

Private sector participation in flood proof urban development projects



A comparative case study of integrating flood protection measures into urban development projects in the Netherlands.

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For those who provided new insights

What did I get myself into? For two years I had no social life, my friends felt neglected and wondered what was wrong with me not going out with them and my boyfriend wanted to throw my computer out several times. Well, at least for the last nine months. So did I.

But I would do it all again. The Master of City Developer provided me with more insight in how things work in urban development projects. The teachers inspired me and challenged me. My classmates became my dear friends, especially De Bende: five men with great humor and good intelligence.

When the time came to start writing the thesis I wondered why there were no reports written in English. Master of City Developer is an English title. Therefore, I decided to write my thesis in English. I got the support from Tom Daamen to do so. I have to admit: there were days I could shoot myself. But Tom always inspired me to continue writing in English. Thank you for that Tom. And thank you for your patience and your time and effort. You truly have the ability to inspire people and provide them with new insights.

I want to thank all the people I interviewed, especially John Jacobs who on his free day travelled to Rotterdam to explain me how things work. I want to thank my colleagues for their support. I also want to thank my mother and brother for putting it all in perspective and supporting me. And off course Lennart van Bommel, who supported me and made me laugh while writing my thesis. 😊

Preface

“Het is overdreven te beweren dat wetenschappers de waarheid in pacht hebben – daar is de wereld te complex voor en het menselijk denkvermogen te beperkt – maar nadenken en onderling gedelibereer bieden perspectieven op de wereld en het leven. En het gaat nu om perspectief (Klamer, 2005, p.12).”
“I would exaggerate stating that scientists are able to offer the truth – the world is too complex for the human intellect – but to think and to deliberate offers perspectives on the world and life. And it is all about perspective (Klamer, 2005: 12).”

Science offers questions a serious change. Professor Klamer of the Erasmus University taught me that during the Master Cultural Entrepreneurship & Cultural Economics. I also experienced this during the Master of City Developer (MCD). The latter offered an extra dimension to my work.

From 2008 until 2014, I have worked as a project manager for urban development for the municipality of Rotterdam. For Rotterdam urban development projects are essential to reach social and economic goals. The aim is to contribute to the development of the city of Rotterdam according to its political goals. The focus lies on the effects on the long term. However, different actors are involved in urban development projects and they all have different interests. This makes it complex and the process dynamic.

The Master of City Developer emphasizes that in order to be able to be successful in urban development projects you need the ability to look at the development from the different perspectives the involved actors have. A clear overview of the context is important. The different theories as well as my classmates gave me the tool to do so. Therefore I could learn not only from new developments and the scientific perspective on my job but also from reality.

When I was involved in the redevelopment of the neighborhood Feijenoord in Rotterdam, I developed an interest for urban planning strategies focusing on dealing with the rising sea level and thus with a risk of flooding. Rotterdam is a delta city and has to be able to deal with consequences of climate change. The risk of flooding, as a consequence of the rising water level, is one of the issues Rotterdam has to deal with. Feijenoord is a part of the city that is located near the river The New Meuse (Nieuwe Maas). At the moment Rotterdam is experimenting with integrating flood protection in urban development projects. Feijenoord is one of the pilot projects to learn how you could integrate flood protection in an integral urban development project.

For this thesis I chose to learn more about several new perspectives. I operate from a governmental point of view, the one of the local government of Rotterdam. I chose to learn more about the perspective of the private sector. I combined this interest with my other interest I dealt with in my work: integrating flood protection in urban development projects.

With this thesis I present my discoveries when it comes to private sector participation in flood protection integrated in urban development projects in delta cities in the Netherlands. The insights could be useful to other delta cities in the world, so that is why this thesis with a typical Dutch topic is written in English.

Summary

Main question and sub questions

Floods are a serious threat for the Netherlands. The majority of the Netherlands lies beneath sea level. Since the great North Sea flood in the Netherlands in 1953, which caused 1,836 victims and widespread property damage, the state focused on protecting the country against floods by building dikes and dunes.

Recently, representatives of the national government explored different strategies to protect the country from flooding. The ambition of the state is to work as efficiently as possible with the money available when it comes to flood protection. One of the strategies is to integrate flood protection in urban development projects and share responsibility for flood protection with private actors like real estate developers.

Because the state is responsible for flood protection in the Netherlands, there is not much knowledge yet when it comes to private sector participation in flood protection measures. Why would they want to participate? At the moment of writing this thesis, there are only a few urban development projects going on that include flood prevention as an integrated element.¹ Flood protection has always been a part of the urban landscape, but it has not been an integral part of urban development projects in the sense that it serves functions other than just flood protection. In order to expand the knowledge of private sector participation in flood protection within urban development projects, this thesis focuses on finding out if, and if so, why private actors do (or do not) participate.

The aim of this thesis is to better understand the motives for private actors to (financially) participate in flood protective urban development projects. From a governmental point of view, knowledge of what motivates private actors to participate will contribute to the implementation of plans and share responsibilities, risks and investments. From a scientific point of view, this thesis aims to contribute to a better understanding of possible local flood risk strategies in urban development projects in the Netherlands.

With the help of the theories of institutionalism and contemporary ideas of how actors should act in sustainable urban development projects, the following main question will be explored:

What institutions influence financial private sector participation in Dutch urban development projects that seek to integrate flood protection measures into the development scheme?

To be able to answer this question the following sub questions will be answered first:

What motives can private actors have to financially participate in flood protection measures in urban development projects? (H2)

What institutions can be expected to influence private sector participation in flood protection measures in the Netherlands? (H3)

¹ See annex 1, the interviews with the experts point out that according to them there are not much urban development projects in the Netherlands that fulfill the criteria that were chosen for the selection of the cases.

To what extent do private actors actually participate in flood protection measures in urban development projects in the Netherlands? (H4 and H5)

To what extent are the institutions formulated in H3 apparent in the actions of private actors in the cases studied? (H6)

Two Dutch flood proof urban development projects were studied to answer these questions: in Heijplaat and in Streefkerk.

The cases are selected based on the following criteria:

- Urban development projects that are located in the Dutch delta
- where flood protection measures are an integral part of the development project
- public and private parties are involved
- and where the flood protection measures are already realized or being realized.

The last criterion has to do with that financial participation of the private actor in this case is already clear and formalized.

Analytical framework

The answers given will only be based on two Dutch flood proof urban development projects. However, the theory of structuration and theories concerning sustainable entrepreneurship help to interpret the cases, and also answer the above question in a more general way.

The theory of structuration forms the basis for the analytical framework of this thesis. The theory stresses that institutions consist of both formal and informal rules that shape the actions of individuals, organizations, groups or other actors and vice versa (Daamen & Vries, 2012: 2). According to Giddens (1984), formal and informal rules or institutions are structures operating on a macro level. The actions of actors operate on a micro level. He stresses that both structures and actions of actors influence each other and that structures and actions are connected through 'social practice' (Giddens, 1984: 25).

In this study, the focus is on formal and informal rules with regard to flood protection measures in Dutch urban development projects. The actions of the actors are analyzed by assuming they will behave in a certain way regarding their participation in realizing flood protection measures. The potential motives for private sector participation are derived from business management theories on sustainable entrepreneurship (Hart and Milstein, Jonker, Van Tilburg et al.).

In the Netherlands the Dutch government is legally responsible for flood protection. The main public actors responsible are the Water Boards and the Ministry of Infrastructure and Environment. Together, they are responsible for the main infrastructure of flood protection. The Provinces and the Municipalities have a responsibility too. The goal of the Dutch government is to keep "dry feet" on the long term (hundreds of years to come). The Dutch government wants to share responsibilities with other actors than the government. One reason for this is that in order for the government to keep on doing her job citizens need to be more aware of the risks of flooding Heems and Kothuis (20132). Another reason is that the government wants to work as efficiently as possible with the money available.

One of the strategies chosen to reach this goal is multi-level security. This means that whereas in the past all attention and most of the budget was given to preventing floods by establishing dikes, nowadays efforts are underway to also investigate the potential of spatial planning and disaster management. Areas that are vulnerable to floods at the moment, like the areas near the river the Meuse, IJssel, Waal and the area near Rotterdam and Dordrecht (Rijnmond-Drechtsteden), have to be on the priority list. However, if more traditional measures such as repairing the dikes or making room for the river cannot be integrated in the built environment or is simply too expensive, other measures are introduced like flood proof urban development projects or evacuation strategies.

The following assumption has been made in this thesis concerning financial private sector participation: in flood proof urban development projects, the Dutch state stimulates public and private actors to cooperate and focus on a sustainable future for society. For this thesis, this was considered as an emerging Dutch institution. Therefore, it was hypothesized that private actors involved in the urban development project do financially participate in flood protection measures (in every phase of the development process). They do this because the Dutch state stimulates public and private actors to cooperate, share responsibility and focus on a sustainable future for society. Hence, private actors do not only want to reduce risks and costs, but also want to contribute to a sustainable future for society.

In order to test this hypothesis, the behavior of the private actors in two flood proof urban development projects have been analyzed by conducting interviews and studying policy documents and development agreements.

The cases

Housing association Woonbron, the Port of Rotterdam and the Municipality of Rotterdam initiated the development of Heijplaat and RDM. They invested time and effort in the initiation phase. Together with other actors they signed the partnership agreement "Samenwerkingsovereenkomst gebiedsontwikkeling Heijplaat 2". They set sustainable goals together including flood protection measures that would protect the whole village, so not only the new houses.

For Heijplaat the assumption that private actors do financially participate in flood protection measures during every phase of the development process (the initiation phase, the feasibility phase, the realization phase and the operation phase) is partially valid. Together with the Municipality of Rotterdam the private actors defined sustainable development as developments that will lead to an improvement of the social, ecological as well as economic situation of Heijplaat and the RDM. Flood protection for the whole village is considered as a sustainable measure by the actors involved. This indicates that they believe a flood-proof urban development is more sustainable. The motivation, therefore, is not only to reduce risk and cost, but also to create long-term value and make a contribution to society as a whole. Although the Port of Rotterdam wanted to pay for the realization of flood protection (on the Heysekade), the Municipality of Rotterdam decided to take care of that.

The private actors involved in the urban development project in Streefkerk are the marina, Housing association Beter Wonen HBC planontwikkeling and Gebroeders Blokland B.V. .The Municipality and the Water Board decided only to include the marina in the development of the climate dike. The Water Boards' main interest is developing the dike as part of the KiS project. The KiS project focusses on the

reinforcement of about 10 kilometers of dike including the development of a climate dike in Streefkerk. They needed to include the marina because they needed extra land owned by the marina for the development of the climate dike. The Municipality included the marina for the same reason.

For Streefkerk the assumption that private actors do financially participate in flood protection measures during every phase of the development process (the initiation phase, the feasibility phase, the realization phase and the operation phase) is flawed. The marina participated by selling or trading land in order to expand the marina. They did this for financial reasons: more income through the extra anchorage grounds. In Streefkerk only the marina was directly involved in the development of the climate dike. The other private actors were not involved although the development of the dike does affect their real estate developments inside the dike.

Remarkable in both cases is the behavior of the public actors involved. The Municipality of Molenwaard and the Water Board Rivierenland did not include the private actors involved in the urban development of Streefkerk inside the dike in the development of the climate dike. The Municipality of Rotterdam decided to not involve the private actors during the realization and maintenance phase although the Port of Rotterdam was willing to financially contribute to the realization of flood protection measures. Why not? In this thesis it becomes clear that the Dutch government wants to share responsibility regarding flood protection. So why did the public actors involve in especially Streefkerk did not involve the private actors responsible for the real estate developments inside the dike? What influenced this behavior?

Conclusion and recommendations

The main question is: What institutions influence financial private sector participation in Dutch urban development projects that seek to integrate flood protection measures into the development scheme? The answer to this question is that the emerging Dutch institution of sharing responsibilities concerning flood protection among public and private actors is competing with the institution that holds that the government is the only one responsible for "keeping our feet dry". This competition is apparent in Dutch practice since we have found that the new line of thinking does seem to affect financial private sector participation in the flood proof urban development project of Heijplaat. However, in Heijplaat as well as in Streefkerk, the Dutch institution that the government is legally responsible for flood protection still is dominant in influencing the behavior of the different levels of the government. This affects financial private sector participation in Dutch urban development projects that seek to integrate flood protection measures into the development scheme in a negative manner. It influences different levels of the government to stay in control and not sharing responsibility and therefore costs. Four recommendations were made based on this conclusion:

1. Set flood proof goals together with all actors financially involved during the initiation phase of the integral urban development project. This way, all actors can figure out themselves if it is of any interest for them to financially participate or not.

2. In order to share responsibility and costs, the Dutch government should focus on raising awareness of the possible financial interest of flood protection for the private actor involved.

3. The government should stay in control of sustainable flood proof urban development projects while sharing responsibilities and costs. The Dutch government could accomplish this by using the planning instruments they already have in flood protection as well as in urban development more effectively.

4. The different levels of the government dealing with flood protection or with urban development projects should exchange knowledge and (legal) instruments to be able to integrate flood protection in urban development projects. When it comes to maintaining flood proof buildings, for example, the legal tool the Water Boards use are much more suited than the development plan used for real estate developments.

1 Introduction

The focus of this thesis is private sector participation in flood protection integrated in urban developments in the Netherlands. This chapter introduces the topic.

1.1 Flood proof urban development projects in the Netherlands

The dynamics of contemporary urban life, like social and economic developments, can create great complexity in the management of cities and urban development projects. Since 2008, urban development projects in the Netherlands are heavily challenged by effects of the economic and financial crisis. The downturn in property markets has brought actors involved to rediscover the demand side of the market. Actors which are involved in urban development projects, like local governments or real estate developers, started to reinvent their role and re-assess governance structure around their projects. New ways to finance property developments were and still are explored. Inviting third parties to join the project is a much used alternative. De Zeeuw (2011), for example, lists a few ideas typical to Dutch urban planning and development practice nowadays:

- The end user is leading: a focus on what the end user wants to buy or let;
- Actors other than the traditional partners are included in the process of development to add value and reinvent their role: municipalities want to facilitate urban development projects instead of developing themselves;
- Real estate developers are reinventing their role in area-based projects;
- Actors are looking for new co-operation and revenue models;
- The national government is experimenting with new laws and legislations.

While the effects of the crisis are still present, cities are challenged by another factor as well: climate change. Extreme weather events, melting glaciers and rising sea levels due to the climate change are impacting the world as we speak.

In 2010, an international conference 'Deltas in Time of Climate change' was organized in Rotterdam. The goal of the conference was to explore the different aspects of climate adaptation and the various challenges delta cities in the world face nowadays. According to the organization of the conference, "it is estimated that more than two thirds of the world's large cities will be vulnerable to rising sea levels and climate change, with millions of people being exposed to the risk of extreme floods and storms. Around 2050, the majority of the world's population will live in cities in or near deltas, estuaries or coastal zones, resulting in even more people living in highly exposed areas."² Cities like Rotterdam, New York, Jakarta, London, New Orleans, Hong Kong, Tokyo and Ho Chi Minh City participated. One of the outcomes was that, although every delta city faces different challenges, each city could learn from the other participating cities. In September 2014 Rotterdam, hosted the next Cities in Climate Change Conference.

Because the signs of climate change are becoming increasingly clear - like floods caused by the rising sea level as well as heavy rainfall and stringent European requirements on the quality of water - the Municipality of Rotterdam decided to develop a water plan together with the Water Boards.³ This plan

² www.climatedeltaconference.org/results

³ Waterplan 2 Rotterdam.

was developed in 2007 and the scenarios of the current plan are made until 2030. The Dutch Water Boards are governmental organizations responsible for the storage of water, the quality of the water and flood protection. This plan describes how the Rotterdam municipality and the Water Boards want to deal with the city's water in the upcoming period.

One of the main issues of the water plan is to make sure the city stays an attractive place to live, work and spend leisure time while in the meantime making sure the city is climate proof. When it comes to flood protection, this issue is especially relevant for parts of the city located inside and outside the dike. This means realizing measures like the reinforcement of dikes and quays themselves, but also measures that prevent new buildings outside dikes to flood. Because all these measures have a physical impact, water managers and urban planners in Rotterdam decided that they should collaborate to integrate these measures in future urban development projects.⁴ From a governmental point of view, it is interesting to find out if this also has an effect on the behavior of the actors involved in urban development projects, specifically when it comes to the behavior of private actors like real estate developers.

1.2 Relevance of the research

Relevance for urban development

Floods are a serious threat. Since the great North Sea flood in the Netherlands in 1953, which caused 1,836 victims and widespread property damage, the state focused on protecting the country against floods by building dikes and dunes. One of the most famous water defense systems in the world was built because of this flood: the Measlandkering.



Images 1 and 2: The Measlandkering while closed

⁴ Waterplan 2 Rotterdam, p. 189.

The majority of the Dutch country lies beneath sea level (NAP). Figure 1 shows that the Netherlands is highly susceptible to both sea-level rise and river flooding; 26% of the country is below sea level, 59% of the country is vulnerable for floods and 55% is protected by dikes and dunes.⁵

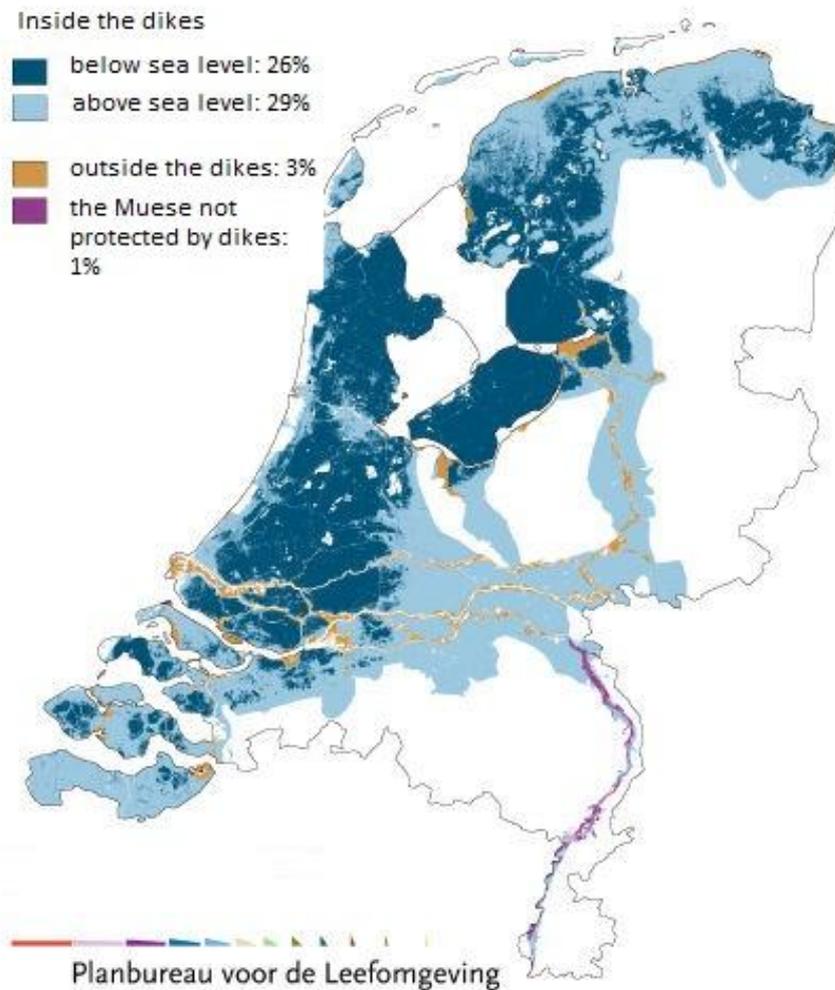


Figure 1: Susceptibility of the Netherlands to both sea-level rise and river flooding based on location below sea level, PBL Netherlands Environmental Assessment Agency, 2007.

The ambition of the state is to work as efficiently as possible with the money available when it comes to flood protection. Furthermore, the Dutch government is increasingly looking for ways to integrate this in urban development schemes: "There are two main strategies with which we can respond to the increased flood risk: a regional-preventive and a local-adaptive strategy. The regional preventive strategy focuses on reducing the probability of urban fluvial and coastal flood risk by passive, robust solutions, such as urban water defenses and major interventions in the Dutch delta (...). A local adaptive strategy focuses on adaptation on a local scale by integrating flood risk management measures with urban

⁵ www.pbl.nl/dossiers/klimaatverandering/content/correctie-formulering-over-overstromomgsrisico

functions, using the dynamics of urban development processes. This approach aims to reduce the consequences of an inundation by promoting flood resilience architecture and local adaptive measures in flood-prone areas” (Van Veelen, 2013:12).

The strategy to integrate flood protection in urban development projects effectively means that the private or semi-public sector needs to take measures and thus take partial responsibility for the protection of a certain area. In theory, this principle could be applied on a local, area-based scale by integrating flood risk management measures in the development of new urban functions. Van Veelen and Stone (2013) developed a method that is based on this principle: Adaptation Pathways. This method helps the multiple stakeholders in the development project to select different measures to protect a certain area against future floods. According to Van Veelen and Stone (2013), the goal of the Adaptation Pathways methodology is to select a set of different measures that are either robust or flexible. The measures should contribute to certain aims that the different stakeholders set together as part of, and integrated in, urban development projects.

The fact that the Dutch government wants to integrate flood protection in urban development projects implies that the government wants to share the responsibility for flood protection with private actors like real estate developers. This presumes that public and private actors involved in urban development have a mutual interest when it comes to flood protection. In the case of, for example, real estate developers, this particular mutual interest could be that it would protect their real estate and that it will add value to the location in which actors are investing. Does this mean that private actors, like real estate developers, will actually share this responsibility with the government? And if so, how exactly? From a government point of view, it is relevant to find out.

Scientific relevance

“There is a tremendous amount of expertise in the Netherlands. Other parts of the World have a great need for this expertise. What I’m learning here is that you have to design your environment in such a way that it is adaptable. The idea of robust construction appears to last for only a limited time, 40 to 50 years.”⁶

The American professor Peter Bosselmann (Architecture, City & Regional Planning, Landscape Architecture and Urban Design) from Berkeley University studies delta cities. During his stay as visiting professor in Delft, he reached the conclusion that the world could learn a lot from the adaptability of cities in The Netherlands.

The Netherlands are extremely experienced in dealing with floods. Recently, representatives of the national government explored different strategies to protect the country from flooding together with researchers. One of the strategies is to integrate flood protection in urban development projects. Moreover, different measures were developed to protect cities of rising water levels. An example is the report of Tromp et al. (2012), who analyzed different water defense systems like buildings that function as dikes or other measures such as floating cities. Van Veelen (2013) analyzed different sets of adaptive measures to determine a flood proof strategy for the unembanked areas of Feijenoord and Noordereiland in the city of Rotterdam. The new approach of the Dutch national government is to both

⁶ Interview met Peter Bosselmann on the website gebiedsontwikkeling.nu

focus on reducing the risks of flooding as well as on the reduction of the effects of flooding. This offers a set of measures that could be used in adaptive strategies. Van Veelen (2013: 65) explains:

“A major challenge for a local adaptive flood risk strategy is to reach an agreement of a mutually acceptable distribution of costs and benefits on the short and long term, and in addition develop workable arrangements to secure responsibilities, risks and investments in the long term. An important condition for a local adaptive flood risk strategy is a clear responsibility distribution. Which public or private party should take the responsibility for maintenance and daily management and which one is responsible for the long-term implementation of the local flood risk strategy? It is necessary to have a debate on public and private responsibilities regarding flood risk.”

This thesis aims to contribute to the debate outlined here by Van Veelen. Because the state is responsible for flood protection in the Netherlands, there is not much knowledge yet when it comes to private sector participation in flood protection measures. Why would they want to participate? At the moment of writing this thesis, there are only a few urban development projects going on that include flood prevention as an integrated element.⁷ Flood protection has always been a part of the urban landscape, but it has not been an integral part of new development in the sense that it serves functions other than just flood protection. In order to expand the knowledge of private sector participation in flood protection within urban development projects, this thesis focuses on finding out if, and if so, why private actors do (or do not) participate.

1.3 Aim of the research

The aim of this thesis is to better understand the motives for private actors to (financially) participate in flood protective urban development projects. From a governmental point of view, knowledge of what motivates private actors to participate will contribute to the implementation of plans and share responsibilities, risks and investments. From a scientific point of view, this thesis aims to contribute to a better understanding of possible local flood risk strategies in urban development projects in the Netherlands.

To be able to successfully pursue this aim, this thesis will focus on the behavior of private actors involved and on financial participation in flood protection measures in urban development projects in the Netherlands.

1.4 Main question and sub questions

In urban development projects, public and private actors often have to closely cooperate. During the different phases of a project (eg. the planning, realization and maintenance phase) the different actors determine their role based on their interests in the development.

The Dutch state wants to stimulate the integration of flood protection measures into urban development schemes. Therefore, this thesis tries to find out if, and if so why, private actors participate in flood protection measures as part of an urban development project. And if they participate, in what kind of way do they participate? Do they only financially participate? Or do these private actors in the Netherlands expect the government to pay for these measures? If the latter is true, this implies that behavior is influenced by what is generally accepted as government responsibility. Such a general

⁷ See annex 1, the interviews with the experts point out that according to them there are not much urban development projects in the Netherlands that fulfill the criteria that were chosen for the selection of the cases.

tendency can be interpreted as an institution: a rule that influences the way actors interact and behave towards one another.

With the help of the theories of institutionalism and contemporary ideas of how actors should act in urban development projects, the following main question will be explored:

What institutions influence financial private sector participation in Dutch urban development projects that seek to integrate flood protection measures into the development scheme?

To be able to answer this question the following sub questions will be answered first:

What motives can private actors have to financially participate in flood protection measures in urban development projects? (H2)

What institutions can be expected to influence private sector participation in flood protection measures in the Netherlands? (H3)

To what extent do private actors actually participate in flood protection measures in urban development projects in the Netherlands? (H4 and H5)

To what extent are the institutions formulated in H3 apparent in the actions of private actors in the cases studied? (H6)

1.5 Theoretical framework

This thesis applies institutional theory to the Dutch urban development context in order to study and improve our understanding of the behavior of private actors. Theories and ideas of how urban planning and development projects in the Netherlands work or should work are understood as institutional rules, norms and beliefs that signify the Dutch urban development context. For example, in this thesis it will be assumed that flood protection is a sustainable measure that should be strived for in practice.

Urban area development in the Netherlands

Franzen et al. (2011) write about the management of urban development processes in the Netherlands. These authors wanted to provide an understanding of current practice, and an overview of acquired knowledge and instruments in the Netherlands.

According to them, urban area development in the Netherlands is “part of a broad range of activities involving government intervention at various levels, from local (municipal), regional or provincial to national or even international level, and all of this in interaction with the activities of private organizations such as property developers (which these days are also often international players). The governmental intervention varies from the development of visions and planning to the regulation of the activities of private parties and, increasingly since the 1980’s, also active cooperation with private parties (Franzen et al., 2011: 9).”

As becomes clear in this definition, the Dutch government has an crucial role in urban development processes. Municipalities decide where certain urban development projects can take place. They have a role in public law as well as in private law. “In Dutch practice it is common for municipalities to develop land or set up development companies (Franzen et al., 2011: 26).” Higher Dutch authorities can also be involved by establishing policy principles that deeply affect the urban development projects by

mobilizing government-owned properties. When it comes to private actors, real estate developers play a significant role in the Netherlands (Franzen et al., 2011: 27). These mostly invest in buildings, taking relatively short-term financial risks.

