect of Risk

*Risk of disaster recurrence.* Hoboken is at risk of being flooded again in a Hurricane or a large storm and suffering large damages. Large parts of the city lie below the 100-year-flood level and just as during Sandy strategic infrastructure that provides basic services, such as water, electricity and transportation are vulnerable. Hypothesis 6 would suggest that the high level of risk leads to a lower level of contentiousness. Nonetheless there is a reluctance in the community to effectively tackle this problem, since many citizens underestimate the risk. This skewed perception can be explained in two ways, temporal and spatial. Hoboken has a young population consisting of many who moved to the city during the last few years and did not experience Sandy. They do not have the first-hand experience that those who already lived in Hoboken have and therefore underestimate the risk. Secondly, there is a divide between those who live in the higher elevated areas of Hoboken, along the waterfront and those who live in the flood zone. The perception of risk differs between these groups and the willingness to act with it (RBD employee, personal communication, 24.06.2016). This means that the mechanism that drives public opinion is not risk itself but the perception of risk.

#### 4.3. Comparison

Three of the six mechanisms analyzed above can be observed in both projects. The following section sets out to compare the similarities and differences and attempt to explain how contextual differences may have led to a different functioning of the mechanisms.

Hypothesis 1, which states that public opinion deteriorates over time holds in the Hudson River Project but not in Roombeek, where the opposite could be observed. Firstly, this may be caused by the differing points in time when the projects were initiated. The Hudson River Project started two years after Hurricane Sandy, while the Roombeek project began in the direct aftermath of the disaster. Additionally, this may be attributed to other mechanisms that were more influential in the case of Roombeek. The theory states that once more details become known this will negatively impact public opinion because citizens will realize how this plan may adversely affect them individually. This could not be observed in Roombeek though. Possibly this mechanism was cancelled out by the project team's effective expectation management and communication strategy, which were lacking in the Hudson River Project.

Comparing the earliness of citizen participation in relation to the first major decision point and the first time a design proposal was introduced illustrates the organizational differences between the Roombeek and the Hudson River Project, which the figure below shows clearly (see appendix D for full scale visualizations).

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*Figure 4: Timeline comparison based on first measure of citizen participation (Ferdelman, Klinkhammer, Quickert, 2016)* 

Citizens in Roombeek were involved at a much earlier stage than those in Hoboken. This is also shown by the amount of citizen participation before the first design proposal was released. The figure below illustrates the striking difference between the two projects.



Figure 3: Timeline comparison based on first design proposal (Ferdelman, Quickert, Klinkhammer, 2016)

Roombeek citizens had the much more freedom to influence the proposal than the citizens in Hoboken. While the community in Roombeek felt included in the process, the community in Hoboken felt they had little influence and were locked into a design before being afforded the opportunity to provide feedback. The earliness of citizen participation is likely to have been one of the major forces driving public opinion formation in both cases.

The conflict in Hoboken in December 2016 and the subsequent recovery of public opinion show that opinion leaders can have a significant impact. However, strong opinion leaders do not necessarily lead to homogeneity in the community. Additional factors have to be considered to determine the role that they play in public opinion formation. First of all, more than one opinion leader may create fragmentation within a community and secondly statements by an opinion leader may create backlash from a part of the community that might have otherwise remained silent, which could both be observed in the Hudson River Project.

Being able to manage expectations and having a comprehensive communication strategy was a crucial factor in both projects. Roombeek being the positive and the Hudson River Project being the negative example of this. Through their open communication the project team in Roombeek was able to foster positive public opinion while the project team in the Hudson River project struggeled with their communication strategy, which led to negative public opinion. Independent of any contextual differences good communication with citizens was the linchpin of fostering positive public opinion in both cases.

The prediction that risk of disaster recurrence would reduce contentiousness of the project could not be observed in either case. In fact, the opposite is the case. However, the analysis shows that risk does seem to play an important role. However it has to be conceptualized in a different way. Instead of conceptualizing it as the risk of disaster recurrence it should be conceptualized as the perception of risk. Meaning that it is measured as the perceived risk of non-action. In that case the analysis would have shown that the high costs connected to not rebuilding Roombeek, which were also perceived as such by the population led to broad support for the project. In the case of the Hudson River Project the low level of perceived urgency by some parts of the population, on the other hand allowed the process to become highly contested.

#### 5. Conclusion

The contexts of Roombeek and the Hudson River Project differ widely from each other and this also influences the way the mechanisms work. The mechanisms that were described by Hypothesis 1, deteriorating public opinion over time, Hypothesis 3, homogeneity through opinion leaders and Hypothesis 6, risk of disaster recurrence could either only be observed in one of the two projects or in

none. Nonetheless, the analyses have provided some valuable insights. Firstly, the analysis of Hypothesis 1 shows that public opinion only deteriorates over time depending on the context and can be mitigated by other mechanisms. Secondly, opinion leaders if they play a large role can be influential, however there are several ways in which they can influence public opinion, meaning that they have to be described and analyzed in more detail. Thirdly, risk has to be defined on the one hand more specifically, as the perception of risk and on the other hand more broadly as the risk of non-action and not only as the risk of disaster recurrence to be applicable in the two studied projects.

