

Bachelor Thesis Geography, Planning & Environment



A qualitative research on the lived experiences of the flooding problem in Kemijen, Semarang.

Jan van 't Klooster, s4576810

Supervisor: Kolar Aparna

Nijmegen School of Management Radboud University Nijmegen

Department of Geography, Planning & Environment

Words: 14.232

13-07-2018

Preface

In front of you is my bachelor thesis for the study Geography, Planning & Environment. It was not love on the first sight with the research area of Indonesia. While we had to choose our research topic there was a presentation about doing your thesis abroad. During that college I was thinking I would never do that, because just in the Netherlands working on my thesis would be hard enough. Well a few months later guess who went to Indonesia, because the topic did really interest me and I somehow thought it was a great opportunity to broaden my knowledge.

In Indonesia I have learned a whole new culture, the politeness the Indonesians have is so wonderful. They are always ready to help you and as a western you sometimes feel ashamed that they treat you like a king.

The conversations with the local people in Indonesia really opened my eyes and did reflect on how good we have it in the Netherlands and still complain that we are not fortunate.

I want to thank Kolar Aparna for supporting me during my research and afterwards in the Netherlands. Her critical eye was needed to make this thesis more relevant for the society. I also want to thank Oely Sidabalok, our contact at the UNIKA university. Furthermore I want to thank Donny Danardono and Benny Sertianto for giving us helpful information about our cases.

I must not forget my translator Danti. She really helped me with gathering information from the respondents. All of our translators were very nice and showed us the city around, I hope you still remember the Dutch pancakes we made for you ;).

I also want to thank my colleagues that were with me in Indonesia. Rindert, Maike and Anniek thank you for accompanying me on my trip to Indonesia, we made a lot of memories together.

Last but not least I want to give my special thanks to my girlfriend who helped me fighting through motivation dips and reread my whole thesis and correcting my English.

Jan van 't Klooster
Nijmegen, 13-07-18

Summary

Flooding is nowadays the biggest natural disaster in the world. This dangerous event is caused by the heating of our own planet. The sea level is rising and there is expected a continuing rise for the upcoming centuries, even if our emissions are reduced and their atmospheric concentrations are stabilised. One of the cities that is coping with the consequences of flooding is Semarang, lying on the North Central part of Java Indonesia. Flooding in Semarang occurs in the low-lying coastal areas which have been reclaimed. The causes of the flooding in Semarang are tidal floods, heavy rainfall and land subsidence caused by groundwater withdrawal. The specific research area of this thesis is the neighbourhood of Kemijen, lying at the coast in Semarang near the Kali Banger river. The vulnerability of this neighbourhood used to be very high due to the surrounding of water.

The cause of flooding is described in the existing literature as the global warming. This global warming causes a rise of the sea level, rise in temperature and heavier storms, extreme rainfalls and extreme droughts.

Together with the causes the consequences of floods will become worse in vulnerable cities. The effects that floods could have could be divided into direct and indirect effects. The direct effects are damages on houses, infrastructure, loss of standing crops and livestock, but also the loss of human lives or health issues.

For all these consequences we have to come up with solutions in order to deal with floods. These solutions could be structural and non-structural. With structural methods are for instance dikes, drainage systems, pump systems and polder systems. Non-structural methods are for instance public education or coastal planning. In Semarang the Dutch worked together with the Indonesian to implement a polder which lowers the vulnerability of several neighbourhoods lying on the coastal areas, also Kemijen.

All these examples given above are written on the basis of global literature. Nevertheless, to make these examples of solutions applicable to Kemijen there must be an understanding of the lived experiences of the causes, consequences and solutions of the inhabitants of Kemijen.

“Lived experience is in qualitative research a representation and understanding of a researcher or research subject’s human experience, choices, and options and how those factors influence one’s perception of knowledge (Boylorn, 2008).”

The understanding of the lived experiences of the inhabitants of Kemijen will be the aim of this research. In order to support this research aim the following research question is formulated:

How do inhabitants connect causes, consequences and solutions of the flooding problem based on their lived experiences in Kemijen, Semarang?

The theory that is used to explain the lived experiences of the Kemijens is the theory of Habitus and fields of Bourdieu.

To understand the way a person enters a certain social space the theory of Bourdieu is very helpful. Bourdieu calls the social space a field. How an individual enters a field depends on his habitus according to Bourdieu. Habitus can be described as socialized norms or

tendencies that guide behaviour and thinking. Fields are presented as structured spaces of positions which properties depend on their position within these spaces and which can be analysed independently of the characteristics of their occupants (Bourdieu, 1994).

In the habitus and fields theory Bourdieu distinguishes four types of capital; cultural, social, economic and symbolic capital (Bourdieu, 1986). These types of capital are needed in order to have influence and power in a field (Bourdieu, 1986). The perspectives of the inhabitants of Kemijen and their meaning of the flood could be described by the sorts of capital of Bourdieu.

During this thesis 10 inhabitants of Kemijen and one expert from the UNIKA soegijapranata University are interviewed. These interviews were transcribed in atlas.ti and coded to highlight relevant information. The results of these interviews are divided in the causes, consequences and solutions according to the lived experiences of the Kemijens. After all these results the data is analysed and conclusions could be made.

The Kemijens used for all the three factors of lived experiences a bottom up perspective. Due to their lack of economic and cultural capital they are not able to see the flood problem from a top down approach, like the global literature does. So due to their lack of these form of capital they only implement small scale solutions for the flooding problem and no structural solutions that keep their feet dry. The solution for the Kemijens was partly the Banger Polder Project, implemented due to a cooperation between the Dutch Hoogheemraadschap Schieland & Krimpenerwaard and the government of Semarang. In the future there must be a cooperation between the inhabitants and the government to fulfill both needs.

Table of contents	
Preface	II
Summary	III
1. Introduction	1
1.1 Motive	1
1.2 Background	3
1.2.1. Focus area	3
1.2.2. Kemijen	5
1.2.3. Causes based on existing literature about floods	7
1.2.4. Consequences based on existing literature about floods	10
1.2.5. Solutions based on existing literature about floods	12
1.3 Scientific relevance	14
1.4 Societal relevance	14
1.5 Research objective	15
1.6 Research framework	15
1.7 Research question	17
2. Theoretical framework	18
2.1 Theoretical concepts	18
3. Methodology	21
3.1 Research strategy selection	21
3.2 Applied method	22
3.4 Data analysis	25
4. Results	27
4.1 Causes according to the lived experiences of the Kemijens	27
4.2 Consequences according to the lived experiences of the Kemijens	31
4.3 Solutions according to the lived experiences of the Kemijens	33
5. Analysis	41
5.1 Causes related to lived experiences	41
5.2 Consequences related to lived experiences	42
5.3 Solutions related to lived experiences	42
6. Conclusion	44
7. Reflection	46
References	47
Appendix	50
Interviewguide Kemijen	50
Interviewguide Benny Sertianto	52

1. Introduction

1.1 Motive

Flooding affects several million people globally each year. The population of people living in coastal areas which are vulnerable to coastal flooding will rise in the upcoming years (Jongman et al, 2012). According to the IPCC (Intergovernmental Panel on Climate Change) (2007) this will be caused by an overall growth in population and wealth, and an increased sea-level due to climate change. One of these places in which the population might face disasters due to flooding is Semarang. Semarang is with its metropolitan of almost 3 million people, and city of around 1.5 million people the biggest city of Central Java and is facing serious consequences of climate change in the future. Flooding is one of the biggest future problems of Semarang. Flooding causes damage on human lives and property, due to bad protection and a lack of awareness of the consequences of flooding.

Therefore, the impact of flooding in Indonesia is much higher than in the Netherlands. But why do we still have thousands of people living in uncertainty of their lives and property in case of flooding in their neighbourhood?

And while the clever foxes come up with ideas to manage the flooding problems better, how do the inhabitants of a flood prone neighbourhood see these ideas and solutions?

This tension in the field of the flooding problems worldwide needs to be solved to get a better approach in tackling flooding problems. The global frameworks that are produced by the organisations and the lived experiences of the inhabitants of a flood prone neighbourhood should be combined into new strategies to tackle worldwide flooding.

With current adaptation methods the risk of flooding is reduced in Semarang, as stated by Hoogheemraadschap Schieland en de Krimpenerwaard (HHSK). With for instance the Banger Polder project, the chance of flooding of the Banger river is reduced from daily to one or two times a year (HHSK, 2017).

Although, this is what the HHSK states. Empirical research in the neighbourhood of Kemijen will lead to a perception of the experiences with the flooding in 2018.

Nevertheless, what is the reaction of the communities when it comes to the causes of the flooding? And what are the consequences for the communities if their neighbourhood is flooded due to climate change?

Moreover, what does the government do to protect them against these hazardous events, and how about their own protecting ways? Are they happy they don't have to worry that much anymore about again mopping their home for the second time in the week? Are they not scared anymore about losing value of their property again by another flood? Are they still aware of the problems that might face their houses in the future if they continue living their life as they do nowadays? All these questions have something in common; the perception of the locals. This aspect is exactly where this thesis will be based on. The lived experiences of the local inhabitants, of a flood prone neighbourhood in Semarang, with regards to the causes, consequences and the solutions of the flooding problem.

These causes, consequences and solutions are frequently described in already existing literature but not much from a bottom up perspective. Who else than the local inhabitants can tell us more about their experiences with the flooding problem. They see the causes,

consequences and solutions in their everyday life. With this thesis I hope to answer all these questions.

1.2 Background

1.2.1. Focus area

The research area in this case study is Semarang, North Central Java Indonesia (the exact location can be found in figure 3). Semarang has been coping with flooding for a long time. In Semarang flooding occurs in low-lying coastal areas which have been reclaimed. The extraction of groundwater by communities at the coast is contributing to significant land subsidence and the impacts of floods are likely to get much worse in the future if they continue the path. The prediction of the sea level rise of 21 centimeter in 2050 will affect a lot of coastal infrastructure in Semarang.

For example, if the train station or the port will flood in the future, the citizens of Semarang are unable to travel to work and the import or export goods can't be transported, which leads to economic and humanitarian disasters (Technical Team for Climate Adaptation of Semarang City and City Working Group 2010).

In the coastal areas of Semarang land subsidence is one of the biggest issues. Land subsidence in Semarang is caused by groundwater withdrawal, the natural consolidation process of alluvium soil (loose soil or sediments which have been eroded in a non marine setting), and subsidence induced by the load of constructions (Marfai & King, 2008).

All these facts about Semarang are written from a global perspective on the flooding problems. Nevertheless, do the inhabitants of a flood prone neighbourhood see these causes and consequences the same way or do they look different towards the problem. To what extent does it bothers them how much the sea level will rise? Is it more important for them to know how much water there will flow in their neighbourhood than to exactly know the amount of economic loss their city faces? These global experiences are interesting for researchers and inhabitants of regions where there is no fear for flooding but it does not help to understand the real lived experiences of communities who face flooding on a daily basis.



Figure 1: Java, Indonesia (Lonely Planet, n.d.)

Semarang faces three different types of flooding, according to Marfai & King (2008), summed up in the following:

- Local flood inundation: this type of flooding occurs due to an inadequate number and quality of drainage systems on the residential areas, especially on low lying and coastal areas. In the most cases the drainage system is inefficient or does not have the capacity to drain the large amount of water during the rain season (Marfai & King, 2008). In the research area of Kemijen, Semarang, this is the type of flood that occurs the most nowadays.
- River flood: this type of flood occurs during the rain season. The extreme amount of water which is transferred through the river flows over the banks of the river. The floods occur in the low areas of the catchment due to less flow, caused by a low difference in height in low lying areas. Also sedimentation causes worse problems in the regime of the rivers (Marfai & King, 2008).
- Sea water tide flood: this type of flood occurs when the sea level rises to a height above the coastal lands due to tidal elevation (Marfai & King, 2008). In semarang the inhabitants of low lying coastal areas face this type of flood on a daily basis.