Sustainable urban area development and flood protection

Urban development projects are affected by their social context. Globalization and the emergence of (information) technology and the Network Society caused that the speed of change has rapidly increased. Moreover, rapid increase in population growth has resulted in massive migration from rural areas to cities and growing inequities in income (Hart and Milstein, 2003: 59). Because of both these developments, policies are aimed at improving the living environment, including for example social issues, long-term economic growth, and environmental quality. Urban development projects have to contribute to these goals. These goals can only be reached by an interactive process between various (market) actors and the urban community.

Sustainability plays an important role in Dutch urban development projects. Scientists like Jan Rotmans, for example, believe the world is now transforming into a sustainable society. An integrated and durable approach of dealing with issues that are affected by urban development is necessary. Figure 2 shows that according to Jan Rotmans (2014) we are at a tipping point.⁸

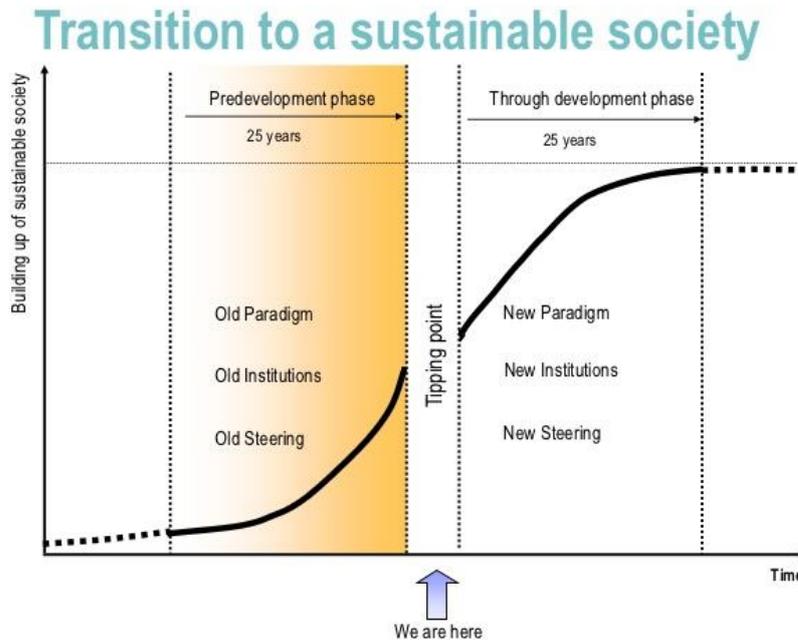


Figure 2: Transition towards a sustainable society, Jan Rotmans 2013

According to Hal (2009), sustainability is taking into account the interests of the different actors in the here and now in such a way that the interest of actors in the future are also taken into consideration. Hart and Milstein (2003) use the same definition in their article about connecting sustainable goals to

⁸ The model transition towards a sustainable society has been copied from the website: <http://www.janrotmans.nl/presentaties/transition-modelsviennamarch2013.html>

the shareholder value firms (or private actors) focus on (2003: 56). Hart and Milstein (2003) and Jonker (2012) state that sustainable business models have to exclusively focus on creating multiple values, so not only on economic values but also social as well as ecological values. Van Tilburg et al. (2012) distinguish four types of business cases for sustainable development based on what motivations companies have to invest in a sustainable business case.

The theories of Hart and Milstein (2003), Jonker (2012) and Van Tilburg et al. (2012) are used to formulate hypotheses of what motivates private actors to financially participate in flood proof urban development projects. This will be dealt with in chapter two.

Structuration

The theory of structuration will help to better understand the behavior of both private and public actors. The British sociologist Anthony Giddens is an important architect of sociological institutionalism, called the theory of structuration. This theory stresses that institutions consist of both formal and informal rules that shape the actions of individuals, organizations, groups or other actors and vice versa (Daamen & Vries, 2012: 2).

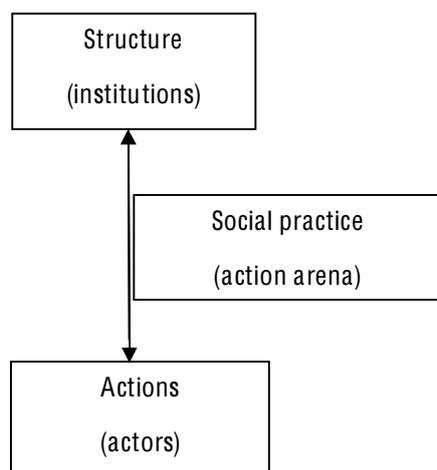


Figure 3: Interaction between structure and agency according to Giddens (1984)

Based on the theory of Giddens (1984) this thesis identifies which institutions are apparent in Dutch urban development practice, specifically when it comes to integrating flood protection measures into a project framework. In order to apply the theory of structuration to this specific topic, the conceptual tools of Elinor Ostrom (2005) will be used.

Ostrom (2005) is interested in how institutions influence the behavior of people. According to Ostrom (2005), in order to successfully analyze institutions, you have to choose the right level of institutional analysis relevant to that specific research question you are focusing on. The analytical focus of Ostrom is the “action arena”, where social decisions are taken. The action arena is a social space where participants with different interests and goals interact, exchange goods and services, solve problems and have a certain relationship with each other. For this thesis this is the project organization (or arena)

where different stakeholders behave in a certain way and make decisions regarding the urban development project.

1.6 Research type and approach

The results presented in this thesis are based on a qualitative research methodology. Providing insights in the behavior of private actors in flood proof urban development projects is the general aim of this study. Due to the fact that there is limited academic knowledge on this specific topic, the research has an exploratory character. To be able to analyze the different cases described in chapter four and five, hypotheses are derived from preliminary theoretical work on Dutch urban development processes and the theories mentioned in the previous section.

The hypotheses used in this study are derived from a set of presumptions about what motivates private actors to participate in flood protection. These presumptions include ideas about the institutions that affect the behavior of these actors. Based on these hypotheses, specific urban development cases were analyzed. These cases were selected based on if the integral urban development project includes flood protection measures. The cases are urban development projects located in the Dutch delta. Both of the cases were studied during the urban development process and have an experimental character. In both cases the Dutch government is experimenting with the implementation of its new policy: integrating flood protection in urban development projects.

The case studies consist of a combination of desk research and fieldwork. All the data was collected by qualitative interviews with representatives of the actors involved in the different urban development projects that include flood protection measures. For the interviews, an interview schedule of topics was used in a loosely planned order (Baarda et al., 2005: 234). The appendix includes a list of persons who were interviewed.

The choice for qualitative interviewing was not straightforward since it encounters several difficulties. The danger of interviewing as a tool of social research is that many different variables could affect the outcome. This includes, for example, the interviewer, the interviewee, the location etcetera (Baarda et al, 2005: 254- 255). Awareness is very important here. However, because in this case persons are responsible for the choices made concerning the development of flood protection measures and the process of urban development projects is complex, interviewing is a very suitable tool to obtain the necessary information. This counts especially when it comes to why private actors make the decision to participate and why.

Besides interviews, other data was analyzed like (government) reports, development plans and contracts, (newspaper) articles and previous studies concerning the development of these urban areas. A coding scheme made it easier analyzing the data (Baarda et al., 2005). This coding scheme can be found in the enclosure.

On the basis of the theories and developments in the Dutch urban development project context mentioned in the previous section, an analytical framework was constructed. This framework continued being developed while the research proceeded. Firstly, some essential concepts were taken from the

existing theories and secondly information about the Dutch context concerning flood protection. These concepts form the hypotheses formulated and worked out in chapter two and three.

For the selection of the two cases, experts who dealt with flood protection and urban development projects were interviewed. This includes people having a job in this sector and people who are studying the integration of flood protection and urban development. The goal was to explore what was going on in the Netherlands in this field. It was interesting to find out that there are not a lot of urban development projects going on at the moment where flood protection measures are a main part of. Some exist in the planning phase, but not in the realization phase. And if they do exist, the only actor is the government.

The cases are selected based on the following criteria:

- Urban area development projects that are located in the Dutch delta
- where flood protection measures are an integral part of the development project
- public and private parties are involved
- and where the flood protection measures are already realized or being realized.

The last criterion has to do with that financial participation of the private actor in this case is already clear and formalized.

Based on these criteria, two urban development projects were selected: Heijplaat in Rotterdam (located near the river The New Meuse) and Streefkerk (located near the river the Lek).

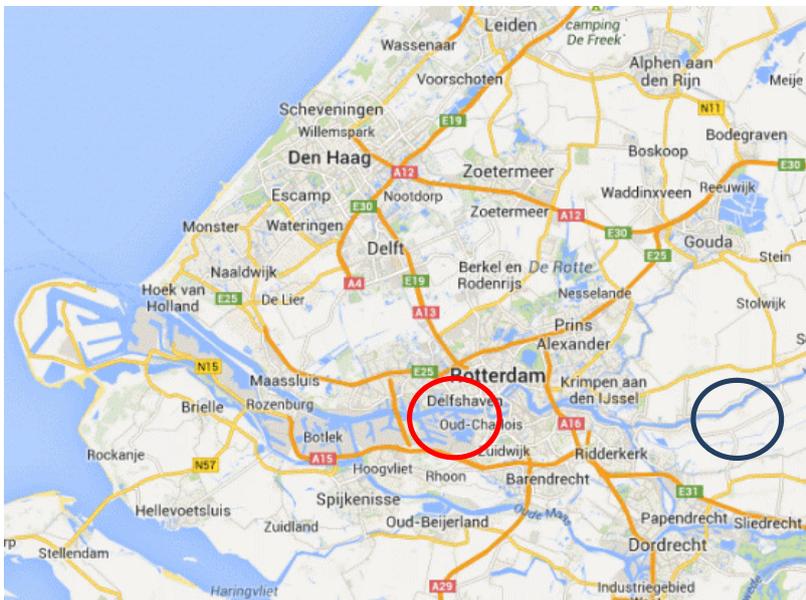


Image 3: The location of Heijplaat (red circle) and Streefkerk (blue circle) in the Netherlands.

Heijplaat is part of the delta city Rotterdam. In the area of the urban development about 1,500 people live. Streefkerk has approximately 2,400 inhabitants. So although the case Heijplaat might seem different

because it is part of a city instead of in rural area like Streekerk, the cases are similar when it comes to flood risks and scale of area the urban development project is located.

1.7 THESIS STRUCTURE

This chapter introduced the topic of this thesis and specified what questions it wants to answer, why and how. The goal is to find out what motivates private actors to financially participate in flood protection measures in flood proof urban development projects. Moreover it will be discussed whether institutional factors influence these decisions. In the next chapter (chapter 2) the theories and ideas of sustainable urban development in the Netherlands will be described in order to create a structured basis for the analytical framework. The analytical framework is based upon the theories of institutionalism and sustainable urban development and entrepreneurship.

In chapter 3 the theories will be applied to the Dutch context. Even though the whole world deals with climate change, all countries have their own context which influences 'how things work' locally. To be able to understand the behavior of private actors, understanding the Dutch context is important.

Chapter 4 and 5 describes the flood proof urban development projects in Heijplaat and Streekerk. What are the motives of the private actors to participate or not and to what extent? What influences their behavior to financially participate (or not)?

Chapter 6 concludes by subjecting the theories to reality. To what extent do the motives of the private actors to financially participate (or not) differ among cases? What institutional factors influence this behavior? This chapter will offer recommendations for further research and for in practice.

2 Motives for participation in flood proof urban development projects

2.1 Introduction

This chapter deals with the theories that will help to answer what institutions will influence private sector participation in flood proof urban development projects in the Netherlands. In chapter one the theories were briefly introduced. It became clear that the theories of Hart and Milstein (2003), Jonker (2012) and Van Tilburg et al. (2012) will help to formulate hypotheses to be able to answer the (sub) question; What motives can private actors have to financially participate in flood protection measures (in urban development projects)? This chapter will answer this question.

In the previous chapter, we also introduced the theory of structuration (Ostrom, 2005 and Giddens, 1984), which helps us to better understand why private and public actors behave in a certain way. Based on this theory an analytical framework is developed. The framework will be used to analyze the two cases to find out what institutional factors are expected to influence private sector participation in flood protection measures in the Netherlands. The 'uploading' of the framework with Dutch institutions concerning flood protection will be dealt with in chapter three.

Before we reach this part, it is important to explore what (sustainable) urban development projects in the Netherlands are, what private and public actors may be involved, and what the literature says about financial participation, responsibilities and interests of private actors in urban developments.

2.2 (Sustainable) urban development projects in The Netherlands

Peek and Van Remmen (2012) published a report in which they recognize a trend in urban development in the Netherlands – the so-called urban development 3.0. According to these authors, a shift will take place concerning the importance of urban development projects. The overall focus is changing from making a profit to being sustainable (while still making a profit). The future use of the public space or real estate is the starting point for new development projects. The future use and maintenance will determine the urban development project. Furthermore, the decision for new urban development projects is based on what it contributes to the existing built environment (Peek and Van Remmen, 2012). Peek and Van Remmen also describe a trend of involving other actors in urban development projects than traditional ones like local government bodies and property developers, such as actors that deal with issues that make the use of real estate possible. Organizations that deal with energy, waste, water, transport, communication health care, etc. (Peek and Van Remmen, 2012). The integration of real estate and energy aspects could, for example, lead to cost efficiency and efficiency during the maintenance phase.

Figure 4 shows the phases of urban development projects 1.0, 2.0 and 3.0. Figure 5 shows the urban development process from the governmental point of view and what collaborations are common according to Peek en Remmen (2012).

The 'old' way to deal with urban development projects are what Peek and Van Remmen (2012) call 1.0 and 2.0. (see figure 4). The focus of urban development projects 1.0, according to Peek and Van Remmen (2012), is on large-scale development projects with great ambitions when it comes to new development projects and supply based initiatives. The Dutch government played an active role in this

and bought land in order to sell it again to real estate developers. The focus was on quick realization of the projects and the involvement ended when the realization phase was over as shown in figure 5.

2.0 is characterized by small urban development projects that fit into a larger plan for a certain area. The integral plan is realized step by step. The small incremental steps made this strategy focus on managing the financial risks. This particular way of working seems to be crisis proof. However, it does not explicitly include sustainable ambitions.

Exploitation phase	Initiation phase	Feasibility phase	Realization phase	Exploitation phase
	Urban development 1.0			
Urban development 2.0				
Urban development 3.0				

Figure 4: City development 1.0, 2.0 and 3.0 according to Peek and Van Remmen (2012: 18)

Urban development				
approach	Focus	Role	Added value	Private actors
1.0	Development	Real estate developer: active	Economies of scale	Real estate developer
2.0	Present use	Facilitator	Vertical chain integration	Present real estate owners and users
3.0	Future use	Initiator and co-investor	Horizontal chain integration	Future owners and users

Figure 5: What collaborations are common when it comes to city development 1.0, 2.0 and 3.0 (Peek and Van Remmen, 2012: 21).

According to Peek and Van Remmen (2012), urban development 3.0 has not been put into practice yet in the Netherlands. Actors involved in Dutch urban development projects are still experimenting with this new model. The Dutch Ministry of Infrastructure and the Environment commissioned to write a report in order to inform the actors involved in urban development in the Netherlands on how to be sustainable. Furthermore, this does not mean that the “old ways of doing things” do not work anymore. The ministry

emphasizes that it strongly depends on the specific urban development if this way of working is the most suitable or not (Peek and Van Remmen, 2012).

Peek & Van Remmen (2012) acknowledge that their concept of how new urban development works is incomplete. Simply involving new actors in order to incorporate the user phase into the planning process does not mean instant success in urban development projects. This is just a first step to innovate in city development.

Peek & Van Remmen (2012) distinguish different phases of urban development. As we see in the figure above, it includes the initiation phase, the feasibility phase, the realization phase and the operation/usage phase. They mention in their article that the real estate investor's point of view is best suited when the new way of urban development (3.0) is implemented. This is due to the fact that the long-term perspective of the investor is taken into account instead of the short-term perspective characteristic for the real estate developer during urban development 1.0. They describe it in the following way:

"Urban development 3.0 affects the current collaboration. On the one side this happens by introducing other actors than the usual suspects, like energy suppliers and on the other side by involving users and owners of real estate. A change in the attitude and behavior of municipalities and their current partners is therefore required. This needs to happen for two reasons. Firstly, to create space for new actors and consider other working methods. Secondly, the role of the investor instead of developer better suits with the new working method. An investor pursues a long term profit out of the exploration of the area and keeps an eye on the price development of his current real estate (Peek and Van Remmen, 2012)".

2.2.1 Public and (semi-) private actors in urban development projects

In the Netherlands, different authorities are involved in urban development, from a national government level to a provincial or municipal level. This could be either in a more passive way through planning policies, or in a more active way through subsidies.

For urban development projects the role of the municipality is significant. Franzen et al. (2011: 26) explain that 'first of all, there are the municipalities who make decisions regarding the location a specific urban area development takes place in. The municipality plays a role in public law (creating land-use plans, granting building permits, etc.), but it can also make use of private law by pursuing its own land development (also called active land policy)." Van 't Verlaat & Wigmans (2011) point out that in the Netherlands, it is common for municipalities to develop land or set up development companies. However, due to the financial crisis and subsequent economic recession, this is not common anymore.

Dutch municipalities consist of various professional departments such as the spatial planning department and the real estate department. These departments all deal with urban development, but from different perspectives. All these departments work for an elected administration, i.e. the Board of Mayor and Alderman.

The different levels of the Dutch government are part of the public sector. The private sector involved in urban development in the Netherlands consists of many different actors. Private actors are actors that at their own expense and risk undertake projects within the context of the current market (Franzen et al., 2001). In the Netherlands, real estate developers play a significant role. However, following the trend Peek & Van Remmen (2012) point out, the investor will gain more and more importance.

In the Netherlands, housing associations also play an essential role in urban development. A housing association is an authorized institution by the Dutch government. They are independent, private organizations, with a public responsibility (Ouwehand en Van Daalen, 2002). The housing associations work within a legal framework set up by the government. The legal basis of these organizations is laid down by the Housing Act of 1901. Key tasks for housing associations are (Ouwehand & Van Daalen, 2002: 27):⁹

- “ the prioritization of appropriate accommodation for the target group, so that low-income households receive priority in the allocation of inexpensive dwellings;
- the qualitative upkeep of the housing stock: maintenance, renovation, and new construction of social-rental dwellings;
- the involvement of tenants in the management of their dwellings and the development of new policy;
- the guarantee of the financial continuity of the housing association;
- a contribution to the quality of life in the neighborhoods where the housing associations’ dwellings are situated;
- the combination of housing and care.”

Social housing is a popular political topic, in particular on the local level. In the Netherlands, the government as well as people who live in social housing have an influence on its quality (Ouwehand & Van Daalen, 2002). For the year 2014, the monthly rent is not allowed to exceed € 699,48 (basic rent).

Low income groups receive governmental housing benefits in order to make it possible for them to live in an affordable, good quality houses. To qualify for social housing you have to not pass a certain level of income. In 2014 this limit for social housing is an annual income of € 34.678.¹⁰ Every year 90% of the social housing that is owned by housing associations and becomes available for rent has to be assigned to people that have a low income. The national government allows housing associations to assign 10% every year to people with a higher income.

For this thesis, housing associations are considered as a semi-private actors following the argument of Franzen et al. (2011: 28): “In recent years, the role of the housing corporations has drastically changed because of a shift in national strategy (from government directed towards market-oriented house building) and as a result of particular social changes (increasing prosperity has given rise to building more expensive houses). As corporations must now ‘paddle their own financial canoe’, they have in reality become private actors in urban development projects and increasingly focus on more integrated area-based schemes.”

2.2.2 Financial private sector participation

Rompelberg et al. (2008) write about the financial real estate advisor and the importance of managing the costs or values. They point out the different interests of all actors during the different phases of development. These actors are: the landowner, the real estate developer, the investor and the end user of the real estate. Rompelberg and Hesp (2008) focus on the phases of development important for actors

⁹ See annex 2

¹⁰ www.rijksoverheid.nl/onderwerpen/huurwoning/sociale-huurwoning-huren

involved in real estate development. Real estate is a significant part of an integral urban area development project and forms the basis for financial private sector participation. They distinguish the following phases: the land operation phase, the real estate development phase, the maintenance phase and the phase where the end user uses the real estate (2008).

Valuing real estate development				
	Land exploitation phase	Real estate development phase	Maintenance phase	Using the real estate
Actor:	Land owner	Real estate developer	investor	User
Focus:	land revenue	Costs	value	Rent or mortgage

Figure 6: Valuing real estate development from an investors point of view (Rompelberg and Hesp, 2008: 14).

The different roles Rompelberg & Hesp (2008) mention could be fulfilled either by different actors or one actor. For example, the real estate developer could also be the investor or the end user (this is the case when people build their own house for example). However, the reason for financial participation is based on profit. It differs for each phase if this constitutes profit on a short (one phase) or on the long term (during every phase of the development process).

2.2.3 Sustainable business cases

Rompelberg and Hesp (2008) point out that making a profit is the main reason why private actors are involved in urban development projects and real estate is the mean to reach this goal. The focus lies on costs and risk reduction. However, according to Hart and Milstein (2003) private actors should also focus on contributing a positive effect on the world in the sense of protecting the natural systems and cultures upon which the global economy depends. In order to achieve this, private actors need to directly link enterprise sustainability to the creation of shareholder value. Shareholder value has to do with reducing costs and risks on the short term and anticipating on long-term survival of the firm. "The global challenges associated with sustainability, viewed through the appropriate set of business lenses, can help to identify strategies and practices that contribute to a more sustainable world and, simultaneously, drive shareholder value; this we define as the creation of sustainable value for the firm (Hart & Milstein, 2003: 57). "

Hart and Milstein (2003) developed a sustainable-value framework. Firms can use this framework to analyze whether they contribute to a sustainable global economy and at the same time create shareholder value. The creation of shareholder value requires performance on multiple dimensions. Sustainable development is also a multidimensional challenge. "In short, global sustainability is a complex, multi-dimensional concept that cannot be addressed by any single corporate action. Creating sustainable value thus requires that firms address each of the [following] four (...) drivers. First, firms can create value by reducing the level of material consumption and pollution associated with rapid industrialization. Second, firms can create value by operating at greater levels of transparency and

responsiveness, as driven by civil society. Third, firms can create value through the development of new, disruptive technologies that hold the potential to greatly shrink the size of the human footprint on the planet. Finally, firms can create value by meeting the needs of those at the bottom of the world income pyramid in a way that facilitates inclusive wealth creation and distribution (Hart and Milstein, 2003: 59).”

“Such strategies and practices hold the potential to reduce cost and risk; enhance reputation and legitimacy; accelerate innovation and repositioning; and crystallize growth path and trajectory—all of which are crucial to the creation of shareholder value. The challenge for the firm is to decide which actions and initiatives to pursue and how best to manage them” (Hart and Milstein, 2003: 64).

Hart and Milstein (2003) discovered that most firms exclusively focus their time and attention on short-term solutions tied to existing products and stakeholder groups. Programs in pollution prevention and Hart and Milstein’s ‘product stewardship’ are well institutionalized within most firms today and have saved hundreds of millions of dollars over the past decade. Product stewardship is defined as pollution prevention that extends beyond organizational boundaries and therefore includes the entire product life cycle (from raw material access, through production processes, to product use and disposal of spent products).

Relatively few firms have begun to exploit the opportunities associated with focusing on building new capabilities and markets (Hart and Milstein, 2003: 64). Bold strategies in clean technology continue to be less common among large, established corporations than activities in pollution prevention or product stewardship. Payoffs from such investments take time and are determined more by trial and error than internal hurdle rates.

Jonker (2012) concludes in his study that creating multiple value is the reason why organizations work with sustainable (or new) business models. Jonker (2012) was involved in an explorative research initiated by the Radboud University Nijmegen on new (sustainable) business models. Sustainability, according to Jonker, is a general (overarching) value in which social economic and ecological values are embedded. Sustainability is achieved through mutual collaboration, by collectively working on value-adding aspects.

Jonker (2012: 3) wanted to get more insight in what new business models are (in comparison to the old ones), which features they have in common and how they function. Therefore, he interviewed twenty-eight entrepreneurs who say that they are working with new sustainable business models. His study is just a first step to get answers to this question.

Old business models primarily focus on the internal organization. Contrary, new business models focus on creating multiple values including social, ecological value and economic value. New business models focus on the internal as well as the external organization, in the sense that cooperation with other organizations is important (Jonker, 2012, p7). This cooperation should be based on mutual responsibility. This way, the all actors eventually benefit. According to Jonker (2012: 17) this is achieved by “sharing, knowledge, making connections (sustainability is between companies), awareness, and multiple value creation.”

Van Tilburg et al. (2012: 14) mention that issues like climate change, human rights, and quality of life affect the success of a private company. The consumer highly values sustainability. For private actors this lead to great business opportunities. Van Tilburg et al. (2012) analyzed twenty sustainable companies to discover how they managed to stick to this dual aim of making a profit and add value to society.

According to Van Tilburg et al. (2012: 14), 'sustainable entrepreneurship is a process in which a company on its own initiative sets and realizes goals that add value to society. These goals go further than rules and regulations demand.' This way the company not only fulfills the expectations their consumers have but also the expectations society has. This matches the statement of Hart and Milstein (2003) where they mention that firms should not only focus on making a profit but also contribute to a positive effect on the world in the sense of protecting the natural systems and cultures upon which the global economy depends and Jonkers (2012) multiple value creation.

Just as Hart and Milstein (2003) Van Tilburg et al. (2012) recognize several phases when it comes to sustainable entrepreneurship. On one side there is the phase of inactivity where companies believe sustainability is a governmental issue. Rules and regulations make sure the company is sustainable. On the other side there is proactivity which means that the company has a leading role when it comes to sustainable issues like poverty or a healthy environment. These companies always want to be ahead of new developments and want to cooperate and share information with different parties to reach certain goals together. Adding value on the long term and not only on the short term.

Van Tilburg et al. (2012: 48) distinguish four types of business cases for sustainable development according to the theory of Zadek (2000) and Kurucz et al. (2008):

The classical business case

Sustainability as a direct motive to maximize profits. This can be achieved in many ways, like improving the quality of employees or through product innovation. It could also be achieved by reducing costs when dealing with environmental issues. This contributes to reaching a high ROI (return on investment).

The defensive business case

Sustainability as a means to prevent financial losses. An example is to build a strong reputation for the company so consumers will choose your product. Another example could be that companies avoid stricter environmental laws and regulations.

The strategic business case

Sustainability as an integral part of the strategy to keep a strong competitive position on the long term and/or part of the strategy to survive. An example is to avoid the firms' dependency on products like oil. This is a product that are not inexhaustible, and cause pollution or focus production on societal challenges.

The societal or 'new economy' business case

Sustainability as part of the strategy that will lead to more added value and the ability of the company to easily adjust to the changes in society, to innovate, to manage risks and opportunities in a dynamic and

complex environment. An example is that the company develops new revenue models or finds new partners to cooperate with.

The business cases reveal the motives of the company to aim at a certain level of sustainability. Van Tilburg et al. (2012) point out that when you read the business cases mentioned above it becomes clear that the difference between the previous business case is that another motive for sustainability is added. The classical business case is purely based on financial reasons. The societal business case contributes to the future of society.

