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The Role of Stakeholder Fragmentation in Post-Disaster Resilience Projects

A Comparative Study of Roombeek and Hoboken

Abstract

This study explores the effect of stakeholder fragmentation on the adequacy of interactive decision-making in post-disaster resilience projects. It investigates on whether or not the level of stakeholder fragmentation affects the influence of stakeholder involvement on the adequacy of interactive decision-making. Comparing two post-disaster resilience projects in the Netherlands and the USA, this study draws conclusions about general and context-related mechanisms in terms of stakeholder involvement and fragmentation, which lead to a higher adequacy of interactive decision-making. The results can be used in for further research as well as in future post-disaster resilience projects.

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1. Introduction

In the face of the ongoing urbanization and climate change, neighborhoods around the world increasingly encounter catastrophes which affect whole populations. Disasters such as floods and explosions are difficult to predict and authorities struggle to find the best way of dealing with them. Especially cities with a high population density face a large scale of demolition, and have to find mechanisms to become resilient and cope with that. Social resilience plays a great role here, including the dimension of politics into the rather ecological term of general resilience (Keck & Sakdapolrak, 2013). After a disaster strikes, the variety of tasks which come up is immense: people may have to be accommodated, houses may have to be reconstructed, electricity has to be restored, and basic functions of the city have to work. Coping mechanisms have to be developed to secure the city from future disasters. Various groups of people have an essential stake in that and try to shape the decision-making processes that determine the way these tasks are managed. Thereby, the vision of a complete recovery, and a result which is better than before, is desirable. The reconstruction of a city is expensive and takes a lot of time and effort, and sometimes does not produce desired outcomes. But to which degree should these stakeholders be involved? And which stakeholders are the most important ones? Whose interests have to be served? The involvement of stakeholders certainly has an important influence on the decision-making process of projects. Some authors see it as a key factor of success: “Without attention to needs and expectations of a diverse range of stakeholders, a project will probably not be regarded as successful, even if the project manager was able to stay within the original time, budget and scope”(Olander, 2007, p. 277). Thereby the most important issue is managing the relationship between the project and its stakeholders (Aaltonen, Jaakko, & Tuomas, 2008).

In order to contribute on the body of knowledge of this success factor, this study takes a closer look at two post-disaster resilience projects and their structures, timelines, and stakeholder environments. Since post-disaster resilience projects are extremely particular and differ from other projects, this research contributes further on the existing body of knowledge on stakeholder fragmentation and involvement in post-disaster resilience projects.

Stakeholders can bring in new ideas and support the project, but managing them is a highly complex task. Not only political bodies and companies can be stakeholders, but also citizens become stakeholders by organizing their interests. These stakeholder groups can be fragmented or homogenous in the level of power, support, and urgency they have related to a project. This research deals with the role stakeholder fragmentation takes in the interactive

decision-making process of post-disaster resilience projects by looking in detail at the cases of the Roombeek Project in the Netherlands and the ongoing Hudson River Project, as an outcome of the Rebuild By Design competition, in the USA.

1.1 Research Questions

This paper deals with the following research questions:

- Q1: *To what extent and how did the level of stakeholder fragmentation of the post-disaster resilience projects in Roombeek and Hoboken affect the adequacy of interactive decision-making?*
- Q2: *To what extent is the effect of the level of stakeholder involvement on the adequacy of interactive decision-making moderated by the level of stakeholder fragmentation in the post-disaster resilience projects in Roombeek and Hoboken?*

These questions will detect causes for whether or not the interactive decision-making in Roombeek and Hoboken was adequate. They are of explanatory nature, because they investigate the various antecedents and consequences of stakeholder involvement in the two respective post-disaster resilience projects. They look at the Roombeek case after the decision-making process was finished in 2010, and examine the ongoing Rebuild By Design project in Hoboken in May 2016.

1.2 Scientific and Societal Relevance

There is a lot of general theory on stakeholder involvement already. This research contributes to that by looking at the antecedents and consequences of very specific aspects of it, namely stakeholder fragmentation and the adequacy of interactive decision-making. Stakeholders represent certain interests which oftentimes reflect interests of the society. Knowing when and to which extent stakeholders should be involved therefore also gives public authorities knowledge about how and when they should incorporate society's organized interests. Furthermore, this study expands the scientific knowledge about interactive decision-making by looking at two real cases which have not been studied before and elaborates on the effects of stakeholder fragmentation and stakeholder involvement on that. Future research can use the results of this study to find out more about post-disaster resilience projects, stakeholder involvement and interactive decision-making.

Understanding stakeholder involvement in post-disaster resilience projects can be useful in future research projects, but also in future post-disaster resilience projects. By comparing two cases of best-practice, future project managers can utilize the findings of this study to improve their projects' outcomes. They can increase the satisfaction about the project by involving the correct amount of stakeholders to the right extent. Next to that, they can build a participatory decision-making process in which many new ideas for the project come up. Recognizing the particular stakeholder environment of every single disaster, they can use the findings in order to conduct available strategies more efficiently and come to a better result in the end. Other projects than post-disaster resilience projects might be able to utilize the findings of this study as well.

1.3 Selection of the Cases

In May 2000, a fireworks warehouse exploded in the Roombeek district of the city of Enschede, the Netherlands. It was a major disaster, destroying a whole neighborhood and taking the lives of twenty-two people (Denters & Klok, 2010). The Roombeek district was known for being disadvantaged and rather poor (Denters & Klok, 2010). The authorities did not only manage to give a rapid response on this man-made disaster and swiftly began the rebuilding process, but also showed a remarkable interest in involving the various groups of stakeholders. Scholars see the efforts of Roombeek as an example of a successful post-disaster resilience project because of the immediate disaster response, the well-planned and inclusive rebuilding process and the direct reaction of political leaders, who promised all former inhabitants a "right to return"(Fullilove et al., 2008).

On the other side of the Atlantic Ocean in the USA, Hurricane Sandy hit the city of Hoboken in 2012. Big parts of the city were flooded and massive power outages occurred (Union of Concerned Scientists, 2014). There is a high vulnerability to flooding, 79% of Hoboken falls into the FEMA flood zone (Fund for a Better Waterfront, 2013). The public goal after the damages of Hurricane Sandy was to not only repair the city, but also to decrease its vulnerability, and to increase the living quality. This should happen through the Rebuild By Design project, a design competition to create solutions for resilience in the future. This project tries to involve stakeholders with its inclusive process which "[…] has since provoked a paradigm shift in the way that planners and governments approach both disaster response and emergency preparedness" (Rebuild By Design, n.d.-a). Among many other projects, one outcome of this competition was the Hudson River Project, which presents a comprehensive

approach to resilience consisting of four components: Resist, Delay, Store, Discharge (Office of Flood Hazard Risk Reduction Measures, n.d.).

Contextual differences in the implementation of both projects characterize their selection. While Roombeek was a disadvantaged district in a Dutch town of normal size, Hoboken is located in the New York metropolitan area and has approximately 50000 residents, most of them have a higher-than-average income (Wikipedia, n.d.). This has an impact on the project structure and stakeholder environment, as shown in the case description part. A crucial difference in both projects was the financial part. Both projects were funded by the federal government, but the decision-making of the Roombeek Project was completely concentrated at the municipal level of the city of Enschede (Denters & Klok, 2010). In contrast to that, the US federal administration, just as the State of New Jersey's Department of Environmental Protection, are involved into the Hudson River Project and directly take part in the decision-making process. Furthermore, the cities of Hoboken, Jersey City, and Weehawken are involved (NJDEP, 2016).

2. Theory and Hypotheses

This research uses network theory as a general theoretical framework, assuming that public policy is the result of interactions between different actors with their own perceptions and strategies, which have to be managed in order to achieve interesting outcomes (Edelenbos & Klijn, 2006). Interactive decision-making, as a new form of network governance, is about involving citizens, social organizations, enterprises, and other stakeholders in the early stages of the policy making process (Edelenbos & Klijn, 2006). It is regarded as a possible way of increasing citizen participation and decreasing the perceived gap between citizens and government (Edelenbos & Klijn, 2006). In addition, it can be seen as a "way to cope with interdependencies in complex processes" (Edelenbos & Klijn, 2006). The assumption that all involved stakeholders and their interactions play a crucial role in the decision-making process of a public project is prevalent in these concepts. Generally, stakeholders can be defined as "any individual or group of individuals that are directly or indirectly impacted by an entity or task" (Sutterfield, Friday-Stroud, & Shivers-Blackwell, 2006, p. 27). These individuals or groups can indeed affect the functioning, goals, development and even survival of an organization or project (Chinyio & Olomolaiye, 2010). The main motives to involve stakeholders in a decision-making process are to diminish their veto power, to improve the

quality of decision-making by using the additional available information, and to bridge the perceived growing gap between citizens and politics (Edelenbos & Klijn, 2006).

But 'normal' public projects are different from post-disaster resilience projects. As Mannakkara and Wilkinson (n.d.) point out, the increasing frequency of disasters and the need for better post-disaster reconstruction practices have given rise to the idea that post-disaster resilience projects should not only make a place as good as before, but make it even better. This approach sees disasters not only as something negative, but also as a chance for the betterment of urban aspects which could have otherwise not been improved. Thus, a post-disaster resilience project reforms things which could not have been reformed by 'normal' public projects. Therefore the concept of "Build Back Better" (BBB) has become very significant in the last years. This concept "[…] uses a holistic approach towards reconstruction and recovery implementing initiatives to simultaneously improve the physical, psycho-social and economic aspects of affected communities in an effective and efficient manner" (Mannakkara & Wilkinson, n.d., p. 3). Stakeholder involvement in those projects would actively contribute to the improvement of these aspects by incorporating parties who are actually affected by a disaster, instead of letting decision be made by councils who do not have a direct connection to it. Therefore, this study sees adequate interactive decision-making as a factor which positively influences the achievement of the Build Back Better goals.