According to Marfai & King (2008) there are 20 villages in Semarang located on low-lying areas neighbouring the shore. These low lying areas have an estimated altitude of maximum 10 meters above sea level. Most people live in the villages of Tanjung Mas, Bandarharjo, Panggun Lor, Kuningan and Kemijen, displayed in figure 3. When there is a flood it has huge impact on the population and economic activities in these villages. In 1990 for instance, there was a flood that took the lives of 47 people.

Because the fish industry is very important for Semarang, people are still living in these low lying areas for their jobs. Their lack of financial resources also thrives them to live in a dangerous area, if their financial status would have been better they would have left for sure.

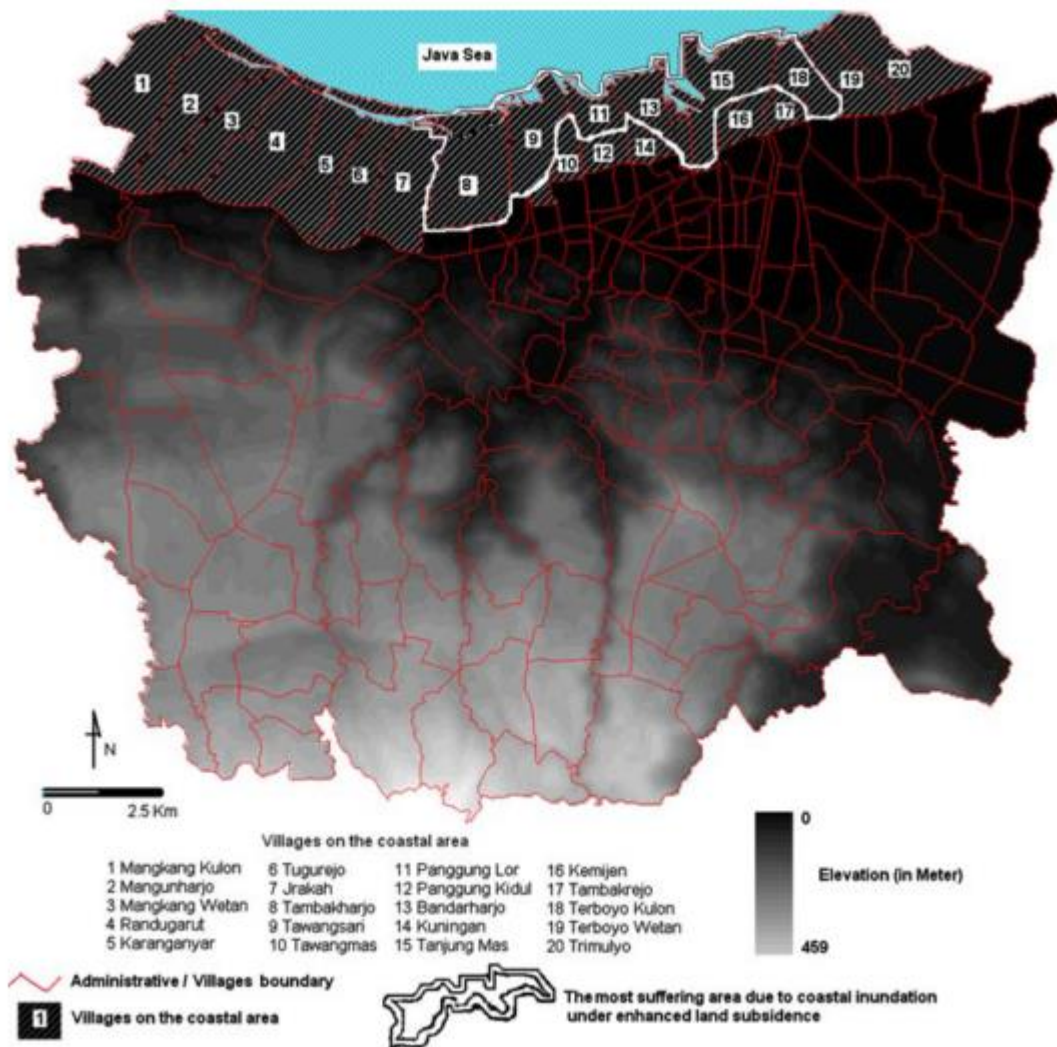


Figure 2: Villages on the coast of Semarang (Marfai & King et al, 2007)

1.2.2. Kemijen

The specific area in Semarang which is chosen for in this research is Kemijen. After pitching my research proposal towards lecturers and my supervisor of the UNIKA soegijapranata University in Semarang, they helped me find a neighbourhood that is suitable for my research topic. According to the topic of this thesis I wanted to find a neighbourhood which has already taken adaptive measures towards the flooding problem. That is why they suggested that I would go to Kemijen, area number 16 in figure 3, and do my research in this neighbourhood. In Kemijen the Banger Polder Pilot project has done a lot for the neighbourhood to tackle their flooding problems. With the help of the project the neighbourhood does not have any tidal flooding anymore. The following figure shows the neighbourhood of Kemijen.



Figure 3: Sea level rise projection and associated flooding scenarios for Semarang City (Arief Darmawan, 2014)

The following map will zoom in further on the neighbourhood of Kemijen. Highlighted in red are the borders of the neighbourhood.



Figure 4: Kemijen, Semarang (Google Maps, 2018)

As you can see Kemijen is being surrounded by water and is lying close to the sea. In the past the neighbourhood was flooded frequently due to the high tide of the sea, which flows in

to the river straight to the residents of Kemijen. The river banks are not high enough to hold the water inside of the river so the residential area will flood full of seawater. The houses of the inhabitants are not high enough to keep the water out and thus their houses will flood. The houses lower every year due to the land subsidence, which is around 5 till 10 centimetres a year, so they need to heighten their houses year after year. Kemijen has several community leaders, who inform the neighbourhood about events and projects in their area. For instance, the community leaders inform the inhabitants about the stages of the Banger polder pilot project.



Figure 5: Kemijen entrance sign (van 't Klooster, 2018)

This entrance sign was of course the first thing we saw when we entered the neighbourhood. The experience of really entering a neighbourhood in Semarang is very different than just driving on main roads and looking from out the car into a neighbourhood. The so far read literature about Kemijen and Semarang comes now to reality. Before we entered the neighbourhood we had made our own expectations based on the literature we have read behind our desktop. When entering a neighbourhood like Kemijen the literature faded away and the real experiences of such a neighbourhood starts to take over your thoughts.

1.2.3. Causes based on existing literature about floods

During the last decades one of the main topics in world wide politics is climate change. But what exactly causes climate change and what are the effects of climate change?

The extreme emission of carbon gases from the heavy industry, agriculture and cities have caused problems related to large climate change. Also deforestation and livestock farming are drivers of global temperature rise. Dry areas become dryer and warmer and some ice and snow in the world will melt permanently. The effect of this drying will be a rise of the sea level. Together with this rise of the sea level, the chance of flooding in low-level coastal areas will rise as well, which Semarang is itself. While a lot of successful cities with much inhabitants are built near the sea or a river, millions of people need to be protected for the rise of the sea level (Yevjevich, 1992).

Other effects of global warming are heavier storms like hurricanes, tsunamis or extreme droughts. A lot of animal species are threatened with extinction and human lives will be on the line. To do something about global warming a lot of leaders of countries in the world came together in 2015 in Paris. After the so called climate top in 2015 in Paris 195 countries, including Indonesia, have adopted the Paris Agreement to bring down the global warming limit to 2 degrees of Celsius or lower.

If we keep on polluting as much as we were doing the last decades we will face an increase in temperature between 3°C and 7°C in 2100. The following graph shows the difference between the current pollution and the maximum temperature rise as agreed to in Paris.

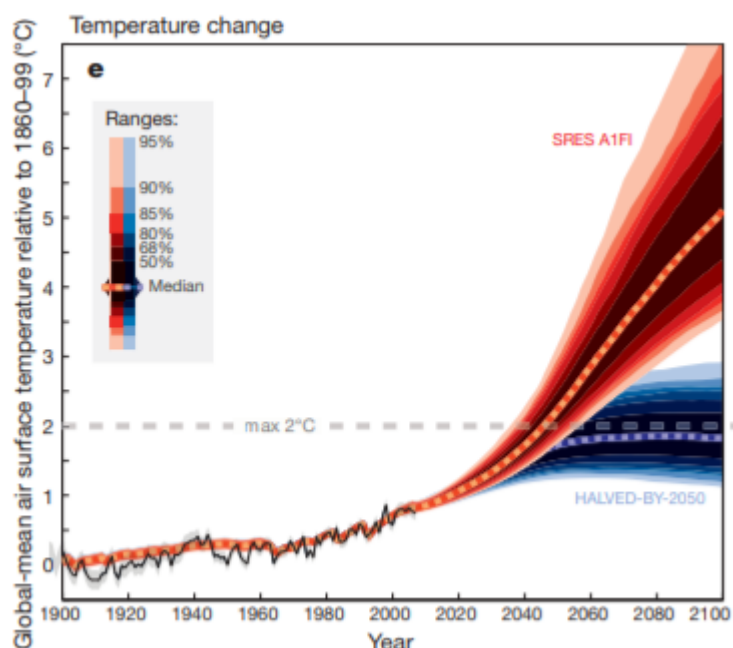


Figure 6: Surface air global-mean temperature (Meinshausen et al, 2002).

In the agreement the following main points which are relevant for this thesis are focused on:

- Mitigation; developing countries should continue enhancing their mitigation efforts, and are encouraged to move towards economy-wide targets over time in the light of different national circumstances (United Nations Framework Convention on Climate Change, n.d.).
- Adaptation; a global goal is established on adaptation, of enhancing adaptive capacity, strengthening resilience and reduction of vulnerability to climate change. All the parties involved in the agreement should engage in adaptation planning and are expected to submit and periodically update an adaptation communication on their priorities, implementation and support needs, plans and actions. Developing countries will receive support for adaptation actions (UNFCC, n.d.).

The local government of Semarang has implemented adaptive measures to tackle their flooding problem, for instance the Banger Polder Pilot Project. Not only big projects like the Banger Polder Pilot Project have been implemented, also on a low scale they have done some, in their eyes, successful adaptive measures. But what is the reaction of the inhabitants of a flood prone neighbourhood in Semarang towards these so called successful adaptive measures from the local government? And do the inhabitants of a flood prone neighbourhood in Semarang see these adaptive measures as the solutions for their flooding problems?

Further in this background section the already existing adaptation measures in Semarang will be discussed.

As said before, the sea level is rising and there is expected a continuing rise for the upcoming centuries, even if our emissions are reduced and their atmospheric concentrations are stabilised. The most important factors of sea-level rise are thermal expansion of the ocean and the melting of land ice, which includes glaciers and ice caps.

According to Church and White (2006) the sea level in 2100 will be raised with around 31 centimetres with a range of 3 centimetres compared to the sea level in 1990. When we look at data from the IPCC they state that at the end of the 21st century the sea level rise will be between 18-59 centimetres (Pachauri & Reisinger, 2007). The sea level rise is one of the biggest problems that causes natural disasters. As shown in figure 2, the biggest natural disaster between 1995 and 2015 is flooding. Semarang is one of the cities that is having big troubles with flooding.