Only in the case of the classical business case an investment in sustainability will lead to a direct financial profit. In the other business cases only the costs of sustainability are clear. The revenues are usually spread out over the long term and not demonstrable to a certain activity. For this thesis it is not important to quantify sustainability.

2.2.4 Motives for financial participation in sustainability

The different business cases of Van Tilburg et al (2012) will be used to analyse the motives private actors have to financially participate in flood protection measures or not. The theory of Hart and Milstein (2003) give some insight in how firms could contribute to a sustainable global economy and create shareholder value as well. Their sustainable- value framework encompasses the same motivations for firms to be sustainable as the business cases of Van Tilburg et al. (2012). They both point out that firms could focus only on reducing costs and risks or also contribute to the future of society. Jonker (2003) confirms this with his study that private parties focus on sustainability to add multiple values. Van Tilburg, Hart and Milstein and Jonker all confirm that economic value or making a profit remains the main focus of a private party.

This is truly also the case concerning financial private sector participation in urban development projects (Rompelberg and Hesp, 2008). This thesis assumes that private firms and private actors involved in urban development projects have the same reasons to focus on sustainability. Therefore, this thesis uses the theories of Hart and Milstein (2003), Jonker (2012) and Van Tilburg et al. (2012) to formulate a hypothesis that will help to answer the sub question: What motives can private actors have to financially participate in flood protection measures (in urban development projects)? With this assumption based on the theories, reality in the two case studies will be analyzed.

When the motivations of firms to financially participate in sustainability is discussed, Hart and Milstein (2003) discovered that it is not common for private parties to use bold strategies in clean technology. Activities in pollution prevention or product stewardship are much more common. Payoffs from such investments take time and are determined more by trial and error than internal hurdle rates.

Van Tilburg et al. (2012) mention that private actors using the classical business case are purely focussed on reducing cost or risk. If a private actor uses the societal business case it also wants to contribute to the future of society.

However, as we have seen at the beginning of this chapter, the Dutch state has some expectations concerning sustainable urban development processes. They expect actors to contribute to a sustainable society on the long term. This also applies to integrating flood protection in urban development projects.

The Dutch government expects private actors to contribute to a sustainable and flood proof urban development. Although actors involved in urban development are still experimenting, this thesis will formulate the following hypothesis concerning financial private sector participation:

Private actors financially participate in flood protection measures during every phase of the development process (initiation, feasibility, realization and the operation phase).

They do this because they believe in a sustainable and flood proof urban development. The motivation, therefore, is not only to reduce risk and cost but also to contribute to future society.

Van Tilburg et al. (2012) also refer to the influence rules and regulations can have on the motivation of private parties to focus on sustainability. He mentions that companies should focus on being sustainable in order to avoid stricter environmental laws and regulations and therefore prevent potential financial losses. The next section deals with a theory that seeks to explain how formal and informal rules affect actor behavior and vice versa.

2.3 The theory of structuration

The British sociologist Anthony Giddens is an important architect of sociological institutionalism, called the theory of structuration. This theory stresses that institutions consist of both formal and informal rules that shape the actions of individuals, organizations, groups or other actors and vice versa (Daamen & Vries, 2012: 2). According to Giddens (1984), formal and informal rules or institutions are structures operating on a macro level. The actions of actors operate on a micro level. He stresses that both structures and actions of actors influence each other and that structures and actions are connected through 'social practice' (Giddens, 1984: 25).

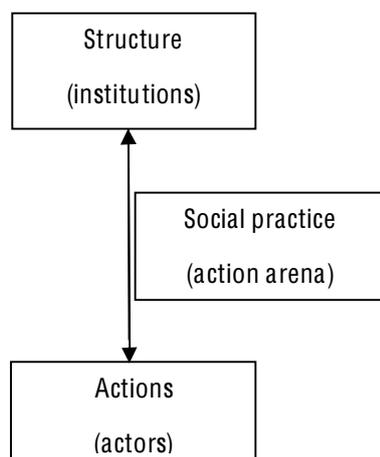


Figure 7: Interaction between structure and agency according to Giddens (1984)

"The theory offers an approach to the dynamic relationship between 'agency and structure', i.e. between what actors do and the specific context in which they operate in. This means that (...)

it offers a way to investigate and make sense of the way actors involved in an urban development project interact, and the specific time and place in which the project is situated (Daamen, 2010: 24).” However, Giddens (1984) does not provide a clear method of how to analyze this in practice in empirical research. Therefore, every researcher can use another methodology to apply the theory of structuration of Giddens to his or her own object of research (Metselaar, 2000: 65). Due to this, this thesis will use part of the method Elinor Ostrom uses in her book “Understanding Institutional diversity” (2005: 3-29).

Ostrom (2005) states that institutional factors determine the expectations we have of the behavior of others and vice versa. She explains that there are multiple levels of institutional analysis because institutional factors influence human behavior from different levels of scale. This makes it hard to understand behavior.

Ostrom (2005) is interested in how institutions influence the behavior of people. To be able to successfully analyze institutions, you have to choose that right level of institutional analysis which is relevant to that specific research question you are focusing on. For this thesis this entails the level of the urban development project. Furthermore, you should understand the institutions in that context. In this case the context of the Netherlands.

The analytical focus of Ostrom is the “action arena”, where social choices and decisions take place (Ostrom, 2005: 16). The action arena is a social space where participants with different interests and goals interact, exchange goods and services, solve problems and have a certain relationship with each other. In the case of this thesis this is the project organization (arena) where different stakeholders involved in this specific area development deal with each other in a certain way.

Three broad categories of variables are identified as influencing the action arena: institutions or rules that govern the action arena, the characteristics of the community or collective unit of interest, and the attributes of the physical environment within which the community acts (Ostrom, 2005).

Examples of institutions or rules that govern the action arena are entry and exit rules, position rules, scope rules, payoff rules, aggregation rules, authority rules, and information rules. Key characteristics of the community can include factors such as the homogeneity of its members or shared values. ”¹¹ Values that are commonly accepted among stakeholders. The term culture is often used in this context. Here, it refers to the experiences actors have with institutions on different levels and how this affects the way actors understand, implement, change or ignore these institutions. Attributes of the physical environment refers to physical characteristics in this case, the urban context of the project.

The next chapter will deal with the Dutch context. The three broad categories of variables that influence the action arena according to Ostrom will be used to describe the Dutch context of flood protection. But first, in the next paragraph the analytical framework is introduced based on Giddens (1984) and Ostrom (2005).

¹¹ Webpage about Institutional Analysis and Development (IAD) Framework emerged from the Workshop in Political Theory and Policy Analysis at Indiana University, Bloomington. Pioneered by Elinor and Vincent Ostrom, it is the product of multiple collaborations among researchers from around the world who are interested in understanding how individuals behave in collective action settings and the institutional foundations that inform such arrangements.

2.4 Analytical framework (part 1)

Ostrom (2005) is explicit in describing what the structure is made of. That makes it easier to apply it to our own topic of research. The physical environment is the starting point of this thesis: areas that deal with the risk of flooding.

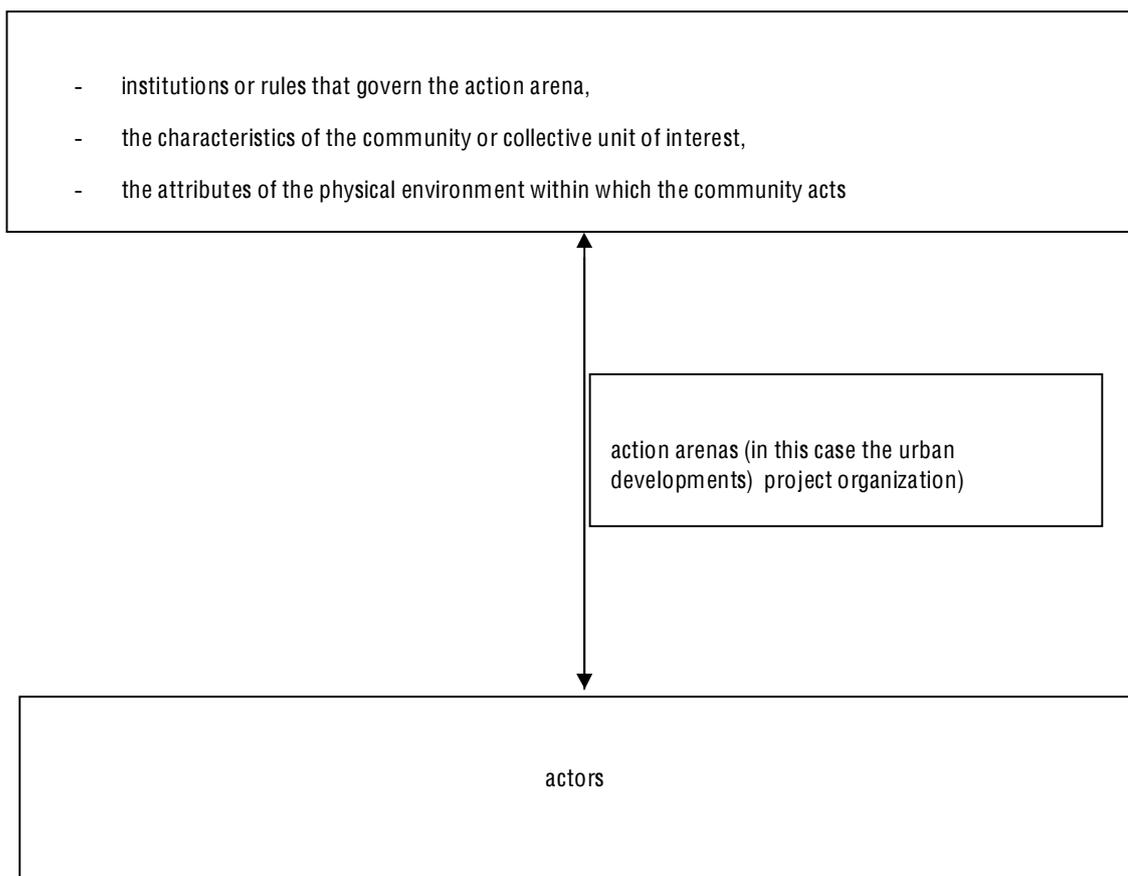


Figure 8: Theoretical framework combining the theory of Giddens (1984) and of Ostrom (2005).

An example of a study that uses the theory of structuration is the study Daamen and Vries (2012) conducted. They studied different European waterfront zones in which the geography of the port and its city meet each other (port- city interface). They studied the dominant forces shaping the spatial and functional changes in these zones and evaluated the role of European seaport authorities. Their goal was to gain insight into the governance process regarding the areas where the seaport meets the city.

According to Daamen and Vries,(2012: 3) "the relationship between institutions and governance processes cannot be analyzed in a holistic, determinant manner. In his framework of actor-centered institutionalism, Scharpf (1997) explains that it would, for example, be a life's work to account for all the

legal rules that influence the outcome of a particular governance process. Even if the meaning and mechanisms of those legal rules would stay universal and stable over time, research results might still prove insignificant for understanding the actual activities observed.”

The focus of this thesis is the behavior of private actors (based on their motives for financial participation). As it became clear in the previous section, this thesis has a hypothesis that is used to analyze the motives for private parties to financially participate in flood protection as part of an integral urban development. This concerns the level of the agencies. However, according to the theory of structuration their motivation and consequently their behavior will be apparent in the action arena and is influenced by (and will influence) institutions.

For this thesis, the assumption is made that one institution is dominant in forming the structure that influences this behavior. In practice, more institutions influence behavior. Furthermore, the actions of the actors influence these institutions as well. However, it is not possible to analyze all institutions that influence behavior. The institution analyzed will be distilled from practice in the Netherlands: cases of integrating flood protection in urban development projects. Chapter three focuses on institutions in Dutch flood protection measures. This will be the next and final step of the development of the analytical framework.

2.5 Concluding remarks

In this chapter, we have begun to answer the first sub question of this thesis: What motives can private actors have to financially participate in flood protection measures (in urban development projects)? It is now clear what the Dutch state refers to as sustainable urban development in the Netherlands. Sustainable urban development has to do with a longer-term perspective, which means that all the different phases from the planning phase to utility and maintenance phase are integrated from the start. This method has not often been put into practice yet. It also became clear what this thesis defines as private actors. A focus on making a profit is important here. It was explained that in the Netherlands we also have semi-private actors involved in urban development: the housing associations. The theories of Hart and Milstein (2003), Jonker (2012) and Van Tilburg et al. (2012) helped to formulate a hypothesis to be able to answer the (sub) question. The following hypotheses will be used to analyze the motives of the private parties involved in the two cases that will be studied:

Private actors financially participate in flood protection measures during the initiation phase, the feasibility phase, the realization phase and the exploitation phase because they want to contribute to a positive effect on the world in the sense of protecting the natural systems and cultures upon which the global economy depends. Therefore the motivation is not only reducing risk and cost but also on enhancing reputation and legitimacy, accelerating innovation and repositioning; and crystallizing growth path and trajectory.

The theory of structuration (Ostrom, 2005 and Giddens, 1984) will help to better understand why private and public actors behave in a certain way. The framework in figure 8 will be used to approach the two cases in order to find out what institutions influence private sector participation in flood realizing protection measures in the Netherlands. In the next chapter, we will specify the approach and work out an analytical framework to explore Dutch institutions at work in current urban development practice.

3 Flood Protection and water management in the Netherlands

3.1 Introducing Dutch water management

"A significant part of Holland is situated up to approximately seven meters below sea level. The Dutch don't notice any of this though, because an incredibly innovative and intricate system keeps the ever-rising seawater from flooding the country. Even during spring tide, the Dutch are safely guarded from being washed away..."¹²

This above text is from the website of Kinderdijk, a collection of 19 authentic windmills that is on the UNESCO World Heritage list. Kinderdijk is a village in the region called Alblasserwaard, which is located in the south-east of the Dutch province Zuid-Holland and is surrounded by several rivers and canals. Alblasserwaard is located below sea level. The windmills were built in the 18th century to prevent the village from flooding by making sure the water was pumped from lower areas into the river Lek.

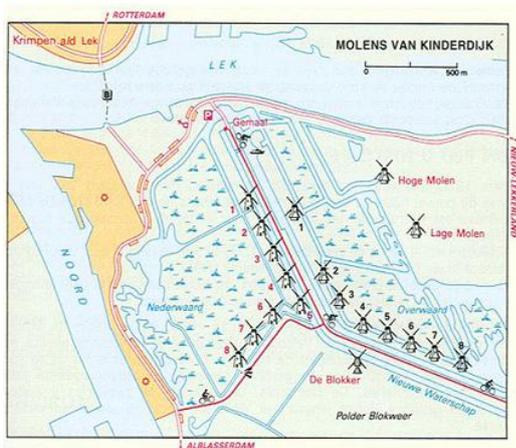


Image 4: The windmills of Kinderdijk ¹³



Image 5: Alblasserwaard ¹⁴

¹² www.kinderdijk.com

¹³ www.ruimtelijkeplannen.nl

¹⁴ www.plaatsengids.nl/alblasserwaard-en-vijfheerenlanden

The example of Kinderdijk illustrates the long history of water management in the Netherlands. Water management comprises the prevention of water nuisance, the protection against depletion, safeguarding water quality, the supply of water to its users and flood protection (Dicke, 2001: 16). Nowadays, high water level protection is still an issue for the Netherlands. The sea level is rising, it rains more often than before and the average temperature rises. About 60% of the Netherlands is at risk of being submerged in case of a flood, particularly the most urbanized Western part of the country. The biggest cities are located in this area. The (economic) effect of a flood would be much bigger than the flood that happened in the night of 31st of January and the first of February 1953. This flood caused about 1,800 victims. Another major flood almost happened in respectively 1993 and 1995, when the water levels in the rivers were reaching dangerous heights. In 1995, about 250,000 people had to be evacuated.

This chapter deals with the question: What institutions can be expected to influence private sector participation in flood protection measures in the Netherlands? To be able to answer this question a better understanding of flood protection as part of Dutch water management is necessary.

The answer to this question will specify the analytical framework introduced in the second chapter. In that chapter, we assumed that institutions (i.e. the formal and informal rules at work in a particular context) influence the behavior of actors and vice versa, and that the actual behavior of actors in a particular practice plays out in an action arena. In this thesis, this action arena refers to the interaction between actors involved in an urban development project.

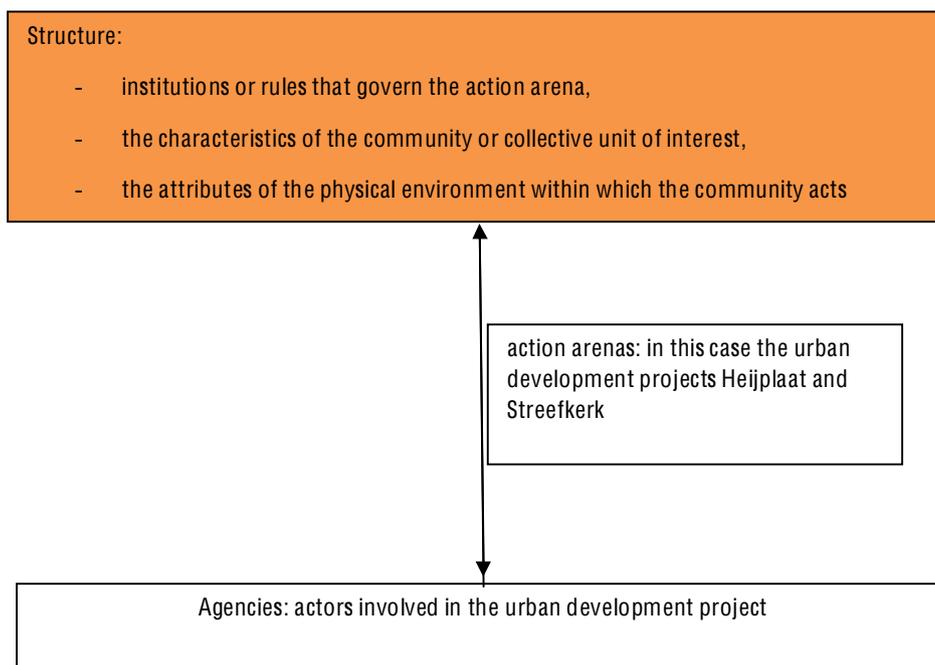


Figure 9: analytical framework based on the structuration theory of Giddens (1984)

The level of the action arena and the level of the agencies were already explained in the previous chapter. The level of institutions (what Ostrom calls the structure) will be described in this chapter.

3.2 Actors involved in flood protection in the Netherlands

In the Netherlands, different levels of government deal with water management. The central state, the Provinces, the municipalities, the water boards on a national level and the European Commission on a European level. Before the water of the rivers reach the Netherlands it passes through other countries, for example Germany. Other countries thus influence the amount and/or quality of water in these rivers and therefore influence Dutch water management.

Dutch water management is historically a government task (Dicke, 2001: 107). However, it started with communities that took care of protecting themselves of floods and financing it, like in Kinderdijk. Landowners in villages or communities paid for this. In the 12th century, the Netherlands installed so-called Water Boards, who are responsible for coastal defense and drainage. Since 1848, these boards have been authorized as full government bodies. The difference from other government bodies like municipalities, the state or the Provinces is that they are directed towards a specific task instead of an area. Water boards are responsible for water management within certain territorial boundaries, but not for other tasks within the same territory. "Their tasks can be grouped under five headings (...). The first is taking care of dams and dikes, secondly the maintenance of water balance and soil hydrology, water quantity management is the third task, the fourth is water quality management, and the last task is the care of roads and water ways. The two main tasks are maintenance of water levels and soil hydrology and on the other hand the responsibility for dams and dikes. The latter is fixed in the Delta Act from 1958, just after the flood in 1953 (Dicke, 2001: 173)." The area in which a water board operates is determined by the natural course of a water system.

The Ministry of Transport, Public Works and Water management is responsible for the Water Boards. The Water Boards have to act according to the national water management policy of the ministry. The state used to pay 100% of the cost for the dikes near the coastal lines. For dikes along the rivers, the central State paid 80%, the Water Board paid the remaining sum (Dicke, 2001: 173). However, this changed. From 2014 on the state will finance 50% of the costs for realizing and maintaining primal water defense systems and the Water Boards need to finance the other 50% (Deltaprogramma, 2015: 124). Primary water defense systems are dunes or dikes that protect the country from water from the sea or the main rivers like the Meuse or the Rhine. There are 23 Water Boards in the Netherlands at this moment (September 2014). They all collect their own taxes within its region.

Water Boards not only cooperate with the central state but also with the Provinces and the municipalities. Provinces are responsible for the organization of regional water management. Provinces have delegated this responsibility to the Water Boards. The Province only monitors and supervises. They also play a role in the co-ordination between the municipalities and the Water Boards. In 1969 Provinces are charged with the care for the quality of the surface water. This task was delegated to the Water Boards.

Water Boards and municipalities have to deal with each other when it comes to spatial planning. "This encounter is not always unproblematic. Municipalities design plans for the region, but water management or management of dams and dikes is not always the core concern in the design of their

plans (Dicke, 2001: 174).” If an actor wants to build near or on dike you need a permit from the Water Boards.¹⁵ They need to approve and can set up a list of conditions.

On a European level, it is encouraged to cooperate on an international level. Member states should work together based on river basins. For the Netherlands this means cooperation between countries the rivers Rhine, Meuse, or the Scheldt river flow trough. The European Commission does not oblige the different countries to work together. However, in reality countries do cooperate to manage the quantity and the quality of the water and the water level. The different levels of the Dutch government are aware of the fact that the contribution on a local level must always be considered in a global context.

3.3 From segmented to integrated water management

There are two main important events regarding the Dutch water management. These events caused a shift in importance in Dutch water management and therefore in flood protection.

The first event is the flood in 1953. A lot of people died because of this flood. It caused a sense of urgency for the Dutch government to start focusing on flood protection again. Furthermore, “the 1953 flood was also a major incentive for the reorganization of water management in the Netherlands. Until 1953 many small Water Boards managed the quantity of water. Since then, an increase in scale has taken place. More than 2000 Water Boards have been reduced to the number of 57 (Dicke, 2001: 162)” Nowadays, in October 2014, there are only 23 Water Boards left.¹⁶ The state became responsible for water policy and the Water Boards for realization and maintenance. Hence, water management in The Netherlands became more centralized and focusing on a national level instead of only on a local level.

The 1953 flood led to the realization of the first Delta Works Program. A Delta Committee provided advice and managed the realization of the program. The goal of the Delta Program was to prevent another flood and in the meantime making sure there was enough fresh water in the Dutch rivers and lakes. In order to achieve these goals, the Dutch national government decided to build a major water defense system. This plan included a combination of building dams and dikes. One example is the Rotterdam floodgates, called the Maeslantkering. The gates can automatically open and close to allow ships to pass by. When closed, the gates protect Rotterdam from flooding by acting as a storm surge barrier.



Image 6: The Maeslantkering while closed

¹⁵ www.rijnland.net

¹⁶ www.waterschappen.nl

The second event worth mentioning is that in 1989 the Dutch state emphasized an integrated water management approach as the official way to work. Before the 1980s, water management was divided into different segments based on different products of water (Dicke, 2001: 178). The different aspects of water management were dealt with in a separate way instead of in an integrated way. For flood management, this meant that the approach was aimed at reducing the probability of flooding using structural measures focused on the enforcement of dikes (Ward et al., 2012: 4). With the new approach flood protection became an integrated part of water management where different levels of governments work together. Furthermore, it was the first step to integrate water management with other policy fields. An example is that nowadays the national state wants to integrate water management and spatial planning - two separate streams of policy-making (Ward et al., 2012: 4).

Contemporary water management

Since 1989, integrated water management has been a formal Dutch national water policy. The various aspects of water, the different uses and users of water should be looked at in a comprehensive way. National policy emphasized much more the coherence between the policy for water, spatial planning and the environment oriented towards the different interests of safety, agriculture, nature, drinking water supply, transport, recreation and fishery (Dicke, 2011: 178).

In 1993, 1994 and 1995 the river Rhine and the Meuse had to cope with high water levels. Large-scale operations were executed to evacuate inhabitants of the area threatened by flooding in 1995. Due to this no one got injured. After the floods in 1993, 1994 and the near-disaster in 1995, another Delta Project was established; the Large Rivers Delta Plan. This Delta Plan focused on the threat of the rivers instead of the sea. Because of the sudden urgency caused by the nearly floods of the 90's the plans were implemented immediately. By the year 2000, nearly all river dikes had been strengthened as planned.

In the same year (1995) as the Large Rivers Delta Plan started, a new policy was introduced by the Dutch state: Room for the river. The goal was to maintain and increase the capacity of the main rivers to discharge water, as well as preventing floods. There should be no further restriction on space for water. Consequently, the development of all kind of functions, buildings and activities along the river were prohibited. With this policy a shift in importance occurred. The focus changed from strengthening dikes as the only solution for safety to space for the river and an increase of the resilience in combination with strengthening of the dikes (Dicke, 2001: 167). This is in line with the preferred approach the national state introduced: integrating water management with other policy fields.

With the room for the river program the national policy shifted from fighting water to working with the water in the sense that nature keeping its space in combination with protection would be more effective to reduce the water level and thus protect the country from flooding (Dicke 2001: 197). The downside of this program is that some municipalities were not very pleased with this program. Locations meant for development were no longer prioritized due to the room for the river program.

National policy expanded the Room for the River program by introducing a water test. Plans for new real estate developments should be subjected to a so-called Water Test, which means that urban development projects with a negative effect for water management will no longer be pursued. This happened in the Dutch city of Nijmegen. A new development was planned at the smallest part of the river Waal. The water test made it clear that instead of building more houses, room for the river had to

be integrated in the urban development plan. The development of 1,500 planned housing units was cancelled.

On the other hand, the room for the river program became a catalyst for urban planning in Nijmegen, because urgency rose to develop this area. The urban development project in Nijmegen thus shows that different levels of the government working together, and public and private cooperation, will lead to more integrated, sustainable and multifunctional flood protection measures.

Flood protection and the Delta program

This new approach regarding water management also affected flood protection. "Traditionally, flood management has concentrated on preventing floods through technological measures, like storm surge barriers and dikes. However, there is currently an international shift towards more adaptive and integrated systems of flood risk management. In this context, flood risk is defined as the probability of flooding multiplied by the potential consequences, like loss of lives and economic damage (Ward et al., 2012: 2)."

The dikes and sea defenses had to protect land against high water that occurs with the risk of 1: 10,000 in a year. These norms are determined in the Dam and Dike Act of 1996. The more advanced approach to safety involves more than a plain calculation of the risk of flooding. Instead, it takes the consequences in terms of damage and casualties into account.

This shift in importance in flood management is implemented on different levels of government, from the European to the municipality level. Only a few cities, however, have implemented this approach in plans serving as blueprints for climate proof developments. Rotterdam is one of those cities. Rotterdam has established Connecting Delta Cities as part of their own Rotterdam Climate Proof Program. Connecting Delta Cities is an international network to exchange knowledge and share best practices on spatial development, water management, and adaptation strategies (Ward et al, 2012: 2).

So nowadays, the Netherlands still has a national Delta program. However it differs quite a lot from the one in 1953. In 2009 the Dutch national government launched the Delta Program, a national policy program aimed at investigating the effects of climate change on water safety and fresh water supply, and formulating adaptation strategies (Verkerk et al. 2013: 1). The Delta Program aims to reach a few national key decisions that will force or stimulate actors on lower levels to adjust to the expected climate change.