Stakeholder involvement in post-disaster resilience projects is distinct from normal projects because of the high particularity of every single case (Zhou & Wang, 2015). This lack of generalizability can lead to difficulties in analyzing mechanisms of the stakeholder environment and its fragmentation. This research is interested in the effect of the level of stakeholder fragmentation and the level of stakeholder involvement on the adequacy of interactive decision-making in post-disaster resilience projects. As Edelenbos and Klijn (2006) point out, evaluating on interactive decision-making is difficult due to its multi-actor nature. Due to this fact, this study takes a rather broad definition, defining the adequacy of interactive decision-making as the degree of actor contentment and enrichment. Actor contentment is about whether the involved parties see the outcome of the interactive process as positive, or in other words, whether they are satisfied. Enrichment, in contrast, is about ideas. It is the degree to which new ideas were developed because of the interactive decision-making process, and to which these ideas were implemented into the outcomes of the process (Edelenbos & Klijn, 2006). Thus, adequate interactive decision-making means that there is an enrichment of ideas and that the stakeholders are satisfied.

The level of stakeholder involvement consists of the width and depth of participation. The degree to which involved parties, meaning citizens and other stakeholders, have the opportunity to determine the final outcome of the interactive process is the depth of participation (Edelenbos & Klijn, 2006), whereas "the width of participation is the degree to which each member of a community is offered the chance to participate in each phase of the interactive process" (Edelenbos & Klijn, 2006, p. 428). The level of stakeholder fragmentation is determined through the distribution of urgency, support and power of stakeholders. These three attributes are seen as crucial for describing the level of stakeholder fragmentation, because they give information about how equal or unequal the stakeholders' positions and possibilities are. It will be further elaborated on these attributes in the Methodology part.

This study takes a closer look at the following hypotheses, as depicted in the causal model in Figure 1:

Hypothesis 1a: The depth of participation positively affects the adequacy of interactive decision-making.

A high depth of participation gives stakeholders the right to determine the final outcome of the project. This makes them feel taken seriously, which contributes to their contentment. At the same time, they carry more responsibilities and put more effort into the project. This increases the amount of ideas which comes up during the decision-making process. Therefore it is in the natural interest of public administrators to have a high depth of participation.

It is expected that the depth of participation in the Roombeek Project is higher than in the Hudson River Project. This is firstly because the politicians' promise of the 'right to return' to former inhabitants in the Roombeek Project is expected to be reflected in the depth of participation, because it symbolically showed that the citizens' lives and concerns were taken seriously. Secondly the level of stakeholder fragmentation, which is assumed to negatively influence the depth of participation, is expected to be lower in the Roombeek Project than in the Hudson River Project as further explained in Hypotheses 2 and 3 a. As opposed to this, the Hudson River Project is expected to have a lower depth of participation because there are various levels of government involved. This is usually associated with many regulations, which also limit the allowed depth of participation.

At the same time, it is expected that both projects have a relatively high adequacy of interactive decision-making. This is because both projects are known for being innovative and

are used as best-practice models for participatory approaches. This indicates that there is a high satisfaction among stakeholder and a high enrichment of ideas in both projects. Still, it is assumed that the Roombeek Project has a higher adequacy of interactive decision-making than the Hudson River Project, because of its lower stakeholder fragmentation, as stated in Hypothesis 2.

Hypothesis 1b: The width of participation positively affects the adequacy of interactive decision-making.

A high width of participation has a positive influence on the actor contentment, because it is expectable that stakeholders whose interests cannot be served would be even less satisfied if they couldn't express their concerns at all. Furthermore, inviting many stakeholders can lead to a higher enrichment of ideas. This is firstly for the simple reason that more ideas arise when more stakeholders think about it. Secondly especially non-fragmented groups of stakeholders work together harmoniously and come up with new ideas about the project.

It is expected that the width of participation in the Roombeek Project was higher than in the Hudson River Project. One goal of the Roombeek Project was to make the decision-making process as inclusive as possible (former Roombeek Project manager, personal communication, 28.04.2016). This naturally means that the invitation policy is broad and as many stakeholder groups as possible should take part. There were not many stakeholders in the Roombeek Project, and the University of Twente, which is located in the city of Enschede, let the project management use big facilities for public meetings (former Roombeek Project manager, personal communication, 28.04.2016). The Hudson River Project has a significantly higher number of stakeholders than the Roombeek Project, and the city of Hoboken does not have facilities for big public meetings. This limits the possibilities for a wide invitation policy.

The expectations about the adequacy of interactive decision-making in each project are represented in Hypothesis 1a.

Hypothesis 2: The level of stakeholder fragmentation negatively affects the adequacy of interactive decision-making.

Different groups of stakeholders have different levels of support, power, and urgency. A bigger difference in the levels of these attributes naturally leads to a bigger difference in the stakeholders' expectations about the project. When there is for instance an unequal

distribution of urgency, the stakeholders will expect or hope that the project happens in different timeframes. It is hard to meet such different expectations as a public administrator in a post-disaster resilience project, which lowers the satisfaction of stakeholders. Furthermore, an unequal distribution of urgency means that the stakeholders are under different degrees of time pressure, so that fewer ideas come up during the decision-making process. These mechanisms lead to the assumption that the level of stakeholder fragmentation has a negative influence on the adequacy of interactive decision-making.

It is expected that in Roombeek there is a low level of stakeholder fragmentation, because it is a small district of a rather small city with a disadvantaged population. This oftentimes goes hand in hand with less organized interests. Furthermore, the decision-making in Roombeek is concentrated at the municipal level; which prevents financial conflicts between different levels of government. The Hudson River Project is expected to have a higher level of stakeholder fragmentation than the Roombeek Project. This is because it is located in the New York City metropolitan area and the inhabitants are mainly above average income earners. This is usually an indicator for a lot of organized interests. Contrary to Roombeek, many different levels of government are involved, which can lead to financial and political conflicts and increase the stakeholder fragmentation.

The expectations about the adequacy of interactive decision-making in each project are represented in Hypothesis 1a.

Hypothesis 3a: The level of stakeholder fragmentation negatively affects the depth of participation.

A big difference in the levels of support, power, and urgency shows that stakeholders have different opinions on the project. Very concentrated levels of support show that some stakeholders are in favor of the project, whereas others oppose it. This, in combination with concentrated levels of power, is likely to make the stakeholders block each other in order to realize their opinions. Public administrators don't want a high depth of participation in this case, because they want to prevent a blockage of decision-making. If they give a very fragmented stakeholder group decision-making powers, this could be used to work against each other. Therefore this hypothesis assumes that the level of stakeholder fragmentation has a negative effect on the depth of participation.

The expectations about the level of stakeholder fragmentation and the depth of participation in each project are represented in Hypotheses 1a and 2.

Hypothesis 3b: The level of stakeholder fragmentation positively affects the width of participation.

As mentioned in Hypothesis 2, a very fragmented stakeholder environment indicates that the stakeholders have different opinions on the project. These different opinions are a problem for public administrators, because they don't want anybody to oppose their plans. It is in their interest to mediate between the different opinions and move them more towards a compromise. If they invite a big variety of stakeholders to participate in the decision-making process and meetings, these stakeholders will have to communicate. Communication among them raises the mutual understanding and might bring them closer to a compromise in the end. Therefore this hypothesis assumes that the level of stakeholder fragmentation has a positive effect on the width of participation.

The expectations about the level of stakeholder fragmentation and the width of participation in each project are represented in Hypotheses 1b and 2.

Hypothesis 4a: The level of stakeholder fragmentation negatively affects the influence of the depth of participation on the adequacy of interactive decision-making.

As described in Hypothesis 1a, the depth of participation positively affects the adequacy of interactive decision-making because stakeholders feel taken seriously, which contributes to their contentment. A fragmented stakeholder environment also means that the levels of power and support are unequally distributed among the stakeholders. This means that some stakeholders are more powerful than others, and that there are supporting and opposing stakeholders. If the 'strong' stakeholders dominate the 'weak' ones and can fully make use of their powers because of a high depth of participation, the increase in the general contentment of the stakeholders will not be as strong as in a non-fragmented stakeholder environment. Even though there is still a higher enrichment of with a higher depth of participation, a fragmented stakeholder environment limits this effect by causing stakeholder to work against, and not with, each other.

Hypothesis 4b: The level of stakeholder fragmentation negatively affects the influence of the width of participation on the adequacy of interactive decision-making.

Even though stakeholders are more satisfied when they are involved in the decision-making process, this effect gets weaker when it is clear whose interests will be served from the very

beginning. This is usually the case in fragmented stakeholder environments, because the levels of power among the stakeholders are unequally distributed. The powerful stakeholders are the ones with the biggest bargaining power and their interests are naturally more important for public administrators than the interests of the 'weak' stakeholders. This also limits the positive effect of the width of participation on the enrichment of ideas, especially when the levels of support among the stakeholders are unequally distributed. This is because stakeholders who oppose the project will try to work against stakeholders who support it, so that the full potential of new ideas cannot be reached.