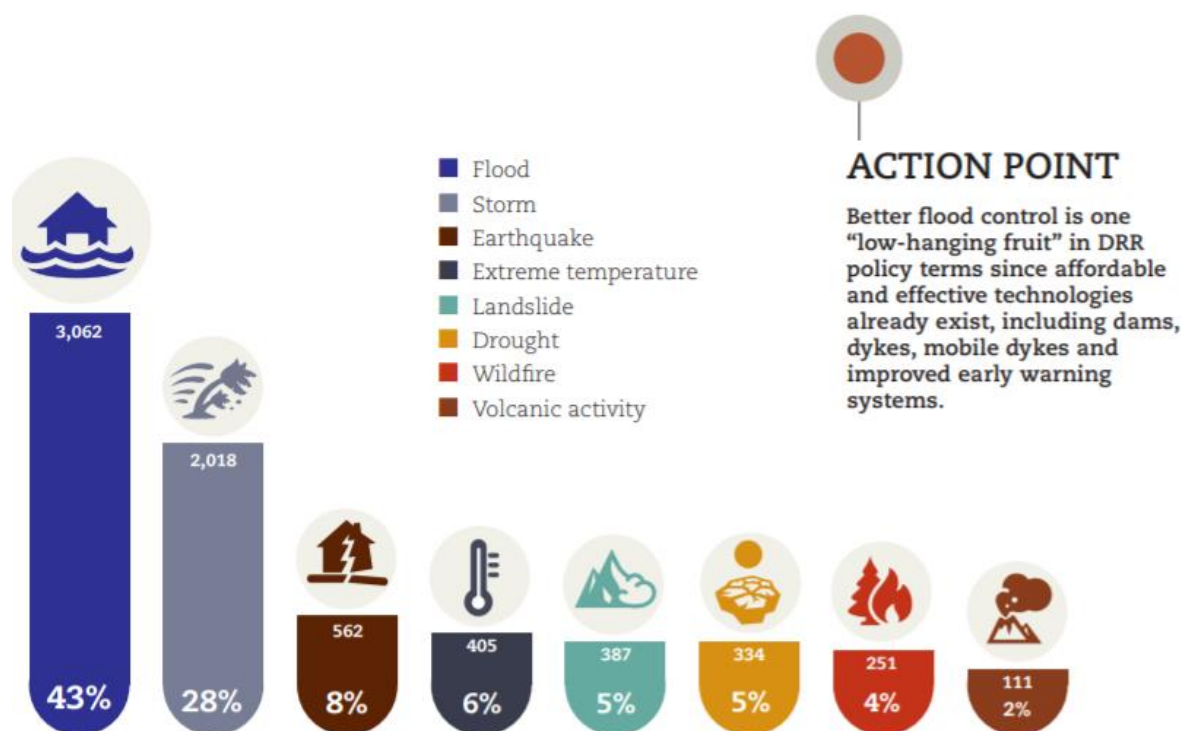


Figure 7: Percentage of occurrences of natural disasters by disaster type from 1995-2015 (Wahlstrom & Guha-Sapir, 2015).

1.2.4. Consequences based on existing literature about floods

The second part of this thesis consists out of the consequences regarding to flooding. In this chapter the consequences will be quickly described on the basis of existing literature.

In the future a doubling in the numbers of people that will be killed in coastal flood is expected according to Haines et al (2006). So the impact of floods will be higher in the future. However, what are these impacts exactly and how do they take more lives from people?

According to Messner & Meyer (2006) the damage of flood can be divided into direct and indirect effects. Direct flood damage includes harm which relate to the 'immediate physical contact of flood water to humans, property and the environment' (Messner & Meyer, 2006). Examples of these types of damage are houses, infrastructure, loss of standing crops and livestock, but also the loss of human lives or health issues. Increases in diarrhoeal and respiratory diseases have been reported in countries all over the world, not only in low-income countries (Haines et al, 2006).

Indirect flood damage deals with economic and social activities. An example of this type of damage is the loss of economic production due to destroyed energy facilities, or traffic disruptions due to broken infrastructure (Messner & Meyer, 2006). All these type of damages are possible in Semarang. In order to get an clear sight of the consequences of the inhabitants of Kemijen, we have asked them during the interviews. The perception of the inhabitants about the damages, direct or indirect, will be elaborated in the results part.

When we take a look at the land subsidence in Semarang we can see that due to the land subsidence several parts of Semarang are already below sea level. This increases the vulnerability to tidal flooding. Land subsidence causes damage to infrastructure such as houses, fabrics, roads and the railway, which will sink on the low lying coastal areas (Kuehn et al, 2010). Due to the land subsidence the flooding is getting worse and people have to leave their houses and build a new one, as shown in the following picture. Both the causes of high water, land subsidence and heightening the street in Kemijen causes the disappearing of houses below the street level.



Figure 8: Old house in Kemijen disappeared due to land subsidence (van 't Klooster, 2018)

1.2.5. Solutions based on existing literature about floods

The solutions of the flooding will be the third aspect in which this thesis tries to elaborate through the perception of the inhabitants of Kemijen. Current adaptive measures from the government will be explained in this part of the background.

In order to get less harm from flooding the US Army Corps of Engineering and the IPCC prescribed several adaptive responses which could be used to protect coastal areas against flooding. These responses include accommodation, protection, and retreat strategies. Accommodation strategy is meant for communities that in the future still occupy the coastal areas but are making some adjustments. Examples of these adjustments are elevating buildings on piles, or growing flood tolerant crops.

The aim of the protection strategy is to protect the land behind the sea from the sea so the existing land use can continue. This could be implemented by constructing hard structures, seawalls, dikes and breakwaters, but also soft measures, like beach nourishment.

The retreat strategy can be described in informal words as the strategy to give up, there will be no attempt to protect the land and evacuation is needed in an extreme case (Marfai & King, 2008).

When we look at the Banger Polder Project, you can see similarities with this theory. There are dikes built and hard structures like the pump house. So the protection strategy is implemented in Semarang. But is this the only strategy that is implemented in Semarang?

The Semarang local government is taking structural and non-structural methods to tackle the problems caused by coastal flooding. Structural methods are for instance dykes, coastal-land reclamation, drainage systems, pump stations and polder systems.

As non-structural methods the local government uses public education and is strengthening the organization framework for disaster management, coastal planning and management. Figure 6 shows an overview of structural and non-structural measures of the local authority in Semarang.

Structural	<p>Extensive : Reshaping of land surface Protection from erosion Delay of runoff processes Increase of infiltration Urban work</p> <p>Intensive : levees, dikes, floodwalls Dams and reservoirs Flood ways and diversion work Polder and fill Drainage works</p>
Non-structural	<p>Regulation : Zoning Coding</p> <p>Flood defence : Forecasting Warning Flood proofing Evacuation Relocation Formation of task forces</p>

Figure 6: Structural and non-structural measures of the local authority of Semarang (Dewi, 2007).

Nevertheless not only structural and non-structural measures are a way of protecting against flooding. Ecosystem-based measures are helpful against the water problem as well.

According to Renaud et al (2013) there are three main categories.

1. "Healthy and well-managed ecosystems that can serve as natural infrastructure to prevent hazards or buffer hazards impacts." Think about protection forest in areas where landslides are a common phenomenon. Or mangroves which reduce the height of waves coming from the sea.
2. "Healthy and well-managed ecosystems that help to reduce the exposure of people and their productive assets to hazards." Floodplains is in this case a good example for the ecosystems as mentioned. They absorb flood waters and thus reduce the flood peak.
3. "Ecosystems which sustain human livelihoods and provide for basic need, such as food, shelter and water - before, during and after hazards events." Well-managed ecosystems can provide services in this case. For instance salt water resistant food crops is an option, because they would not be damaged much by a flood from the sea.

The biggest adaptation measure in Kemijen is the Banger Polder Pilot Project. The Banger Polder Pilot Project, in short BPP, is started in 2001 after several parties agreed on a congress that they want to research the reduce of floods with the help of a polder system (HHSK, 2017). The BPP is a project funded by both the Dutch government as the Indonesian government. The goal of the pilot is to prevent a big residential area around the Banger river from flooding in the future. The solution for heavy rainfall will be a retention basin near the Banger river. This basin will only be used when the drainage canal of the Banger is full. Two dikes where built during the project, one in the North part to held the tidal water and one in the East part of the area, to prevent the river from flooding (HHSK, 2017).

The management of the polder in the coming years is handed over to the SIMA in 2009. In 2010 they officially started with the construction of the polder, and the so called polder board was appointed to manage the polder. The polder board consists out of three members of three universities in Semarang, three members of the municipality of Semarang, two members of businesses of the project area, and three members of the local residents in the project area. The twelfth member is someone from another area, to be a sort of guard to check if other neighborhoods are not being harmed.

To finance the maintaining costs in the future, a water contribution will be introduced tot he inhabitants of the polder project area. The project is meant to be finished in 2018 (HHSK, 2017).

Another adaptive measure which comes from the local government is the heightening of the street. The government finances the local communities to buy cement and stones. With these stones and cement the roads between the houses of the residents is heightened by the inhabitants themselves.

1.3 Scientific relevance

Many literature focuses on flooding in Semarang (Marfai et al, 2008), the adaptation measures of the local government (Harwitasari, 2009) and the local communities (Dewi, 2007). Nevertheless there are less studies focused on the perceptions of the local communities in Semarang towards flooding and what their perception thrives.

The scientific relevance of this research consists of the development of the understanding of the perceptions of flooding from the inhabitants of a flood prone region.

What do the locals see as the causes, consequences and solutions of the flooding problem and how is that perception formed by them?

Which factors influence the inhabitants of Kemijen to form their perception on the flooding problem? With connecting these three aspects there should be formed an overview of the flooding problems through the eyes of the locals. This research tries to help to get a better understanding of the factors that play a role in the perception of the inhabitants of Kemijen.

1.4 Societal relevance

The possible use of the outcome could be for policymaking in flood prone areas or adaptation measures from the local government. With the knowledge of communities' perceptions towards the problems related to flooding there could be made better policies towards the tackling of the flooding problem in Semarang.

Understanding community and people's response to flooding is essential to addressing issues of concrete action in coastal hazard management (Marfai & King, 2008).

Moreover, Semarang is not the only city in Indonesia that is facing problems with water, so the outcomes could be used for other cities in Indonesia as well. However, a quick note must be taken that the culture of communities in other cities may differ from the culture in the

researched area in this thesis. This is something that researchers should take in mind when applying this research in another city.

1.5 Research objective

The goal of this research is to point out the experiences of citizens in a high flood risk neighbourhood towards the causes, consequences and solutions of the flooding problem. How do the citizens see the problems and how is that perspective formed? The form of this research will be a case study with the focus on the lived experiences towards the causes, consequences and solutions of the flooding problem in Kemijen.

1.6 Research framework

In order to get clear what is the aim of the research and what had to be done to achieve this goal, it is important to think about how to perform the research. Therefore, it is helpful to create a research model and think about the different steps of the research. This will lead to realization of the research objective.

This research will be divided into the following steps:

1. Literature review: finding out what is already known in general about the concepts of the case.
2. Theoretical concepts: in order to answer the research question, relevant theories and central dimensions should be identified for this case. The questions for the interviews will be based on these theoretical concepts.
3. Empirical / Field research: in order to achieve new information on the case and come with conclusions and recommendations it is useful to do in-depth interviews in Indonesia.
4. Data analysis: the data received from interviews should be analysed.
5. Conclusions and recommendations: after analysing, the research questions will be answered and will result in conclusions and possible recommendations to the local government and citizens of Semarang.