The Committee had to develop a plan so that the Netherlands would be prepared for the upcoming climate change. Sustainability and quality of life were considered to be important conditions. To achieve this they found solutions that concerned new policy, new governance structure and solutions that combined flood protection with urban planning.¹⁷

The Delta Committee worked together with different levels of the government, such as Provinces, municipalities and Water Boards. Other partners were involved as well, such as universities, or potential stakeholders like the harbor industry. The committee advised several measures to the national

¹⁷ Deltacommissie, (2008). "Samen werken met water Een land dat leeft, bouwt aan zijn toekomst.

government that together would form an integrated strategy for the protection of the Netherlands. These measures not only included physical ones, but also tapped into the governance of water protection. Sustainability and multifunctional use of flood protection measures were important for the selection. The most important measure the committee advised was to introduce the Delta Act. This Act states¹⁸:

- Every year the status of the program has to be presented to the Dutch national government: what will be realized during the following year, including its financial feasibility (and what will be realized later on);
- The role of the Delta commissioner;
- The financial aspects of the program, such as that there has to be a special Delta fund to be able to finance the program.

The Dutch national government adopted the advice, and ever since 2012 the Netherlands has a Delta Act.¹⁹

Delta Program 2015

The Delta Program 2015 emphasizes that the Netherlands should be prepared for climate change and specifically for the rising water level and last not but least that there is enough supply of water.²⁰ Another goal is to stay attractive for (foreign) companies to locate here. This means that measures need to be flexible and able to adapt to flood, heavy rainfall, or serious drought. For flood protection this means that the focus stays on limiting the consequences of a flood in terms of damage and casualties. Areas where floods will cause the most economic damage, will damage infrastructure of national importance or that will cause the most casualties will still be better protected. This also applies for vital functions like depots for drinking water or hospitals and ICT facilities. Because of new methods and better insights, better estimations can be made when it comes to the consequences of floods and therefore the risks of flooding.

In order to reach these goals, the Delta Commission developed five policy measures to focus on in the coming year (2015). These five policy measures were developed by cooperating with different levels of the government (the central state, the provinces, water boards and municipalities), Dutch companies and with different knowledge institutions. The five policy measures are²¹:

1. Delta Decision Water Safety. This approach includes new safety norms for dikes.
2. Delta decision Drinking water: this approach focuses on maintaining enough fresh water for, eg. drinking purposes or agriculture.
3. Delta decision spatial adaptation: this approach focuses on water robust spatial planning so that in the case of a flood everyone is safe. National policy will stimulate the Dutch government on different scales to implement this policy in their policy of spatial planning. The city of Dordrecht,

¹⁸ www.rijksoverheid.nl

¹⁹ www.rijkswaterstaat.nl

²⁰ Deltaprogramma 2015, Werk aan de delta.

²¹ Deltaprogramma 2015, Werk aan de delta.

for example, already integrated the policy and integrated this in their view on the development of the physical environment.

4. Delta decision Rhine – Meuse Delta: this is an area with many inhabitants and is of great economic importance for the Netherlands. The Rotterdam Port is located here for example. The two cases dealt with in chapter four and five are located in this area.
5. Delta decision IJsselmeer area: this approach focuses on the quality of the water and therefore maintaining fresh water in the lake IJsselmeer.

For this thesis especially the third Delta decision is of great importance.

For flood protection, multi-level security is chosen as a strategy. This means that whereas in the past all attention and most of the budget was given to preventing floods by establishing dikes, nowadays efforts are underway to also investigate the potential of spatial planning and disaster management. Areas that are vulnerable to floods at the moment, like the areas near the river the Meuse, IJssel, Waal and the area near Rotterdam and Dordrecht (Rijnmond-Drechtsteden), have to be on the priority list. However, if more traditional measures such as repairing the dikes or making room for the river cannot be integrated in the built environment or is simply too expensive, other measures are introduced like flood proof urban development projects or evacuation strategies.

The concept of multi-level security was already launched in 2008.²² There are three distinct layers within this concept. The first one is prevention and refers to the primary dike system. The safety level of this system is determined on the basis of a cost/benefit analysis and a victim analysis based on the probability of flooding. Legal safety norm determine the safety level.

The second layer focuses on managing the consequences by sustainable spatial planning (Pieterse et al., 2013). This refers to spatial partitioning, for example compartmentalization by means of secondary dikes or other structures. Efforts are underway to find opportunities to use spatial measures to address multiple purposes, such as nature conservation, recreation and infrastructure. In this second level of water safety, zoning is based on flood risk. Second layer measures are already a common practice in rural areas of the Netherlands, and these have recently been developed for urban areas, such as in the concept of the "Self-reliant Island of Dordrecht".

The third level is the level of disaster management. This involves realizing better coordination between the various emergency service providers, administrative decision-making, communication modes and evacuation plans. Water-robust construction and infrastructure, as well as the development of emergency refuges, are other measures that belong to this third layer.

For urban development, this means that flood protection becomes an integrated part of the project. The involved actors have to be aware of the location specifics (is the location protected by a dike or not) and should develop a flood strategy focused on protection and managing the consequences.

²² www.stowa.nl. A website about multilevel safety water resilient urban and building design.

3.4 Formal rules in Dutch flood protection

In the Netherlands, the Dutch national government is legally responsible for the safety of the water defense systems. The Directorate-General for the Environment and International Affairs (Rijkswaterstaat) and the water authorities maintain the primary water defense systems. Primary water defense systems are dunes or dikes that protect the country from water from the sea or the main rivers like the Meuse or the Rhine. The Provinces are responsible for the secondary water defense systems, like canals or water from lakes within the Province. The municipalities have a responsibility when it comes to the quality of the water or when developments take place outside the dikes. In the latter case, this is not a legal responsibility. The legal responsibilities are described in the Dutch Water Act. With regard to the institutional aspects of water management, it is only since the constitution of 1983 that the role of the State is formulated.

The Ministry of Infrastructure and Environment is responsible for national policies concerning flood protection in the Netherlands. The ministry closely collaborates with other Ministries, for instance with the Ministry of Economic affairs and Finance, but also with other countries to be able to deal increasingly more effectively in the water management.

The Directorate-General for the Environment and International Affairs (Rijkswaterstaat) is the executive agency of the Ministry of Infrastructure and Environment. It bears responsibility over the Dutch main waterway network, the main water systems, and the environment in which they are embedded. Rijkswaterstaat keeps the national water system safe, clean, user-friendly and protects the Netherlands against flooding.²³ The main waterway network is state-owned and operated by Rijkswaterstaat. Smaller waterways are managed by many different provincial authorities or drainage boards.

The Dutch Water Boards play a key role in the environmental management in the Netherlands because they are responsible for managing and maintaining flood defenses along the coast, rivers and waterways. An integrated part of this task is to manage and maintain sufficient quantity of surface water of adequate quality for various purposes – drinking water, domestic and industrial uses. This includes managing and operating municipal wastewater treatment plants and the discharge of treated water into surface waters. It also involves continuous monitoring of the chemical and biological quality of surface waters.²⁴ There are in total 23 water authorities in the Netherlands.

3.4.1 Rules for urban development projects outside dikes

According to Ward et al. (2012: 9) a prerequisite for successful collaboration in complex environments that involve multiple actors there should be transparency with respect to responsibilities and tasks. The legal responsibility of the different levels of government is clear when it comes to dikes and what lies behind the dikes. However when it concerns areas outside the dikes it is not clear who is responsible for safety, or who is responsible for recovery and claims. According to Ward et al. (2012: 9) this unclear situation of who is responsible for what leads to a stagnation in the development of proposals for creating residential areas.

²³ www.government.nl/ministries/ienm/organisation

²⁴ www.government.nl, subject: roles-and-responsibilities-of-provincial-government-municipal-governments-and-water-authorities

In the Netherlands, roughly 100,000 people live in outer dike areas, next to a river or the sea. These areas are originally meant to store water or transport water. These unembanked areas are not legally protected by Dutch law against flooding. The risk of a flood is not great at the moment. However the consequences will be great when it does go wrong. However, this does not mean that it is not safe to live in unembanked areas. Local governments, with the help of policy developed by the Provinces, are responsible for the safety of the people in these areas.

The Dutch national government published a brochure in July 2012 to inform people that the rules differ for people that live in unembanked and in embanked areas.²⁵ In this brochure, it becomes clear what part of the government has which responsibilities when it comes to flood protection. Specifically when it is about policy, flood protection and communication. The Dutch government thus wants to raise transparency when it comes to responsibilities and tasks in areas outside the dikes.

The safety of the people in unembanked areas is the responsibility of the Municipalities with the help of the Provinces. Municipalities can allow real estate development outside the dikes if this development is built in such a way that the potential risk of flooding is reduced. The risk of casualties and of damaging the essential utilities like electricity or gas, have to be reduced to an acceptable level. Most municipalities use measures like an evacuation plan, or the development needs to be built on a certain level. Some unembanked areas are even built on a more elevated level than embanked areas. Legal instruments for municipalities are building permits and development plans (land use).

Every Province is allowed to develop its own policy for unembanked areas in addition of the national policy. The Province of South Holland, for example, developed a tool municipalities can use to determine the safety risks when it comes to potential floods.²⁶ To make sure the tool is useful, the Province developed this tool in cooperation with different municipalities. As of February 2013, the municipalities have to include an estimation of flood risks of the specific development in outer dike areas by using this tool in the development plan.²⁷

People who want to live and work or develop real estate in outer dike areas are responsible for taking the necessary measures to reduce the risks of flooding. The Dutch government provides the preconditions to be able to do this or will simply not allow it.

People who want to live and work or develop real estate in areas outside the dikes are responsible for taking the necessary measures to reduce the risks of flooding. The Dutch government provides the preconditions for private actors to be able to do this. If the private actors do not include this into their plans, the municipality will not allow the development to be realized. New constructions are validated against municipal zoning plans and regulations without a proper liability construction; so if you build a new building according to the zoning plan, any suffered flood damages will not be compensated by a third-party.²⁸

²⁵ www.deltacommissaris.nl

²⁶ The Netherlands is divided into 12 Provinces and 403 municipalities (January the first of 2014). The Province of South Holland contains 67 municipalities like Rotterdam, The Hague, Dordrecht, Delft.

²⁷ In the Netherlands the government decides what function (water, green, living, working, industry, etc.) is possible where. This makes it clear for real estate developers where they could build what.

²⁸ www.rotterdamclimateinitiative.nl

Important for this thesis is the legal responsibility of the state for flood protection. The legal responsibilities are described in the Dutch Water Act. The Ministry of Infrastructure and Environment is responsible for national policy surrounding flood protection in the Netherlands. The Directorate-General for the Environment and International Affairs (Rijkswaterstaat) executes this policy together with the Water Boards. However, they mainly focus on flood protection inside the dikes. The municipalities with the help of policy developed by the provinces are responsible for safety of people outside the dikes.

3.5 Informal rules: the Dutch general attitude and flood protection

The concept of multi-level security signals a shift in responsibilities. The Dutch state will still be responsible for flood protection. However, when regarding to minimizing the risks of a flood by integrating it in urban development projects for example, implies that other actors besides the government will have to take responsibility too. At least, that is what current Dutch policy states.

Public as well as private actors will become responsible, especially when it comes to the second and the third layer of the multi-level security. How does this work in reality? Do private actors such as real estate developers but also citizens accept this responsibility? According to Mees (2013: 264) they do. The University of Utrecht analyzed three urban development projects that used adaptive measures as an integral part of the development. Adaptive measures in this case means measures that contribute to dealing with the risks of a flood. The focus is on safety of the people who live and work in this area in case of a flood. All the developments were transformations of former harbor areas into urban areas. Mees (2013: 260) mentions that it was difficult to find European examples of such developments that use adaptive measures.

The involved private actors in the discovered cases all accepted the responsibility and even took financial responsibility for what they considered as their part. In this case, private actors are real estate developers and citizens that developed or owned real estate. According to the private actors involved, the reason why these actors did this was because the government communicated very well and explained the risks and opportunities very clearly. Mees also concludes that in every case the non-economic interests count as much as the economic interests. The cases the University of Utrecht analyzed were Hafencity in Hamburg, Kalasatama in Helsinki and Heijplaat in Rotterdam. The latter case is also part of this thesis.

Heems and Kothuis (2012) have a different conclusion concerning the acceptance of the responsibility of private actors. The focus of their study was on Dutch citizens and concluded that the Dutch government does not succeed in making them aware of the importance of flood protection. The reason why they initiated this research is that citizens in their neighborhood protested when the government wanted to remove trees from a dike to secure the water safety of their town. According to the citizens in the cases they studied, the government should guarantee "dry feet" (Heems and Kothuis, 2012: 32).

Heems and Kothuis (2012: 35) conclude that there is a difference in perception between the government and the Dutch citizens regarding flood protection. Most citizens understand there can't be full guarantee of dry feet. In 1993 and 1995, the Dutch rivers almost overflowed. Yet, when the government wanted to discuss the risks and try to organize cooperation for dealing with the risks, citizens simply do not accept

it. Heems and Kothuis (2012: 38) state that this is due to “the dry feet myth”. This contradiction essentially means that even though the Dutch people acknowledge there is always a risk of flooding, the Delta Works have led the Dutch people to be convinced that floods are surely a thing of the past and the government along with its expert will simply ensure that.

The authors state that if the government wants other parties to participate in dealing with flood protection or eliminating risks, the government should focus on two things: developing a type of trust where people are critical on the experts, and making people more aware of the risks of possible life threatening floods (Heems and Kothuis, 2012: 39). It requires a change of culture, which is much like changing a focus on risk management towards the acceptance of vulnerability.

This could also increase the amount of inhabitants that will show up for the elections of the water boards. Although inhabitants can vote for the water boards the turnout is low (around 20%). According to Dicke (211: 195) this is because half of the voters are not familiar with the tasks or the role of the water board. The consequence is that farmers are still overrepresented.

Heems and Kothuis' (2012) conclusions do not match Mees' (2013) conclusion. However, the starting point is different. Mees (2013) wrote about the context of urban development. Heems and Kothuis (2012) had a general point of view; citizen awareness on the importance of flood protection in general. The government took their advice, though. It seems that the government tries to change existing culture through urban development projects and by changing the creed from “fighting the water” to “living with water” and therefore making different actors responsible and aware. At least, this is the case in the urban development projects Mees (2013) wrote about.

3.6 The analytical framework based on the Dutch context (part 2)

In chapter two, the analytical framework based on the theories was introduced. The theory of structuration (Ostrom, 2005 and Giddens, 1984) will help to better understand why private and public parties behave in a certain way. The framework in figure 10 will be used to approach the two cases in order to find out what institutions influence private sector participation in realizing flood protection measures in the Netherlands. The action arena has been described in the second chapter. The two urban development cases together form the action arena. The agencies or actors have also been introduced in the second chapter.

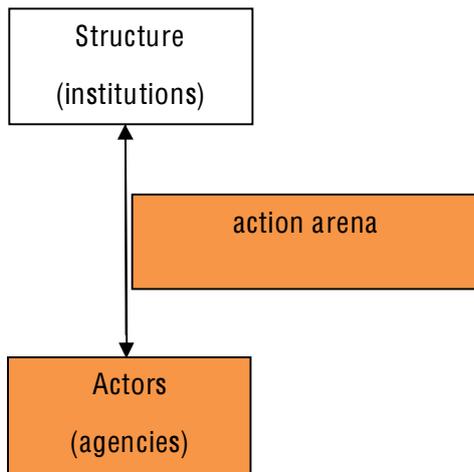


Figure 10: description of the action arena and the actors in chapter 2 based on the interaction between structure and agency (Giddens, 1984).

In this chapter, the structure based on the Dutch context was described so that the analytical framework could be completed. It is too complex to analyze the relationship between institutions and governance processes in a holistic determined manner (Daamen and Vries, 2012: 12). Therefore, the starting point for the analysis of the two cases for this thesis is that institutions or formal and informal rules influence the behavior of private actors in flood proof urban development projects. This does not necessarily mean that the behavior cannot be influenced and eventually change the structure. It could be the case that while trying to find out if the structure influences the behavior of private actors to participate or not in flood proof urban development projects, it will become clear that the structure is influenced by certain behavior as well.

An assumption of which institution influences the behavior of the private sector involved will be tested in order to find out if this assumption is true or false in the two Dutch urban developments. This does not mean that other formal or informal rules do not influence this behavior. The assumption is just a starting point. By analyzing the motivations and the effect of the Dutch institution chosen for this thesis it can also become clear that other institutions influences the behavior.

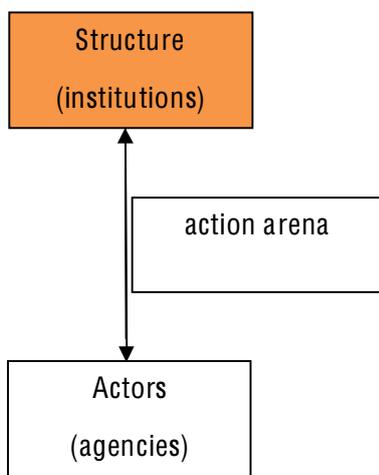


Figure 11: description of the structure (Dutch formal and informal rules when it comes to flood protection measures) chapter three based on the interaction between structure and agency (Giddens, 1984).

The structure (or Dutch formal and informal rules)

Ostrom (2005) divided the structure in three categories: Institutions or rules that govern the action arena, the characteristics of the community or collective unit of interest and the attributes of the physical environment within which the community acts. Examples of institutions or rules that govern the action arena are entry and exit rules, position rules, scope rules, payoff rules, aggregation rules, authority rules, and information rules. Key characteristics of the community can include factors such as the homogeneity of its members or shared values. These values are values that are commonly accepted among stakeholders. The term culture is often used in this context. Here, it refers to the experiences actors have with the institutions on different levels and how this affects the way actors understand, implement, change or ignore these institutions. Attributes of the physical environment refers to physical characteristics in this case, the urban context of the project. The attributes of the physical environment is the starting point of this thesis: areas that deal with the risk of flooding. The two Dutch urban developments are selected based on these criteria.

Another Dutch institution that influences private sector participation is that the Dutch inhabitants believe they are safe and that there is no risk of flooding (the characteristics of the community or collective unit of interest). The Dutch central state tries to change this and want to make people aware of the potential risks. The state also wants to integrate flood protection in to other policy fields.

Dutch policy requires different levels of governments to work together on flood protection. In the Netherlands, as in many other countries, local governments play a major role in achieving flood protection and fresh water supply. However, the classical bureaucracy of governments based on a clear hierarchy does not fit anymore with regards to controlling and coordinating in complex multilevel systems. "There are strong indications that the classic government's capacity to coordinate its own complex governance systems is limited (Van Buuren et al., 2014: 2)." Therefore, Ward et al. (2014: 2) state that effectiveness of government measures depend on the actions of other levels of governments dealing on a different scale. Adaptation strategies applied in multilevel governance systems like flood protection measures in urban development projects are only effective when they stimulate others to take supportive actions.

Multilevel governance is the challenge of realizing policy goals in a nested and compounded governance structure, in which the interactions are dynamic and rather unpredictable. Actors in these complex nested systems are mutually dependent in achieving their own goals and therefore need to coordinate their actions with the other actors. This means that various interaction processes on different levels are being processed at the same time, dealing with different issues and following their own dynamics. "The relations between these processes are to some extent hierarchical because higher levels possess the authority to influence lower levels' room to maneuver. At the same time, the relations between the levels are more network-like and based upon mutual interdependence (Van Buuren et al., 2014: 3)."

This has to do with the built-up experiences actors have with institutions on different levels and how this affects the way actors understand, implement, change or ignore these institutions. Ostrom (2005) refers

to this as “the characteristics of the community or collective unit of interest”. This implies that this change of approach of the Dutch government affect the way private actors behave in integrating flood protection in urban development projects.

Ward et al. (2012) wrote about how climate governance are implemented on a city-scale. They discovered that on the city-scale the large number of actors, the uncertainty over climate change impacts and the demand for immediate action, combined with long-term horizons, leads to the fact that cities are still experimenting with implementation and the organization of adaptation. “Traditional boundaries between actors, and between the public and the private sector, are blurred as a consequence (Ward et al. 2012: 5).” The authors mention that climate proofing is an additional challenge for public and private actors in realizing their core ambitions. Moreover, they discuss prerequisites for effective and legitimate adaptation governance. “Adaptation governance requires: integration of long-term ambitions and short-term needs; readjustment of choices and instruments when new information becomes available; consistency; and deliberation over efficient timing and the sequence of measures (Ward et al., 2012: 12).” Furthermore, adaptation should be integrated into (long and short –term) societal aims and interests.

The reference to effective and legitimate governance point out that Dutch policies and responsibilities are important conditions for effective implementation on city-scale. Ward et al (2012: 12) call this mainstreaming, which refers to the integration of current and future climate change vulnerabilities (or adaptation) within broader government policy aims and implementation programs.

This is relevant for this thesis because it mentions that clear government rules and regulations do affect the behavior of (private) actors involved in flood protection measures in urban development projects. If these rules and regulations are not clear however, public and private actors have to reinvent their role (it becomes challenging when realizing their core ambitions). This refers to what Ostrom (2005) calls ‘Institutions or rules that govern the action arena’: the Dutch state is legally responsible for flood protection. The Dutch general attitude is based on this legal responsibility of the state.

Completion of the analytical framework

In order to find out what institutional factors influence financial private sector participation to integrate flood protection measures into urban development projects in the Netherlands, two Dutch urban development projects will be analyzed. The two urban development projects already integrated flood protection. The theory of structuration in combination with the hypotheses concerning sustainable urban development provides a tool to be able to analyze these cases.

In chapter two, based on the theories of Van Tilburg et al. (2012), Hart and Milstein (2003) and Jonker (2012), the assumption was made that private actors financially participate in flood protection measures during every single phase of the development process. In this case private actors are profit actors like real estate developers that are involved in the urban development projects Heijplaat and Streefkerk (dealt with in chapter four and five). This assumption is based on that, according to Van Tilburg et. al and Hart and Milstein, private actors not only want to reduce risks and costs but also want to give their contributions to a sustainable future for society. In this case this is a flood proof urban development.

In chapter two it also became clear that the Dutch government is stimulating actors involved in urban development projects to act in a sustainable way and therefore contribute to a sustainable future for society. Peek and van Remmen (2012) published a policy document in which the Dutch state stimulates public and private actors to work together and set sustainable goals together for future use of the public space and real estate. The overall focus is on changing from focussing solely on profits to being sustainable (while making a profit). The future use of the public space or real estate is the starting point for new developments. The future use and maintenance will determine the urban development project. Furthermore, the decision for new urban development projects is based on what it contributes to the existing built environment (Peek and Van Remmen, 2012).

In this chapter (chapter three) it became clear that because the Dutch government is (and already has been for a long time) legally responsible for flood protection, private actors believe they are safe and believe this is a governmental task. However, it also became clear that the Dutch government is successfully in making other parties aware of the risks of flooding. Mees (2013) discovered that in some urban development projects private actors are already financially participating in flood protection measures.

The assumption is that this current government policy influences the behavior of the actors involved and that this will be visible in the action arena. The assumption is that private actors financially contribute to flood protection measures because the Dutch state stimulates to share responsibility and therefore the costs.

So in urban development projects as well as in integrating flood protection in urban development projects the Dutch state stimulates public and private actors to co-operate and focus on a sustainable future for society. For this thesis, this is considered as a Dutch institution. This means that because the Dutch state stimulates public and private actors to cooperate, share responsibility and focus on a sustainable future for society private actors involved in the urban development project will financially participate in flood protection measures (in every phase of the development process). Private actors do not only want to reduce risks and costs but also want to contribute to a sustainable future for society.

In order to find out if this assumption is true or false, the behavior of the private actors in the action arena will be analyzed.

This hypothesis will be tested on two different levels: on the level of the agency by interviewing private actors, and on the level of the action arena by looking at their actual behavior. In this way, an analysis can be made on what private actors say they did or are doing (interviews) and what private actors actually do (behavior in the urban development project). For the analysis on the level of the action arena interviews with other involved parties than the private actors were conducted and formal documents like development contracts were analyzed.

The answers that were given during the interviews by the private actors will be analyzed in order to find out to what extent these or other institutions are apparent in their answer and their actual behavior. Financial participation is considered as proof that that actor feels responsible or not.

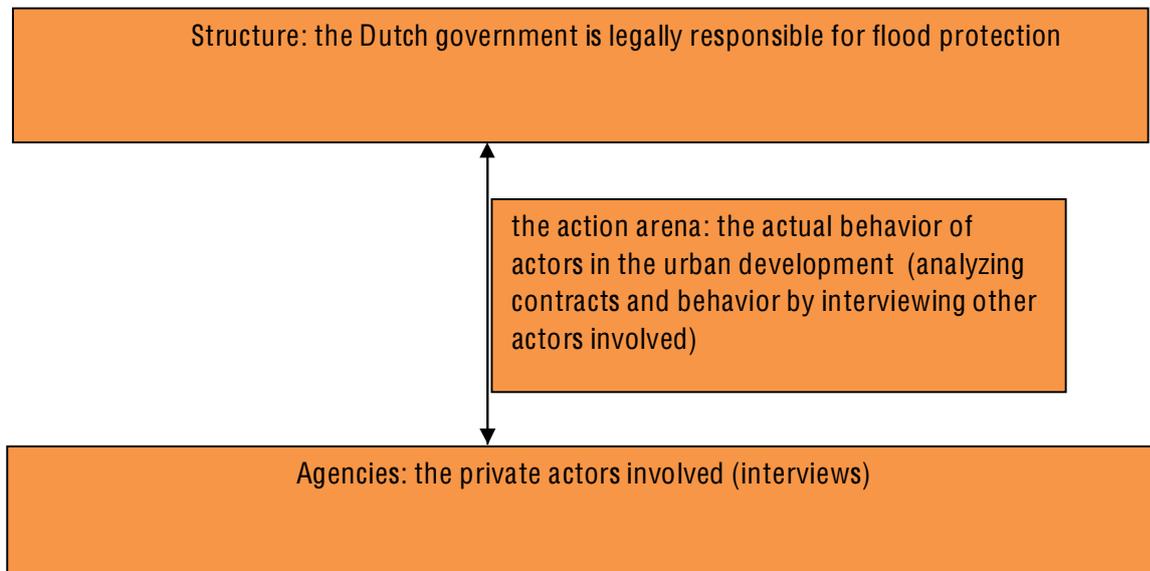


Figure 12: Analytical framework combining the theory of Giddens (1984) and of Ostrom (2005).

3.7 Concluding remarks

This chapter dealt with the question: What institutional factors are expected to influence private sector participation in flood protection measures in the Netherlands? Based on the Dutch context it became clear that the national government is and already has been for a long time legally responsible for flood protection. However, current policy focuses on stimulating private actors to participate in flood protection measures as part of an integral urban development. Although it has not been put into practice a lot yet, there are already some examples of urban development projects in which private actors financially participate in flood protection. The assumption is that Dutch policy influences financial private sector participation in flood protection measures.

In order to find out if this assumption is true, the next chapters will analyze the behavior of private actors in two Dutch flood proof urban development projects: Heijplaat and Streefkerk.