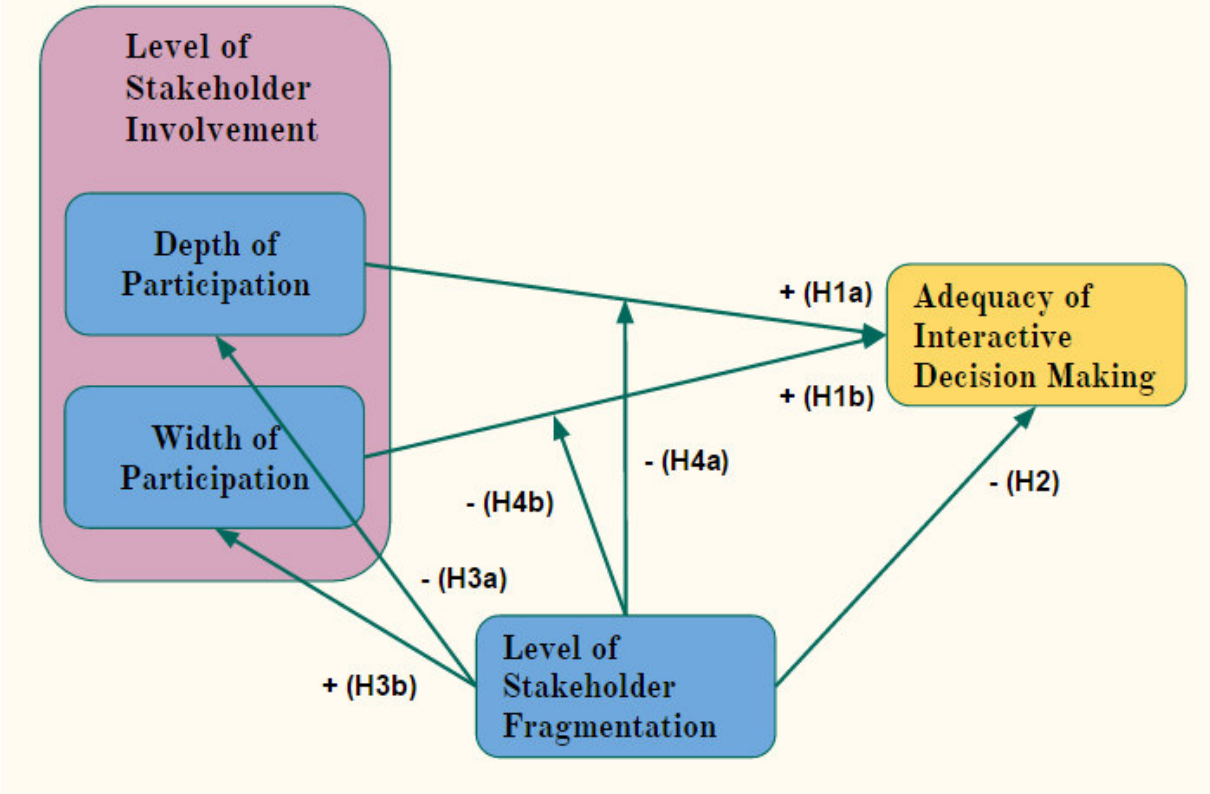

Figure 1: Causal model including the hypotheses

3. Methodology

3.1 Research Design

Pawson and Tilley (1997) wrote in their book "Realistic Evaluation", that the experimental research design is to be criticized for not depicting reality accurately. They argue that even though some phenomena are to big parts "similar", they are not comparable because they happened in different contexts. According to them, the 'logic of realist explanation' should be

used instead in order to find out about underlying mechanisms. The context of a phenomena in combination with the underlying mechanisms leads to regularities, or in other words outcomes or patterns, which is illustrated by their mathematical formula "context + mechanism = regularity" (Pawson & Tilley, 1997). The context consists of structure, which is the societal and institutional environment, and agency, which means context-related decisions. The underlying mechanisms refer to the interplay of structure and agency, and in the end lead to regularities. This research is concerned about understanding the context, the mechanisms and the regularities in Roombeek as well as in Hoboken. The comparison of these two cases offers the unique possibility to deeply look at two post-disaster resilience projects which have remarkable similarities, but also obvious differences in the context they operate in.

However, there are some threats to this research design. The external validity cannot be completely ensured because it is not sure whether the research results can be used for other post-disaster resilience projects, especially because of the high particularity each of these projects has. In addition to that, the internal validity of this design has limits. While investigating on the role of stakeholder involvement and its influence on the outcome of the project, it is impossible to completely exclude the effect of third variables. Nonetheless, this research rather focuses on the process tracing, i.e. on mechanisms connecting the independent and the dependent variable. These mechanisms can be of different nature, but this research specifically follows the design of Pawson and Tilly. Therefore mechanisms are context-related mechanisms, meaning the interplay between structure and agency.

3.2 Operationalization

The units of analysis are the post-disaster resilience projects in Roombeek and Hoboken. The data for this research is partly of qualitative and partly of quantitative nature. Next to qualitative information about the project, some quantitative data is necessary in this study, because the variables are measured in scales. The used data consists of information about the stakeholder fragmentation of the projects, structures which give insights about the width and depth of participation, and the adequacy of interactive decision-making. The data for all variables was collected in semi-structured interviews with key persons in the decision-making processes of both post-disaster resilience projects. A definition of the values which are attributed to the different variables can be found in Appendix a.

a. Level of Stakeholder Involvement

The level of stakeholder involvement is composed of the width and depth of participation. The degree to which involved stakeholders have the opportunity to determine the final outcome of the interactive process is the depth of participation (Edelenbos & Klijn, 2006). The width of participation is "*the degree to which each member of a community is offered the chance to participate in each phase of the interactive process*" (Edelenbos & Klijn, 2006, p. 428). The level of stakeholder involvement is the average value of the depth and width of participation, depicted in an index ranging from 1 to 5, 5 being the maximum value. The width consists of information about the project's invitation policy and the actual participation and will be measured on a scale of 1-5, reaching from very narrow to very wide. The depth was measured by means of the participation ladder which Edelenbos and Klijn (2006) use in their paper. This participation ladder has the five possible values: informing, consulting, advising, coproducing, and co-deciding (Edelenbos & Klijn, 2006).

b. Level of Stakeholder Fragmentation

This study measures the level of stakeholder fragmentation by using an index variable in an ordinal scale. This important moderating variable for the explanation of the effect of the level of stakeholder involvement on the adequacy of interactive decision-making is composed of the distribution of power, the distribution of support, and the distribution of urgency among the stakeholders of each respective case. The attributed values of the sub-variables are summed up, so that each of them makes up one third of the level of stakeholder fragmentation. It has a value between 1 and 6, whereby 6 indicates a very fragmented stakeholder environment. The distribution of power, distribution of support, and distribution of urgency are all calculated by utilizing the Herfindahl-Hirschman Index, looking at the specific attribute of each stakeholder. This Index is generally accepted as a heterogeneity measure and accurately depicts whether an attribute is accumulated at a few stakeholders, or widely distributed. The formula for the Herfindahl-Hirschman Index is depicted in Figure 2.

$$H = \sum_{i=1}^{N} s_i^2$$

Figure 2: Formula Herfindahl-Hirschman Index (Wikipedia, 2016)

Guided by the 2010 Horizontal Merger Guidelines, a Herfindahl-Hirschman Index with a value lower than 1500 shows that a distribution is "unconcentrated", a value between 1500 and 2500 shows a "moderately concentrated" distribution, and a value above 2500 indicates a "highly concentrated" distribution (The United States Department of Justice, 2015). Using this classification of the Herfindahl-Hirschman Index, this study attributes the number 1 to an unconcentrated distribution, 2 to a moderately concentrated distribution, and 3 to a highly concentrated distribution of power, support, or urgency among the stakeholders in both cases.

The distribution of power is calculated by utilizing the Herfindahl-Hirschman Index of the level of power of each stakeholder. As Bourne and Walker (2008) point out, the level of power is each stakeholder's "relative power to kill the project". It is rated on scales of 1 to 4, whereby the value 1 means that there is "no chance in which the stakeholder could change the outcome", and 4 means that the stakeholder "can kill the project". The distribution of power is chosen as a crucial part of the level of stakeholder fragmentation because it indicates whether the stakeholders can put the same extent of pressure on the decision-making process, or whether only some can really pressurize it.

The distribution of support is deduced from the Herfindahl-Hirschman Index of each stakeholder's level of support. It was rated on scales of 1 to 5, whereby the value 1 means "active opposition" and 5 is "active support"(Bourne & Walker, 2008). The distribution of support is an important part of the level of stakeholder fragmentation, because it indicates whether the stakeholders support the project to the same degree, or whether there is big disagreement.

The distribution of urgency is derived from the Herfindahl-Hirschman Index of each stakeholder's level of urgency. The level of urgency is about how time sensitive and critical the project is to the stakeholder, and was rated on a scale of 1 to 5, whereby 1 means "There is little need for action outside of routine communications", and 5 means "Immediate action is required"(Bourne & Walker, 2008). The distribution of urgency is a crucial part of the level of the level of stakeholder fragmentation, because very unequally distributed levels of urgency indicate that the different stakeholders may behave in a different manner, because they have different degrees of pressure above them.

c. Adequacy of Interactive Decision-making

The theoretical constitution of the concept of interactive decision-making into actor contentment and enrichment of ideas has been outlined in the theory part already. Inspired by

the work of Edelenbos and Klijn (2006), the aggregate value of the actor contentment and enrichment is used to calculate the adequacy of interactive decision-making. This study operationalizes the adequacy of interactive decision-making as the average value of both attributes, ranging from 1 to 5. In order to find out about the actor contentment, a key person from the decision-making process was asked to rate the aggregate satisfaction of all stakeholders about the outcome on a scale of 1 to 5. The enrichment consists of the variety of ideas and the influence of ideas which came up in the interactive process, both measured on scales of 1 to 5. The average of these two values represents the enrichment.

3.3 Case Description

a. Roombeek Project

1. Organizational Structure

The Roombeek Project was governed by three parties: the City Council, the Project Bureau Reconstruction, and the affected Citizens.

The City Council was not involved in the planning and implementation of the reconstruction. After the disaster happened, there was a public outcry to rebuild Roombeek in a very participatory form. Therefore the City Council created the Project Bureau Reconstruction. In the end of the whole participatory process, the City Council had to approve the final plans for the reconstruction.

The Project Bureau Reconstruction was set up as part of the municipal administration. Its main task was to decide on the structure of the participatory process and implement it. This includes informing the public about the reconstruction process and hosting meetings with Citizens, in which it had to discuss their thoughts and concerns with them. It had to firstly develop a draft plan, which incorporated the results of the various meetings, and collect comments and critique of the citizens on that. Consequently, it had to create a final plan for the reconstruction of Roombeek, and let the Citizens as well as the City Council vote on it.