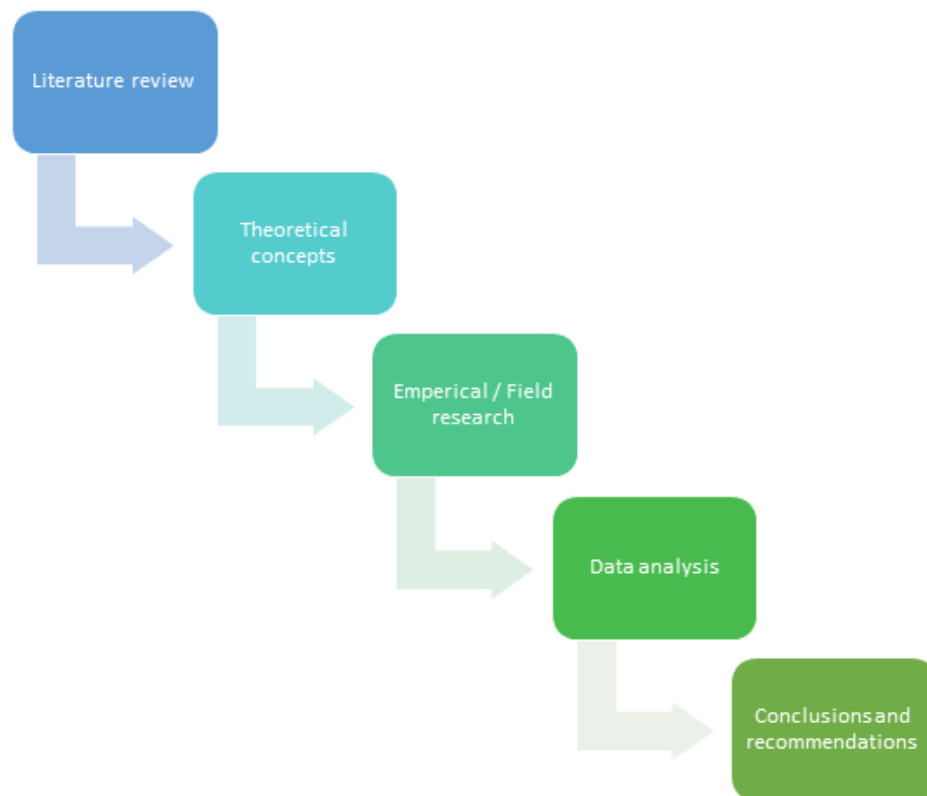


Figure 9: Research model

1.7 Research question

Following the research objective mentioned above, the following main research question will be answered in this research:

How do inhabitants connect causes, consequences and solutions of the flooding problem based on their lived experiences in Kemijen, Semarang?

This research question covers three dimensions which will be discussed dynamically throughout the research.

The theoretical framework will be based on theories which could explain these three dimensions of the flooding problem through the perception of the inhabitants of Kemijen.

2. Theoretical framework

2.1 Theoretical concepts

This chapter provides the basis for the analysis part. In this part the theoretical framework which will be used in the analysis is described and slightly applied to the topic of this thesis. In this theoretical part I try to explain the lenses which could be used to look at the flooding problem from a bottom up view.

Lived experiences

“Lived experience is in qualitative research a representation and understanding of a researcher or research subject’s human experience, choices, and options and how those factors influence one’s perception of knowledge” (Boylorn, 2008).

The lived experience method does not critique individual lives, but compares the lives of individuals with others. The method focuses on what people do and how they do it (Boylorn, 2008).

Bourdieu’s Habitus and fields

To understand the way a person enters a certain social space the theory of Bourdieu is very helpful. Bourdieu calls the social space a field. How an individual enters a field depends on his habitus according to Bourdieu.

Habitus can be described as socialized norms or tendencies that guide behaviour and thinking. According to Lizardo (2004) ‘Habitus is a system of embodied dispositions that organize the way in which individuals perceive the social world around them and how they react to it.’ Habitus influences the identity, actions and choices of the individual. Bourdieu distinguishes the habitus of class and the individual habitus.

Fields are presented as structured spaces of positions which properties depend on their position within these spaces and which can be analysed independently of the characteristics of their occupants (Bourdieu, 1994). A field defines itself by defining specific stakes and interests. The structure of the field is a state of the power relations among the agents or institutions engaged in the struggle. The field in the case of the inhabitants of Kemijen is the flood issue that Kemijen is facing. To get more knowledge about the way the inhabitants of Kemijen enter the field of the flood issue their capital must be examined.

In the habitus and fields theory Bourdieu distinguishes four types of capital; cultural, social, economic and symbolic capital (Bourdieu, 1986). These types of capital are needed in order to have influence and power in a field (Bourdieu, 1986). The perspectives of the inhabitants of Kemijen and their meaning of the flood could be described by the sorts of capital of Bourdieu.

Cultural capital

The Cultural Capital can exist in 3 forms: embodied, objectified and institutionalized (Bourdieu, 1986). An example of embodied cultural capital is cultural knowledge and literacy, people take a long time to get this kind of knowledge (Bourdieu, 1986). Objectified Cultural Capital are tangible cases which are transmittable goods like books, computers or a car (Bourdieu, 1986). These type of goods express a person’s capital. Institutionalized Cultural

Capital consists of for example educational qualifications, which a person can have in order to have power in a field (Bourdieu, 1986).

Social capital

Social capital is all about social networks, which can help people to gain influence and power in the field (Bourdieu, 1986). These social networks can be built by trust, social relationships and being part of a community (Bourdieu, 1986).

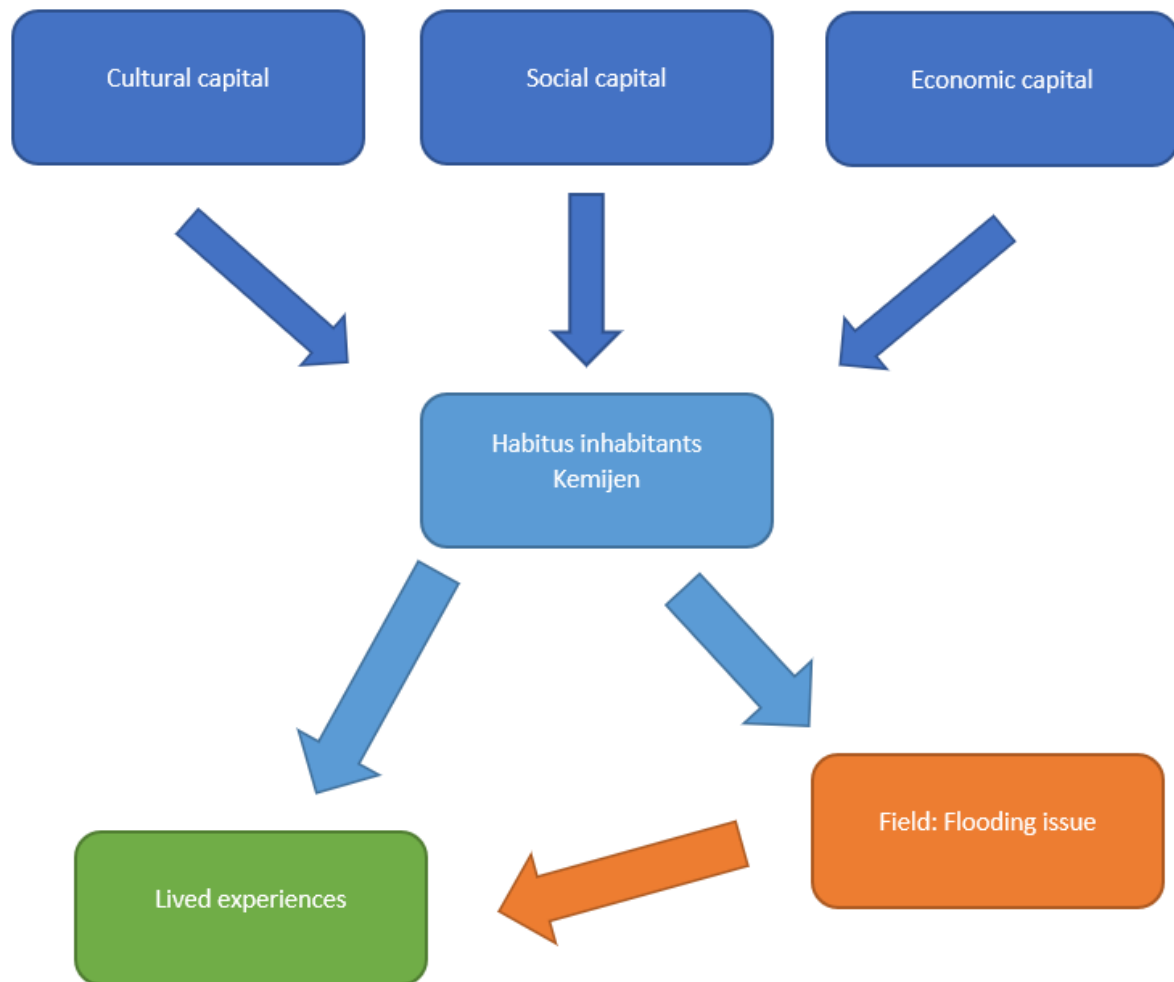
Economic capital

The different types of capital can be derived from economic capital, but only at the cost of a more or less great effort of transformation, which is needed to produce the type of power effective in the field in question (Bourdieu, 1986). So, "economic capital is at the root of all the other types of capital" (Bourdieu, 1986). "All these transformed, disguised forms of economic capital produce their most specific effect only to the extent that they conceal the fact that economic capital is at their root and thus at the root of their effects" (Bourdieu, 1986). Because economic capital is mainly related to the money, or sometimes property rights someone owns, it is possible to convert economic capital into the other forms of capital.

Symbolic capital

These three forms of capital together contribute to the symbolic capital. Though this capital is different from the other three forms of capital. Symbolic capital is something you can achieve by owning the other forms of capital. It is more like a perception; seen as a legitimate quality of someone. This is an automatic process which happens when a field is being entered by a person.

Following the theory of habitus and fields from Bourdieu the following model is produced, regarding to the thesis subject.



Conceptual model of theory of habitus and fields (van 't Klooster, 2018)

When we look at the theory of habitus and fields in terms of causes, consequences and solutions the theory could be very helpful to understand the lived experiences of the Kemijens.

How the Kemijens see the field in this specific case, where the field is the flooding issue, is dependent on the habitus of them. The field in this case we can distinguish in causes of flooding, consequences of flooding and solutions of flooding. How the lived experiences of these aspects of the field are formed could be explained throughout their habitus. The three sorts of capital play a role in the way they approach the flooding problem.

The causes, consequences and solutions of the floods could be explained with the theory of habitus and fields as following:

The causes, consequences and solutions of the flooding problem is for everybody different, based on their perception of the problem. The general view of a flooding problem is climate change, land subsidence and bad adaptation measures. Nevertheless the causes, consequences and solutions could be seen different by someone who really lives in a neighbourhood that is frequently flooded. This could be explained throughout the sorts of capital a person has. When for instance a person has low cultural capital, which means their education level is not high and so forth, they don't know much about the causes, consequences and solutions described in the literature and taught in school. Nevertheless

if someone does have a high social capital there is the opportunity that they have gained knowledge about the field of causes through social contact. This social contact determines they way someone looks at certain phenomena.

When you look at the importance of economic capital the solutions are receiving much attention. The way someone sees certain solutions for their own or from the government is related to their economic capital. If they have a low economic capital they have to come up with low-cost solutions and are supporting the responsibility of the government. They see the field of solutions as almost untouchable for them. They have little influence on the solutions for their neighbourhood through their lack of economic capital.