4 Case Heijplaat in Rotterdam

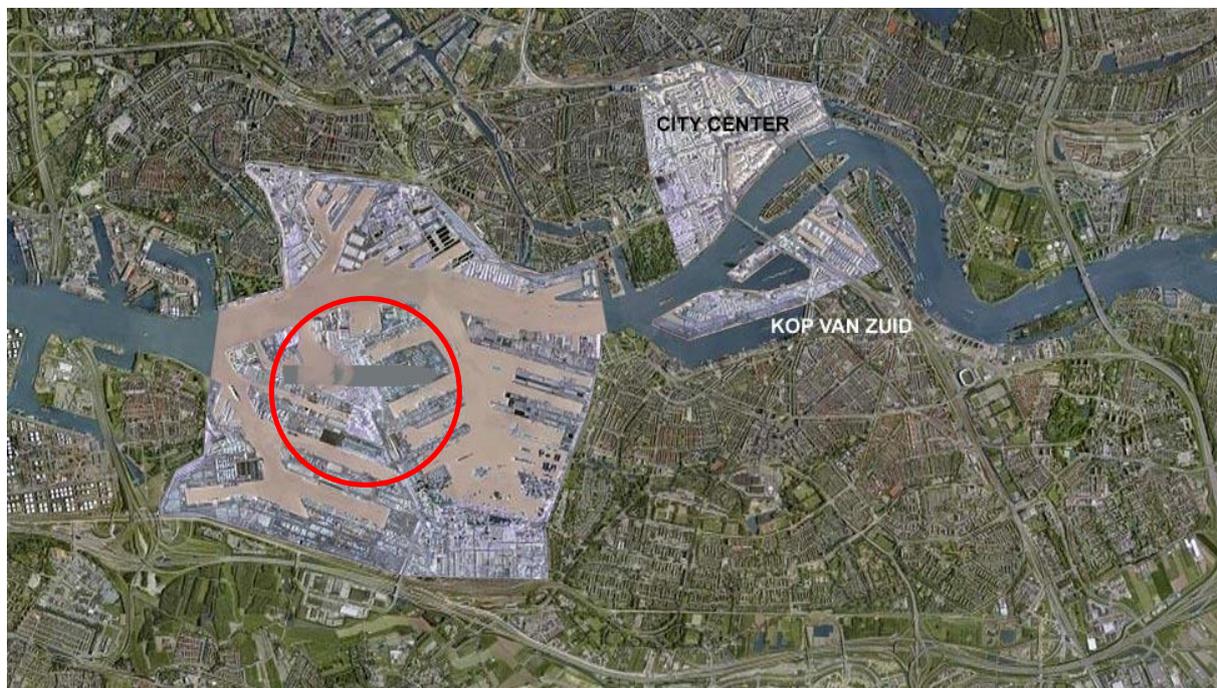


Image 7: Heijplaat in Rotterdam (red circle)

4.1 Introduction of the case studies

The main question of this thesis is: What institutions influence financial private sector participation in Dutch urban development projects that seek to integrate flood protection measures into the development scheme? In the upcoming two chapters, we will dive into practice and explore what institutions influence the behavior of private actors involved in two actual urban development projects. Based on our exploration of the Dutch policy context in the previous chapter, we hypothesized that private actors in Dutch practice are prepared to financially participate in flood protection measures in urban development (i.e. in every phase of the development process). We assume that this is the case for two reasons: One is that private actors want to contribute to a sustainable future for society taken from literature, and the other is that the Dutch government stimulates public and private actors to cooperate and share responsibility in flood proof urban developments which we found in the policy context of Dutch practice.

In order to test these assumptions, two Dutch urban development projects located in the Dutch delta will be analyzed. The two cases that will be analyzed are the urban development projects of Heijplaat and of Streefkerk, which are part of the same Rijnmond-Drechtsteden estuary (also known as the region of Rotterdam and Dordrecht). Specific to this region is that it is a combination of multiple urbanized areas. Most people that live in unembanked areas in the Netherlands, reside in this region.

In 2009, the municipalities that are part of this region started to draft plans for the implementation of the overall strategy that was later presented by the second Delta committee.²⁹

Heijplaat is part of the delta city Rotterdam. About 1,500 people live in the area in which the urban development takes place. Streefkerk has about 2,400 inhabitants. Both urban development projects are focused on redevelopment of the existing built environment. Both areas are located near a river. Although the case Heijplaat seems very different because it is part of a city instead of a rural area like Streefkerk, the cases are similar when it comes to location near a river and the number of inhabitants.

The two projects were selected based on whether and how flood proof measures have been integrated into the development project. Secondly, the measures had to be realized or financial agreements had already to be made. In this way, whether or not private actors actually financially participate and in what phase could be verified. Experts that were asked which Dutch urban development projects fulfill these criteria pointed out those two cases.³⁰ Heijplaat is located outside the dike system, and Streefkerk is only partially located outside the dike. This chapter (chapter 4) and the next (chapter 5) deal with the following sub question: To what extent do private actors actually participate in flood protection measures in urban development projects in the Netherlands? (H4 and H5)



Image 8: The location of Heijplaat (red circle) and Streefkerk (blue circle) in the Netherlands.

This chapter deals with the case Heijplaat.

4.2 Heijplaat, a village near the river The New Meuse

4.2.1 Introduction and location specifics of Heijplaat

Heijplaat is part of the municipality of Rotterdam. It is a small village located in an unembanked area. Roughly 1,500 people live here in Heijplaat. The village is surrounded by port industry and is located near

²⁹ Stuurgroep Rijnmond-Drechtsteden, juni 2014. "Deltaprogramma Rijnmond-Drechtsteden. Advies Deltaprogramma Rijnmond-Drechtsteden. Stuurgroep Rijnmond-Drechtsteden." Report.

³⁰ See annex 1

the river the New Meuse. The Rotterdam Dry Dock Company (RDM) built the village in the period between 1914 and 1918 for their employees. For that time, it was a modern residential area which had facilities like schools, shops and churches. Heijplaat had and still has a closed community. The RDM closed down in the 80's. Some old employees still live in Heijplaat.



Image 9: Heijplaat

The village is divided into an old part and a new one. The actors involved in the redevelopment of the village call it the old and the new part because in the old part nothing will change according to the development plans. The majority of the houses are social housing and do not fit present-day quality norms. Social housing are inexpensive dwellings for people with low-incomes.³¹ Dutch housing associations are responsible for these dwellings. They are independent, private organizations, with a public responsibility (Ouwehand en Van Daalen, 2002). Dutch housing associations are authorized institutions by the Dutch government. In Heijplaat the social houses are owned by Housing association Woonbron.

³¹ See annex 2 and chapter two

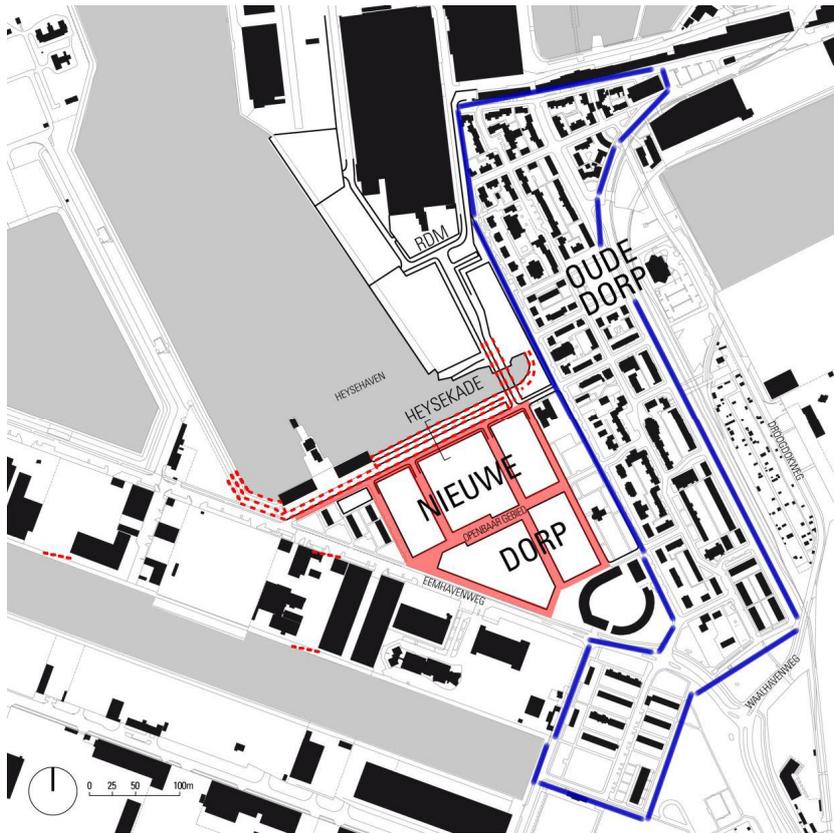


Image 10: Heijplaat village the old and the new part.³²

The average income per household on Heijplaat is less than the average of Rotterdam.³³ In 2011, for example, the average annual income per household on Heijplaat was €26,600. For Rotterdam it was €29,300 and for the Netherlands it was €34,200 per household annually.

Heijplaat is part of Cityports Rotterdam (Stadshavens Rotterdam). The municipality, together with the port of Rotterdam, wants to redevelop over 1,600 ha of land and harbor basins. The aim is to develop an economic cluster as well as to expand the city so that people could live and spend their free time there. A part of the 1,600 ha will remain allocated for port activities. Another part will be transformed from port to city. Sustainability is an overall aim in the sense that there has to be an equilibrium when it comes to the benefits for people, planet, profit. The intention is that the Port of Rotterdam and the Municipality will equally invest to achieve this goal. However, exact figures have not been put down in a formal agreement yet. Current developments point out that the financial responsibility will be looked at per subproject.

CityPorts is divided into four areas. The former Rotterdam Dry Dock is one of them. The RDM connects the village Heijplaat to the river. The RDM has been turned into a campus with a cluster of innovative

³² The image was copied from the report *Adaptief bouwen Heijplaat Rotterdam. Verkenning ruimtelijk/ fysieke effecten*. Maart 2012

³³ www.rotterdam.nl

business and educational institutes.³⁴ Innovative companies as well as two educational institutes are located here (Hogeschool Rotterdam, Albeda College). RDM now stands for Research, Design and Manufacturing. The RDM Campus still has room to expand. The land is on long lease of the port of Rotterdam.



Image 11: Map of CityPorts Rotterdam , 2014

4.2.2 Aims and ambitions of the urban development project of Heijplaat

The development of the RDM is integrated in the development of the village of Heijplaat. The actors decided to determine beforehand what goals they want to achieve together. They documented it all in the partnership agreement “Samenwerkingsovereenkomst Gebiedsontwikkeling Heijplaat 2”, which was signed by all actors on November 9th 2012.

Housing association Woonbron, the Port of Rotterdam and the municipality of Rotterdam are the initiators of the development of Heijplaat and RDM. Yet, the partnership agreement “Samenwerkingsovereenkomst Gebiedsontwikkeling Heijplaat 2” is signed by seven actors in total. The other actors are a representative of the inhabitants of Heijplaat, Dutch energy supplier Eneco, Stedin a company that is responsible for the maintenance of the energy network for Eneco and one of the educational institutions located on the RDM Campus, De Hogeschool Rotterdam. Furthermore, the World Wildlife Fund (WWF) is mentioned in the agreement. The WWF forms together with Eneco a partnership regarding the realization of energy neutral urban development projects.

In 2011 the first partnership agreement was signed by the municipality, Housing association Woonbron and The Port of Rotterdam. The same ambitions mentioned in the second partnership agreement of 2012 were already outlined in the first agreement. The second agreement is more developed than the first one and more actors committed to the development plan. Therefore, the first agreement does not count anymore and is replaced by the second one.

In the second partnership agreement, the aims and ambitions are registered. Furthermore, it states who is financially responsible for what part of the development and how the cooperation between the actors is organized.

The actors involved agreed to cooperate regarding the following issues:

- “The development of the project called Nieuwe Dorp (the development of about 200 new houses on the west side of the village)
- The development and the realization of facilities that suit 2,000 inhabitants and people who visit or work at the RDM Campus
- To stimulate and realize sustainable initiatives
- The design and realization of the new access road to the RDM campus
- Temporary maintenance of the development locations
- Communication with different stakeholders, but especially with the inhabitants. “³⁵



Image 12: Het nieuwe Dorp, Heijplaat designed by Woonbron³⁶

The emphasis is both on the involvement of the inhabitants of Heijplaat and on a sustainable development. They defined sustainable development as “developments that will lead to an

³⁵ Samenwerkingsovereenkomst Gebiedsontwikkeling Heijplaats 2 , 9 november 2012, p. 7

³⁶ www.ruimtelijkeplannen.rotterdam.nl

improvement of the social, ecological as well as the economic situation of Heijplaat and RDM"³⁷. The actors broadly defined how to reach this goal together for every aspect. One of the measures is flood protection for the whole village. The village of Heijplaat is located outside the dike.

The most important measure that contributes to the improvement of the social situation is the involvement of the citizens of Heijplaat in the project. Other measures consist of connecting the RDM and the village again in a positive way (physical as well as functional), for instance by making sure the RDM and the riverside are attractive places to visit and live and easily accessible for the village. Making sure there are good quality facilities like schools, sport facilities, an ATM or a supermarket is also a goal. The citizens of Heijplaat indicated the facilities as important.

For the social housing in Heijplaat, the actors involved developed a special system for selecting new inhabitants. Heijplaat became a pilot for broadening this selection by adding the criterion that a new inhabitant should contribute to the ambitions of Heijplaat to be a sustainable village. This is possible because Housing association Woonbron owns the majority of the housing in Heijplaat and therefore is able to influence the selection of new tenants.³⁸ Or in the case of Het Nieuwe Dorp, influence the selection of new buyers. Woonbron organizes together with for example the Municipality of Rotterdam and representatives of people who already live in Heijplaat special introductions with the village. This way potential tenants could discover Heijplaat and find out if this is a village they want to live in. This contributes to a sustainable social environment of the village. It is a form of concept development: do people 'fit in'. It can be described as some sort of selection at the gate.

An important measure that will improve the ecological situation is making sure Heijplaat and the RDM will be energy neutral. This part of the development became a pilot project. Actors of the energy market were involved in the development of these measures. They will stay involved in the implementation of the measures as well. The focus will first be on the village. Different measures were developed such as offering the residents a cheap service that makes sure their energy consumption will decrease. Another option is redeveloping or developing real estate in such a way that energy waste is minimized. Concept House Village, for example, is an experiment regarding energy neutral housing. Private actors and educational institutes cooperate and share knowledge to develop and improve these new types of housing.³⁹ Potential buyers are offered a stay in one of the energy neutral houses of Concept House Village to find out if this is what they want. Other measures focus on integrating clean energy in the redevelopment of the village and Heijplaat like solar or wind energy.

An important measure that contributes to the improvement of the economic situation is the development of the RDM Campus, which includes improving the infrastructure or developing real estate so that companies want to locate here. They also focus on the economic situation of the village. Job vacancies by companies or the schools located at RDM, will be shared with the inhabitants of Heijplaat. The inhabitants can also use facilities the school offers. This stimulates a sustainable social and economic development of the village.

³⁷ Samenwerkingsovereenkomst Gebiedsontwikkeling Heijplaats 2, 9 november 2012, p. 4

³⁸ www.woonbron.nl

³⁹ <http://www.heywonen.nl/>

Flood protection

Regarding flood protection, an adaptive strategy was developed for Heijplaat so that the whole village would be protected instead of merely the new developments. The Dutch policy at the moment is that Real estate developments outside the dike have to be built on a certain level. What this level is depends on calculations that determine the rising water levels and therefore the risk of a flood. Based on the estimated rising water levels, for Heijplaat this should be 3.90 meters above sea level (NAP).⁴⁰ The current average level of Heijplaat is between 2.60 and 3.20 meters above sea level. The Heysekade has the level of 3.10 meters above sea level. According to calculations of flood risks based on the current level of Heijplaat, the village would flood once every ten years.

However, to build new real estate developments on the level of 3.90 meters above sea level would only protect the new development in case of a flood. The actors in the urban redevelopment project of Heijplaat chose to develop a strategy focused on protecting the whole village instead of only the new real estate development projects.

The strategy is also part of the development agreement. In March 2011, the authorities decided to make Heijplaat a pilot project for adaptive strategies. The strategy is based on the idea of multi-level security. This means that instead of only focusing on preventing floods by realizing dams and dikes, attention will also be paid to disaster management. The concept of multi-level security was launched by the Dutch national government in 2008. It includes the prevention of floods, the reduction of risks in case of a flood and managing the potential damage.

For the Heijplaats case it means that with regards to the first layer, prevention of a flood, a small dike will be developed next to the river the new Meuse, like on the Heysekade. This will not be a formal dike however, so the municipality stays responsible for the realization and maintenance.⁴¹ The level of the dike will be 3.60 meter above sea level. According to the estimations of the rising water level, this measure will make sure that the risk of a flood for the whole village will decline from once in ten years to once in 250 years.⁴² The small dike will be located next to the new access road.

⁴⁰ Bestemmingsplan Het Nieuwe Dorp, Heijplaat, Onderdeel waterparagraaf, 12 december 2012, p. 12

⁴¹ Bestemmingsplan Het Nieuwe Dorp, Heijplaat, Onderdeel waterparagraaf, 12 december 2012, p. 16 e17

⁴² Bestemmingsplan Het Nieuwe Dorp, Heijplaat, Onderdeel waterparagraaf, 12 december 2012, p. 16



Image 13: Het nieuwe dorp and the Heysekade, bestemmingsplan het nieuwe dorp 2012.

With regards to the second layer, the reduction of risks in case of a flood, the actors involved chose to combine several adaptive measures, like elevate the locations of the new real estate developments, the design of the public space and vital infrastructure, and in the design of the new to build houses.

The new houses will be developed in such a way that they are 'water proof' in case of a flood. This entails using certain materials that are water-resistant until the level reaches 3.90 meters above sea level. Facilities, like electricity and gas machines have to be placed above 3.90 meters above sea level to avoid such important functions from breaking down. Instead of elevating the locations to a level of 3.90 meters above sea level, housing association Woonbron is allowed to elevate the locations to 3.00 meters above sea level.⁴³ In addition, the public space has to be designed in such a way that it is flood proof. Vital infrastructure that has to be used to escape in case of a flood has to be realized on a level of 3.50

⁴³ Bestemmingsplan Het Nieuwe Dorp, Heijplaat, Onderdeel waterparagraaf, 12 december 2012, p. 18

meters above sea level. An evacuation plan in case of a flood is necessary as well. It also involves accepting the risks, like a communication plan that informs people of the risks and the measures inhabitants could take to reduce these risks.

The third layer, managing the potential damage, has to do with good preparations for a potential flood. A plan must be included who is responsible for what in case of a flood and the damage. This plan still has to be developed.

Housing association Woonbron, The Port of Rotterdam and the municipality of Rotterdam together with the Water Boards, the Directorate General for Public Works and Water Management of the national government worked out this multi - level strategy and presented it to the city council of Rotterdam. The council approved it in November 2012. Currently, parts of this strategy are being implemented. It also became part of the land use plan of the Nieuwe Dorp (12 december 2012).

The financial paragraph of the second partnership agreement is an agreement between three actors: housing association Woonbron, the Port of Rotterdam and the Municipality of Rotterdam. In the agreement it becomes clear who will pay for what. Examples for this case include the development of the housing project Het Nieuwe Dorp, the new sport accommodation and the playground. The agreement is confidential. Therefore this thesis will not describe who will pay for what or mention figures. For this thesis it is relevant though that it becomes clear in this agreement that the CityPorts will pay for the planning and the realization phase. CityPorts Rotterdam is a cooperation between the Port of Rotterdam and the Municipality of Rotterdam. This implies that the Port of Rotterdam also financially participates in the planning and realization phase of flood protection. However, in the financial agreement it also becomes clear that this money comes from a government subsidy (Nota Ruimte). This is government money.

With the partnership agreement signed, the planning phase is over. Currently, the different projects of the urban development are in the realization phase.

In 2013 the municipality of Rotterdam and the Port of Rotterdam signed an agreement for the realization and maintenance of the new access road. Also in this agreement it becomes clear that the municipality is financially responsible for the planning and realization of the small dike.

4.2.3 Role and behavior of the actors involved

In the Heijplaat case, three actors are particularly relevant with regard to our research question: the Port of Rotterdam, housing association Woonbron and the Municipality of Rotterdam.

Port of Rotterdam

The Port of Rotterdam is a non-listed, publicly owned limited company. Shares are held by the Municipality of Rotterdam (2/3rds) and the Dutch national government (1/3rd). The core business of the port authority is the sustainable development, management and operation of the port and continued smooth and safe handling of shipping traffic. The Port of Rotterdam lets out - on long-term leases - port

sites to businesses, particularly to storage firms, cargo terminals and the chemical and petrochemical industry, including energy producers. The main sources of income are rents and harbor dues.⁴⁴

The Port of Rotterdam has a dual role in the development of Heijplaat, the village and the RDM. It looks after the interests of CityPorts Rotterdam as well as of the port of Rotterdam. In the context of CityPorts it, together with the municipality, participates in the redevelopment of more than 1,600 ha. This includes the redevelopment of the harbor and the transformation of port area to urban area. The interest of the Port in this context is a sustainable integration with the city on the local level and at the same time making sure the port will keep on developing so that it will be able to compete on an international level.

The development of the RDM Campus is part of integrating the city and the port in a sustainable way. However, like most of the harbor area, the government closed a long lease for the location with the Port of Rotterdam. The Port of Rotterdam is allowed to close long leases with other parties. The redevelopment of the RDM Campus means a possible income for the Port of Rotterdam, because they can offer space to new companies in an attractive environment and collect rent.

In the partnership agreement, it became clear that improving the relationship between the RDM and the village economically, physically and socially contributes to a more sustainable development. The inhabitants even became an official partner by signing this agreement. The port of Rotterdam and the Municipality of Rotterdam hired professional representatives for the inhabitants so that they could get professional advice on how to look after their interests.⁴⁵ The Municipality, Woonbron, the Port of Rotterdam and the representatives of inhabitants regularly met to develop the integral plan together and to make sure everyone still supported the plans.

Even though the development of the RDM Campus and the village of Heijplaat are integrated, there is a certain conflict of interest between the ambitions Cityports Rotterdam has for the RDM and the people who live in the village Heijplaat. The development of a knowledge and business cluster at the RDM causes some inconvenience for the people who live in Heijplaat.

New developments at the RDM site make the riverfront less accessible for the people of the village. This became clear with the development of the hangar for Condor. The inhabitants tried to stop this development because it would block the view on the river.⁴⁶ Woonbron also protested against the development of the hangar. The hangar has dimensions of 28 meters high, 150 meters long and 50 meters wide and would block the view of the apartments they just developed on the Heijse Kade, de Heijse Blick. During that time, the end of 2012, not all of the apartments were occupied yet.

⁴⁴ www.portofrotterdam.com

⁴⁵ BESLUITENLIJST van de vergadering nummer 49 van het Dagelijks Bestuur van de deelgemeente Charlois, gehouden op dinsdag 21 december 2010, 09.30 uur, ter secretarie van de deelgemeente Charlois.

⁴⁶ www.heijplaat.eu



Image 14: Newspaper article (left) image of the plan for a loods viewed from the Heijsekade (right)

Furthermore, it suits the responsibility a housing association like Woonbron has when it comes to the quality of life in the neighborhoods where the housing associations' dwellings are situated. The Port of Rotterdam tried to meet the wishes of the inhabitants and of Woonbron by including them in the design of the hangar.

Another example of a conflict between the development of the RDM and the village is that more economic activities means more traffic. A new access road is needed. When the local authorities visited Heijlplaat, Woonbron, together with the inhabitants, made a clear statement with regards to the new access road. If in the design of the new road no attention is paid to the quality of life of the village, there will be no future for the village as a place to live in. Woonbron and the inhabitants stated that the design and the location of the new road would determine the future of the village.⁴⁷

⁴⁷ See annex 1: interview Maureen Mollis



Image 15: The route of the new access road ⁴⁸

The Port of Rotterdam therefore decided to invest extra money in the design of the road. According to Maike Akkers, about 800,000 euros was invested. One of the demands that the inhabitants had was to develop a bridge crossing the Heijse harbor. This was included into the design. Another was the location of the road. This was set together with the inhabitants, Woonbron and the municipality. On top of this the port of Rotterdam also decided to reserve some space at the RDM for facilities for the village. Like a supermarket. However, this would only work if the targets for these facilities would want to locate here. Until this day no supermarket has been that keen (July 2014).

According to the flood strategy, one element is to elevate the quay on the Heijsekade so that it will function like a dike. According to Maike Akkers of the Port of Rotterdam and involved in the development, the Port of Rotterdam was willing to elevate a part of the new access road so that Woonbron does not have to elevate their building location. This would contribute to the financial feasibility of the development of the real estate development Het Nieuwe Dorp and to the quality of the public space as well as to the flood protection of the whole village. However, the definitive design does not include an elevated road. Instead the road stays on the same height. A small dike will be realized next to the road and along the river.

The Port of Rotterdam participated in the planning phase of the flood strategy. Together with the other actors they participated in sessions to develop a strategy.⁴⁹

⁴⁸ www.ruimtelijkeplannen.rotterdam.nl

⁴⁹ Adaptief bouwen Heijplaat Rotterdam, Verkenning Ruimtelijke/ Fysieke effecten, maart2012.

The new access road has to connect the west side of the RDM to the existing roads on Heijplaat so that traffic can easily reach the RDM. It consists of a new bridge crossing the Heijse harbor and the redevelopment of the existing road over the Heysekade, Eemhavenweg, Arie den Toomweg, and the Bunschotenweg. The Port of Rotterdam finances the realization of the new bridge, the part of the road over the Heijsekade up to the Eemhavenweg, excluding the small dike on the Heijsekade. The Municipality finances the rest including the small dike on the Heijsekade.⁵⁰

The Port of Rotterdam participated in the planning phase, but did not pay for the realization of the flood protection measure on the Heijsekade.

Woonbron

Housing association Woonbron owns 46,000 accommodations and 3,000 other objects in Rotterdam, Spijkenisse, Delft and Dordrecht.⁵¹ In the Netherlands, the housing associations build, rent out, and maintain social houses. Dutch social housing is organized in the Netherlands by a strong independent social-rental sector. Dutch housing associations are independent, private organizations, but with a public responsibility.

Woonbron owns most of the property on Heijplaat. During the 1990s Woonbron decided to invest in Heijplaat the village. The other option was to demolish it because it is in the middle of the harbor industry. Due to present environmental standards, adding more houses in Heijplaat than already are present is not possible. The social and economic situation in Heijplaat was and still is not very good in comparison to the rest of Rotterdam. To be able to keep the facilities present on Heijplaat like the supermarket, the amount of people who live and work here needs to grow as well as the average income.⁵²

In the beginning of the 2000s, Woonbron started to make plans for the redevelopment of the village that ended up in a plan called Het Nieuwe Dorp. The plan incorporates the demolishing of the western part of the village. A total of 296 houses will be demolished. About 290 houses will be built. This means that the total amount of houses will not increase. However, the quality will be improved though. The concept of a garden village will be respected.

First, two apartment buildings were realized. De Wijde Blick consists of 58 apartments including facilities for the elderly. In 2010 the Heijse Blick was realized, an eight-floor apartment building with 58 apartments for sale and rent. People that live in the demolished houses could, if they wanted to, move to this building. Both apartment complexes were built on an artificial hill from about 3.60 to 3.90 meters above sea level.

