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Get ready for the flood! Risk-handling styles in Jakarta, Indonesia

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Introduction

'The kampong will be flooded! Prepare!'¹

It is two o'clock early in the morning of 6 October 2010 when seventeen-year-old Ambran keys this warning text message into his cell phone. Instantly the alarming message disturbs the sleep of his fellow residents.

Ambran lives with his family and several hundred other families in Bantaran Kali, a poor, flood-prone riverbank settlement in Jakarta.² As he was on his way home, after he had finished selling cigarettes at the night market (*pasar malam*), he stumbled upon a neighbour who spoke to him in an anxious tone: 'I have just been informed that it has been raining for days uphill and that the water is coming our way.' Ambran understood that the enormous amount of rainwater that gushed down from the highlands of West Java towards Jakarta Bay would probably cause a large flood in the riverbank settlement where Ambran and his family members live. One experienced look at the river and he felt sure that his neighbour's prediction was accurate: the water level was much higher than when he had left the kampong earlier that day. He immediately typed the text message on his mobile phone warning of the risk of a flood.

When dark rain clouds above the neighbourhood burst open, the SMS messages that Ambran sends around echo in what resembles a musical wave throughout the many houses in the kampong. With various beeps and melodies, the flood warning is transmitted through asbestos and bamboo house walls, first digitally and later via loud human voices that resonate in the streets: 'We will be flooded! Get ready for the flood!' The kampong leaders are alarmed; they call the *kelurahan* (the kampong administration); then they call the gate keepers from the Manggarai and Depok sluices in Jakarta and get the risk expectations officially confirmed: 'the rumours are true,' they are told, 'water from the Ciliwung river already gushes over the sluice doors and it will reach your kampong within hours from now.'

Ambran has already experienced many floods in his young life: small ones that come and go within a day, medium-sized floods when children can swim in the streets, large ones that turn the kampong into a mud pool full of drifting waste, building materials, dead cats and chickens... Ambran has grown accustomed to most of the floods. As do most of his neighbours, he considers floods a part of life. They are a worrisome part of life because they damage goods and make it hard to

¹ See Photo 1 for the version of this text message that Ambran sent to me, and Photo 2 for an impression of this flood (p. 17).

² In order to protect the anonymity of my informants, I have chosen to use a fictive name for the research area. Bantaran Kali is the name that the participants of this study came up with. It translates to 'riverbanks.' In consultation with respondents, their names have also been changed.

continue business, but one can even get used to worries. This is reflected in the saying, 'We're familiar with floods,' (*banjir sudah biasa*) which is popular in the kampong. Ambran can hardly imagine a life without floods: 'They are normal, to me and my neighbours. People here have found their own ways to handle floods and stay safe,' he says.

But that does not count for all of the floods. Some are too large to handle. Too sudden. Residents never know when these 'sudden floods' (*banjir tiba-tiba*) come, but there have been at least four of them in the past fifteen years, and newspapers often carry scary headlines at the start of the wet season that suggest that another one may again be on its way.³ Ambran still has regular nightmares of the largest flood that he ever experienced. When he was twelve years old, Ambran survived a seven-meters high flood that inundated the kampong's alleys in 2007. The house of his family collapsed completely, the family members lost all their possessions, his baby sister Melisa cried for days and nights, and Ambran's coughing and itchy skin lasted for weeks after the flood had receded; but they survived and were able to rebuild their house and life 'stone by stone, step by step.'

This 2007 flood was a trauma for Ambran and his family members. None of them had ever before experienced such a high flood. The grandmother of Ambran often tells him about the times when she and the other children in the kampong would throw coins in the river and dive in and bring them up again. Back then, residents were never afraid of floods, his grandmother remembers. During heavy rains in the wet season, the water from the river would come up to their knees at most. It was nothing like the threatening floods that Ambran experienced during his young life, where the river rose meters high, and strong currents made their devastating way through the kampong, dragging along furniture, houses and inhabitants. In grandmother's times, the river water was clear, deep and wide. Now, it has become black, smelly, narrow, shallow and dangerous. As a result, the ways in which kampong residents respond to them has also changed. Ambran says:

When my grandmother was young, the community just stayed calm during floods. But nowadays, the riverbanks turn into chaos when we are flooded. Some people even disobey the kampong leaders' safety instructions. It's everyone for themselves. Everyone just does what they deem right.