The Citizens had to provide input and discuss their ideas about the reconstruction with the Project Bureau Reconstruction. In the very beginning of the process, they had to decide on who the designing architect will be. They had to give critique and new input on the draft plan for reconstruction. Once the final plan was created, they had to approve it, so that it could be delivered to the City Council.

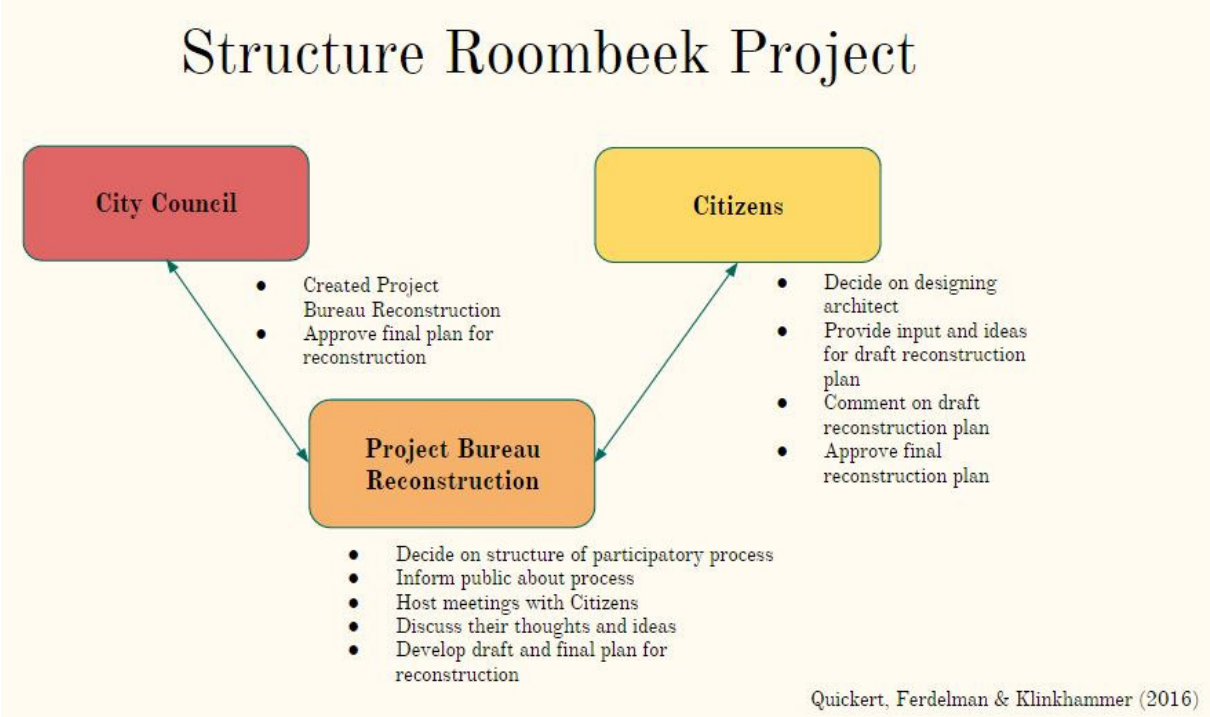

Figure 3: Organizational Structure Roombeek Project (Ferdelman, Klinkhammer, & Quickert, 2016)

2. Timeline

The Resilience Project in Roombeek consisted of three phases. After the explosion of the fireworks depot in Roombeek on the 13th of May 2000, the city of Enschede created the Project Bureau Reconstruction, and *Phase 0* started (Hofman, personal communication, n.d.). This phase included personal meetings of the planners in which general guidelines were agreed upon (Hofman, personal communication, n.d.).

Phase 1, which started in February 2001, was of crucial importance because the participating citizens had to elect the designing architect for the project. After the approval of Pi de Bruin as the architect, general meetings were held and input on a wide range of topics by citizens and stakeholders were collected. This input lead to the formulation of a first draft reconstruction plan by the Project Bureau Reconstruction and to the end of Phase 1 (Hofman, personal communication, n.d.).

Phase 2, in which comments on the draft reconstruction plan were collected, started in July 2001. Citizens had the opportunity to express their concerns and criticism in general meetings and in form of letters (Hofman, personal communication, n.d.). The Project Bureau Reconstruction had to take these concerns into account, and adjusted the reconstruction plan in accordance. The citizens were then asked to approve on the final reconstruction plan, so

that it can be delivered to the City Council. After their approval, the City Council approved the plan on the 19th November 2001 (Hofman, personal communication, n.d.).

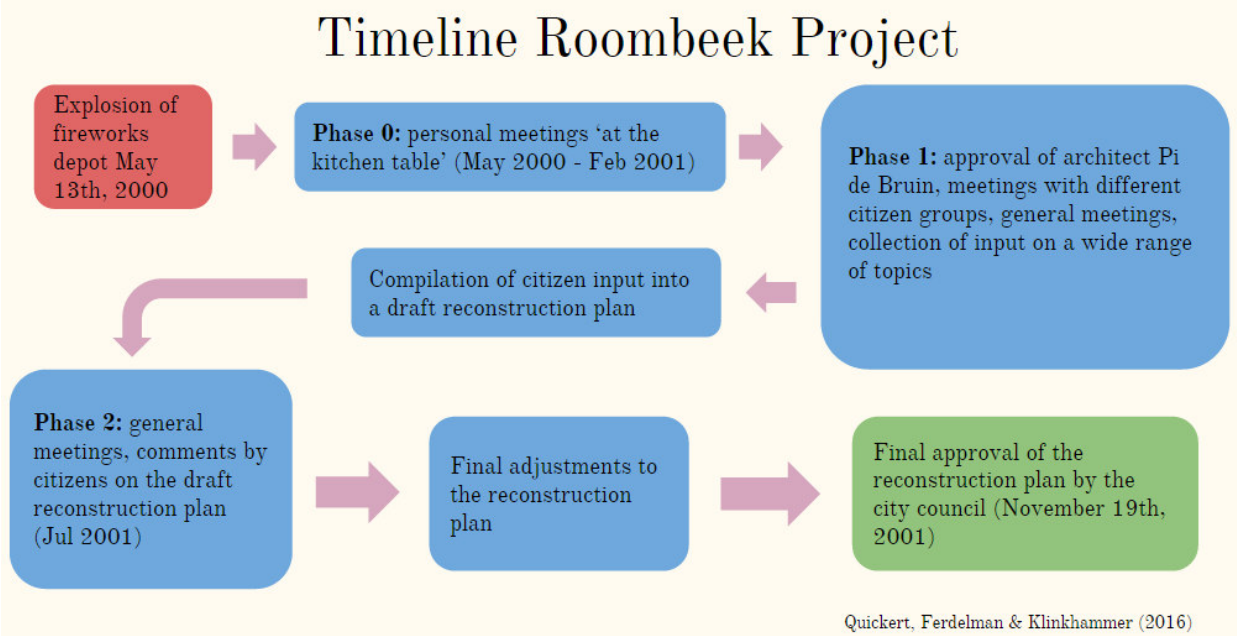

Figure 4: Timeline Roombeek Project (Ferdelman et al., 2016)

3. Stakeholders

A diverse range of stakeholders were interested in the Roombeek Resilience Project. The initial Program Manager of this resilience project provided further information on this. Since the project is finished for many years now and data about all stakeholders cannot be found online, a prioritization was made here by the former project manager. The main stakeholders in the decision-making process were:

- the Housing Corporation "De Woonplaats"
- the Housing Corporation "Domijn"
- the Organization of Victims "BSVE"
- the Organization of Employers "OVR"
- the Mayor and Alderman (City Council; Board)
- the local Elected Politicians in the "Gemeenteraad" (City Council)
- two local schools
- Artists of the Area
- two Local Mosques
- And the Neighborhood-management.

These stakeholders naturally have different interests and different attributes, which can be found in Appendix b. The definitions of these attributes are explained in Appendix a.

b. Hudson River Project

1. Organizational Structure

The Hudson River Project Structure consists of five organizing bodies (NJDEP, n.d.).

The main body is the NJDEP Hudson River Project Team. Its task is to plan further steps and facilitate contact between all involved parties. It has the right to allocate funds and thus veto power. The NJDEP Hudson River Project Team provides new input and information to the various Citizen Advisory Groups/Outreach Committees (NJDEP, n.d.).

These Citizen Advisory Groups/Outreach Committees are located in all three participating cities: Jersey City, Hoboken, and Weehawken. Their purpose is to provide a forum for exchange of information between the Outreach Subcommittee and key citizens and citizen groups representative of that community. They are composed of representatives from a variety of communities within each town, which were identified by the respective Mayor and the NJDEP Constituent Services Manager beforehand (NJDEP, n.d.). In their meetings, they communicate input provided by the NJDEP Hudson River Project Team to the representatives, and listen to their priorities, concerns, and issues. These concerns of the larger community will then be communicated to the Outreach Subcommittee (NJDEP, n.d.).

The Outreach Subcommittee's sole responsibility is outreach. It is populated by representatives of state and local governments; and it has to identify stakeholders and incorporate input from vulnerable populations. Its first task was to establish a comprehensive outreach plan that describes how local groups will be engaged in the project development. The results will be reported to the Executive Steering Committee (NJDEP, n.d.).

The Executive Steering Committee is an advisory board, which provides a forum of exchange and collaboration for committee members. The purpose is to provide input to the NJDEP Hudson River Project Team throughout all phases of the project. Furthermore, it discusses input of the Outreach Subcommittee and attempts to build consensus on the direction of the project, the project schedule, project related policy issues and concerns raised to the Mayor and the NJDEP by the public (NJDEP, n.d.). It includes the NJDEP Hudson River Project Team members and the mayors and their staff from Hoboken, Weehawken and Jersey City. It is chaired by the NJDEP Commissioner and/or his delegate (NJDEP, n.d.).