3. Methodology

3.1 Research strategy selection

In the following chapter the chosen research method will be described. The selection will be made from the book of John Creswell, which outlines five different approaches of qualitative research.

According to Creswell (2007, p.44) qualitative research “begins with assumptions and the use of interpretive/theoretical frameworks that inform the study of research problems addressing the meaning individuals or groups ascribe to a social or human problem”. In this thesis the main goal is to understand the behaviour of communities in a flood prone neighbourhood compared to communities in a non flood prone neighbourhood.

The topics about which this thesis will write are emotionally laden. This thesis will listen to individuals and the questions asked will become more refined during the process of research to get a more reflective understanding of the problem.

Together with qualitative research there will be four basic sources of qualitative information: interviews, documents, observations and audiovisual materials.

Creswell (2007) describes five different qualitative research methods summed up below:

1. Narrative research: it begins as a method with the experiences as expressed in lived and told stories of individuals. The story told to the researcher is intended as a performance to convey a message or point. The stories are often shaped by the researcher as chronologic. Narrative research is the best method for capturing detailed stories and life experiences of a single individual or of a small number of individuals.
2. Phenomenological research: a phenomenological study describes the common meaning for several individuals of their lived experiences of a concept or phenomenon. Phenomenologists focus on describing what all participants have in common as they experience a phenomenon. After the inquirer has collected data from the persons who have experienced the phenomenon he develops a composite description of what they experienced and how they experienced it. A phenomenological research focuses on a single concept or idea explored with a group of individuals. A phenomenology ends with a passage that discusses the essence of the experience about what they have experienced and how.

3. Grounded theory research: the intent of this way of doing research is to move beyond description and to generate or discover a theory for a process or action. The developed theory comes from data gathered from participants who have experienced the process. The primary form of data collection in this type of research is by doing interviews in which the researcher is constantly comparing data gained from participants with ideas about the theory.
4. Ethnographic research: in this type of research, the researcher is interested in examining shared patterns of an entire culture-sharing group. This group mostly consists of 20 people or more. As a process, ethnography involves extended observations of the group through participant observation. Ethnographers study the meaning of the behaviour, the language, and the interaction among members of the culture-sharing group. Ethnographic research starts with a theory, a broad explanation on what they hope to find, drawn from cognitive science to understand ideas and beliefs.
5. Case study research: this type of research is a qualitative approach in which the investigator explores a real-life, contemporary bounded system (a case) or multiple bounded systems over time, through detailed, in-depth data collection involving multiple sources of information. For example by taking interviews, observations and reading reports. A hallmark of a good qualitative case study is that it presents an in-depth understanding of the case.

3.2 Applied method

The applied research method will be chosen among the five types of qualitative research as described in the research strategy selection.

First of all, the narrative research method will not fit the research questions while the narrative research method is based on the life experience of an individual or a small group of individuals. The aim of this research is to get an overall view on the lived experiences of the inhabitants of Kemijen regarding to the causes, consequences and solutions of the flooding problem, which requires more than a story of an individual.

The second suggested research method by Creswell, the phenomenology, also does not fit this research. While this thesis does not want to focus on a specific phenomenon but on lived experiences which has little to do with a specific phenomena.

The grounded theory research is a method which is also not applicable to this research. While the grounded theory is there to explore a new theory, the goal of this thesis is to elaborate on a theory.

The main characteristic of the ethnographic research design is examining shared patterns, while this thesis does not specifically wants to focus on shared patterns but just on the different ways of actions and experiences in a flood prone neighbourhood.

The last of the five mentioned ways of doing qualitative research by Creswell is the case study. This one will be chosen for this thesis while it gives an in-depth understanding of the case. The case in this study will be the causes, consequences and solution through the lived experiences of inhabitants of Kemijen, Semarang.

The methods this thesis plans to use will provide the data that is needed to answer the research questions.

To answer the sub questions and after all the main question, data is needed. In order to collect data, for this research especially qualitative data, first of all literature research is needed. Therefore I have read a number of reports on tackling flooding in Semarang. Furthermore, the data will consist of in-depth interviews with experts and locals, and observations in Semarang. The locals that have been interviewed live in Kemijen, a 'former' flood prone neighbourhood near the coast of Semarang.

With the help from the UNIKA Soegijapranata university I have found the right respondents for this research. At the first meeting with lecturers from the university we pitched our research proposal and they helped us finding the right neighbourhood. For me this was Kemijen, in which the BPP has already found a lot of success. In order to get in contact with the locals we got in contact with mister Puji from LPUBTN, an organisation which helps the farmers and fishermen's in Semarang. Mister Puji also is an inhabitant of Kemijen himself. Mister Puji knows a lot of people in Kemijen and showed us around the neighbourhood and found 10 respondents to have an interview with, including himself.

In order to get the right information from the respondents I needed a translator, because the people in Kemijen only spoke Javanese or Indonesian. My translator was Danti, she just graduated with her bachelors degree. She has never been in Kemijen before so it was new for her too. In the interviews they would translate the questions to Javanese or Indonesian and ask the respondents my questions. In the end the answers would be translated back into English, so I could understand what had been said.

The method that I have used for the interviews was the semi-structured interviews. In this type of interview the researcher sets the outline for the topics that will be covered. While this is exactly the same as in a structured interview the difference of this method lies in the continuation of the interview. During the interview the researcher determines the way of the interview by the responses of the interviewee's (Stuckey, 2013).

The goal of the semi-structured interview is to finding out *why*, rather than *how many* or *how much* (Fylan, 2005). So Danti translated the answers of the respondents back to me and I asked a new question, or a question about the answer that had been given by the respondents.

Semi-structured interviews are especially helpful when you will not get more than one chance to interview someone (Cohen & Crabtree, 2006). This is the case in Kemijen; there is one opportunity to speak with one respondent and after that moment you perhaps will never see them again.

This type of interviewing is clever when the researcher wants to develop a keen understanding on the topic of interest of the interviewee. The inclusion of open-ended questions that might stray from the interview guide does provide the opportunity for identifying new ways of seeing and understanding the topic.

The interview guide that is followed is based on the research questions. The participant does not have to answer the questions in order. It gives freedom in the answers of the participants and both freedom and structure in the researcher's way of interviewing (Stuckey, 2013).

The interview guide that I have used was too broad for the interviews. Our supervisors from the university, miss Sidabalok and mister Setianto, told me before we went to the neighbourhood that it might be too long to ask all the questions we had formulated. So we

decided to narrow the questions down before we went to Kemijen. Nevertheless, during the first two interviews we found out that it still was too long.

With mister Puji, and our two translators, we traveled across the neighbourhood to get to our interview locations. While walking through Kemijen we also made a lot of pictures for our observations. We made these pictures because of the importance of the visualization of the lived experiences of the Kemijens. Not only the lived experiences are outlined by pictures, also our own experiences with the neighbourhood are reflected in the pictures. The pictures makes it easier for the reader to understand the concepts we talk about in the neighbourhood. The pictures in this thesis give body to the flat text.

Before every interview we asked if we were able to record the interview, and in all of the cases it was okay to record it. We have also asked for the name and age of the respondents but in the analysis I will not use the names of the respondents, because it does not change the answers that are given or the way I interpret them.

Due to the fact that we have used translators I think a lot of potentially interesting information has been lost during the translation. The translator gave us a summary of what the respondent said and how they have interpreted the question and answer. It is impossible for the translator to translate everything that has been said so we must accept the fact that we get a short summary with the core of the answer.

The first questions were general questions. For instance how long do they live here and how many family members they have and so forth. After these questions we began to ask about their perception of flood, with asking them about how many times a year there is a flood and when it is considered to be a flood for them. To see if it got worse or less worse over the past years we asked the respondents this question. After three respondents we decided to not ask these questions anymore because of the fact that they all gave the same answer and it was not necessary for our research.

After the first interviews we decided to narrow the questions even more, to get the core out of the interviews, and not only general information.

In the next section of the interview guide we asked questions about their actions and what their actions thrive. So for instance if they considered to move out, why they made a certain decision? How they protect themselves against flooding and how the local government has done this? This gave us a view of their willingness to solve the flooding problem. We also asked about the responsibility for the problem, whether the government should be responsible or the residents, which also explains a part of their willingness.

In the last part of the interview guide I specify on the BPP. I have asked the respondents what they knew about the BPP. Sometimes they were thinking about an answer of that question when mister Puji interrupted and sort of give away the answer for them. To point out what they have experienced from the BPP one question was about the changes they have experienced from the BPP, like changes in actions regarding protecting their properties.

Not only the questions of the interview guide were asked. While doing the fieldwork we found out that there is so much trash on the streets and in the gutters. We concluded that this must be a big problem for the drainage system, which leads to longer floods from heavy rainfall than necessary. This, in terms of lived experiences, is an interesting angle. In the literature we have not read much about the waste problem in Semarang. However, it was a topic that got our interest in the field quite fast, so we already had our own lived experience in Kemijen. So we decided to ask the respondents if they thought the waste is also a cause of

the flooding problem and found some interesting opinions about waste which we in the Netherlands never could understand.

The most negative side of the applied method in this thesis is misunderstanding. While we have a question in our head which sounds understandable for us, our translator might interpret it different than we do and so do the respondents. The second problem is not a problem of the method but a communication problem. Due to the language barrier you could never get the full answer including the right emotions of the respondents. Which also could lead to a wrong view of the respondents answers.

It is no wonder that we have experienced this problems as we come as student researchers to a foreign country for our second research abroad. These variables we have mentioned above are not only for us as student researchers applicable. Also reputable researchers have these kind of challenges when they are doing research and try to work out a policy or a global concept based on that research. The researcher could be misinterpreted by both the translator and both the respondent. This could be because of the researcher is using words the respondent or translator does not know the exact explanation of and is giving an answer in which he hopes the researcher is oke with.

Also the emotions of the respondents could be difficulty been read by the researcher if they don't speak the language of the respondents. This could be missing links in concepts for adaptation based on lived experiences.

3.4 Data analysis

The data gathered from the interviews will be transcribed and analyzed using the program of atlas.ti. During the process of analyzing recurring sayings will be highlighted. There also will be made codes to categorize the answers of the interviewees. These codes will be compared to other interviewees to look if there are similarities in their lived experiences or not. The results of the interviews, the literature and documents will together gather the data to hopefully answer the research questions.

After coding the transcripts of the respondents in the neighbourhood for the first time there were 38 codes used. The second time the codes had been read through, so they were brought down to 19 codes. It is narrowed down because of the wideness of the codes, some codes are almost full sentences which is not helpful for analysing the results.

After coding the codes are put in categories by making code families to discover relations between them and to get relevant outcomes. The code families are causes, consequences and solutions. These three families refer to the main question of this thesis and help to get a better understanding of these three aspects through the eyes of the inhabitants.

Two codes have not been put in these families, the codes of '*motive staying*' and '*moving to Kemijen*', this is done because of the background it gives and not the answers to the questions as mentioned in the research question.

The transcript of the interview with the expert of the area, mister Sertianto, is coded separately from the respondents of the neighbourhood because this reveals information from an outstander of the neighbourhood. This means he could have a more objective view of the problems, although he is closely connected to the neighbourhood with the board of the BBP.

The total of codes that is used for this interview is six. The amount of codes is very low in comparison with the respondents from the neighbourhood because the interview is used to complement the missing links in the interviews of the respondents of the neighbourhood

4. Results

4.1 Causes according to the lived experiences of the Kemijens

The following chapter will describe the causes through the lived experiences of the inhabitants of Kemijen. In the background chapter the causes of flooding are explained at the hand of literature and will now be filled with the thoughts of inhabitants of Kemijen. In Atlas.ti there have been four codes formulated to point out the causes through the lived experiences of the inhabitants.