The next step would be the development of about 200 houses. To be able to develop these houses Woonbron had to demolish another 288 houses. The new houses will be built on the basis of private commissioning, in which the occupant is given the opportunity to come up with their own design using

⁵⁰ Partnership agreement "Overeenkomst Realisatie Westelijke Ontsluitingsweg RDM/Heijplaat. 2 april 2013

⁵¹ www.woonbron.nl

⁵² See annex 1: interview with Willette van Arendonk

their own architect. This means that Woonbron is not developing the houses themselves but is responsible for the estimate of land development. This also means that, in this case, they are acting like a for-profit organization. Woonbron prepares the land for construction and sells it to a new owner or real estate developer. They have already approached some real estate developers that are interested.⁵³

Woonbron's target for social housing on Heijplaat has already been reached. This development would contribute to the improvement of the social and economic situation on Heijplaat. More people with higher incomes on Heijplaat means a user base for the present facilities. The whole village would benefit as well as the tenants of Woonbron.⁵⁴

Woonbron also emphasized a sustainable development of the village. Together with the inhabitants, Eneco and the WWF they formed a partnership regarding the realization of energy neutral urban developments.

Woonbron spent a lot of time and energy in the development of the adaptive strategy. They cooperated with the municipality and the Port of Rotterdam. Woonbron had different reasons to participate. Firstly, Woonbron has a lot of property on Heijplaat. They have a huge responsibility when it comes to the quality of life of the village as a whole. A strategy that would protect the whole village instead of only the new development contributes to the safety of the 'old' houses as well. Furthermore, the inhabitants of Heijplaat prefer Woonbron not to elevate the location to 3.60 or 3.90 meters above sea level. It will cause differences in height in the public space.⁵⁵

Secondly, not having to elevate the development land to a certain level, Woonbron could save about two or three million euros on the investment. The feasibility of the project for Woonbron was already an issue. The result of the costs and benefits were negative. To be able to save two or three million would not have made it a positive result, but made the result less negative.⁵⁶ This means Woonbron had a direct financial incentive when it came to the development of the Nieuwe Dorp.

Some of the measures of the flood protection strategy are specific for the new houses, such as using a certain material that is water-resistant. These measures will cost the new owner about 1,500 euro per house. Woonbron is planning to include these measures in their contracts so that the new owner is obligated to take these measures and thus pay the 1,500 euros. The local government has the task to make sure these measures are realized. This is also mentioned in the partnership agreement.

Woonbron just recently ended this development because it was financially too risky for them.⁵⁷ They are trying to find a new actor to take over this development.

⁵³ See annex 1: interview with Xander van Beers

⁵⁴ See annex 1: interview with Xander van Beers

⁵⁵ See annex 1: interview with Xander van Beers

⁵⁶ See annex 1: interview with Willette van Arendonk

⁵⁷ See annex 1: interview with Xander van Beers

Municipality of Rotterdam

The Municipality, just like the Port of Rotterdam, has a dual role when it comes to Heijplaat. They participate in CityPorts and in the urban development of the village. Their interest includes a successful development of the RDM as part of CityPorts as well as an improvement of the quality of life when it comes to the redevelopment of the village of Heijplaat.

The Municipality of Rotterdam is divided in 14 areas. Heijplaat belongs to Charlois. Every part has its own local authority. This system has changed as of 2014, but the original goal to divide Rotterdam in the first place stayed the same: the areas are responsible for looking after the interests of the people who live and work in these areas. In case of the development of Heijplaat, Charlois looked after the interests of the inhabitants, in comparison to the part of the municipality that deals with urban developments as CityPorts. This thesis does not make a distinction between the two different parts of the municipality. It is far too complex, as the two listed parts can be divided into multiple parts once more, that deal with municipality issues.

The role of the local government in case of Heijplaat was to facilitate the developments of the RDM and the village. They have an active role with regards to the quality of the public space. They finance a part of the new access road and will maintain this road as well as the public space needed for the new village. This was all included in the partnership agreement.

When it comes to flood protection they are the initiators of a new strategy for Heijplaat. The municipality was responsible for the process of developing the strategy with the other stakeholders. They are also financially responsible for the realization and maintenance of the implemented strategy. This responsibility is also included in the partnership agreement.

The Municipality of Rotterdam, together with the other actors involved, developed the strategy but did not share financial responsibility for the realization and maintenance phase.

4.3 Financial participation in the flood protection of Heijplaat

In chapter two and three the assumption was introduced that private actors involved in flood proof urban development projects will financially contribute to flood protection measures. The reason why they financially participate is because the Dutch state stimulates to contribute to a sustainable future for society. Furthermore, according to Van Tilburg et al. (2012) and Hart and Milstein (2003) private actors want to contribute to a sustainable future for society (while making a profit).

In order to find out whether this assumption is true or false in the case of the urban development of Heijplaat, the behavior of the private actors in the action arena was analyzed. The action arena in this case is the urban development project organization of Heijplaat.

The private actors involved in the urban development project in Heijplaat are the Port of Rotterdam and the housing association Woonbron. Both actors financially participated in flood protection measures.

Housing association Woonbron, the Port of Rotterdam and the Municipality of Rotterdam initiated the development of Heijplaat and RDM. They invested time and effort in the initiation phase. Together with

other actors they signed the partnership agreement “Samenwerkingsovereenkomst gebiedsontwikkeling Heijplaat 2”. They set sustainable goals together including flood protection measures that would protect the whole village, so not only the new houses. They defined sustainable development as “developments that will lead to an improvement of the social, ecological as well as the economic situation of Heijplaat and RDM”.

During the feasibility and planning phase all parties financially participated. They all invested time and knowledge in the development of a flood protection strategy for the whole village. The Port of Rotterdam in the development of a plan for the new access road including the elevation of the location on the Heysekade. Housing association Woonbron invested time and knowledge in finding ways to develop water resistant housing (up till 3.90 meters above sea level). They even calculated how much it would cost for the potential buyers/developers of the real estate to realize this.⁵⁸

The port of Rotterdam was willing to financially contribute to the development of a dike near the Heysekade. They also wanted to contribute to the elevation of the road on the Heysekade (interview with Maïke Akkers). However, even though the port of Rotterdam was willing to financially participate in the realization phase, the local government took full (financial) responsibility for this except for the measures when it came to the new buildings. Woonbron wants to include this in the development contract.

The Local government of Rotterdam finances the realization and the maintenance phase.

Figure 13 shows what actors financially participate in flood protection as an integral part of the urban development project of Heijplaat.

⁵⁸ See annex 1: interview with Willette van Arendonk

Actor/Phase	Initiation	Planning	Realization	Maintenance
Housing Association Woonbron	Yes, in time and effort	Yes, by developing a flood proof strategy together with the other actors	No, the flood proof measures needed for the housing will be included in the development contract	No
Port of Rotterdam	Yes, in time and effort	Yes, by developing a flood proof strategy together with the other actors	No, they will realize the road, excluding dike next to the road on the Heysekade	No
Municipality of Rotterdam	Yes, in time and effort	Yes, by developing a flood proof strategy together with the other actors	Yes, they will realize the small dike on the Heysekade next to the new access road	Yes, the municipality is responsible for the maintenance of the dike on the Heysekade

Figure 13: Schematic overview of financial public and private sector participation in flood protection measures as an integral part of the urban development of Heijplaat

4.4 Motives for financial participation

During the interviews the actors were asked why they did or did not financially participate. The Port of Rotterdam as well as Housing association Woonbron had a direct or indirect financial interest in the adaptive strategy. The Port of Rotterdam contributed because they wanted to develop the RDM (letting out port sites). For the development of the RDM a new access road that passes through the village of Heijplaat is necessary. Without the access road the RDM is not an attractive location for companies to locate themselves. A good relationship with the village contributes to the realization of a new access road because otherwise there was a risk that the people who live in the village do not want to cooperate.

Housing association Woonbron wants to sell and rent houses on Heijplaat. A long term commitment with the village is important to them. Housing association Woonbron has a double role in Heijplaat. One is their role as a Dutch housing association that rents out and maintains social housing. The other role is the role as a profit organization, in this case a private land owner when it comes to the real estate development of Het Nieuwe Dorp. In case of Het Nieuwe Dorp Woonbron has a direct financial interest for participation in an adaptive strategy for flood protection. Not having to elevate the land for the real estate development saves Woonbron extra costs. In the case of their other property in Heijplaat, the motivation to participate has to do with a long term relationship with the inhabitants of Heijplaat. Satisfied renters of their social housing means a reduction in the risk that the current renters will move. This is the same reason Woonbron participated in the project they set up together with Eneco and the World Wildlife Fund.

Figure 14 shows the motives of the different actors involved to financially participate in flood protection as an integral part of the urban development project of Heijplaat.

Actor/Phase	Motivation to participate (or not)
Housing Association Woonbron	Satisfied tenants of the social housing owned by Woonbron Feasibility of the real estate development of Het Nieuwe Dorp (reducing costs)
Port of Rotterdam	The future income of letting out port sites on the RDM

Figure 14: Schematic overview of the motives for financial participation in flood protection as an integral part of the urban development project of Heijplaat.

4.5 Concluding remarks

This chapter deals with the question To what extent do private actors actually participate in flood protection measures in urban development projects in the Netherlands? In this case in the flood proof urban development project of Heijplaat. The Port of Rotterdam as well as housing association Woonbron both financially participated in an indirect manner: by time and knowledge. They did this both in the initiation and planning phase of the urban development process. The Port of Rotterdam was willing to financially contribute to the development of the small dike on the Heysekade. Originally the plan was to elevate the entire road. However, this plan changed. The road will stay on the current level and a small dike will be realized next to the road on the Heysekade by the municipality of Rotterdam.

Both Woonbron and the port of Rotterdam had an financial interest in participation.

5 Case Streefkerk in Molenwaard

The urban development project in Streefkerk was selected based on the fact that flood proof measures were integrated in the development project. Secondly, the measures had to be realized or financial agreements had to be already made. This way, whether or not private actors actually financially participate and in what phase could be verified. Experts were asked which Dutch urban development projects fulfill these criteria pointed out those two cases.

Heijplaat is located outside the dike and Streefkerk is only partially located outside the dike. Although Heijplaat is part of the municipality of Rotterdam, Heijplaat and Streefkerk are quite similar in the amount of inhabitants. Furthermore they both are part of the Rijnmond – Drechtsteden area. Heijplaat is surrounded by the Rotterdam Harbour and located near the river the New Meuse. Streefkerk is a rural area and located near the river Lek. This chapter deals with the urban development project of Streefkerk and focuses on the following sub research question: To what extent do private actors actually participate in flood protection measures in urban development projects in the Netherlands?

5.1 Introduction and location specifics of Streefkerk

Streefkerk is part of the municipality of Molenwaard. It is a rural village near the river Lek and has about 2,400 inhabitants. Streefkerk is home to a marina; Jachthaven Liesveld. It has 250 anchorage grounds and a restaurant. The village belongs to the Dutch orthodox-protestant bible belt.



Image 16: plan for the development of Streefkerk, 2010

Streefkerk is part of the Alblasserwaard. This area is surrounded by several rivers: in the northern part one will find the river Lek, in the southern part the river Merwede and in the western part the river Noord. The Alblasserwaard is about one meter below sea level. In Streefkerk some parts are even more

than one meter below sea level, up to about 1.5 meters below sea level.⁵⁹ Therefore, the protection of the village by dikes is necessary.



Image 17: Streefkerk (red circle) in the context of Alblasserwaard⁶⁰

Kinderdijk, also part of the Molenwaard municipality, is located near Streefkerk. Its collection of 19 authentic windmills were built in the 18th century and are classified as UNESCO World Heritage. The mills are an example of the Dutch struggle against the water that has been on-going for centuries. Kinderdijk would have long flooded without the use of windmills.

In 2006 it became clear that the dike between Kinderdijk and Schoonhovenseveer (KiS) does not fulfil the Dutch safety norms anymore. Therefore, the Water Board Rivierenland began to develop a plan to reinforce the dike. Water Board Rivierenland is responsible for the water defense system in this area. They wanted to involve people who live and work in this area and announced this in a newsletter they published regularly during the development and realization phase (the first one was published in 2009).⁶¹ The dike that has to be reinforced is located on the south side of the river the Lek (see image 18). About 10 kilometers of the total 17,5 kilometers of dike will have to be reinforced. The realization phase has already started and by 2017 the project will be realized. The dike in Streefkerk is part of this reinforcement project.

⁵⁹ http://www.ruimtelijkeplannen.nl/documents/NL.IMRO.1927.BPtimmerfbrSKK-VG01/t_NL.IMRO.1927.BPtimmerfbrSKK-VG01.htmlbijlage 5, p. 8

⁶⁰ www.plaatsengids.nl/alblasserwaard-en-vijfheerenlanden

⁶¹ Nieuwsbrief KiS, 2009 website Water Board Rivierenland

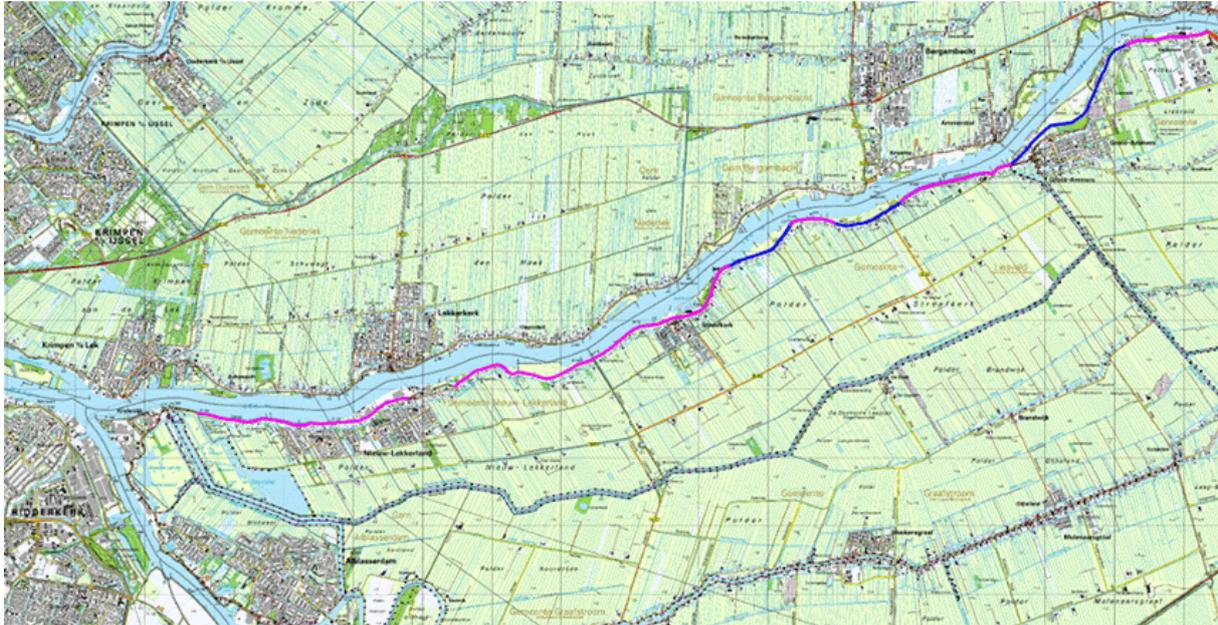


Image 18: The dike between Kinderdijk and Schoonhovenseveer (KiS)

HWBP-2 and Streefkerk

The reinforcement of the dike in Kinderdijk and Schoonhovenseveer is part of the High Water level Protection Program 2.⁶² The Dutch water boards and the Ministry of Infrastructure and Environment (Rijkswaterstaat) are responsible for the execution of the High Water level Protection Program (HWBP). The HWBP is part of the Deltaprogram. This program focuses on making sure the primary dams and dikes fulfil the Dutch safety norms. Primary dams and dikes protect the Netherlands from floods from the sea, the big rivers and the lakes the IJsselmeer and Markermeer.⁶³

The national government determines the safety norms for primary water defence systems like dams and dikes.⁶⁴ Every six years the water authorities check if the most important dikes and dams still fulfil the safety norms. This is recorded in the Dutch Water Act.⁶⁵ The first two checks took place in 2001 and 2006. The outcome was that reinforcements were needed in about 88 different locations in the Netherlands.⁶⁶ These projects are part of the HWBP – 2 Program. This Program includes the reinforcement of 370 kilometres of dams, dikes and dunes. Another program called the new HWBP focuses on primary water defense systems that did not fulfill the safety norm in the third check in 2011. The total costs for the reinforcement programs are about 6,9 billion euros (about 2,3 billion euros for HWBP – 2 and 4,6 billion euros for the new HWBP).⁶⁷ The reinforcement projects are evaluated by a management committee every quarter of the year.⁶⁸ Based on this report, the budget is updated by the Ministry of Infrastructure and Environment.

⁶² Ministerie van Infrastructuur en Milieu, 4 november 2013

⁶³ www.rijkswaterstaat.nl

⁶⁴ www.rijkswaterstaat.nl

⁶⁵ www.rijkswaterstaat.nl

⁶⁶ www.helpdeskwater.nl

⁶⁷ See annex 1: interview Bram de Fockert

⁶⁸ Hoogwaterbeschermingsprogramma. Kwartaalrapportage Q2 2014.

The last time the dike between Kinderdijk and Schoonhovenseveer was reinforced was in the 1980s.⁶⁹ Because of the soft soil and because of the built environment it is not an easy task to reinforce the dike. Furthermore, the Water Boards wanted to preserve the current structure of the built environment and the public space as much as possible. Therefore, the Water Board Rivierenland developed several alternative measures to strengthen the dike, e.g. using innovative technical measures to make sure the dike has a strong basis under the ground so that it will take less space to reinforce the dike. In this way the existing built environment will not be so much affected. Another innovation is the development of a climate dike.⁷⁰ A climate dike is constructed in such a way real estate developments are possible on the dike.

A climate dike⁷¹ is a dike that is about a hundred times safer than it is supposed to be according to the Dutch standards. "In the Netherlands, the Act on the Water Defenses gives for different types of dike rings a standard for the maximum exceeding probability of the design water level a dike section must sustain. These exceeding probabilities range from 1/50 per year for small areas without dikes upstream along the Meuse, via 1/1250 per year for dike rings along the upper part of the Rhine, till 1/10000 per year for the most important dike rings in the provinces North and South Holland along the coast (Eijgenraam, 2006, p.11). " These standard are determined by the Dutch government and are reset regularly.

According to the Dutch standards, a climate dike is developed in such a way there is almost no risk of flooding. It is higher and wider than a 'normal' dike is. Because the construction is very strong the government allows the dike to be used for other functions as well, like developing real estate or infrastructure on the dike. A climate dike is an attractive measure for the Dutch government because they could combine multiple functions with flood protection, like in Streefkerk.⁷² It is relatively expensive to realize (in comparison to dikes that fulfill the safety norms), however on the long term it could save money because it will take more time before it will need reinforcement according to the calculations.

⁷³The climate dike as part of the reinforcement project of Kinderdijk and Schoonhovenseveer (KiS) will be developed in Streefkerk.

This KiS project will cost about 135 million euros. The costs are 100% financed by the state.⁷⁴ This includes costs for preparation, land acquisition and costs for realization.

⁶⁹ Dijkversterking Kinderdijk –Schoonhovenseveer conceptprojectnota/ milieueffectrapport deel A: hoofdrapport.

⁷⁰ Dijkversterking Kinderdijk –Schoonhovenseveer conceptprojectnota/ milieueffectrapport deel A: hoofdrapport. p. 9

⁷¹ A climate dike or a Delta dike: they are the same thing.

⁷² Dijkversterking Kinderdijk –Schoonhovenseveer conceptprojectnota/ milieueffectrapport deel A: hoofdrapport.

⁷³ See annex 1: interview Bram de Fockert

⁷⁴ See annex 1: interview Bram de Fockert

5.2 Aims and ambitions of the urban development project of Streefkerk

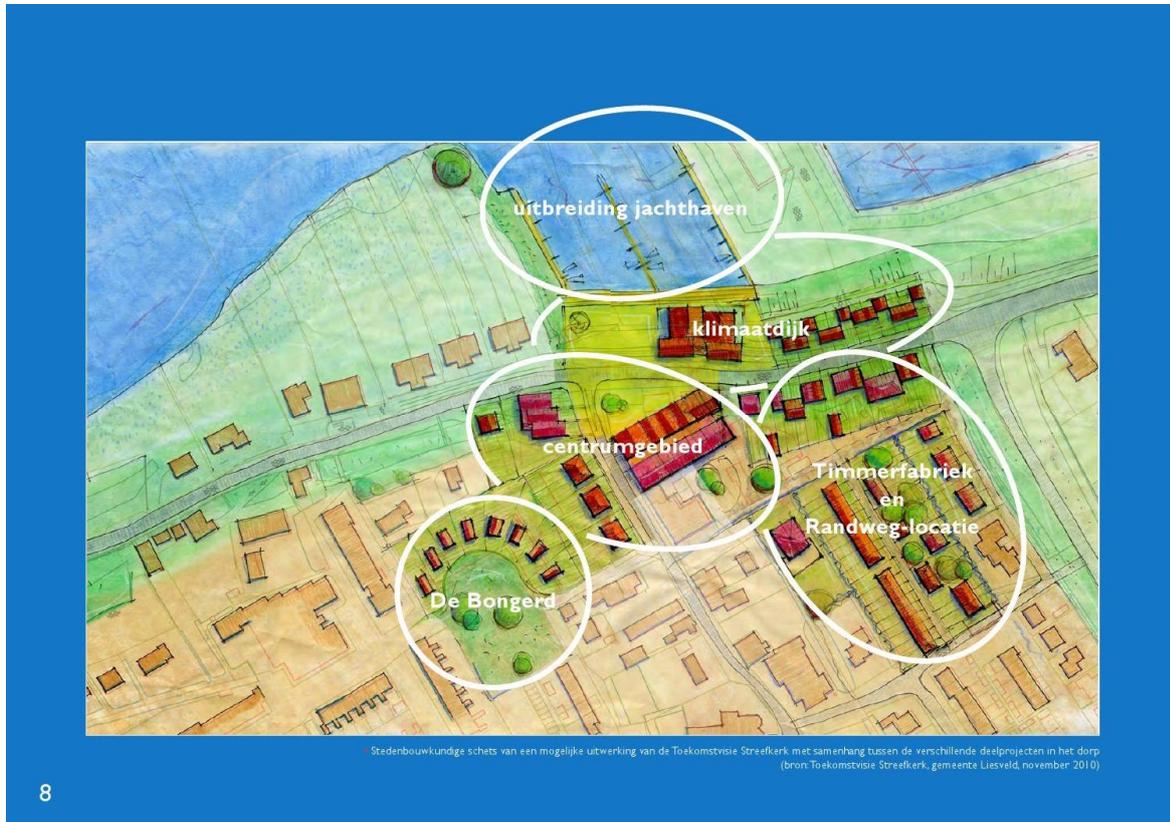


Image 19: The integral development of Streefkerk, Terra Incognita

There are three developments that are relevant for this thesis and specifically for the urban development project in Streefkerk: The climate dike which is part of the KiS project, the expansion plans of the marina and the different real estate developments in Streefkerk.

The climate dike will be realized in Streefkerk. The Water Board selected Streefkerk for two reasons: to be able to develop a climate dike space is needed. The first reason includes that there is enough space in Streefkerk to develop a climate dike. A climate dike is higher and wider than a 'normal' dike. A normal dike in Streefkerk according to the Dutch safety standards should be about 5.5 – 6 meters above sea level and about 3 meters wide.⁷⁵ According to the calculations, a dike with these measures in Streefkerk will protect the village from floods for approximately 50 years. A climate dike should be built in such a way it will protect Streefkerk from flooding for 100 years according to the calculations. This means for the location of Streefkerk the dike has to be about 7 meters above sea level. Furthermore, it has to be wider than 3 meters on the top to be able to develop new housing on the dike. In Streefkerk there was enough land available to develop such a dike. This was also the conclusion of a report conducted by different public, educational and private actors. Streefkerk was also part of a study executed by different

⁷⁵ De klimaadijk in de praktijk. Gebiedsspecifiek onderzoek naar nieuwe klimaatbestendige dijkverbeteringsalternatieven langs de Nederrijn en Lek. Kennis voor Klimaat 2010, p. 36

actors that had the goal to select suitable locations for a climate dike. This report concluded that Streefkerk was a suitable location.⁷⁶

Secondly, the marina was willing to cooperate as well as the Municipality.⁷⁷ In an interview with the Water Board Rivierenland it became clear that idealistically more land than available is actually needed for the development of a climate dike.

The expansion of the marina is a development of the owners of the Jachthaven Liesveld. The owners of the marina want to create extra water surface so that they will have more anchorage grounds to let out. In 2006 the marina presented their plans to the municipality of Liesveld (in 2013 the municipality became part of the municipality of Molenwaard).⁷⁸ The municipality decided to integrate this project in the development of the climate dike. Terra incognita on behalf of the Municipality, together with Witteveen+Bos on behalf of the Jachthaven Liesveld B.V., worked out an integral design for the realization.⁷⁹ For the marina, the development of the climate dike was an opportunity to realize their plans. This way the Municipality was willing to facilitate the expansion.



Image 20 : expansion plan of the Marina

⁷⁶ De Klimaatdijk in de praktijk. Gebiedsspecifiek onderzoek naar nieuwe klimaatbestendige dijkverbeteringsalternatieven langs de Nederrijn en Lek. Kennis voor Klimaat 2010.

⁷⁷ See annex 1: interview Dick van der Kooij and Bram de Fockert

⁷⁸ Notitie aanzet tot een visie op de ruimtelijke ontwikkeling, 9 januari 2007, opgesteld door jachthaven Liesveld B.V.

⁷⁹ Rapport Klimaatdijk en Jachthaven Liesveld, beeldkwaliteitsplan en inrichtingsplan, Terra Incognita, 4 december 2013.



Image 21: current situation: blue circle is the location the marina wants to include. The two red circles are two of the three developments inside the dike; De Bongerd and Timmerfabriek⁸⁰

On the 13th of February 2014, the Municipality, the marina and the Water Board signed the partnership agreement for the integral development of the two projects. The agreement contains three sub projects: the expansion of the marina, the realization of the climate dike, and the realization of housing on the climate dike, including public space that connects the village with the river Lek.

Inside the dike, where the majority of the village of streefkerk is located, several real estate developers and a housing association want to develop or redevelop real estate. Housing association Beter Wonen, real estate developer HBC planontwikkeling and Blokland want to develop better quality housing on the locations called De Bongerd, Timmerfabriek en Randweg-locatie. In total 62 houses will be developed. Moreover 20 apartments for the elderly will be built and 20 houses for starters and the rest for families.⁸¹

Building company Gebroeders Blokland B.V. wants to develop the Timmerfabriek and the Randweg-locatie. Housing for starters will be combined with housing for the elderly. For the development of the housing for the elderly housing association Beter Wonen is involved.

Real estate developer HBC planontwikkeling will develop de houses next to the climate dike near the Randweg.