The Mayors of the three respective cities work together with the NJDEP Constituent Services Manager and the NJDEP Hudson River Project Team on the logistics and scheduling of meetings. They host the Citizen Advisory Groups' meetings and general public meetings. In addition to that, they are members of the Executive Steering Committee (NJDEP, n.d.).

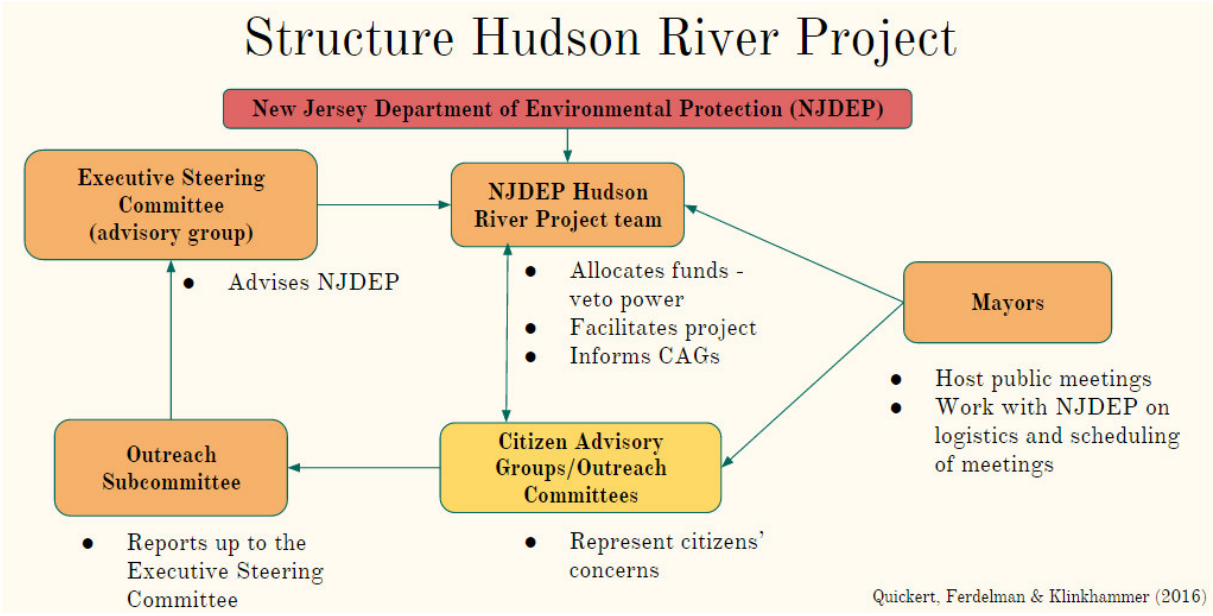

Figure 5: Organizational Structure Hudson River Project (Ferdelman et al., 2016)

2. Timeline

In order to explain the timeline of the Hudson River Project, one also has to take into account the Rebuild By Design Contest. After Hurricane Sandy hit the New York City metropolitan area in 2012, President Obama signed an Executive Order to create a Hurricane Sandy Rebuilding Task Force (U.S. Department of Housing and Urban Development, n.d. [1]). This Task Force launched the Rebuild By Design competition in June 2013, with the goal to promote innovations that lead to solutions which increase the region's resilience (U.S Department of Housing and Urban Development, n.d. [2]).

The Rebuild By Design contest had four different phases: *Talent*, *Research*, *Design*, and *Implementation*. The objective of the *Talent Phase* was to gather talent from all over the world by issuing a Request for Qualifications and Approaches, calling for interdisciplinary teams to tackle the region's vulnerabilities (Rebuild by Design, 2015). The Federal Government assured funding for the implementation of the winning designs in order to enhance participation. In August 2013, ten out of many multidisciplinary teams were selected

to participate in the contest (Rebuild by Design, 2015). In order to give them a broad understanding of the region and its vulnerabilities, the teams conducted three-months of field research in the *Research Phase* (Rebuild by Design, 2015). They were introduced to different stakeholders of the vulnerable areas in and around New York City (Rebuild by Design, 2015). The *Design Phase* went on from November 2013 until February 2014, and the teams worked together with the U.S. Department of Housing and Urban Development, as well as with stakeholder and communities, to develop their designs for increasing the region's resilience (Rebuild by Design, 2015). In the *Implementation Phase* in June 2014, the winning proposals were announced and funds were allocated respectively (Rebuild by Design, 2015).

One of the winning proposals was the Hudson River Project, and the preliminary timeline separates it into six phases. Its *Planning and Data Gathering Phase* began in the third quarter of 2015 and will end in the second quarter of 2017. In this phase the team should gather as many information as possible about the project area, such as elevations, groundwater level and so on (Rebuild By Design Hudson River, 2015). The *Feasibility Study Phase* was started in the fourth quarter of 2015 and ended in the second quarter of 2016. The purpose of this phase was to inspect the ability to finish the project successfully in terms of deadlines and other factors (Rebuild By Design Hudson River, 2015). In the *NEPA/Environmental Impact Statement/Record of Decision Phase*, the team has to develop an Environmental Impact Statement (EIS), in order to be in line with the National Environmental Policy Act (Rebuild By Design Hudson River, 2015). This phase started in the third quarter of 2015, and will probably end in the first quarter of 2017. The *Design, Permitting and Site Development Phase* will start in quarter 4 of 2016, and end in quarter 1 of 2019. Construction specifications will be developed in this phase, permits from governmental agencies have to be obtained, and a phased construction approach will be evaluated (Rebuild By Design Hudson River, 2015). Starting in the first quarter of 2019 and ending in the second quarter of 2022, the *Construction Phase's* purpose is to build the project which was agreed upon. The *Closeout Phase*, as the last one, starts in the second quarter of 2022 and end in the third quarter of 2022. It will be checked whether the construction work was conducted correctly and final contingency payments will be made (Rebuild By Design Hudson River, 2015).

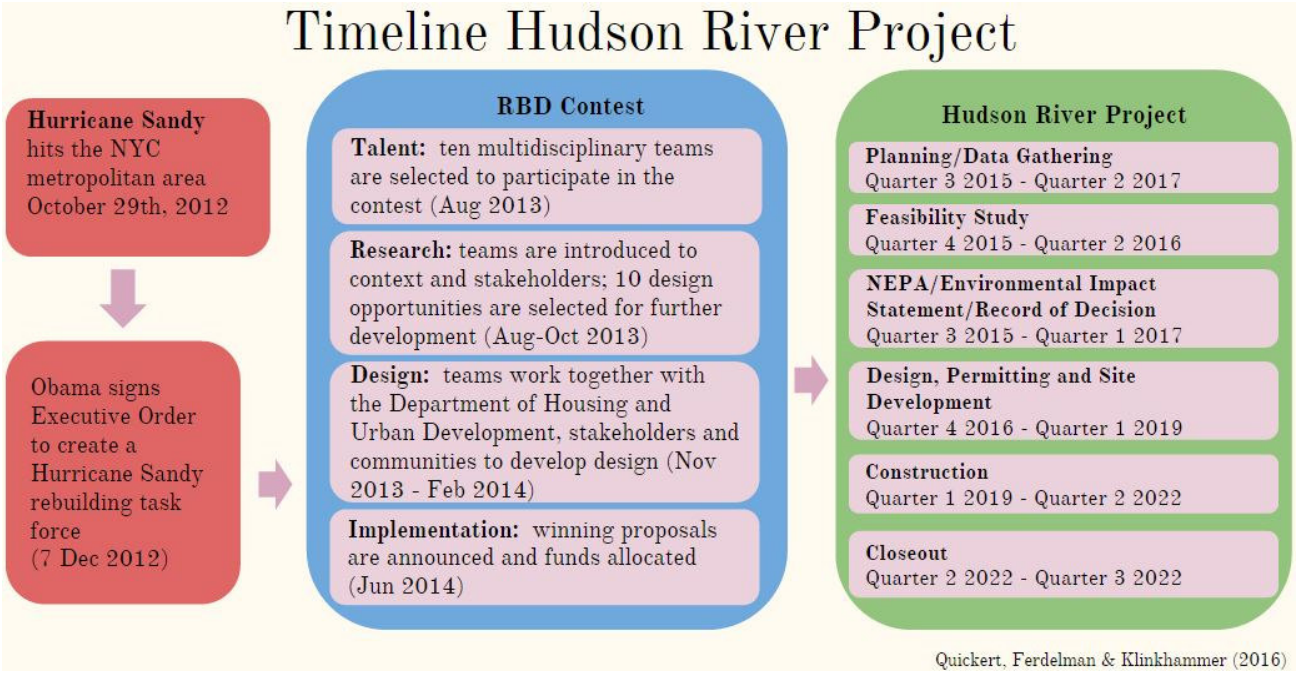

Figure 6: Timeline Hudson River Project (Ferdelman et al., 2016)

3. Stakeholders

The Stakeholders of the Hudson River project can be found online, and are located on all different levels of government as well as in the private and civil sector. The Public Stakeholders are located on the Federal Level, the New Jersey State Level, the Regional Level, and the Municipal Level. Furthermore, a vast variety of community stakeholders from Hoboken are interested in the project. A graphical illustration of the stakeholders and the different levels can be found in figures 7 and 8. A selection and prioritization of the main stakeholders in the Hudson River Project was conducted by interview partners, and can be found in Appendix b.