Ambran expects many more such chaotic situations to occur in his future life: 'Because if you live on the riverbanks, you will always have to survive more floods. It is the risk that we take by living here.'

In order to get an insight into the riverbank settlers' current experiences with floods, let's return to the 2010 flood that was described at the beginning of this introduction. Soon after Ambran sent around the warning text message, the neighbourhood buzzes with activities. Bags are packed; zippers are pulled; windows are slammed; televisions and refrigerators are stored on upper floors;

³ In 1996, 2002, 2007 and 2013. Later in this chapter I will elaborate more on the causes and effects of these large floods.

bundles of clothing are attached to ceilings with strings and nails. Local community leaders and volunteers walk around at a fast pace and routinely bang on each and every front door to make sure all inhabitants are awake. 'Prepare yourselves for the flood,' they instruct residents: 'Get out of here as soon as you can! Quickly evacuate to the safe area!' Everyone knows what they mean by 'the safe area.' It has become usual during large floods for residential volunteers and civil servants working for the *kelurahan* to set up a canvas evacuation shelter just outside the kampong. They count who is there and who is not, and cook rice and boil eggs. Later a team of rescue workers from the *kelurahan* will arrive to provide evacuees with more support and free facilities, such as public toilets, food and water, free medication, and a solid roof that protects them from rain.

But far from all residents of Ambran's kampong make use of the provisions in the shelter. In fact, many of them do not even head in the direction of the safe area, hence disobeying formal safety instructions. Instead, everyone seems to act in very different ways. If there is one description that portrays what happens along the riverbanks after a message warning of the risk of flood is spread, then it must be 'heterogeneity.' Some evacuate, but others clamber on top of their roofs with the use of self-built stairs, while some seem to take no action at all. One of my main aims in this study is to try to make sense of these heterogeneous practices and understand why different people handle risk in different ways. Before I present arguments for the social and academic relevance of such a research topic, I will describe in more detail the heterogeneous practices that Ambran and his neighbours exhibited – practices I witnessed when the flood hit the kampong in 2010.

It has just turned five o' clock in the morning as the call for morning prayer blasts from the speakers of the local mosque.⁴ I notice that only a few inhabitants have followed the instructions of their kampong leaders and are hastily wading through the ankle deep water towards the evacuation shelter, carrying luggage on their heads and backs. Teenager Ambran is among them, struggling to hold on to the hand of his sister Melisa (six years old) and, at the same time, to his cigarette cart and the large cd-player that he wants to keep dry. Luckily, neighbour Yusuf offers to carry Ambran's sizeable grandmother to the evacuation shelter. The woman lies over his shoulder and complains out loud about her uncomfortable position. 'You cannot carry an old person hastily like this!' she screams, 'you will break my bones!' Yusuf sweats and pants for breath under the weight of Ambran's grandmother, but he doesn't mind, he says. He considers it his personal duty to act quickly and help other residents to stay safe during floods. Ambran agrees with that felt responsibility: 'Of course he helps us. Strong people like Yusuf have the task to help us to survive floods here.'

⁴ *Fajr* prayer starts between dawn and sunrise.

Yusuf, Ambran, Melisa and their grandmother pass by tens of other neighbours, who nod and wave at them to indicate that they have heard the news about the flood and the nearby shelter – only to close their doors and disobey instructions to evacuate. Through their windows, some of them shout that they prefer to find a safe spot of their own. Many anxiously climb on roof tops with the help of rope ladders or the knotted hands of family members.