The mechanisms above have proven not to be applicable in both cases. However, there are three mechanisms that are fully applicable to both projects. These are the earliness of citizen participation, expectation management and a comprehensive communication strategy. To make a definitive statement about the mechanisms in the two cases examined one would have to wait until the decision-making process in the Hudson River Project is finalized, however. This study shows that not all theories are applicable in every context because environmental factors can diminish or reverse effects. The theory discussed in section two describes different influence factors on public opinion formation but it does not describe how these might mitigate or cancel each other out in practice. The analysis of Roombeek and the Hudson River Project have shown that while established theory is helpful to identify possible factors that drive public opinion formation it is not always able to predict the mechanisms that are applicable in individual cases. It would therefore have to be specified for varying contexts.

Nonetheless, the three mechanisms that could be observed in these two cases are likely to be observed in others as well. It would therefore be interesting in a next step to examine different cases in other environments or possibly failed projects. Furthermore, examining the relative weights of the mechanisms would be compelling in order to determine whether an effective communication strategy and expectation management cancel out the mechanism of deteriorating public opinion over time in other projects as well. Due to the limited scope of this study there are aspects of public opinion formation that had to be excluded. One of these factors is the role of media. In the case of Roombeek this would have meant an analysis of traditional media such as newspapers and television broadcasts. The Hudson River Project being more recent could also be analyzed based on social media such as Twitter of Facebook. This aspect might give a better insight into the dynamics of public opinion formation between citizens.

This study examined only two post-disaster resilience projects, which means that the observed mechanisms are primarily applicable to these two projects. However, some lessons can already be drawn for the Hudson River Project. Firstly, earlier citizen participation could have allowed citizens to feel more involved with the project from the beginning. The setup of Rebuild by Design competition

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ensured that the Hudson River Project lost the potential that Roombeek had for early citizen involvement. It is of course too late to implement a scheme that allows for earlier citizen involvement but that is a lesson that might be applied in the next project. In addition the example of Roombeek shows how successful a comprehensive communication strategy and effective expectation management can be. Some of these lessons have already been drawn and applied by Mayor Zimmer and her team. They have drastically changed their communication strategy and have recognized that in the future expectation management is an important tool for preventing conflicts. The perception of risk still has to change, however. The saying goes 'where there is a will there is a way' but the opposite is also true. The project team has begun to educate the population of Hoboken on the issue of flood risk but as long as the mind-set about flood prevention does not change it will likely continue to be an uphill battle to implement this project.

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# 7. Appendices

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Timeline Roombeek Project (Ferdelman, Klinkhammer and Quickert, 2016)



Quickert, Ferdelman & Klinkhammer (2016)

Timeline Hudson River Project (Ferdelman, Klinkhammer and Quickert, 2016)

# Appendix B: Organizational Structure

# Structure Roombeek Project



Organizational Structure Roombeek Project (Ferdelman, Klinkhammer and Quickert, 2016)



Organizational Structure Hudson River Project (Ferdelman, Klinkhammer and Quickert, 2016)

# Appendix C: Coding Scheme

Issue	Value	Label
	0	No reference
Meeting or Event	1	Concept presentation 10/12
weeting of event	2	Drop-in session 14/12
	3	Public meeting 17/12
General support	0	No reference
Information flow		
Trust in authorities		
Trust in design team		
Public meetings		
Input heard by project team		Negative
Input reflected in design	1	
Citizen participation		
Temporary floodwall		
Permanent floodwall		Neutral
Concept A	2	
Concept B		
Concept C		
Concept D		
Concept E	3	
Delay		Positive
Store		
Discharge		
Threaten legal action	0	No
	1	Yes

### Appendix D: Process Visualizations

The visualizations show the decision-making processes of the Roombeek and the Hudson River Project over time. Each of them begin with the event that initiated the process and end with the decision on the final design that is to be implemented, which still lies in the future in the case of the Hudson River Project. The coloring of the arrow from red to green in the center of the visualization represents public opinion over time. The ellipses along the arrow stand for important decisions that advance the project. Grouped around the arrow are the measures of public participation that were conducted. These are colored in shades of yellow that represent the varying degree of power that citizens could exercise through the measures. Further away from the central arrow the visualization shows the involved stakeholders in blue ellipses and their distribution of power, support and urgency in the boxes below or above. Since there is a large number of stakeholders in the Hudson River Project the less important ones are only represented by blue dots in the lower part of the visualization. **Public Opinion Formation in Post-Disaster Reconstruction Projects** A Study of Roombeek and the Hudson River Project

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