Rob, heavy rain and land subsidence

While we know a lot about the flooding due to the already existing literature about Semarang, we decided to still ask the inhabitants about the causes of the flooding problems in their eyes. The main topics they discussed are rob, heavy rain and land subsidence. Rob is a typical word of Semarang which they translate as the floods from the sea, in scientific terms the tidal flood.

The respondents told us that the main cause, before the BPP, was rob. Nowadays they don't have rob anymore so that problem is solved by the BPP.

The main problem nowadays when it comes to flooding is the heavy rain. In the raining season it sometimes rains so much that the river bed floods, due to the large amount of water that comes from the higher areas, and the neighbourhood is flooded with river and rainfall water.

"If there is too much water from the rain, the river will rise with 1,5 metres."

Respondent 8 clarifies why the water is not flowing away properly out of the neighbourhood. The drainage systems are made from wood, so he assumes that the quality of the drainage system is bad. Another point he mentioned that delays the drainage of the water is the waste problem in the neighbourhood. The waste is blocking the water from flowing properly.

The low lying area of Kemijen becomes lower every year. Due to the land subsidence of around 10 centimeters a year, according to respondent 6, the vulnerability of the neighbourhood increases every year. This makes the battle to the water harder, but the inhabitants have found a solution for the land subsidence, which is explained in the chapter of the solutions.

To care or not to care

The environment is one of the main concepts in the flooding issue. Due to the quality of the environment the flooding will be affected positively or negatively. In this specific case in Semarang the flooding will be affected negatively. However, how do the inhabitants of Kemijen see the environment as a cause towards the flooding problem?

According to respondent 1 the understanding of the effects the environment has on the flooding is very low in the neighbourhood.

“The presentation for the people that still care for the environment is 20%.”

The explanation respondent 1 gave for the lack of caring is the poverty level. In Kemijen the poverty level is very high which is recognisable on the streets as seen in the following picture.



Figure 10: Ruined house near the entrance of Kemijen (van 't Klooster, 2018)

The community tries to improve the knowledge of the importance of the environment through the so called socialisation. Respondent 1 spoke to the community, in commissioned by the government, to share the importance of the environment.

In further interviews only one respondent mentioned the environment, so even though respondent 1 tries to share the importance of the environment through the community, there still is less knowledge about one of the factors of the flooding problem. Respondent one claims that the knowledge is low because of the poor people, so he suggests that a high income could lead to more care for the environment.

Trash

Where the communities' knowledge about the environment is very low, they do have more knowledge about another factor that affects the flooding problem. Respondent one states that trash is one of the factors that has a negative effect on the current adaptation measures in the community. According to respondent 1 *"that is because the community still doesn't want to throw the trash in the proper place, in the trash can."* The simple explanation of this phenomena is that the people in the community do not care about their waste. When we asked about the bad effects of the waste on their health, he referred to the high level of poverty. He even states that the community prefers working from the morning till late in the evening than helping to clean the community.

Respondent 6, which was our guide through the neighbourhood, also talks about the low understanding of the trash problem. He says that every household has a trash bin in front of their house and they pay 10.000 rupiah (which is €0,60) on a monthly base for the refuse collection service. You would say that these measures help to clean the community from trash but still not the whole community is throwing their waste away properly.

In further interviews we asked the community about their knowledge of the waste problem. It turned out that the knowledge about the waste problem is higher than he expected.

Respondent 4 for example talks about the socialisation as organised by the government to create more awareness of the waste problem.

An interesting angle comes from respondent 6, who says that there is no punishment for the dumping of the garbage near the railway. This is in contradiction to what respondent 1 said about the waste management. Respondent 1 stated that most of the people prefer to work longer to pay a punishment and still throw their trash wherever they want instead of proper waste processing.

It is easy to understand that it is very difficult for the government to control waste management in the neighbourhood because of the big scale of the problem. Once the waste dumping is narrowed down to a low level, you can assume that the awareness of the waste problem is higher. When the awareness is higher, the community will care more about their environment and so on let nobody else throw their waste away in an inappropriate way anymore. This way it would be easier to maintain the rules and punishments regarding to the waste.

In order to create more awareness of their waste there is a recycle center in the neighbourhood where people can bring their trash to.

In this center the useful waste is separated from the unuseful waste and for instance bags are made from the waste.



Figure 11: Waste bank (van 't Klooster, 2018)



Figure 12: Recycled plastic (van 't Klooster, 2018)

4.2 Consequences according to the lived experiences of the Kemijens

The following chapter will describe the consequences through the lived experiences of the inhabitants of Kemijen. In the background chapter the consequences of flooding are explained on the basis of literature and will now be filled with the thoughts of inhabitants of Kemijen.

Four codes have been formulated in Atlas.ti to point out the consequences through the lived experiences of the inhabitants.

Economic problems

A lot of the consequences the inhabitants of Kemijen experience can be related to economic problems.

Respondent 1 has said that most of the people prefer to work till the evening instead of helping to clean the environment. This could mean that most of the people prefer to work in order to get more money to lower their own consequences instead of tackling the problem at their roots. The main economic consequences the respondents talked about were broken electronics, furniture or their kitchen.

Those are also the properties they protected the most against floods. The solutions to protect these properties will be described in the following chapter about the solutions.

When it comes to their furniture, the water has a negative effect on the most of the wooden structures. A lot of inhabitants talked about the chance of a flooded bedroom so they decided to protect their bedroom as much as possible. The need of a safe place to sleep is one of the most important requirements for the community.

Through observation in Indonesia, electronics like a computer or a smartphone seemed to be of the primary life needs, even in such a poor neighbourhood as Kemijen. Therefore it is no wonder that the inhabitants want to protect their electronics as much as possible.

Electronics are expensive for them and must be protected very well against water.

One respondent fixes electronic devices for a living, so even though the neighbourhood is very vulnerable when it comes to flooding, he still has a business in electronics. The consequences for him when there is a flood, he described as followed:

“He can’t handle the electronics when the flood is coming. The flood broke his stuff and not the costumer’s stuff.”

Another primary live need is a kitchen in order to prepare food for their daily needs. When their kitchen is affected negatively by a flood they are able to cook somewhere else in the community, a form of gotong royong. Gotong royong is a very important concept in the Indonesian society. Some neighbourhood have signs in which their ten most important rules are described and gotong royong is one of them very often. Gotong royong means working together or helping each other, literally translated is means ‘live up together’. Respondents have referred to this term a lot of times when they were explaining consequences and their following solutions.

Another consequence mentioned by the respondents is the lack of schooling during floods. When the neighbourhood is flooded, and therefore also the school, the children are not able to go to school.

Motorcycles are often broken when the water rises as high as the electronic equipment in the bikes. When the inhabitants do not have a motorcycle that is running, some are not able to go to work and therefore lose some income.

The quality of the houses also is an important consequence of the flooding. Respondent number 2 has abandoned his old house and build a new one in front of his old house. He had to do this because of the land subsidence; his old house was lying too far below the street level.

Respondent 5 told us a lot about their problems regarding the quality of their house. Her floor has cracks in it due to the pressure of the water and the walls became humid so there was a higher possibility of mold. Also her closet was cracked due to the flood so her house was damaged a lot by the floods. Respondent 6 also told us about broken furniture in his house. The other respondents did not tell us about their problems with the quality of their house that specifically, but we assume that if they had to heighten their house like everybody had to in the neighbourhood they also had experienced these sort of consequences of the floods.



Figure 13: Sunken house (van 't Klooster, 2018)

Health problems

Another big problem that comes with the floods is the problem of the health of the inhabitants. The water contains a lot of bacteria which, according to respondent 9, is due to the waste problem. It affects the drainage very badly and causes diarrhea according to respondent 9. Respondent 9 and respondent 1 are the only ones talking about diarrhea. The other respondents mostly talk about skin diseases. According to respondent 4 the water is dirty because of the amount of waste in it.

The smell of the water also is a big problem according to the inhabitants. Due to the waste the smell is very bad and the polluted water causes asthma problems to respondent number 3.

Mister Sertianto explained the problem of the skin diseases to us. During the raining seasons, the inhabitants are with their feet under water for almost 24 hours a day. The logic consequence for this is that the bacteria in the water have an impact on their feet. If you scratch your feet open, the bacteria are given a free pass to enter your body.

Another problem mister Sertianto mentioned, that is not mentioned by the local respondents, is the problem of a proper toilet.

“During the dry seasons it is hard to wipe their ass because there is no water. During the raining seasons, it is also hard for them to wipe their ass because it is already under water.”

4.3 Solutions according to the lived experiences of the Kemijens

The following chapter will describe the solutions through the lived experiences of the inhabitants of Kemijen. In the background chapter the solutions of flooding are explained on the basis of literature and will now be filled with the thoughts of inhabitants of Kemijen. In Atlas.ti four codes have been formulated to point out the solutions through the lived experiences of the inhabitants.

Own solutions

The inhabitants of Kemijen are so called experienced flooding dealers, they have had problems regarding floods for almost their entire lives and came up with their own solutions against the flooding problem. The following paragraphs describe these solutions.

In order to get less harm from the flood most of the respondents are heightening their electronics and house equipment when there is a flood. We have seen several bedrooms in which the beds are heightened with stones underneath. Also, the electronics are put on tables to protect them from flooding.

The kitchen also was an important property we have learned throughout the interviews. They try to heighten their kitchen as much as possible but when there is a flood and they are unable to cook, they have the opportunity to cook somewhere else in the neighbourhood.

“They work as a community in order to establish a general kitchen and cook together.”

The community refers this to the so called gotong royong.

Out of all the respondents we have interviewed only one that said she would not help her neighbours that fast because she first wants to secure herself and her relatives.

Another measure a lot of the inhabitants have taken to secure their own safety is the heightening of their houses. A lot of houses are lying below street level because of the land subsidence and the heightening of the streets. In order to secure themselves against high water they have to heighten their house almost every five years. The costs of this heightening are very high for the inhabitants but it is necessary.

We have asked them if they would leave if they had the chance and the answers were diversified. About half of the people would stay because of the sense of place they have with Kemijen and the other half would have left if they had the money. To get a better understanding of what it costs to have a house on the higher areas of Semarang respondent 4 told us the average price of a house over there. Converted into euros there is 24.000 euro needed to go to a higher place on the hill than Kemijen.

Nevertheless some inhabitants of Kemijen do not even have the money to heighten the floor of their houses and have to accept the consequences of the flooding.



Figure 14: Partly sunken house, barely able to stand (van 't Klooster, 2018)

Another inventive method respondent 3 used was a pump made from a fish aquarium. With that pump he lowers the level of water in case of a flood. In terms of gotong royong he also helps his neighbours with the pump when his own house is not flooded anymore. Although the pump helps a bit it is not enough for him to keep his feet dry.

The respondent who has a business in fixing electronic devices has his own solution to filter the water. He made a barrier from purr to get the water more clean. It is a temporary solution and does not prevent the water from coming into his house, but tries to filter bacteria. I assume that the filtering is not working that well because the bacteria are already in small parts in the water and the barrier is only protecting his house against big waste parts in the water.

Nevertheless two respondents told us they do not heighten their house and they only *“just move everything to a higher place and just waits till it is over.”* If the flood becomes to high they evacuate themselves and come back when the water level is lower.

Governmental solutions

The government of Indonesia and Semarang has also provided several solutions to tackle the flooding problem.