⁸⁰ Stedenbouwkundige visie van de herontwikkeling van Locatie Timmerfabriek De Jong van Aartrijk, Brandweerkazerne en Randweg Locatie De Bongerd

⁸¹ Stedenbouwkundige visie van de herontwikkeling van Locatie Timmerfabriek De Jong van Aartrijk, Brandweerkazerne en Randweg Locatie De Bongerd, p 9

The Municipality wants to cooperate because the real estate developments contribute to the ambitions of Streefkerk to increase the number of inhabitants and the ambitions when it comes to the quality of the housing. The development plan 'Timmerfabriek Streefkerk' has already been approved by the municipality of Molenwaard on the 4th of February 2014.⁸²

Existing real estate has to be demolished before new real estate can be developed on these locations. At the moment, there is not enough market demand to redevelop these housing areas. So nothing has happened yet.

The municipality of Molenwaard took the initiative to integrate the different development projects.⁸³ In 2009, the municipality of Molenwaard asked Terra Incognita, an office for urban planning, to design a plan to integrate different initiatives for development projects in Streefkerk. This plan had to contain preconditions for the different initiatives for real estate development in Streefkerk. Furthermore, the plan had to garner the support of all stakeholders, especially that of the inhabitants.⁸⁴ Terra Incognita presented this plan in 2010. The municipality used this plan to test new developments in Streefkerk whether it fulfils the preconditions of the integral urban development of Streefkerk.⁸⁵

For the municipality, it is important that the number of inhabitants in Streefkerk increases. The municipality focuses on people who already live here and want to stay here and on people who have a certain connection with or preference for Streefkerk⁸⁶. Therefore they focus on upgrading the quality of the public space and the shopping street. This includes an attractive waterfront so that tourists and inhabitants have better access to the river Lek. Furthermore, they wanted to add more houses of better quality that fit the current standards households have (good isolation, enough square meters etc.). The municipality wants to improve the shopping street together with Beter Wonen. Here, most of the real estate is privately owned. The owners want to improve the real estate, however they currently do not want to invest. So the actors involved are still trying to find the right strategy for improvement.

⁸² www.ruimtelijkeplannen.nl

⁸³ See annex 1: interview Willem van Valen

⁸⁴ See annex 1: interview Jan Maurits van Linge

⁸⁵ See annex 1: interview Willem van Valen

⁸⁶ Eindrapport Toekomstvisie Streefkerk, terra incognita in opdracht van gemeente Liesveld, 2010

5.3 Role and behavior of the actors involved

Jachthaven Liesveld



Image 22: the urban plan for the climate dike and the extension of the Jachthaven Liesveld (marina) in Streefkerk.

The owners of Jachthaven Liesveld already wanted to expand the marina in 2006. In 2014 the development agreement was signed by the marina, the municipality and the water board Rivierenland. Because the municipality wanted to integrate the expansion project in the development of the climate dike, the municipality wanted to wait. The planning phase for the reinforcement of the dike took a few years.

Part of the land necessary for the realization of the climate dike is owned by the marina⁸⁷. Therefore, the water authorities needed the marina to be able to develop the climate dike. The owners of the marina needed the cooperation of the Municipality to extend the marina. The Municipality and the Water Board decided to cooperate with the marina.

The marina sold the land needed for the development of the climate dike to the Water Board Rivierenland. In exchange for this, the Water Board Rivierenland will sell the land for real estate

⁸⁷ Anterieuere overeenkomst uitbreiding Jachthaven Liesveld en ontwikkeling Klimaatdijk Streefkerk inclusief bijlage 7

development that will be realized on the climate dike.⁸⁸ The quality of the development on the climate dike will affect the quality of the marina. Therefore, the owners of Jachthaven Liesveld decided to develop the houses themselves so that they can actually influence the quality of the development. The owners of the marina want to develop housing for rent for most likely starters. However, this has not been decided yet. First they want to realize the expansion. Momentarily they are working on the development plan to get the permits to do so. After the realization of the expansion they will start working on the development plan of the real estate development on the climate dike. In the development plan of the reinforcement of the dike between Kinderdijk and Schoonhovenseveer the real estate development is not included.

The marina took care (also financially) of the development plan and the realization of the expansion of the marina. The municipality checked if these plans are according to the integral plan Terra Incognita developed for them in 2010.

The marina will also take (financial) care of the realization of parts of the public space near the river Lek. They will realize a square, for example, so that the people of Streefkerk can use this square and organize events on the square. This contributes to the ambition of the municipality to connect the village with the river Lek again. The maintenance of the public space will be the responsibility of the municipality.⁸⁹

Municipality of Molenwaard

The Municipality did not own land that was needed for the development of the climate dike or for the expansion of the marina. They had tools like permits or the approval of development plans to be able to influence the expansion of the marina or the realization of the climate dike.

The Municipality maintained very good relationships with the Water Board. The Water Board was going to develop and finance a climate dike on which extra housing could be build. The dike also contributed to an attractive connection between the village and the river Lek.

The Water Board and the marina designed and will finance the realization of the public space according to the wishes of the Municipality. The Municipality will maintain it.

Furhtermore, the Municipality made sure that all the plans were according to the preconditions of the integral plan for Streefkerk. Because the extension takes place in an unembanked area, the province is responsible for the permits to create extra water.

Water Board Rivierenland

The climate dike is part of a bigger dike reinforcement project, the Kinderdijk – Schoonhevenseveer reinforcement project KiS. The Water Board Rivierenland needed the land owned by the marina to develop the climate dike. Based on the integral urban development plan of the Municipality and together with the marina they designed the dike and the public space on it. They do not have an interest in the development of real estate on the dike. Therefore, they sold the land to the marina that did have an interest in the quality of the development on the dike. They even offered to prepare the land for construction of the real estate development on the dike for the marina. The marina, however, did not take the offer. It is unknown how much and what kind of houses will be built.

⁸⁸ Anterieure overeenkomst uitbreiding Jachthaven Liesveld en ontwikkeling Klimaatdijk Streefkerk inclusief bijlage 7

⁸⁹ Anterieure overeenkomst uitbreiding Jachthaven Liesveld en ontwikkeling Klimaatdijk Streefkerk

The development of the climate dike is included in the budget the Water Board has for the total reinforcement project KiS (the total costs of about 135 million euros). The revenues for selling the land on top of the climate dike is an additional income (interview Dick van der Kooij en Bram de Fockert). However, it does not become clear whether the Water Board while trading land for the climate dike made a profit or not. The figures are not available.

Housing association Beter Wonen, HBC planontwikkeling and Gebroeders Blokland B.V.

The Water Board, the Municipality and the marina did not include Housing association Beter Wonen HBC planontwikkeling and Gebroeders Blokland B.V. in the development of the climate dike. The municipality and the marina preferred to not include other actors. They wanted to better connect the village with the marina and the Lek. The development of a small extension of the village on the dike by the marina was a positive scenario for both the marina and the Municipality. Furthermore, the Municipality believes that another actor than the marina could mean a focus on profit. The marina had land that was needed for the realization of the climate dike. The marina also had a direct interest regarding the quality of the real estate development on the dike. It seemed a more logical cooperation to not include other actors (interview Willem van Valen).

The developers of the houses inside the dike are not very pleased with the height of the new climate dike. This will block the view on the river of the new. Blokland already made it clear that in case of the process of a development plan, he will formally try to stop the real estate developments on the dike (interview Rob Wannyn and Balt Bouter).

5.4 Financial participation in the flood protection of Streefkerk

In chapter two and three the assumption was introduced that private actors involved in flood proof urban development projects will financially contribute to flood protection measures. The reason why they financially participate is because the Dutch state stimulates to contribute to a sustainable future for the society. Furthermore, based on the work of Van Tilburg et al. (2012) and Hart and Milstein (2003) it is hypothesized that private actors involved in integrating flood protection measures do this in pursuit of a sustainable future for society (while making a profit). The private actors involved in the urban development project in Streefkerk are the marina, Housing association Beter Wonen HBC planontwikkeling and Gebroeders Blokland B.V.

The municipality of Streefkerk divides the development of Streefkerk in three separate development projects (interview Willem van Valen):

1. the climate dike and the expansion of the marina
2. the development of the shopping street
3. the real estate developments inside the dike

The different developments are considered as separate developments when it comes to the realization and maintenance phase. The Municipality facilitates by building permits or development plans. The Municipality and the Water Board decided not to include other actors in the development of the climate dike. The Water Boards' main interest is developing the dike as part of the KiS project. They needed to include the marina because they needed extra land owned by the marina. The Municipality included the marina for the same reason.

The other private actors were excluded in the development of the climate dike. Even though the climate dike will affect the real estate developments inside the dike. One example is the development of Blokland: the development of the dike will have a negative effect on this development according to Blokland. Only the marina, the Water Board and the Municipality signed an agreement together.

The Marina is not interested in the development of a climate dike. This marina is located outside the dike so they are not interested in flood protection (interview Rob Wannyn and Balt Bouter). They did participate however in integrating their plans in the development of the climate dike. They will also financially contribute to the realization of the public space. However, the latter has nothing to do with flood protection.

Figure 15 shows what actors financially participate in flood protection as an integral part of the urban development project of Streefkerk

Actor/Phase	Initiation	Planning	Realization	Maintenance
Jachthaven Liesveld B.V. (marina)	No, the water board initiated this together with the municipality	Minimal, to be able to realize their extension plan they decided to participate in time in the integration of their plan together with the water board	No, they will finance the realization of the public space, but this has nothing to do with flood protection	no
Housing association Beter Wonen HBC planontwikkeling and Gebroeders Blokland B.V.	No, they were not included by the Municipality or the Water Board.	no	no	no
Municipality of Molenwaard	Yes, contribution in time	Yes, contribution in time	no	Yes, , together with the water board. The municipality will take care of the public space and the water board for the dike
Water board Rivierenland	Yes, the water board wanted to experiment with a climate dike and Streefkerk	Yes, financially	Yes, financially	Yes, together with the municipality. The municipality will take care of the public space and the water board for the dike

Figure 15: Schematic overview of financial public and private sector participation in flood protection measures as an integral part of the urban development of Streefkerk

5.5 Motives for financial participation

The marina integrated the design of the expansion of the marina in the development plan of the climate dike. They will finance the realization of the public space needed for the inhabitants to enjoy the riverside. They bought (or traded) the land on top of the dike to control the quality of the development. They did not interfere with the specifics of flood protection nor did they finance it.

The motive for participation was to be able to realize their expansion plan. The integration of their plan in the plan for the development of the climate dike had the purpose to get support from the municipality for their plan. They had a financial interest in participation.

Housing association Beter Wonen HBC planontwikkeling and Gebroeders Blokland B.V. were not included by the Municipality or the Water Board. The developers of the houses inside the dike are not very pleased with the height of the new climate dike. This will block the view on the river of the new. Blokland already made it clear that in case of the process of a development plan, he will formally try to stop the real estate developments on the dike

Figure 16 shows the motives of the marina to financially participate in flood protection as an integral part of the urban development project of Streefkerk.

Actor/Phase	Motivation to participate (or not)
Jachthaven Liesveld B.V.	The marina participated to integrate their expansion plan to get the permits needed from the government.
Housing association Beter Wonen HBC planontwikkeling and Gebroeders Blokland B.V.	They were not included by the Municipality or the Water Board

Figure 16: schematic overview of the motives for financial participation in flood protection as an integral part of the urban development project of Streefkerk.

5.6 Concluding remarks

This chapter deals with the question To what extent do private actors actually participate in flood protection measures in urban development projects in the Netherlands? In this case this entails the flood proof urban development project of Streefkerk. The marina Jachthaven Liesveld B.V. is the only private actor directly involved in the flood proof urban development of Streefkerk. The other private actors were not included in the development of the climate dike.

The marina participated in time and effort in the planning phase, to integrate their plan into the plan for the realization of a climate dike. They did this because they wanted the cooperation of the municipality of Molenwaard they needed to be able to realize their expansion plan. They had a direct financial interest: the expansion will lead to more anchorage grounds to let.

The marina is located outside the dike. They do not benefit from flood protection. The marina is not the only private actor involved. Inside the dike two real estate developers and a housing association are planning to develop approximately 60 houses. However, the municipality did not include these actors in the planning process even though the municipality initiated to integrate the entire urban development project in a plan developed in 2010. The other private actors do not appreciate the height of the climate dike. It will block the view on the river.

6 Conclusions and recommendations

6.1 Dutch institutions and financial private sector participation

In this thesis, it was explored to what extent private actors financially participate in flood protection measures as integral part of Dutch urban development projects. Two cases that were studied are situated in the Rotterdam-Rijnmond region: Heijplaat in Rotterdam and Streefkerk in Molenwaard. The main question that was asked is what institutions influence financial private sector participation in Dutch urban development projects that seek to integrate flood protection measures into the development scheme?

The answers given in this chapter will only be based on the two cases studied. However, the theory of structuration and theories concerning sustainable entrepreneurship help to interpret the cases, and also answer the above question in a more general way.

Analytical framework

The theory of structuration forms the basis for the analytical framework of this thesis. The theory stresses that institutions consist of both formal and informal rules that shape the actions of individuals, organizations, groups or other actors and vice versa (Daamen & Vries, 2012: 2). According to Giddens (1984), formal and informal rules or institutions are structures operating on a macro level. The actions of actors operate on a micro level. He stresses that both structures and actions of actors influence each other and that structures and actions are connected through 'social practice' (Giddens, 1984: 25).

In this study, we focus on formal and informal rules with regard to flood protection measures in urban development projects. The actions of the actors are analyzed by assuming they will behave in a certain way regarding their participation in realizing flood protection measures. The potential motives for private sector participation are derived from business management theories on sustainable entrepreneurship.

Motives for private sector participation according to the theories

According to the theories studied for this thesis, the private sector companies first of all focus on the creation of shareholder value. Shareholder value has to do with reducing costs and risks on the short term and anticipating on long-term survival of the firm (Hart and Milstein, 2003).

However, consumers increasingly value sustainability. According to Van Tilburg et al. (2012) this generally leads to great business opportunities. Sustainable entrepreneurship is a process in which a company initiates, sets and realizes goals that add value to society as a whole. Hart and Milstein (2003) and Van Tilburg et al. (2012) recognize several phases in the process towards sustainable entrepreneurship. On the one hand there is the phase of inactivity where companies believe sustainability is a governmental issue. Rules and regulations make sure the company is sustainable. On the other hand there is pro-activity, which means that the company has a leading role when it comes to sustainable issues like poverty or a healthy environment. These companies always want to be ahead of new developments and want to cooperate and share information with different actors to reach certain goals together. Adding value on the long term and not only on the short term.

Although contributing to a better society will lead to great business opportunities, economic value or making a profit remains the main focus of a private actor. It is not common for private actors to use bold strategies. Payoffs from such investments take time and are determined more by trial and error (Hart and Milstein, 2003).

Does this also count for sustainable measures in urban development projects? According to Mees (2013) it does. The University of Utrecht analyzed three urban development projects that used flood protection measures as an integral part of the development. The focus is on safety of the people who live and work in this area in case of a flood. All the development projects were transformations of former harbor areas into urban areas. The cases the University of Utrecht analyzed were HafenCity in Hamburg, Kalasatama in Helsinki and Heijplaat in Rotterdam. The latter case is also part of this thesis.

The involved private actors in the discovered cases all accepted the responsibility and even took financial responsibility for what they considered as their part. Private actors in this case are real estate developers and citizens that developed or owned real estate. According to the private actors involved, the reason why these actors did this was because the government communicated very well and explained the risks and opportunities with regard to flooding very clearly.

Mees (2013) also concludes that in every case, the non-economic interests count as much as the economic interests. She also mentions that it was difficult to find European examples of such developments that integrated flood protection measures. This could have something to do with what Heems and Kothuis (2012) call the "dry feet myth". This contradiction essentially means that even though the Dutch people acknowledge there is always a risk of flooding, the Delta Works have led the Dutch people to be convinced that floods are surely a thing of the past and the government along with its experts will simply ensure that.

If the government wants other parties to participate in dealing with flood protection or eliminating risks, Heems and Kothuis (2012: 39) argue that the government should focus on two things: developing a type of trust where people are critical towards experts, and making people more aware of the risks of possible life threatening floods. It requires a change of culture, which is much like changing the focus on risk management towards the acceptance of vulnerability: from fighting the water to living with water.

Climate proofing is an additional challenge for public and private actors in realizing their core ambitions. "Adaptation governance requires integration of long-term ambitions and short-term needs; readjustment of choices and instruments when new information becomes available; consistency; and deliberation over efficient timing and the sequence of measures (Ward et al., 2012: 12)." Furthermore, adaptation (here: adapting to the context and therefore making sure that we could live with water) should be integrated into (long and short-term) societal aims and interests.

It seems that the Dutch government took the above advice. The Dutch state has some expectations concerning sustainable urban development processes. They expect actors to contribute to a sustainable society on the long term. This also applies to integrating flood protection in urban development projects. The Dutch government expects private actors to contribute to a sustainable and flood proof urban development project. The report of Peek and Van Remmen (2012) is an example of this. In this report

the Dutch government points out a trend in urban development projects. The overall focus is changing from making a profit to being sustainable while making a profit. Another example is that the Dutch government is increasingly looking for ways to integrate flood protection into urban development schemes (Van Veelen, 2013).

Although actors in urban development projects are still experimenting when it comes to being sustainable and flood proof, this thesis will formulate the following hypothesis concerning financial private sector participation:

Private actors do financially participate in flood protection measures during every phase of the development process (initiation, feasibility, realization, and operation). They do this because they believe a flood-proof urban development project is more sustainable. The motivation, therefore, is not only to reduce risk and cost, but also to create long-term value while making a contribution to society as a whole.

Dutch institutions concerning flood protection

In the Netherlands, the government is legally responsible for flood protection. The Water Boards play a key role in flood protection as described in the Dutch Water Act. As we already stated above, the general belief of the Dutch citizens is that the government will protect them against floods (Heems and Kothuis, 2012). However, nowadays, the Dutch government wants to share responsibilities with other actors than the government. One reason for this is that in order for the government to keep on doing her job citizens need to be more aware of the risks of flooding Heems and Kothuis (2013). Another reason is that the government wants to work as efficiently as possible with the money available.

One of the strategies chosen to reach this goal is multi-level security. This means that whereas in the past all attention and most of the budget was given to preventing floods by establishing dikes, nowadays efforts are underway to also investigate the potential of spatial planning and disaster management. Areas that are vulnerable to floods at the moment, like the areas near the river the Meuse, IJssel, Waal and the area near Rotterdam and Dordrecht (Rijnmond-Drechtsteden), have to be on the priority list. However, if more traditional measures such as repairing the dikes or making room for the river cannot be integrated in the built environment or is simply too expensive, other measures are introduced like flood proof urban development projects or evacuation strategies.

So, in urban development projects as well as in integrating flood protection in urban development projects, the Dutch state stimulates public and private actors to cooperate and focus on a sustainable future for society. For this thesis, we have considered this as an emerging Dutch institution. Therefore, it was hypothesized that certain private actors involved in the urban development project do financially participate in flood protection measures. They do this because the Dutch state stimulates public and private actors to co-operate, share responsibility and focus on a sustainable future for society. Hence, private actors do not only want to reduce risks and costs, but also want to contribute to a sustainable future for society.

In order to test this hypothesis, the behavior of the private actors in the action arena of two cases has been analyzed by conducting interviews and studying policy documents and development agreements.

6.2 Heijplaat and Streefkerk: a comparison

The private actors involved in the urban development project in Heijplaat are the Port of Rotterdam and housing association Woonbron.

Private actors are actors that at their own expense and risk undertake projects within the context of the current market (Franzen et al., 2001). In the Netherlands, when it comes to private actors real estate developers play a significant role in urban development projects. However, following the trend Peek & Van Remmen (2012) point out, the investor will gain more and more importance.

Woonbron is a housing association. In the Netherlands, housing associations build, rent out, and maintain social houses. Dutch social housing is organized in the Netherlands by a strong independent social-rental sector. Dutch housing associations are independent, private organizations, but with a public responsibility.⁹⁰ In the case of Heijplaat, however, housing association Woonbron operated like a land owner and was focused on making a profit by selling land for the development of houses.

The Port of Rotterdam is a non-listed, publicly owned limited company. Shares are held by the Municipality of Rotterdam (2/3rds) and the Dutch national government (1/3rd). The core business of the port authority is the sustainable development, management and operation of the port and continued smooth and safe handling of shipping traffic. The Port of Rotterdam lets out - on long-term leases - port sites to businesses, particularly to storage firms, cargo terminals and the chemical and petrochemical industry, including energy producers. The main sources of income are rents and harbor dues. Although the shares are held by the Municipality of Rotterdam and the Dutch national government, the Port of Rotterdam is a for profit organization.

Both actors (Woonbron and the Port of Rotterdam) financially participated in flood protection measures as integral part of the urban development of Heijplaat. During the initiation phase they invested time and effort. Together with the Municipality of Rotterdam they initiated the development of the village of Heijplaat and the adjacent port-industrial zone of RDM. Together with other actors they signed the partnership agreement "Samenwerkingsovereenkomst gebiedsontwikkeling Heijplaat 2". They set sustainable goals together including flood protection measures that would protect the whole village, so not only the new developments. They defined sustainable development as "developments that will lead to an improvement of the social, ecological as well as the economic situation of Heijplaat and RDM".

During the feasibility and planning phase all parties financially participated in the projects. They all invested time and knowledge in the development of a flood protection strategy for the whole village. The Port of Rotterdam invested in the development of a plan for the new access road including the elevation of the location on the Heysekade. Housing association Woonbron invested time and knowledge in finding ways to develop water resistant housing (up to 3.90 meters above sea level). They even calculated how much it would cost for the potential buyers/developers of the real estate to realize this.⁹¹

⁹⁰ See Annex 2: the Dutch social housing system in a nutshell

⁹¹ See annex 1: interview Willett van Arendonk

The port of Rotterdam was willing to financially contribute to the development of a dike near the Heysekade. They also wanted to contribute to the elevation of the road on the Heysekade.⁹² However, even though the port of Rotterdam was willing to financially participate in the realization phase, the local government took full (financial) responsibility for this except for the measures when it came to the new buildings. Woonbron wants to include this in the development contract. The municipality of Rotterdam finances the realization and the maintenance phase.

The Port of Rotterdam as well as housing association Woonbron had a direct or indirect financial interest in the flood protection strategy. The Port of Rotterdam contributed because they wanted to develop the RDM (letting out port sites). For the development of the RDM a new access road that passes through the village of Heijplaat is necessary. Without the access road the RDM is not an attractive location for companies to locate themselves. A good relationship with the village contributes to the realization of a new access road because otherwise there was a risk that the people who live in the village do not want to cooperate.

Housing association Woonbron wants to sell and rent houses on Heijplaat. A long term commitment with the village is important to them.⁹³ Housing association Woonbron has a double role in Heijplaat. One is their role as a Dutch housing association that rents out and maintains social housing. The other role is the role as a profit organization, in this case a private land owner when it comes to the real estate development of Het Nieuwe Dorp. In case of Het Nieuwe Dorp Woonbron has a direct financial interest for participation in an adaptive strategy for flood protection. Not having to elevate the land for the real estate development saves Woonbron extra costs. In the case of their other property in Heijplaat, the motivation to participate has to do with a long-term relationship with the inhabitants of Heijplaat. Satisfied tenants reduce the risk that they will move. This is the same reason Woonbron participated in the project they set up together with energy company Eneco and the World Wildlife Fund.

Figure 17 shows an overview of financial public and private sector participation in flood protection and figure 18 shows the motives of the different actors involved to financially participate in flood protection as an integral part of the urban development project of Heijplaat.

⁹² See annex 1: interview Maïke Akkers

⁹³ See annex 1: interview Willette van Arendonk

Actor/Phase	Initiation	Planning	Realization	Maintenance
Housing Association Woonbron	Yes, in time and effort	Yes, by developing a flood proof strategy together with the other actors	No, the flood proof measures needed for the housing will be included in the development contract	No
Port of Rotterdam	Yes, in time and effort	Yes, by developing a flood proof strategy together with the other actors	No, they will realize the road, excluding dike next to the road on the Heysekade	No
Municipality of Rotterdam	Yes, in time and effort	Yes, by developing a flood proof strategy together with the other actors	Yes, they will realize the small dike on the Heysekade next to the new access road	Yes, the municipality is responsible for the maintenance of the dike on the Heysekade

Figure 17: Schematic overview of financial public and private sector participation in flood protection measures as an integral part of the urban development of Heijplaat

Actor/Phase	Motivation to participate (or not)
Housing Association Woonbron	Satisfied tenants of the social housing owned by Woonbron Feasibility of the real estate development of Het Nieuwe Dorp (reducing costs)
Port of Rotterdam	The future income of letting out port sites on the RDM

Figure 18: Schematic overview of the motives for financial participation in flood protection as an integral part of the urban development project of Heijplaat.

The private actors involved in the urban development project in Streefkerk are the Marina, Housing association Beter Wonen, HBC planontwikkeling, and Gebroeders Blokland. The Municipality and the Water Board decided only to include the Marina in the development of the climate dike. The Water Boards' main interest is developing the dike as part of the KiS project: the reinforcement of the dike between Kinderdijk and Schoonhovenseveer. About 10 kilometers of the total 17,5 kilometers of dike will have to be reinforced. The realization phase has already started and by 2017 the project will be realized. The Water Board Rivierenland needed to include the Marina because they needed extra land owned by the Marina. The Municipality of Molenwaard included the Marina for the same reason.

The other private actors were excluded in the development of the climate dike. Even though the climate dike will affect the real estate developments inside the dike. One example is the development of Blokland: the development of the dike will have a negative effect on this development according to Blokland. Only the marina, the Water Board and the Municipality signed an agreement together.

The Marina is not interested in the development of a climate dike. They benefit from water, it is their business.⁹⁴ However, they did participate in integrating their plans in the development of the climate dike. In addition, they will also financially contribute to the realization of the public space. However, the latter has nothing to do with flood protection.

The Marina integrated the design of the expansion of the marina in the development plan of the climate dike. They will finance the realization of the public space needed for the inhabitants to enjoy the riverside. They bought (or traded) the land on top of the dike to control the quality of the development. They did not interfere with the specifics of flood protection nor did they finance it.

The motive for participation was to be able to realize their expansion plan. The integration of their plan in the plan for the development of the climate dike had the purpose to get support from the municipality for their plan. They had a financial interest in participation.

Housing association Beter Wonen, HBC planontwikkeling, nor Gebroeders Blokland were included in the development of the climate dike. During the initiation and the planning phase they were involved because the climate dike was part of the integral plan for Streefkerk. The Municipality wanted an overview of all the different projects planned in Streefkerk and wanted to make sure all these plans fit the aims the municipality had for Streefkerk.⁹⁵ Therefore, the private actors were aware of the development of the dike, but did not have direct involvement. The developers of the houses inside the dike are not very pleased with the height of the new climate dike, because it will block the view on the river for the new residents. Blokland already made it clear that in case of the process of a development plan, he will formally try to stop the real estate development on top of the dike.

Figure 19 shows an overview of financial public and private sector participation in flood protection and figure 20 shows the motives of the different actors involved to financially participate in flood protection as an integral part of the urban development project of Streefkerk.