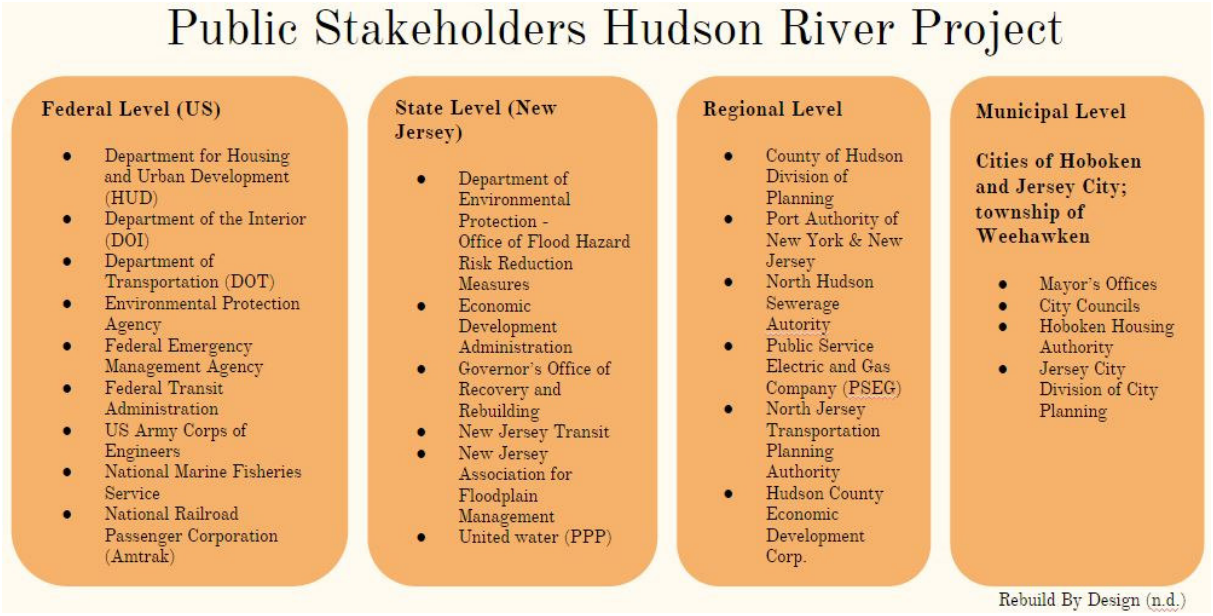

Figure 7: Public Stakeholder Hudson River Project (Rebuild By Design, n.d.-b)

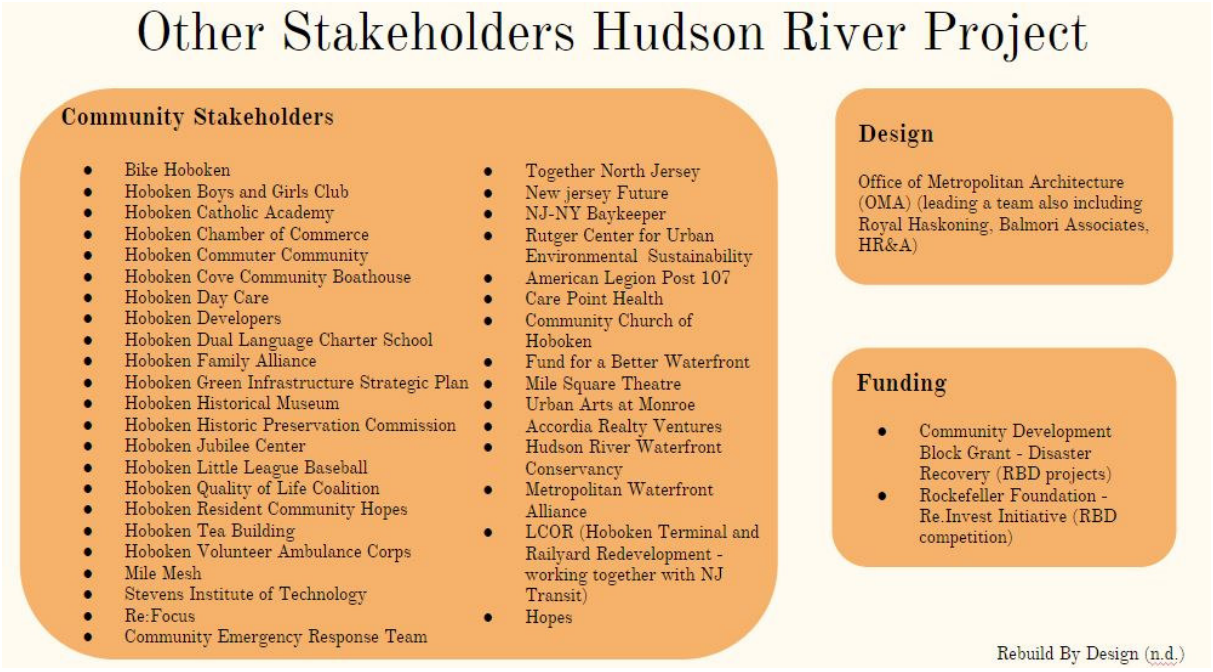

Figure 8: Other Stakeholders Hudson River Project (Rebuild By Design, n.d.-b)

c. Case Comparison

The two post-disaster resilience projects show significant differences in their organizational structures, timelines, and stakeholders. The Roombeek Resilience Project has three organizational bodies, whereas the Hudson River Project has five. These bodies have two connections in the Roombeek case, and six connections in the Hoboken case. Furthermore, while the citizens in Roombeek could decide on the designing architect and veto the final

reconstruction plan, the citizens in Hoboken can only express their concerns and bring in new ideas. They have no formal right to co-decide, which can be seen by looking at Figure 5: the citizens are no organizational body in the Hudson River Project. Instead, power is concentrated among the NJDEP Hudson River Project Team and the Executive Steering Committee.

A comparison of the timelines of both projects shows that the Roombeek Resilience Project did not only have a simpler organizational structure, but also a simpler structure in terms of time phases. The project is separated into three phases, whereby *Phase 0* was about creating the structure, *Phase 1* about creating a draft reconstruction plan, and *Phase 2* about approving the final reconstruction plan. The Hudson River Project, in contrast, consists of two different time periods: the Rebuild By Design Contest and the Hudson River Project itself. Both of these periods have a lot of phases, and in total there are ten different phases of the project. The crucial difference is that the Hudson River Project is still ongoing.

It is not possible to determine how many stakeholders the Roombeek Resilience Project had, but on the basis of interviews it is concluded that there were ten groups. All of them had high levels of support for the project, and nobody tried to oppose it. The Hudson River Project has at least 67 stakeholders, in various levels of government and the private and nonprofit sector.

Even though the aforementioned contextual and organizational differences exist, the two projects have many features in common. Both cases took place in cities of approximately the same size. Both projects are the response to a disaster which has shocked the city. Decision-makers in both cases tried to use this chance to not only go back to the pre-disaster stage, but to "build back better" and increase living quality. A crucial element of both projects is citizen participation and stakeholder involvement, and they both formally appreciate the importance of participatory politics (Denters & Klok, 2010; Rebuild By Design, n.d.-a). Furthermore, both projects are well known in their countries for using innovative approaches. The Roombeek Project is repeatedly used for best-practice comparisons of citizen participation (Denters & Klok, 2010). The Rebuild By Design competition, as the predecessor of the Hudson River project, was used as a model for other projects within the USA and the world: "President Obama launched the National Disaster Resilience Competition in June 2014, 'inspired by the success of Rebuild By Design'" (Rebuild By Design, n.d.-a), and the 100 Resilient Cities Challenge is working together with Rebuild By Design to export its practices to cities around the world (100 Resilient Cities, 2015).

4. Comparative Analysis of the two Projects

The data in Figure 9 shows the different values of the level of stakeholder involvement, the level of stakeholder fragmentation, and the adequacy of interactive decision-making for the Roombeek Project and the Hudson River Project. Those data were collected during the interviews and attended events.

	Roombeek Project	**Hudson River Project**
Level of Stakeholder Involvement	**4**	**1.75**
- Depth of Participation	4 (Coproducing)	2 (Consulting)
- Width of Participation	4	1.5
Level of Stakeholder Fragmentation	**1**	**1**
- Distribution of Power	1 (HHI: 1133.3)	1 (HHI: 1173.46938)
- Distribution of Support	1 (HHI: 1011.342)	1 (HHI: 1045.36489)
- Distribution of Urgency	1 (HHI: 1121.8)	1 (HHI: 1085.7142)
Adequacy of Interactive Decision-making	**4.15**	**3.25**
- Enrichment	4	3.5
- Variety of Ideas	4	4
- Influence of Ideas	4	3
- Actor Contentment	4.3	3

Figure 9: Data Comparison

4.1 Level of Stakeholder Involvement

By comparing the collected data on both projects in Figure 9, it becomes clear that the Roombeek Project scores much higher in the degree of stakeholder involvement than the Hudson River Project. On a scale of 1 to 5, 5 being the highest possible score of stakeholder involvement, the Roombeek Project scores 4. The Hudson River Project, in contrast, just scores 1.75. This is due to the differences in the depth and width of participation: While the depth of participation in the Roombeek Project is 4 and represents “Coproducing” in the participation ladder which Edelenbos & Klijn (2006) use, it is only 2 in the Hudson River Project and therewith represents “Consulting”. Furthermore, the Roombeek project has a width of participation of 4, whereas the Hudson River Project only has 1.5. This shows that

relatively fewer stakeholders were involved in the Hudson River Project, and these stakeholders were involved to a lesser extent.

Moreover, The Roombeek Project has a significantly higher score in the adequacy of interactive decision-making. On a scale of 1 to 5, 5 being the highest possible value, the Roombeek Project scores 4.15. The Hudson River Project, in contrast, scores 3.25. This value is composed of the enrichment of ideas and the actor contentment, and the comparison thus represents differences in that: the Roombeek Project scores 4 in the variety of ideas and 4 in the influence of ideas, which sums up to a total score of 4 in the enrichment of ideas. The Hudson River project scores 4 in the variety of ideas as well, but only 3 in the influence of ideas. This sums up to a total score of 3.5 in the enrichment of ideas. The Roombeek Project's actor contentment has a value of 4.3, whereas the Hudson River Project's actor contentment reaches 3.