One of the governmental solutions that was very weird for us to understand was the heightening of the streets in Kemijen. The government provided money to heighten the level of the streets in Kemijen. This way the inhabitants could buy concrete and rocks to heighten the street and on the other hand relatively lower their houses. When there is a flood the street will not flood that fast because of the difference in height level with the houses. The water will flow of the streets straight towards the houses of the inhabitants and they serve as a sort of bassin for the water. In our vision the government is causing bigger problems for the inhabitants. Respondent 5 also describes the government in that way; as a cause of the problems in their houses.



Figure 15: Heightening of the street (van 't Klooster, 2018)

According to respondent 1 the neighbourhood received help from the World Bank between 2014 and 2016. They gave money to manage the environment throughout the resettlement program. The goal of this program was to have 100% development, 0% slum area and 100% sanitation and clean water. Respondent 1 states that this development program spoiled the people in Kemijen.

“The people said: the government will do it.”

Another quote from a respondent confirms this statement of respondent 1.

“And the government should give money and equipment to the people living in Kemijen. They have to provide them.”

The government has not always helped the inhabitants of Kemijen to protect them from floods. According to respondent 1 in the 1990's the government cut down a mangrove forest, that was a natural barrier for the sea, to construct governmental buildings.

Respondent 5 also is very skeptical about the countries government. She said that a political party was responsible for the money to heighten the streets.

In one of the last interviews respondent 9 and 10 came up with something we have not heard before.

“The local government first helped in giving rice and instant noodles and groceries and thing like that”.

It seems clear that respondent 9 and 10 attach more value to the low scale help than the tackling of the big problem. It was important for them that the government provided them in their daily needs in case of a flood.

Banger Polder Project

The biggest adaptive measure in the area of Kemijen, and therefore the biggest solution, is the Banger Polder Project. As described in short in the background, the BPP defends a large part of Semarang against the dangerous floods. Nevertheless, what do the inhabitants think about this adaptive measure?

According to almost all of the respondents the BPP was successful for the community. Most of the respondents told us that the rob has stopped and the only problem nowadays is the heavy rain according to some respondents. Others say that there are not even heavy rain floods anymore. They have not experienced a flood in the last year, while others said there is a flood once or twice a year nowadays. The difference in this perception is not explained in the interviews but it might be that some streets are lying on the safe side of the river in case of heavy rain or their house is high enough to keep the water from heavy rain out. This are just suggestions from my side and are not based on lived experiences of the inhabitants.



Figure 16: Pump house of BPP (van 't Klooster, 2018)

Respondent 3 has come with a solution which could help the water in the river flow properly:

“The government need to clean the polder banger from a plant. Etjeng gunduh. This plant makes the barrier for the water so it can't flow properly.”



Figure 17: Etjeng gunduh in the Kali Banger river (van 't Klooster, 2018)

Nevertheless two respondents say that the BPP is not working that well. Respondent 9 is saying that there are still floods both from the sea and the heavy rain.

Another problem with the polder is that the polder is shifting the problems.

“The problem is moving because of the dam to other areas.”

The dam is a great barrier for the sea to enter Kemijen but the dam is not lying in the surrounding neighbourhoods. So the water that is normally going to Kemijen is going to the surrounding neighbourhoods.

Responsibility

One important aspect for the solution is the responsibility. Who is responsible for the flooding problem?

We asked the inhabitants if they could give us their answer to the question who is in fact responsible for the flooding problem.

The answers were different from each other so there could not be written one specific view about the responsibility of the community.

Respondent 1 and 3 told us about the parent-child relation of the government and the community.

“They think the government is responsible because the government is like their father. So the parents should be responsible for their child.”

Respondent 1 said that the government treated them like a baby, so like a father would treat his child. But still they think that the government is responsible for the flooding problems.

Another frequently heard word is money, *“the government should give money and equipment to the people living in Kemijen to provide them”*, according to respondent 8. A few other respondents support this statement by the fact that the government has the money.

Some respondents answered that both the community and the government are responsible for the flooding problem. The people have chosen to live in this neighbourhood so they have to act first, according to respondent 10. The people who decided to live in Kemijen have to take the risk of flooding so it is their own responsibility to cope with the flooding.

Respondent 7 comes with an very interesting idea. He said that the government and community should work together through a Kemijen council, with people who work together with the government. He also comes up with the idea that the community should pay taxes for the infrastructure and the government should maintain the infrastructure with that money.

According to mister Sertianto one of the problems of the lack of trust in the government is the solution in another neighbourhood. In one neighbourhood in Semarang a Japanese organisation is in charge to protect that neighbourhood from flooding. While they do not ask for a contribution for the maintenance of the defending structures it is controversial for the Kemijens.

“People next door they don’t have to pay, why should we pay?”

Although the tax that the Kemijens will have to pay in the future is not that high, 72.000 rupiah a year, there still is this voice against the taxes. When you compare the price of the tax to the price of the heightening of an house, which is estimated by mister Sertianto at around 1 million rupiah, you could say that the Kemijens should not complain about the taxes.

5. Analysis

In this chapter the causes, consequences and solutions of the flooding problem experienced through the eyes of the Kemijens will be compared with the causes, consequences and solutions according to the literature review that has been done in this thesis before. Together with that comparison the lived experiences will be tried to be explained through the lens of Bourdieu's theory of habitus & fields, which will be the final analysis of this thesis.

5.1 Causes related to lived experiences

The literature review of this thesis provided us a view of the causes that have been writing in global literature. These global patterns are for the academics in the world the causes of flooding problems in neighbourhoods such as Kemijen. However, this thesis asked the inhabitants of Kemijen to their lived experiences of the causes. What will be their opinion about the causes of the flooding problem and how is that opinion compared to the already existing literature?

In the global existing literature the term rob is never mentioned by writers, while we experienced in Kemijen it is a very important concept. The reason why rob is not mentioned is of course because the word is a local translation of tidal flood. Nevertheless for the Kemijens it is an important concept, while it explains their view on the causes of the flooding problem. The term rob is in the community very important and is related to cultural capital. The use of rob instead of the literal translation is a part of the cultural knowledge of the Kemijens. To understand the lived experiences of the Kemijens it is important to have more knowledge about the cultural knowledge of the Kemijens.

Interesting point of angle is that none of the respondents that have been interviewed in this research mentioned global warming as a cause of the flooding. The inhabitants of Kemijen have little knowledge about global problems, despite they all do have a smartphone. They do not connect the flooding problem in their area with the global warming due to the emission of carbon dioxide they produce. The perception of the problem is through the eyes of the Kemijen thus formed by a bottom up perspective. They only describe the causes of flooding by what they see. So you could say that global climate change is interpret different in some parts of the world. This could be formed by a lack of institutionalized cultural capital, the educational qualifications they have. If they have never learned about global warming or other causes of flooding problems it are only their lived experiences they link to the causes of the flooding problem.

The causes that the inhabitants do see through their lived experiences are the rob, heavy rain and land subsidence.

Another important aspect that was mentioned is the trash problem. As mentioned before we as researchers had our own lived experience in the neighbourhood where we could not imagine that the trash problem has nothing to do with the flooding as well. In the neighbourhood there is a low understanding of the trash problems which causes a lot of waste on the streets and at the river banks. This problem could be related to both the economic capital as the cultural capital. The economic part of the waste problem is the lack

of money to pay for the refuse collection service. Moreover, the lack of the understanding of the problems their waste causes leads to a low cultural capital in this case.

5.2 Consequences related to lived experiences

In the same style as the causes this paragraph will continue to analyse the results of this research, with the focus on the consequences.

The existing literature does not take the reader deep in to the neighbourhoods where the consequences are the most heaviest. The damage that is done due to flood is divided in the literature into direct and indirect effects, on a global scale. These effects are described in general, for instance the loss of human lives, health issues and damage to houses. However, it is hard for the reader to really understand these consequences when they do not understand the lived experiences of victims of floods.

One of the enormous impacts the floods have on the lives of the Kemijens is the economic impact. Because almost all of the Kemijens have to heighten their house every five years they need to save money from their pay check every month. This narrows down their opportunity to create a better wealth for their family. Because of this vicious circle they can hardly move from the neighbourhood or protect their house once and for all to get rid of the floods. This type of consequence has an impact on their economic capital, which could not grow and reduces their power in the field of the flooding problem.

Another impact on one of their capitals is the lack of schooling during floods. When there is a big flood the schools are closed and their institutionalized cultural capital, gained through educational qualifications, could not elaborate. You can imagine that during the raining season a lot of classes will be cancelled due to a flood.

The existing literature tells us something about the health issues the victims of a flood have to cope with. The respondents told us exactly the same things as the literature described, nevertheless mister Sertianto explained how the skin diseases the inhabitants talked about are formed, something that was missing in the existing literature.

5.3 Solutions related to lived experiences

The last paragraph of this chapter will be based on the solutions of the flooding problem. Exactly the same as in the former paragraphs the perspective of the Kemijens is laid aside the existing literature and explained by the forms of capital of Bourdieu.

The already existing literature writes about both global and local solutions for the flooding problem. The local solutions mostly go about the banger polder project, which is implemented in Semarang, and is making big steps in order to get dry feet for the Kemijens. The Kemijens are thankful for the BPP, which already caused no flooding from the sea anymore, if we must believe the inhabitants. Not every respondent is in line with that argument but there is no doubt that the BPP brought significant changes in the flooding problem.

The Kemijens have also implemented their own solutions. The example of the barrier made

from purr, as given in the results part, is a fine example of an own solution. The barrier tries to filter the dirty water from bacteria. Nevertheless the bacteria are not that big that they cannot go through cracks. So this is in the eyes of the respondent a solution for the skin diseases. However, due to his lack of institutionalized cultural capital, he does not see that it is not going to work that well.

A very important term which comes to the table when there need to come solutions for the flooding problem is the term of gotong royong. With gotong royong a lot of small problems could be solved in the neighbourhood. The general kitchen for instance solves the problem of not being able to cook at home for a lot of Kemijens. The gotong royong term is a typical example of social capital. The social contact in the neighbourhood is very high due to the culture of the Kemijens. This social contact makes the flooding problem easier to solve, because of the cooperation between the Kemijens.

Although the social contact between the Kemijens seems to be high, the social contact between the government and the Kemijens leaves much to be desired. The Kemijens told us that they do not like the road to be heightened because of the difference in level with their homes is the result of this. This makes the vulnerability of their homes higher. The social capital in this field of cooperation with the government is not that high could we conclude out of this.

6. Conclusion

In this research the lived experiences of the inhabitants of Kemijen, a neighbourhood in Semarang, were explored on the basis of 3 factors of flooding, the causes, consequences and solutions. The aim of this research was to get an overall view on the lived experiences of the inhabitants of Kemijen regarding to the causes, consequences and solutions of the flooding problem.

The conclusion tries to give an answer to the main question: *“How do inhabitants connect causes, consequences and solutions of the flooding problem based on their lived experiences in Kemijen, Semarang?”*

The answer to this question is not just a simple enumeration of the stories told by the respondents. To answer this question there is first of all taken a look at the already existing literature on causes, consequences and solutions of flooding. This literature is laid aside to the answers that were given by the respondents, and the differences of these have been explained in the analysis. Together with the theory of Bourdieu’s habitus and fields there is given an explanation of these lived experiences.

When we look at the causes of floods the inhabitants of Kemijen used a bottom up approach to get a better understanding of the problem. The Kemijens see the causes through their own habitus. This habitus is perceived through knowledge, social contact and economic situation. Their educational level is not high enough to see the causes at their roots, so they look at the small scale causes. Due to this lack of knowledge they are not able to solve the problem themselves.