⁹⁴ See annex 1: interview Rob Wannyn and Balt Bouter

⁹⁵ See annex 1: interview Willem van Valen

Actor/Phase	Initiation	Planning	Realization	Maintenance
Jachthaven Liesveld B.V. (marina)	No, the Water Board initiated this together with the municipality	Minimal, to be able to realize their extension plan they decided to participate in time in the integration of their plan together with the water board	No, they will finance the realization of the public space, but this has nothing to do with flood protection	no
Housing association Beter Wonen HBC planontwikkeling and Gebroeders Blokland B.V.	No, they were not included by the Municipality or the Water Board.	no	no	no
Municipality of Molenwaard	Yes, contribution in time	Yes, contribution in time	no	Yes, together with the Water Board. The municipality will take care of the public space and the Water Board the dike
Water Board Rivierenland	Yes, the Water Board wanted to experiment with a climate dike and Streefkerk	Yes, financially	Yes, financially	Yes, together with the municipality. The municipality will take care of the public space and the water board for the dike

Figure 19: schematic overview of financial public and private sector participation in flood protection measures as an integral part of the urban development of Streefkerk

Actor/Phase	Motivation to participate (or not)
Jachthaven Liesve ld B.V.	The marina participated to integrate their expansion plan to get the permits needed form the government.
Housing association Beter Wonen HBC planontwikkeling and Gebroeders Blokland B.V.	They were not included by the Municipality or the Water Board

Figure 20: schematic overview of the motives for financial participation in flood protection as an integral part of the urban development project of Streefkerk.

In Heijplaat private actors financially participated in realizing flood protection measures. However, they did this mainly indirectly, by investing time and expertise. They did this during the planning and initiation phase of the urban development project. During the realization and maintenance phase, the Municipality of Rotterdam took over even though the Port of Rotterdam was willing to pay for the realization of one of the flood protection measures: the small dike on the Heysekade. The main reason for the private actors to participate was because they would financially benefit from the results. Woonbron will benefit from a flood proof urban development because it will protect the whole village instead of only a part of it. Woonbron owns the majority of the dwellings in Heijplaat. Furthermore, Woonbron benefits because the measures have a positive effect on the feasibility of the real estate development of Het Nieuwe Dorp (reducing costs). The Port of Rotterdam has a financial interest in a good relationship with the inhabitants of Heijplaat for the development of the RDM (letting out long-term leases).

For Heijplaat, the assumption that private actors do financially participate in flood protection measures during every phase of the development process is only partially valid. Together with the Municipality of Rotterdam the private actors defined sustainable development as developments that will lead to an improvement of the social, ecological as well as economic situation of Heijplaat and the RDM. Flood protection for the whole village is considered as a sustainable measure by the actors involved. This indicates that they believe a flood-proof urban area is more sustainable. The motivation, therefore, is not only to reduce risk and cost, but also to create long-term value and make a societal contribution.

In case of Housing association Woonbron and the Port of Rotterdam, these actors already believe in not only reducing risk and costs, but also creating long-term value and making a societal contribution. Dutch housing associations are independent, private organizations, but with a public responsibility. Housing associations have a long term perspective: they build, rent out, and maintain social houses. The Port of Rotterdam is a publicly owned limited company. In Streefkerk, only the Marina was directly involved in the development of the climate dike. The other private actors were not involved although the development of the dike does affect their real estate development inside the dike. The Marina has no interest in flood protection. The real estate developers active inside the dike do. The climate dike effects their real estate development, like in the case of the development project of Blokland.

For Streefkerk the assumption that private actors do financially participate in flood protection measures during every phase of the development process is flawed. The Marina participated by selling or trading land in order to expand the marina. They did this for financial reasons: more income through the extra anchorage grounds.

Remarkable however is the behavior of the public actors involved. The Municipality of Molenwaard and the Water Board Rivierenland did not include the private actors involved in the urban development of Streefkerk inside the dike in the development of the climate dike. The Municipality of Rotterdam decided to not involve the private actors Port of Rotterdam and Woonbron during the realization and maintenance phase. Why not? In chapter three it became clear that the Dutch government wants to share responsibility regarding flood protection. So why did the public actors, particularly in the

Streefkerk case, not involve the private actors responsible for the real estate development inside the dike? What influenced this behavior? The next section will address this issue.

6.3 The dominance of legal responsibility

The Dutch state stimulates public and private actors to cooperate, share responsibility and focus on a sustainable future for society. When it comes to flood protection the Dutch state stimulates to share responsibilities concerning flood protection as opposed to being the only one responsible for this. They want to change Dutch societal culture from “fighting the water” to “living with water”. Multi-level protection was introduced to contribute to this goal and integrate flood protection in urban development projects. For this thesis, we have considered this as an emerging Dutch institution. Therefore, it was hypothesized that certain private actors involved in an urban development project do financially participate in flood protection measures (in every phase of the development process). They do this because the Dutch state stimulates public and private actors to co-operate, share responsibility and focus on a sustainable future for society. Hence, private actors do not only want to reduce risks and costs, but also want to contribute to a sustainable future for society.

In Heijplaat, private actors did financially participate in flood protection measures as an integral part of the urban development. They did this because the government communicated very well and explained the risks and opportunities very clearly. This is in line with what Mees (2013) concluded in her study that private actors financially participate in flood protection measures integrated in urban development projects because the government communicated very well and explained the risks and opportunities very clearly. Both actors, Housing association Woonbron and the Port of Rotterdam, as a private organization already believe in creating long-term value and making a societal contribution while making a profit. They both have a certain public responsibility.

The municipality of Rotterdam stimulated public and private actors to cooperate and focus on a sustainable future for society in the flood proof urban development of Heijplaat. They initiated the urban development project to be a flood proof urban development by formalizing this by making it a pilot project for the municipality.⁹⁶ The municipality had the goal to share responsibility concerning integrating flood protection in the urban development project. They succeeded by involving Housing association Woonbron and the Port of Rotterdam to set sustainable goals together including flood protection measures that would protect the whole village, so not only the new houses. They invested time and effort in the initiation phase. Together with other actors they signed the partnership agreement “Samenwerkingsovereenkomst gebiedsontwikkeling Heijplaat 2” in which they defined sustainable development as “developments that will lead to an improvement of the social, ecological as well as the economic situation of Heijplaat and RDM”.

In Heijplaat, the Dutch institution introduced in chapter three influenced the behavior of private actors. It became apparent that the Dutch state stimulates public and private actors to cooperate and focus on a sustainable future for society in urban development projects as well as in integrating flood protection in urban development projects. However, this does not change that private actors stay focused on making

⁹⁶ Samenwerkingsovereenkomst Heijplaat en RDM-terrein, ondertekend in september 2011.

a profit or reducing costs. The private actors involved participated because they had a financial interest in flood protection.

Furthermore, the municipality chose to stay in control when they decided to finance the realization and the maintenance phase. This could be an indication of that the different levels of the Dutch government is still affected by their legal responsibility for flood protection. In Heijplaat the local government of Rotterdam wanted to share responsibility and they did, but they also missed a change. They excluded the Port of Rotterdam even though they were willing to financially participate in the realization phase.

In Streefkerk, the private actors did not financially participate in flood protection measures. The Municipality of Molenwaard and the Water Board Rivierenland did not include all private actors in the project although the development of the climate dike will affect their real estate development. The motives for the Water Board for not including them is because they mainly focus on the realization of the climate dike as part of the KiS project (the reinforcement of the dike between Kinderdijk and Schoonhovenseveer). The Water Board has a clear assignment, a budget and a deadline to realize the KiS project. Their goal is to realize the reinforcement of the dike in 2017. They already started with the realization of the climate dike in Streefkerk. Their main goal is to realize the climate dike according to plan. Including the Marina was needed for the realization because they owned land. The motive for the Municipality for not including the other private parties was that they needed the climate dike to be developed. They had an interest in the development of new houses on the climate dike. The marina was the key for the development of the climate dike.

In Streefkerk, it seems that the Water Board and the Municipality do not practice what the Dutch government preaches (yet). Heems and Kothuis (2012) state that even though the Dutch people acknowledge there is always a risk of flooding, the Delta Works have led the Dutch people to be convinced that floods are surely a thing of the past and the government along with its expert will simply ensure that. The authors state that if the government wants other parties to participate in dealing with flood protection or eliminating risks, the government should focus on two things: developing a type of trust where people are critical on the experts, and making people more aware of the risks of possible life threatening floods (Heems and Kothuis, 2012: 39). It requires a change of culture, which is much like changing a focus on risk management towards the acceptance of vulnerability. However, in the case of Streefkerk and, to a lesser extent, in Heijplaat it seems the other way around: the government should be convinced to share responsibilities instead of the private actors.

The main question is: what institutions influence financial private sector participation in Dutch urban development projects that seek to integrate flood protection measures into the development scheme? The emerging Dutch institution of sharing responsibilities concerning flood protection among public and private actors is competing with the institution that holds that the government is the only one responsible for "keeping our feet dry". This competition is apparent in Dutch practice since we have found that the new line of thinking does seem to affect financial private sector participation in the flood proof urban development project of Heijplaat. In Heijplaat the public and private actors shared responsibility for the initiation and the planning phase. This indicates that the institution of sharing responsibilities is more dominant in this case.

In Streefkerk the Municipality of Molenwaard and the Water Board Rivierenland did not involve all the private actors. In Heijplaat the Municipality of Rotterdam did not involve the private actors in the realization phase although the Port of Rotterdam was willing to pay for (part of) the realization of the small dike on the Heysekade. In Heijplaat as well as in Streefkerk, the Dutch institution that the government is legally responsible for flood protection still is dominant in influencing the behavior of the different levels of the government. This affects financial private sector participation in Dutch urban development projects that seek to integrate flood protection measures into the development scheme in a negative manner. It influences different levels of the government not to share responsibility and therefore costs.

In comparison to the behavior of the private actors, the behavior of the public actors in the two cases indicate that the public actors are less willing to cooperate and share responsibility than the private actors. The next section will provide four recommendations for the Dutch government.

6.4 Four recommendations for the Dutch government to share responsibly

In current practice, the Dutch government is emphasizing cooperation and sharing responsibilities regarding the creation of a sustainable future for Dutch society. Flood proof urban planning and development therefore have to take into account the improvement of the social, ecological and economic situation now and in the future.

In the first chapter, it became clear that this thesis wants to contribute to the debate outlined by Peter van Veelen (2013: 65): "A major challenge for a local adaptive flood risk strategy is to come to an agreement of a mutually acceptable distribution of costs and benefits in the short (and long term), and develop workable arrangements to secure responsibilities, risks and investments in the long term. An important condition for a local adaptive flood risk strategy is a clear responsibility distribution. Which public or private party could take the responsibility for maintenance and daily management and the long-term implementation of the local flood risk strategy? It is necessary to come to a debate on public and private responsibilities regarding flood risk." A local adaptive strategy focuses on adaptation on a local scale by integrating flood risk management measures with urban functions, using the dynamics of urban development processes. This approach aims to reduce the consequences of a flood by promoting flood resilience architecture and local adaptive measures in flood-prone areas (Van Veelen, 2013).

Based on the two cases, the following four recommendations can be formulated. These recommendations reflect the perspective that public and private actors should strive towards projects in which they share responsibility for a flood-proof urban development.

1. Set flood proof goals together with all actors financially involved during the initiation phase of the integral urban development project. This way, all actors can figure out themselves if it is of any interest for them to financially participate or not. In the case of Heijplaat the local government of Rotterdam developed a flood protection strategy together with the private actors involved and the people who live in the village. In this way, every actor got informed of the risks of flooding (awareness). Based on that information they were able to determine whether or not it was interesting for them to participate or not.

In chapter three Mees (2013) also referred to this. Mees studied three urban development projects that used adaptive measures as an integral part of the development. The private actors involved in the discovered cases all accepted the responsibility, and even took financial responsibility for what they considered as their part. One of the reasons why these actors did this was because the government communicated very well and explained the risks and opportunities very clearly.

Mees (2013) also concludes that in every case the non-economic interests count as much as the economic interests. In the cases Heijplaat and Streefkerk however, indirect or direct financial benefits were dominant. For the Port of Rotterdam the development of the RDM was the main reason for participation (closing long leases for port sites). For Woonbron the feasibility of the real estate development of Het Nieuwe Drop was important (reducing costs) as well as the preferences of the current renters of the social housing (rental income).

2. In order to share responsibility and costs, the Dutch government should focus on raising awareness of the possible financial interest of flood protection for the private actor involved. Both cases in this thesis show that the dominant motives for financial private sector participation are direct or indirect financial benefits. The Dutch government should focus on a sustainable future for society, and therefore, should initiate a flood proof urban development. Private actors probably also find it important to pay attention to a sustainable future for society. However, making a profit for them is contributing to a sustainable future for their company. This is their main responsibility.

The point of this recommendation is that the focus of private actors on financial benefits does not mean they cannot contribute to a more sustainable or flood proof urban development project. The Port of Rotterdam, Woonbron and the Marina in Streefkerk all had a direct or indirect financial interest. The Marina did not even care about flood protection. But without the marina the climate dike could not be realized in Streefkerk. If the government better understands this, they could stop only emphasizing that private actors should contribute to a sustainable future of society but also point out the business opportunities.

3. The government should stay in control of sustainable flood proof urban development projects while sharing responsibilities and costs. The Dutch government could accomplish this by using the planning instruments they already have in flood protection as well as in urban development more effectively. In the Netherlands the Dutch government is legally responsible for flood protection. The main public actors responsible are the Water Boards and the Ministry of Infrastructure and Environment. Together, they are responsible for the main infrastructure of dams and dikes. The Provinces and the Municipalities have a responsibility too. The goal of the Dutch government is to keep "dry feet" on the long term (hundreds of years to come).

The dense built environment in the Netherlands makes it difficult for government actors to realize their goals. For the development or maintenance of dikes and dams, for example, space is needed. Developing outside the dike could affect the quality of the public space in a negative manner. Furthermore, to stay attractive for people to live and work in the Dutch Delta it is necessary to also pay attention to an attractive development of flood protection measures (Delta Program, 2015). The Dutch government

wants to integrate flood protection in urban development projects and share (financial) responsibility with other actors and make the Dutch people aware of the risks of flooding.

The Dutch government has enough (legal) instruments to stay in control of flood protection in every phase of the development of urban areas. However, they do not use them in an optimal manner yet. An example is flood proof buildings. In Heijplaat, Woonbron will include the measure of developing a flood proof house up until 3.90 meters above sea level. However, the actors involved did not agree how this will work in the future when people live in this building. Imagine someone wants to realize a window that you could open in their building beneath the level of 3.90 meters above sea level. In this case the flood protection measure will not fulfill the purpose anymore. Based on current tools the government has to control real estate projects like a development plan, the government cannot refuse this. A development plan does not include measures that concern the level of a building. However, when an actor wants to develop on or in a dike, you need a permit from the Water Boards. If the Municipality of Rotterdam could use the same tool the Water Boards have, they are able to refuse the development of a window below sea level in Heijplaat or certain flood proof conditions can be set (like a flood proof window).

This has to do with the final recommendation:

4. The different levels of the government dealing with flood protection or with urban development projects should exchange knowledge and (legal) instruments to be able to integrate flood protection in urban development projects. When it comes to maintaining flood proof buildings, for example, the legal tool the Water Boards use are much more suited than the development plan used for real estate developments.

6.5 Reflection

I started this thesis by pointing out the importance of perspective. Klammer (2005) put it into words very clearly when he wrote: "I would exaggerate stating that scientists are able to offer the truth – the world is too complex for the human intellect – but to think and to deliberate offers perspectives on the world and life. And it is all about perspective."

As a civil servant, I wanted to learn more about the perspective of the private sector. For this thesis, I combined this interest with another interest I dealt with in my work as a project manager for the municipality of Rotterdam: integrating flood protection in urban development projects.

Therefore, I chose to study private sector participation in flood protection integrated in urban development projects in delta cities in the Netherlands.

The theory of structuration offered me a tool to analyze the behavior of private actors in a more holistic manner. The theory of structuration is based on the idea that behavior is influenced by institutions – formal and informal rules – and vice versa. The theory forced me to put the behavior of private actors in the Dutch context. The perspective of the Dutch citizens is that the government will protect them against floods. Indeed, the Dutch government is legally responsible for this, but it now wants to share responsibility concerning flood protection (Van Veelen, 2013). One of the strategies is to involve other actors than "the usual suspects" like the Directorate – General for the Environment and International Affairs (Rijkswaterstaat) and the Dutch Water Boards. There were three interesting discoveries while studying the Dutch context concerning flood proof urban development projects.

The first one was that there were not many cases that fulfilled the selection criteria I set. The Dutch government has published new policies regarding flood protection, where they introduced strategies like integrating flood protection with urban development projects. This way, actors like real estate developers are assumed to get involved: to share responsibility and therefore costs. In the Netherlands, they are still experimenting with this new strategy, as Van Veelen (2013) pointed out. This made it difficult for me to find cases that fitted the criteria I set: realized urban development projects with flood protection as an integrated part of the project. I wanted to analyze urban development projects that were already realized because this way I was able to double-check what private actors say they do and what they actually do in current practice. The search for these kind of urban development projects was very interesting. It turned out that the cases that fulfill the criteria I set in the Netherlands is very limited. By talking to experts in the field of flood protection and in the field of urban development projects that have to deal with the rising water level, I decided to focus on two cases: in Heijplaat and in Streefkerk.

The second interesting discovery I did during my research was that the shift in policy of the Dutch government how to deal with flood protection influenced the behavior of private actors in one of the cases studied. The private actors involved in the flood proof urban development project of Heijplaat did share responsibility with the municipality of Rotterdam. Interesting, however, is that the institution of legal responsibility of the Dutch government seems to still influence the different levels of the Dutch government to not share this responsibility. The Municipality of Rotterdam decided to take full responsibility in the realization and maintenance phase of the flood proof measures developed for Heijplaat even though the Port of Rotterdam was willing to pay for at least part of the realization. In

Streefkerk the Municipality of Molenwaard and the Water Board Rivierenland did not even include the private actors that had an interest in the development of the climate dike (like Blokland). This indicates that the Dutch institution that the government is responsible for 'dry feet' is still very alive in Dutch government. However, more research is necessary to investigate to what extent this is the case. For example, one could study more cases and make a comparison between them if this is also the case in the other flood proof urban development projects.

I chose to select one institution to analyze the behavior of private actors. With the knowledge I have now, I would have assumed a transformation from one Dutch institution to another. At the on end there would be public and private actors sharing responsibilities concerning flood protection and at the other end the institution that holds that the government is the only one responsible for "keeping our feet dry" (legal responsibility). The outcome would have been the same, but in this way the transformation from one institution to the other would have been integrated in my analytical framework. A framework that points out a process of change. This also becomes clear in the two cases studied: In Heijplaat the municipality was willing to experiment and in Streefkerk there was no sense of urgency to include other actors.

The third interesting discovery has to do with the theories concerning sustainable entrepreneurship. The theories taught me that private actors can still contribute to a sustainable or flood proof urban development project while making a profit. As they say in Dutch: the focus on making a profit does not bite the focus on a sustainable development. From a government point of view (which I am inclined to have) this means that pointing out the financial interest of financial private sector participation in flood proof urban development projects will eventually stimulate private actors to share responsibility and therefore costs.

This thesis was written in English. I wanted to contribute to knowledge concerning integrating flood protection in urban development projects on an international level. It was a hell of a job writing in English. I could never have done it without the support of Tom Daamen.

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Figures

Figure 1: susceptibility of the Netherlands to both sea-level rise and river flooding based on location below sea level, PBL Netherlands Environmental Assessment Agency, 2007.

Figure 2: transition towards a sustainable society, Jan Rotmans 2013

Figure 3: interaction between structure and agency according to Giddens (1984)

Figure 4: City development 1.0, 2.0 and 3.0 according to Peek and Van Remmen (2012: 18)

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Figure 6: Valuing real estate development from an investors point of view (Rompelberg and Hesp, 2008: 14).

Figure 7: Interaction between structure and agency according to Giddens (1984)

Figure 8: Theoretical framework combining the theory of Giddens (1984) and of Ostrom (2005).

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Figure 13: schematic overview of financial public and private sector participation in flood protection measures as an integral part of the urban development of Heijplaat

Figure 14: Schematic overview of the motives for financial participation in flood protection as an integral part of the urban development project of Heijplaat.

Figure 15: Schematic overview of financial public and private sector participation in flood protection measures as an integral part of the urban development of Streefkerk

Figure 16: schematic overview of the motives for financial participation in flood protection as an integral part of the urban development project of Streefkerk.

Figure 17: Schematic overview of financial public and private sector participation in flood protection measures as an integral part of the urban development of Heijplaat

Figure 18: Schematic overview of the motives for financial participation in flood protection as an integral part of the urban development project of Heijplaat.

Figure 19: schematic overview of financial public and private sector participation in flood protection measures as an integral part of the urban development of Streefkerk

Figure 20: schematic overview of the motives for financial participation in flood protection as an integral part of the urban development project of Streefkerk.

8 Enclosures

Annex 1 Interviews (in Dutch)

Streefkerk

- Jan Maurits van Linge – Stedenbouw en Landschapsarchitectuur bureau Terra Incognita, 11 juni 2014
- Rob Wannyn en Balt Bouter – Rob Wannyn adviseert de eigenaren van jachthaven Liesveld op het gebied van Ruimtelijke Ordening en op het gebied van de ontwikkeling. Balt Bouter is de havenmeester, 18 juni 2014
- Dick van der Kooij en Bram de Fockert van Waterschap Rivierenland, 18 juni 2014 en 14 oktober 2014
- Willem van Valen van de gemeente Molenwaard, 26 juni 2014
- De heer Heesteren van HBC Planontwikkeling – donderdag 20 november 2014

Heijplaat

- Maureen Mollis, projectmanager van de gemeente Rotterdam, heeft gewerkt aan de gebiedsontwikkeling van Heijplaat het dorp, 4 juni 2014
- Williette van Arendonk, ontwikkelmanager van Woonbron Ontwikkelbedrijf BV, 11 juni 2014
- Maïke Akkers, gebiedsmanager vanuit het Havenbedrijf Rotterdam, 20 juni 2014
- Andréa Lanters – Celano, stedenbouwkundige van de gemeente Rotterdam, 20 juni 2014
- Xander van Beers, conceptmanager en ontwikkelmanager vanuit Woonbron en betrokken bij de ontwikkeling van het Nieuwe Dorp. Hij heeft de werkzaamheden van Willette eind 2013/ begin 2014, 24 juni 2014 en 15 juli 2014 overgenomen
- Hein Pierhagen, projectmanager van de gemeente Rotterdam, heeft gewerkt aan de gebiedsontwikkeling van Heijplaat het dorp, 25 juni 2014

Expert meerder malen gesproken of mailcontact gehad, maar vooral in juni en juli 2014

- John Jacobs, Programmamanager binnen het voormalige Rotterdams klimaatprogramma (Rotterdam Climate Initiative/ Rotterdam Climate Proof). Expert op het gebied van water en adaptatie.
- Peter van Veelen, Stedenbouwkundige bij de Gemeente Rotterdam en promovendus aan de TU Delft. Hij promoveert op het onderwerp integraal en duurzaam design van multifunctionele hoogwaterbescherming.
- Willem Heese, Projectleider Ruimte en Water Platform31, een kennis- en netwerkorganisatie voor stedelijke en regionale ontwikkeling.
- Mevrouw Alblas van de Unie Van Waterschappen. De Nederlandse waterschappen zijn verenigd in de Unie van Waterschappen. De Unie van Waterschappen behartigt de belangen van de waterschappen en zorgt voor kennisuitwisseling en samenwerking tussen de waterschappen. De Unie vertegenwoordigt de waterschappen in het nationale en internationale speelveld.
- Michelle Hendriks, Programmadirectie Hoogwaterbescherming. Het hoogwaterbeschermingsprogramma is een samenwerking van de waterschappen en het

ministerie van Infrastructuur en Milieu. De waterschappen en het ministerie van Infrastructuur en Milieu (Rijkswaterstaat) voeren in het Hoogwaterbeschermingsprogramma maatregelen uit om de primaire waterkeringen aan de veiligheidsnorm te laten voldoen, nu en in de toekomst. Het Hoogwaterbeschermingsprogramma is onderdeel van het nationale Deltaprogramma.

- Anky Spanjers, Senior adviseur ruimtelijke plannen, Hoogheemraadschap van Delfland
- Karlien Stroeve, projectmanager van het projectmanagementbureau van de gemeente Rotterdam. Zij houdt zich bezig met de ontwikkeling van het dakpark in Rotterdam.

Topic list

The case studies consist of a combination of desk research and fieldwork. All the data was collected by qualitative interviews with representatives of the actors involved in the different urban development projects that include flood protection measures. For the interviews, an interview schedule of topics was used in a loosely planned order (Baarda et al., 2005: 234). The following topics were discussed in the interviews:

- Financial participation and in what phase of the development
- Motives for participation in flood protection measures (or motives for not participating)
- Responsibilities concerning flood protection and the effect on the behavior of actors

Coding scheme

Based on the topics the interviews were analyzed using the following codes:

- Participation
- Motive
- Responsibility

The interviews were written down in a report. This report is can be claimed by contacting the author, but only in the case the people who are interviewed agree to this.

Annex 2 The Dutch social housing system in a nutshell

In the Netherlands, housing associations build, rent out, and maintain social houses. Dutch social housing is organized in the Netherlands by a strong independent social-rental sector. Dutch housing associations are independent, private organizations, but with a public responsibility.

A housing association is an authorized institution by the Dutch government. The housing associations work within a legal framework set up by the government. The legal basis of these organizations is laid down by the Housing Act of 1901. Key tasks for housing associations are:

- “ the prioritization of appropriate accommodation for the target group, so that low-income households receive priority in the allocation of inexpensive dwellings;
- the qualitative upkeep of the housing stock: maintenance, renovation, and new construction of social-rental dwellings;
- the involvement of tenants in the management of their dwellings and the development of new policy;
- the guarantee of the financial continuity of the housing association;
- a contribution to the quality of life in the neighborhoods where the housing associations’ dwellings are situated;
- the combination of housing and care (Ouwehand & Van Daalen, 2002, p.27).”

The national government set general regulations which are incorporated in the legislation, and supervises the financial position and the legitimacy of operations. The coordination of policy takes place at both national and local levels. On the national level a number of program objectives are set including how those objectives should be achieved. Based on this, the local authorities and housing associations have to draw up performance agreements. In these agreements the targets for the next coming years are set. Supervision is based on these agreements. If a housing association fails to meet the requirements imposed by the government, the national government can intervene. In an extreme case the government can undo the status of an authorized institution.

Although the government sets general rules and takes up a supervisory role, housing associations are independent organizations, setting their own objectives and bearing their own financial responsibilities. In general, housing associations do not get direct subsidies from the government. The government subsidizes the tenant. They invest their own resources in the interest of social housing within the given legal framework and in consultation with the government. Housing associations build up their own assets through carrying out social responsibilities, with the purpose of safeguarding their capability to undertake these responsibilities in the future. They are not for profit organizations. They exclusively operate in the interest of public housing and therefore no profits from the construction or letting of houses may be distributed to other people or organizations. “A housing association should be managed and organized as a company. While it is a company with social objectives, it must nevertheless be just as efficiently organized and effective as any other commercial company in the fulfilment of its social objectives (Ouwehand & Van Daalen, 2002, p. 36).”

Recently the Dutch national government introduced a measure that affects the social housing sector. The Dutch national government wants to stimulate the housing market so that it will have a positive effect on the Dutch economy. One of the measures is called the ‘verhuurdersheffing’ (landlord levy).

Housing associations that let out more than 10 social houses have to pay a percentage of the value of these houses (WOZ-waarde) . In 2014, this is 0,381%.⁹⁷

⁹⁷ <http://www.rijksoverheid.nl/onderwerpen/huurwoning/verhuurderheffing> (geraadpleegd per 25 juli 2014)