I accompany Ida, a widow in her forties, as she works her way up onto the roof of her house. Drops of sweat run along her face as she prepares a private evacuation space for herself and her four children (the youngest is eight years old; the eldest thirteen) on the rooftop of her house. She has built the tiny shelter herself during past years, from wood that she collected from the river. Ida gasps as she pulls up her valuables to the rooftop. During floods, electric devices are not safe downstairs. Her rice cooker must be protected against floodwater, just as her fan. She looks around the two square meters where she plans to stay with her children during the flood and decides to put both devices on top of a stack of clothing and shoes, furthest away from the side where water might enter. Ida does not own many other valuables. She has little income and cannot afford to buy much apart from her basic needs. 'That is the only advantage of being as poor as I am,' she grins, 'if you don't have much, floods can't take away much either.' Ida puts batteries in a plastic flashlight, then tests the device, turning it on and off again. She carefully places a paper bag with salted eggs aside – the cheap yet nutritious side dish that is known in the neighbourhood as 'flood food' (*makanan banjir*). She sticks her birth certificate and identity card in her bra. Also a little brown envelope filled with Rp 300,000 in cash, money she has saved in anticipation of expenses that usually come along with a flood.

One look at the river and she calculates: 'The water rises fast, and people say that it is raining extensively uphill, so I think that I only have about half an hour before my house is completely flooded.' Time enough to pray first, she decides. She bends her body to the floor and prays to Allah, asking Him to protect her goods and herself from drowning. Ida has reasons to fear such a risk: earlier floods in her neighbourhood have damaged her house severely and caused injuries, illness and even death among co-residents. Drips of rain trickle through the canvas that functions as Ida's improvised ceiling. She predicts what will happen in the next hours:

I won't keep dry here. I never do during large floods. My children might get ill from the water and the cold, and I will get scared for sure, because I can't swim, but I am ready to make it through yet another flood. I have learned how to survive all by myself. I have become clever at surviving floods.

Others appear less confident that they can protect themselves against floods. Moustached Mr Kurdi (forty-eight years old), for example, who lives only two houses away from Ida, sighs when he sees neighbours wading through the water in the direction of the shelter. He will not follow them any

time soon, because 'that is just not what I do if there is a flood.' Nervously, Kurdi pours himself a small glass of a locally brewed alcoholic beverage.⁵ His hands tremble. 'Even good Muslims need one of these a day,' the man explains, 'it calms the mind. During floods, we might even need more.' Unlike Ida and many other riverbank settlers, Kurdi has not saved any of the income he earns as a vegetable seller to be used for problems like floods; nor has he stocked foods, a flashlight, batteries or important documents. Rain batters against the windows of Kurdi's dwelling, and the ceramic floor tiles are already covered with floodwater that enters his house through cracks in the walls. Still dressed in light blue pyjamas, Kurdi places his bare feet across the furnished sofa and leans back. 'No need to hassle,' he remarks laconically:

Waiting for assistance from the government is my best chance to stay safe. All I must do is keep calm and be patient. I'm definitely not evacuating, like the kampong leader wants me to do. Instead I will be rescued by *kelurahan* rescue workers any time soon. This is how I always survive large floods.

When I ask him what he plans to do if the water would rise even higher and no helping hand would reach out to him in time, Pak Kurdi thinks for a moment, then shrugs and says:

Rescue workers from the *kelurahan* will come to this house for sure, because they know that I need them to survive floods. We are not just *regular* poor people, you know. The government does not care for regular poor people. But in this riverbank settlement the situation is different. We are *flood victims*. Our neighbourhood is famous for floods. We are on the news, in the newspapers! That is why we can get all the help we need from the *kelurahan*. They send out boats to rescue us and even rebuild our houses to compensate for our losses after floods. If we suffer, they give us blankets, food, milk, new clothing, furniture, even money! I have even made a profit during former floods – I was able to buy a new television from the financial help I received afterwards! Thanks to floods, the spotlights are on us. All we must do to get helped is stay calm and wait.

Clearly Kurdi has a very different strategy to handle floods than Ida: she tries to find ways to survive a flood autonomously, while he acts as if he is completely dependent on external assistance. While the water in the kampong rises, Kurdi sits, drinks and waits. When the electricity shuts down, Kurdi pours himself some more *jamu* and drinks it in the dark. When the currents force open his door and water gushes in faster, he rises, places his bare feet on his sofa and continues the waiting in standing position.⁶ By the time his furniture is covered with muddy water he is finally saved. Not by a governmental rescue worker, as Kurdi expected, but instead by Yusuf, the volunteer neighbour who also carried the grandmother of Ambran to the evacuation shelter. Yusuf paddles his way through the alleys on a raft that is normally used for transporting residents crossing the river.