With the current adaptive measures in Kemijen this view is changing. The Banger Polder Project makes clear that the problem can be solved with big adaptive measures and not only small measures at their houses or streets. The success of this project might change their attitude towards adaptive measures from the government, in which the inhabitants do not always trust due to the history. The Kemijens made the government responsible for the flooding problem, but the help from the government is not that useful according to some residents.

A better approach would be a cooperation between the Kemijens and the government, supported by many of the respondents. The so called community leaders work now together with the government to create a better awareness of the problems Kemijen is coping with. This already resulted in a waste bank in Kemijen to get more awareness about the waste they are dumping.

The difference between the consequences that are given by the literature and the respondents are not that big. The literature also describes the economic impact on the victims of the floods. Nevertheless the inhabitants told us the reasons for these economic impacts of the floods. The main impact on their economic situation is the heightening of their house due to the flooding in combination with the land subsidence. This costs them every year a lot of money, which negatively affects their economic capital and therefore the way they could approach the field of flooding.

The solutions the Kemijens come up with regarding the flooding are different than the ones from the global literature. Where the global literature is talking about big adaptive measures

to deal with flooding the Kemijens have a very bottom up approach. This could be easily explained through their lack of institutionalized cultural and economic capital. They have little knowledge about the flooding and how to tackle the problems regarding flooding. Together with the absence of money in most of the families in the neighbourhoods the solutions they come up with are from a very low scale. They are heightening their houses for decades now because they had no other opportunity to just keep on heightening when the government is not doing significant measures against the flooding. It is a vicious circle where the Kemijens were in. With the newly adaptive measures from the government in cooperation with international organisations the Kemijens do not have to come up with their own 'primitive' solutions.

7. Reflection

The difficulty of doing research abroad has proven itself during this research. The difficulties are within the communication problem at first. As I consider myself not a very good English speaker I sometimes find it difficult to express my thoughts in English and scientific readings, which mostly contain scientific words, were sometimes difficult to read. I have learned a lot through just throwing my uncertainties about my English away and taking the opportunity to go abroad.

During the fieldwork it was difficult to point out for myself if I got the right information, with which I could actually work in the Netherlands. The difficulty is that if I would miss information I am not able to get back to Indonesia to ask the respondents again.

While during the feedback session of my research in Indonesia my supervisor told me that the answers of the interviews were not really corresponding with my research question I had to change my research question working backwards. This was hard in the beginning, but in the end a good learning process for my further researches.

Also the respondents might have been misinterpreted due to the language barrier. With the use of a translator the emotions of the respondents are difficult to read and the questions and answer could be misinterpreted by both the respondents as well as the translator.

Nevertheless I do think the interviews gave some very interesting points of view of the inhabitants of Kemijen which is interesting to read.

References

- Bourdieu, P. (1986). 'The Forms of Capital', in J.G. Richardson (ed.), *Handbook of Theory and Research for the Sociology of Education*, New York: Greenwood Press, pp. 241-258.
- Bourdieu, P. (1994). *Sociology in question*. London: Sage pp. 72-77.
- Boylorn, R. (2008). Lived experience. *The Sage Encyclopedia of Qualitative Research Methods*. SAGE Publications. Retrieved June, 26, 2018
- Church, J. A., & White, N. J. (2006). A 20th century acceleration in global sea-level rise. *Geophysical research letters*, 33(1). doi:10.1029/2005GL024826
- Cohen, D., & Crabtree, B. (2006). Qualitative research guidelines project. Retrieved March 27 from https://www.sswm.info/sites/default/files/reference_attachments/COHEN%202006%20Semistructured%20Interview.pdf
- Creswell, J. W. (2007). *Qualitative Inquiry & Research design: choosing among five approaches*. (3rd ed.). California, United States: Sage Publications. doi: 10.1177/1524839915580941
- Dewi A (2007) *Community-based analysis of coping with urban flooding: a case study in Semarang, Indonesia*. M.Sc. thesis, ITC, Enschede, The Netherlands
- Fylan, F. (2005). Semi-structured interviewing. *A handbook of research methods for clinical and health psychology*, 65-78.
- Google Maps. (2018) Kemijen. Retrieved May 29, 2018, from <https://www.google.nl/maps/place/Kemijen,+East+Semarang,+Semarang+City,+Midden-Java,+Indonesi%C3%AB/@-6.9571855,110.4326909,16z/data=!3m1!4b1!4m5!3m4!1s0x2e70f35cd940b44d:0xadca6c5b55cb78b9!8m2!3d-6.9582315!4d110.4386227>
- Haines, A., Kovats, R. S., Campbell-Lendrum, D., & Corvalán, C. (2006). Climate change and human health: impacts, vulnerability and public health. *Public health*, 120(7), 585-596. doi: 10.1016/j.puhe.2006.01.002
- Hoogheemraadschap van Schieland en de Krimpenerwaard. (n.d.). *Het Banger Polder pilot project in Semarang*. Retrieved March 22, 2018, from <https://hhsk2017.nl/wp-content/uploads/2017/08/Het-Banger-Polder-pilot-project-in-Semarang.pdf>
- IPCC, 2007. Regional climate projections. In: *Climate Change 2007: The Physical Science Basis*. Contribution of Working Group 1 to the fourth assessment report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge.

Jongman, B., Ward, P. J., & Aerts, J. C. (2012). Global exposure to river and coastal flooding: Long term trends and changes. *Global Environmental Change*, 22(4), 823-835. doi: 10.1016/j.gloenvcha.2012.07.004

Kuehn, F., Albiol, D., Cooksley, G., Duro, J., Granda, J., Haas, S., ... & Murdohardono, D. (2010). Detection of land subsidence in Semarang, Indonesia, using stable points network (SPN) technique. *Environmental Earth Sciences*, 60(5), 909-921. doi: <https://doi.org/10.1007/s12665-009-0227-x>

Lonely Planet. (n.d.). Map of Java [Photograph]. Retrieved June 8, 2018, from <https://www.lonelyplanet.com/maps/asia/indonesia/java/>

Marfai, M. A., & King, L. (2008). Coastal flood management in Semarang, Indonesia. *Environmental geology*, 55(7), 1507-1518. doi.org/10.1007/s00254-007-1101-3

Marfai, M. A., King, L., Sartohadi, J., Sudrajat, S., Budiani, S. R., & Yulianto, F. (2008). The impact of tidal flooding on a coastal community in Semarang, Indonesia. *The Environmentalist*, 28(3), 237-248. <https://doi.org/10.1007/s10669-007-9134-4>

Meinshausen, M., Meinshausen, N., Hare, W., Raper, S. C., Frieler, K., Knutti, R., ... & Allen, M. R. (2009). Greenhouse-gas emission targets for limiting global warming to 2 C. *Nature*, 458(7242), 1158.

Messner, F., & Meyer, V. (2006). Flood damage, vulnerability and risk perception—challenges for flood damage research. In *Flood risk management: hazards, vulnerability and mitigation measures* (pp. 149-167). Springer, Dordrecht. doi: https://doi.org/10.1007/978-1-4020-4598-1_13

Nehren, U., Sudmeier-Rieux, K., Sandholz, S., Estrella, M., Lomarda, M. and T. Guillén. 2014. The Ecosystem-Based Disaster Risk Reduction Case Study and Exercise Source Book, Geneva and Cologne: Partnership for Environment and Disaster Risk Reduction and Center for Natural Resources and Development

Pachauri, R. K., & Reisinger, A. (2007). IPCC fourth assessment report. *IPCC, Geneva*, 2007.

Renaud, F., K. Sudmeier-Rieux & M. Estrella (eds.), 2013. The role of ecosystems in disaster risk reduction, United Nations University Press, 440 pp

Stuckey, H. L. (2013). Three types of interviews: Qualitative research methods in social health. *Journal of Social Health and Diabetes*, 1(2), 56. doi: 10.4103/2321-0656.115294

Swyngedouw, E. (1992). *Economic Geography*, 68(3), 317-319. doi:10.2307/144191

Technical Team for Climate Adaptation of Semarang City, City Working Group. 2010. City Resilience Strategy: Semarang's adaptation plan in responding to climate change. Retrieved February 15, 2018, from http://accrcn.org/sites/default/files/documents/6_Semarang_Resilience_Strategy.pdf

United Nations Framework Convention on Climate Change. (n.d.). Summary of the Paris Agreement. Retrieved February 20, 2018, from <http://bigpicture.unfccc.int/#content-the-paris-agreement>

Verschuren, P., & Doorewaard, H. (2007). *Het ontwerpen van een onderzoek* (4e [herz.] dr. ed.). Den Haag: LEMMA.

Wahlstrom, M., & Guha-Sapir, D. (2015). The human cost of weather-related disasters 1995–2015. *Geneva: United Nations International Strategy for Disaster Reduction*.

Appendix

Interviewguide Kemijen

Interviewguide fieldwork Kemijen 14 April 2018

General questions

Gender:

Name:

Age:

Family members:

How long do you live in Kemijen:

What do you for a living:

Questions regarding living conditions in their home

- How many times a year is there a flood (so I can see their perception)?
- When is it considered a flood for you?
- Did the flooding get worse or less over the past years?
- What is your worst perception with flooding?
- Does the flooding affect you in your daily life? And how?
- Do you know where the flooding is caused by?
- How have you protected your house against flooding?
- Who taught you the way you are protecting your house?
- In what way have you protected your house before?.
- Have you ever thought about protecting in a different way?
- How do your neighbours protect themselves against flooding and do you know why?

*If all the same, do they know someone who protects their house different from themselves?

- What would you do if you had the opportunity to live elsewhere and why would you make that decision that way?
- How has the local government protected Kemijen against flooding?
- Why do they protect or do they not protect Kemijen against flooding?

Questions regarding the Banger polder project

- What do you know about the Banger polder project?

- What changes have you already experienced from the Banger polder project?
-How were the situations before then?
- To what extent do you fear for flooding disasters in the future?
- How does that come so?

-Compared with the past, are you more or less feared and why so?
- How does the local government inform you about the Banger polder project?
-If not, how do you get knowledge about it?
- What kind of properties have you protected frequently in the past against flooding and are you now less worried about? (and why?)

Interviewguide Benny Sertianto

Interviewguide Benny Setianto

Introduction of ourselves

General information

Name:

Age:

Current function:

Questions regarding Kemijen

- Could you tell us something about Kemijen and the flooding issue?
- Can you tell us something about the causes of the flooding issue in Semarang, and especially in Kemijen?
- Can you tell us something about the consequences for the local residents regarding the flooding issue?
- Could you tell us something about how frequent there was a flood in Kemijen, before the Banger Polder project?
- Does the flooding only take place in Kemijen, or in more areas in Semarang?
- Can you tell us a little more about the term 'gotong royong'?
- How do you see the cooperation between the government and the local residents?
- Do you think the waste problem is a cause of the flooding problem?
- If yes, do you think that education or higher awareness, stimulated by the government is a solution to the waste problem and therefore the flooding issue?
- How much do you think the local residents care about the environment, in combination with waste?
- How do you see the solutions of the problems regarding water in Kemijen?
- Who do you think is responsible for solving the problem?
- What actions can the local residents undertake when their house is flooded?
- Why do you think that even if people are aware of the flooding problem, they are not willing or able to act against the flooding problem, or to come up with solutions?
- Or do you think they already come up with enough solutions and actions taken regarding the flooding issue in Kemijen?

Banger polder project

- Could you explain your role in the project?
- Why is there not enough funding to finish the dam?
- What is the reason that the residents in the retention area still haven't moved?
- How does the board of the project inform the local residents of the stages and of the project?
- What kind of reactions do you get back from the local residents regarding the project?
- We have heard that the dam is shifting the problem to Tambak Lorok, what do you know about that?