Having a relatively high depth of participation with a score of 4, and a high adequacy of interactive decision-making with a score of 4.15, the depth seems to have a positive influence on the adequacy of interactive decision-making in the Roombeek Project. Several mechanisms are the reason for that. Giving somebody the chance to determine the final outcome of a process, or in other words increasing the depth of participation, shows that the project management trusts the stakeholders. It gives away power to others, which increases their satisfaction. This mechanism explains why a higher depth of participation has a positive effect on the actor contentment and the effectiveness of stakeholder involvement. Furthermore, giving more power to the stakeholders encourages them to come up with more ideas, because the project has a bigger meaning for them. This mechanism describes why a higher depth of participation leads to a higher variety of ideas. Another mechanism, which describes why it also positively affects the influence of ideas, is that stakeholders with more power will use that power to include their ideas in the project proposals. Therefore Hypothesis 1a, claiming that the depth of participation positively influences the adequacy of interactive decision-making, can only be observed in the Roombeek Project.

The width of participation is also high in the Roombeek Project; therefore it seems that it has a positive influence on the adequacy of interactive decision-making. Different mechanisms lead to this observation. First of all, giving someone the chance to participate makes that person feel taken more seriously. It therewith increases the satisfaction of that person about the whole process. Even if the person does not have the opportunity to determine the final outcome of the process, being involved contributes more to the satisfaction than not being

involved at all. This mechanism explains why a higher width of participation has a positive effect on the actor contentment, and subsequently on the adequacy of interactive decision-making. Additionally, inviting more people naturally brings up more ideas. This basic mechanism gives a reason for why a high width of participation leads to a higher variety of ideas, and consequently to a higher enrichment of ideas. However, this is no explanation for a positive effect of the width of participation on the influence of ideas. The influence of ideas is highly particular and depends on each single case. Consequently Hypothesis 1b, which says that the width of participation has a positive effect on the adequacy of interactive decision-making, can be observed in the Roombeek Project, but not in the Hudson River Project.

The above mentioned mechanisms from Hypotheses 4 and 5, which explain why a high width and depth of participation lead to a higher adequacy of interactive decision-making in the Roombeek Project, are context-related: The Roombeek Project was able to have a high width of participation because the number of stakeholders was very limited. The Hudson River Project, in contrast, has many more stakeholders. This goes hand in hand with limitations for the width of participation in form of location, personnel and finances. Also, a higher number of stakeholders, like in the Hudson River Project, make project managers hesitant to increase the depth of participation. Next to that, projects have different regulatory frameworks. It was possible to have a high depth of participation in the Roombeek Project because the responsible authorities allowed it. The Hudson River Project, in contrast, is subject to all levels of government in the US, and therewith has to stick to many regulations which dictate certain competences and responsibilities. Despite its low level of stakeholder involvement, the Hudson River Project has a relatively high level of the adequacy of interactive decision-making. It is likely that this is because of the technicality of matters: Since the Hudson River Project is about flood protection, discussed topics had a much higher technical component than in the Roombeek Project. This makes people more comfortable with not being involved or deeply involved in the decision-making, because they know that they don't have the necessary expertise. Instead, they trust the authorities and their expert knowledge. This mechanism explains why despite its low level of stakeholder involvement, the Hudson River Project still has a high level of the adequacy of interactive decision-making.

4.2 Level of Stakeholder Fragmentation

The collected data in Figure 9 shows that both projects score the value 1 in the level of stakeholder fragmentation, which is the minimum value for fragmentation. The Herfindahl-

Hirschman Indices for the distribution power, the distribution of support, and the distribution of urgency of each project are 1, meaning that all the distributions are unconcentrated. This is against the expectations of this study, which assumed that the level of stakeholder fragmentation is higher in the Hudson River Project. The explanation for both projects having a low value in the level of stakeholder fragmentation is that the need to do something about the situation was very big in both cases, so that there was a general degree of time pressure and no stakeholder wanted to oppose the project. This might be a general mechanism in post-disaster resilience projects. The initial data on the different stakeholders and their attributes can be found in Appendix b.

Both projects have a very low level of stakeholder fragmentation, and a relatively high adequacy of interactive decision-making. Several underlying mechanisms explain this relation. A non-fragmented distribution of support for the project among the stakeholders prevented a rivalry between them in both projects, which contributed to the actor contentment and the enrichment of ideas. Furthermore, the observed levels of support are very high in both projects, which prevented conflict between the stakeholders and in the end leads to a higher actor contentment. Similarly, both projects had very high and non-fragmented distributions of urgency among the stakeholders. Expectations about the time frame of the decision-making process were therewith similar, so that no stakeholder felt overrun in the end. This naturally contributed to the actor contentment. Another mechanism refers to the levels of power among the stakeholders, which were also rather non-fragmented in both projects. This non-fragmented distribution of power prevented certain stakeholders to block others or overthrow others' ideas, which again contributed to the actor contentment and to the enrichment of ideas. All these mechanisms were found in both post-disaster resilience projects, despite all their contextual differences. It is observable that these findings are in line with Hypothesis 2 in both cases, which states that the level of stakeholder fragmentation has a negative effect on the adequacy of interactive decision-making.

While both post-disaster resilience projects have the same low level of stakeholder fragmentation, the Roombeek project scores 4 in the depth of participation, whereas the Hudson River project only scores 2. The following underlying mechanisms can explain this phenomenon. When there is a high level of stakeholder fragmentation, managers of post-disaster resilience projects are hesitant to give formal powers to stakeholders, because the stakeholders have different levels of support, power, and urgency. This usually represents differences in opinions about the project too. Project managers may see this as a fragile basis

for letting the stakeholders determine the outcome of the interactive process. They rather mediate between the stakeholders and discuss, but determine the outcome themselves. This is not the case in non-fragmented stakeholder environments, which explains the high depth of participation in the Roombeek Project. This phenomenon is not observable in the Hudson River Project due to its high level of technicality. Flood protection measures require a certain degree of technical knowledge in order to be evaluated, and most citizens don't have that and have trust in authorities instead. The Hudson River Project team decided against a high depth of participation, so that the authorities can take decisions on the basis of their expert knowledge. Therefore Hypothesis 3a, which states that the level of stakeholder fragmentation negatively affects the depth of participation, is observable in the Roombeek Project, but the data of the Hudson River Project is not in line with it.

As mentioned above, both projects have the same low level of stakeholder fragmentation. Nevertheless, the Roombeek Project scores high in the width of participation, whereas the Hudson River Project scores very low. The underlying mechanism for this observation is that project managers in a fragmented stakeholder environment want to bring different stakeholders together to create dialogue and awareness for the other's situation. For instance, very concentrated levels of support mean that there are supporting and opposing stakeholders, which makes project managers feel the necessity to invite more stakeholders so that they can balance out each other. The explanation why this is observable in the Hudson River Project, but not in the Roombeek Project, is that the Roombeek Project had essentially less stakeholders. Therefore it was much easier for this project to achieve a high width of participation, even if the stakeholder environment is not fragmented. Hypothesis 3b, which claims that the level of stakeholder fragmentation positively affects the width of participation, is observable in the Hudson River Project, but the data of the Roombeek Project is not in line with it.

Hypothesis 1a states that the depth of participation positively affects the adequacy of interactive decision-making. As stated above, that is observable in the Roombeek Project, but not in the Hudson River Project. A negative moderating effect of the level of stakeholder fragmentation on the influence mentioned in Hypothesis 1a can be observed in the Roombeek Project, because it has the lowest possible value of stakeholder fragmentation, whereas the initial effect of the depth of participation on the adequacy of interactive decision-making is very strong. The Hudson River Project, in contrast, does not have a positive effect of the depth of participation on the adequacy of interactive decision-making. It scores higher in the

adequacy of interactive decision-making than hypothesis 1a would expect it to due to its low depth of participation. The level of stakeholder fragmentation does not seem to have a negative moderating effect here, because otherwise the adequacy of interactive decision-making in the Hudson River Project should be lower. This can be explained by the technicality of matters. The Hudson River Project is very technical because it is about flood protection, which gives the stakeholders completely different expectations about the depth of participation. Therefore Hypothesis 4a, which states that the level of stakeholder fragmentation negatively affects the influence of the depth of participation on the adequacy of interactive decision-making, is observable in the Roombeek Project, but not in the Hudson River Project.

Hypothesis 1b claims that the width of participation positively affects the adequacy of interactive decision-making, and it was already stated that this is observable in the Roombeek Project, but not in the Hudson River Project. In the Roombeek Project, a negative moderating effect of the level of stakeholder fragmentation on the influence mentioned in Hypothesis 1b can be observed, because there is a strong effect of the width of participation on the adequacy of interactive decision-making, while the level of stakeholder fragmentation has the lowest possible value. In the Hudson River Project, however, the positive effect of the width of participation on the adequacy of interactive decision-making is not given. Even though its width of participation is very low, it scores higher in the adequacy of interactive decision-making than expected. A negatively moderating effect of the level of stakeholder fragmentation on the influence mentioned in Hypothesis 1b would be indicated by a lower adequacy of interactive decision-making here. Just like for Hypothesis 4a, a reason for this difference is the technicality of matters. Many stakeholders don't expect to be invited when it is about matters which are as technical as in the Hudson River Project. This is why Hypothesis 4b, which claims that the level of stakeholder fragmentation negatively affects the influence of the width of participation on the adequacy of interactive decision-making, is observable in the Roombeek Project, but not in the Hudson River Project.