⁵ This beverage is sold in the kampong by a *jamu*-trader—a woman who brews a drink from traditional herbs and spices. *Jamu* is alcohol-free, but inhabitants know well that the trader also sells alcoholic versions of the drink, in which the *jamu* is mixed with locally made palm wine. Kurdi drinks the alcoholic version of *jamu*.

⁶ At this point, I left the house of Kurdi to seek shelter myself and warned other people that Kurdi was still inside his house. He refused to join me. The rest of his story, I only heard from him afterwards. It was confirmed by several other neighbours, including Ida.

Later that day Yusuf reflected on how frustrated he felt on that raft, as he had just heard that the *kelurahan* was not going to assist flood victims to evacuate during this flood. The water level in the kampong remained too low for residents to 'deserve' external help. A few days after the flood a civil servant of the *kelurahan* explained to me why his superiors refused to help the residents of Bantaran Kali:

We are only obliged to help flood victims during disastrous, severe floods, not when a flood is just a few meters high. Residents of the riverbanks are used to medium-sized floods like this. They experience them all the time. They can save themselves.

This flood that inundated the houses of Ambran, Ida and Kurdi eventually rose only two meters high, and so governmental spotlights remained off the victims.⁷ Therefore it is all up to Yusuf and his neighbours to help each other.

'Anybody need assistance?,' Yusuf shouts from his raft. 'Anybody need help to evacuate?' Kurdi replies by first crying out a word of thanks to Allah, then to 'those good people who are strong enough to save my life every time we have a flood.' Yusuf assists Kurdi to enter his raft and takes him along to the shelter. On their way out, he calls out one more time to other residents potentially in need. Neighbour Ida remains behind in silence as she watches Kurdi evacuate. She does not want to be saved by Yusuf, nor by others. The day after the flood receded, she explained her reasoning to me:

I used to be just as reliant on other people as many of my neighbours still are. During past floods, I used to hope that the government would solve my problems. I waited for them to help me. But I have learned my lesson. If you are as poor as I am, it is better not to depend on anyone. We never know whether they will show up to save us or whether they will let us down. And even if a regular neighbour offers you help, they might want something in return that disadvantages you... That man Yusuf; maybe he helps me today, but then tomorrow he might come back to demand a favour in return! People who are as poor and needy as we are in this neighbourhood only give in order to take. Therefore I refuse all help that is offered to me by others. I never owe anything to anyone. I would rather protect myself against the floods in my own way.

Research problem

One river. One settlement. One flood. Yet the local practices that were exhibited in the face of the coming flood were diverse. Some residents took autonomous and preventive measures; others saw chances to profit financially from the flood; others perceived it as their duty to assist their neighbours in staying safe, and others accepted such assistance. Clearly, the residents in the kampong that is called Bantaran Kali in this dissertation exhibited highly heterogeneous risk-handling practices in the face and aftermath of floods. Through a combination of qualitative and quantitative

⁷ The height depends on where it is measured: houses closest to the riverbanks were flooded by up to three meters; houses a bit higher up the riverbanks were *only* flooded by two meters of water.

methods used in the field (discussed in chapter 2), I observed and have defined eighty-two different risk-handling practices exhibited by riverbank settlers before, during or after flood events. For example, spreading the flood-risk message (Ambran), building an improvised evacuation shelter on the rooftop (Ida), helping others evacuate (Yusuf), or just 'waiting for help' (Kurdi).

The heterogeneity in risk-handling practices that I observed during my fieldwork in Bantaran Kali is not incidental or arbitrary. Instead, similar patterns of behaviour by the same people arise each and every time the settlement is flooded. The narratives of respondents indicate that riverbank settlers have typical ways of handling flood risk. For example, Ida *never* evacuates during large floods, while Ambran *always* does. Kurdi has waited in his house for help to arrive during *each of* the past larger floods, while Yusuf *usually* assists others to evacuate during floods. Hence, their risk-handling practices are structured along lines of habit and strategy. In technical terms, we might say that actors have *heterogeneous risk-handling styles*.⁸

As I have indicated, I want to understand what brings about this heterogeneity of risk-handling styles. What is different with my study is that I offer a view from below on experiences and responses to flood and risk. A perspective from below is important because, as I argue later, it has remained under-exposed in studies of flood and risk in Jakarta. Further, such a perspective might help policy makers to implement more effective flood-management policies. This latter argument for the academic and societal relevance of this study topic becomes even stronger if one considers that the consistent heterogeneity in risk-handling styles of different individuals in Bantaran Kali is not unique to their community. Indeed, it reflects a phenomenon that is recognized by many scholars who examine risk in different places around the world.