5. Discussion and Conclusion

After conducting in-depth studies of the post-disaster resilience projects in Roombeek and Hoboken, it becomes clear that the two cases have important contextual and organizational differences. Most importantly for this study, the level of stakeholder involvement, both in terms of width and depth, was much higher in the Roombeek Project than it is in the Hudson

River Project. This is partly because of contextual differences: The Hudson River Project has more stakeholders than the Roombeek Project, and a greater variety of levels of government is involved. This makes the Hudson River Project subject to more regulations than the Roombeek Project. Furthermore, the adequacy of interactive decision-making in the Roombeek Project is indeed higher than in the Hudson River Project, but the difference is not too big. Both projects score relatively high in this. However, both projects face the same minimum level of stakeholder fragmentation. This is because they are both post-disaster resilience projects, which usually have unconcentrated levels of support and urgency among the stakeholders because of the extraordinary situation and the need to act. Based on the gathered data it can be said that:

- Hypothesis 1a is observable only in the Roombeek Project,
- Hypothesis 1b is observable only in the Roombeek Project,
- Hypothesis 2 is observable in both Projects,
- Hypothesis 3a is observable only in the Roombeek Project,
- Hypothesis 3b is observable only in the Hudson River Project,
- Hypothesis 4a is observable only in the Roombeek Project,
- Hypothesis 4b is observable only in the Roombeek Project.

Hence, this study comes to the following conclusions, by answering the initial research questions.

Q1: *To what extent and how did the level of stakeholder fragmentation of the post-disaster resilience projects in Roombeek and Hoboken affect the adequacy of interactive decision-making?*

Since both projects have the lowest level of stakeholder fragmentation possible, there was no decrease in the adequacy of interactive decision-making. On the contrary, it is observable that there are high levels of the adequacy of interactive decision-making in both projects. Therefore the level of stakeholder fragmentation influenced the adequacy of interactive decision-making, but did not decrease it because of its minimum level. Both cases seem to have non-fragmented stakeholder environments because both cases are post-disaster resilience projects. These projects naturally have a rather non-fragmented stakeholder environment because usually all stakeholders support the project. At the same time, it is clear to everybody that action has to be taken soon, which is why the levels of urgency among the stakeholders

are rather equally distributed as well. Even though the levels of power among the stakeholders might be unequally distributed it is expectable that the levels of urgency and support, which make up two thirds of the level of stakeholder fragmentation, are rather equally distributed among the stakeholders. This minimum level of stakeholder fragmentation prevented rivalries between the stakeholders in both projects, because the levels of support were rather equally distributed. Moreover, conflicts between public and private stakeholder groups were prevented because the levels of support for the project were rather high in both cases. Additionally, no stakeholder felt overrun because the levels of urgency were not unequally distributed, which means that the stakeholders had comparable expectations about the time frame of the decision-making process. Finally, the levels of power among the stakeholder were rather equally distributed as well, which prevented 'strong' stakeholders to dominate 'weak' ones. All these mechanisms explain how the level of stakeholder fragmentation affects the adequacy of interactive decision-making in the post-disaster resilience projects in Roombeek and Hoboken.

Q2: *To what extent is the effect of the level of stakeholder involvement on the adequacy of interactive decision-making moderated by the level of stakeholder fragmentation in the post-disaster resilience projects in Roombeek and Hoboken?*

The significant differences in the level of stakeholder involvement in both projects lead to different levels of the adequacy of interactive decision-making. It is observable that in the Roombeek Project this effect is moderated by the level of stakeholder fragmentation. The effect of the depth and width of participation on the adequacy of interactive decision-making should get weaker in that project if the level of stakeholder fragmentation increases. In contrast to that, this moderating effect is not observable in the Hudson River Project, neither for the depth nor for the width of participation. This is because of one crucial difference of both projects. The Hudson River Project has a much higher technicality of matters. While in the Roombeek Project many topics are mainly about personal interest and preferences, the Hudson River has to decide on many highly technical questions related to flood protection. It is difficult for stakeholder to decide on these questions, and most stakeholder rather want the authorities with their technical expertise decide on that. If the level of stakeholder fragmentation gets higher in the Roombeek Project, stakeholders would start working for their own interest and against each other, which decreases the positive effect of the level of stakeholder involvement on the adequacy of interactive decision-making. Even though

stakeholder involvement is helpful in the Roombeek Project, stakeholders would be less satisfied and fewer ideas would come up in a more fragmented stakeholder environment. If the level of stakeholder gets higher in the Hudson River Project, there would be no effect of the influence of the level of stakeholder involvement on the adequacy of interactive decision-making. Stakeholders have much less room to only follow their own interests in that project, because they have to choose between technical solutions to flooding. Therefore the effect of stakeholder involvement is more stable in the Hudson River Project when it comes to stakeholder fragmentation

The results of this study do not only bring in new aspects on stakeholder involvement in post-disaster resilience projects, but also shed light on the role of stakeholder fragmentation in that. In addition, this study contributes to the knowledge on interactive decision-making, by looking at the effect of stakeholder involvement and stakeholder fragmentation on that. It can be said that stakeholder involvement positively influences the adequacy of interactive decision-making. Apart from that, this study showed that due to the extreme particularity of every single post-disaster resilience project, it is hard to draw general conclusions.

This study only compared two post-disaster resilience projects, which limits the generalizability of its findings. Many aspects are context-related because of the high particularity of post-disaster resilience projects. Furthermore, the operationalization of this study is too big parts based on subjective statements of interview partners, which further limits the generalizability. Future research can therefore contribute to this topic by finding more objective measures of stakeholder fragmentation, stakeholder involvement and the adequacy of interactive decision-making. Using these more objective measures, a comparison of projects with different levels of stakeholder fragmentation would be useful to see whether the effects found in this study can still be observed. A comparison of projects which have similar levels of stakeholder involvement, but different levels of stakeholder fragmentation, would also help to find out more about this topic. One specific aspect which should be further elaborated on in future research is the technicality of matters. This aspect seems to play a big role in post-disaster resilience projects and interactive decision-making process, but there is still a lack of literature on it.

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7. Appendices

a. Definition of attributed values

- **Level of Power (1-4)**
  - 1 = There is no chance in which the stakeholder could influence the outcome of the project.
  - 2 = The stakeholder can influence the outcome of the project to some extent.
  - 3 = The stakeholder can influence the outcome of the project to a large extent.
  - 4 = The stakeholder can "kill" the project.
- **Level of Urgency (1-5)**
  - 1 = There is little need for action outside of routine communications.
  - 2 = There is time, but some actions need to be taken outside of routine communications.
  - 3 = Action will be required in the near future.
  - 4 = Action is required very soon.
  - 5 = Immediate action is required.
- **Level of Support (1-5)**
  - 1 = Active opposition
  - 2 = Passive opposition
  - 3 = Neutral
  - 4 = Passive Support
  - 5 = Active support
- **Variety of ideas (1-5)**
  - 1 = No new ideas came up during the interactive process.
  - 2 = Some new ideas came up during the interactive process.
  - 3 = A fair amount of ideas came up during the interactive process.
  - 4 = Many new ideas came up during the interactive process.
  - 5 = The amount of new ideas which came up during the interactive process was very high and unexpected.
- **Influence of ideas (1-5)**
  - 1 = None of the new ideas can be found in the final result.
  - 2 =Only a few of the new ideas can be found in the final result.
  - 3 =A fair amount of the new ideas can be found in the final result.
  - 4 =Many of the new ideas can be found in the final result.

- 5 = All of the new ideas can be found in the final result.

- **Actor contentment (1-5)**
  - 1 =All stakeholders were unsatisfied with the outcome of the project.
  - 2 = Most of the stakeholders were unsatisfied with the outcome of the project.
  - 3 = The satisfaction about the outcome of the project was mixed.
  - 4 =Most of the stakeholders were satisfied with the outcome of the project.
  - 5 = All stakeholders were satisfied with the outcome of the project.
- **Width of participation (1-5)**
  - 1 = Very narrow
  - 2 =Narrow
  - 3 =Medium
  - 4 = Wide
  - 5 = Very wide
- **Depth of participation (Edelenbos & Klijn, 2006)**
  - 1 = "*Informing*: To a large degree, politicians and administration determine the agenda for decision making and inform those involved. They will not use the opportunity to invite interested actors to have input in policy development."
  - 2 = "*Consulting*: To a large degree, politicians and administration determine the agenda but regard those involved as a useful discussion partner in the development of policy. Politicians do not, however, commit to the results of these decisions."
  - 3 = "*Advising*: In principle politicians and administration determine the agenda but give those involved the opportunity to raise problems and formulate solutions. These involved actors play a full-fledged role in the development of policy. Politicians are committed to the results in principle but may deviate (if accounted for) for them in the final decision making."
  - 4 = "*Coproducing*: Together politicians, administration, and those involved determine a problem-solving agenda in which they search for solutions together. Politicians are committed to these solutions with regard to the final decision making, after having tested this outcome in terms of a priori conditions."
  - 5 = "*Co-deciding*: Politicians and administration leave the development and decision making of policy to those involved, and the civil service provides an

advising role. Politicians simply accept the outcomes. The results of the process have an immediate binding force."

b. Stakeholder Attributes

The following data is provided by the interview partners.

	Power (1-4)	**Urgency (1-5)**	**Support (1-5)**
City Council = Board (College = Mayor and Alderman)	4	3	4
City Council (Gemeenteraad; elected politicians)	4	4	5
Housing Corporation 1	4	5	5
Housing Corporation 2	4	5	5
Organization of victims (citizens)	4	5	5
Organization of employers	3	5	5
2 local schools	2	4	4
Artists of area	2	4	5
2 local mosques	1	1	4
Neighborhood Management	2	2	4

Stakeholder Attributes Roombeek Project

	Power (1-4)	**Urgency (1-5)**	**Support (1-5)**
Waterfront Property Owners	3[1]	2	3
New Jersey Department of Environmental Protection (NJDEP)	4	5	5
Department of Housing and Urban Development (HUD)	4	3	4
Dewberry	1	5	5
Operating Engineers/Labor Unions	1	2	3
Resident Associations	3	3	3
Hoboken Mayor's Office	4	4	5

[1] This number is derived from the interviews

Weehawken Mayor's Office	4	4	4
Jersey City Mayor's Office	2	4	4
North Hudson Sewerage Authority	2	3	3

Stakeholder Attributes Hudson River Project