My data confirms the data of scholars who have studied flood responses by human actors in Europe and other areas in Asia (Grothmann & Reusswig, 2006; Few, 2003; Harries, 2008; Febrianti, 2010). They too observed that different people handle flood risk in different ways. Moreover, in 2007, social geographer Pauline Texier (2008, p. 365) observed that Jakarta flood victims in other neighbourhoods than the one I studied used highly heterogeneous risk-handling practices, of which she described many as 'risky' – in the sense that they go against formal safety advice. Studies about the ways in which people react to other types of risk (for instance, non-natural hazards) consistently point to similar findings: different people exhibit heterogeneous practices to handling risk.⁹ The question that remains unsolved in all of these studies is: why? If people share a similar risk, what explains the consistent heterogeneity of their risk-handling practices? Why would Kurdi typically

⁸ I will explain more precisely what I mean by 'risk-handling practices' and 'risk-handling styles' in chapter 1. For now, it is most relevant to know that, in line with Smith (2001), I define 'risk' as exposure to uncertain and potentially unfavorable consequences, and use the term 'hazard' synonymously.

⁹ For example, see Nootboom (2003, 2014) on heterogeneous social security practices, Ryan (2000) on the heterogeneous risk-handling practices of mental health service users, or Hair, Park, Thomson & Moore (2009) on heterogeneous risky behaviour among late adolescents.

exhibit such a different way of handling floods than Ambran, Yusuf or Ida? Those are the questions that lie at the basis of this dissertation.

I will argue in the next section that these are complex and crucial questions that need to be answered for both academic and societal reasons, especially in an age when exposure and vulnerability to natural hazards has increased dramatically (Deltadiologues 2008; Marfai, Yulianto, Hizbaron, Ward & Aerts, 2009; Wisner, Blaikie, Cannon & Davis, 2004; Wisner & Caressi-Lopez, 2012; World Bank, 2011).

Relevance of the research project

Published studies dealing with environmental risks in Jakarta focus mainly on the impact on the city, without investigating how kampong inhabitants and other residents are affected.¹⁰ Several researchers before me have paid attention to how households in Jakarta experience flood risks (Spies, 2011; Wilhelm, 2011; Febrianti, 2010; Marschiavelli, 2008; Texier, 2008). Their studies provide at least four significant analyses of local responses to flooding in Jakarta that are insightful for this thesis and will therefore be discussed briefly here.

A short geographic study by Texier (2008) provides some insights on how poor and middle class households were affected by and coped with the severe flood in 2007, while Marschiavelli (2008) conducted a more detailed, though rather technocratic, vulnerability assessment in *Kampung Melayu*, a flood -affected neighbourhood close to the study area in this dissertation. Two other small studies report on human responses to floods. Wilhelm (2011) and Spies (2011) provide brief yet insightful analyses of kampong dwellers' practices in the face and aftermath of floods. Nevertheless, there is to my best knowledge no long-term study that offers detailed insights into the heterogeneous ways in which riverbank settlers in Jakarta experience flood risk, nor one that offers emic insights into the reasons that may lie behind such heterogeneity.

I have noted above that one of the values of such a study would be that it could help to improve the effectiveness of flood-management policies in urban, flood-prone centers. At present, the heterogeneous ways in which people handle flood risk in Jakarta make it hard for policy makers to impose effective coherent safety policies in flood-prone communities. The insights gained from a study such as this would help them develop strategies to overcome some of the problems that they currently struggle with. A kampong leader in Bantaran Kali explained to me the difficulty he has in implementing effective flood-intervention measures. His efforts have remained unfruitful up to now, because of the enormous variety in riverbank settler's risk behaviour:

¹⁰ Firman, Surbakti, Idroes & Simarmata (2011) and Steinberg (2007) have argued that in most studies of natural hazard in Jakarta, socio-economic conditions have been neglected, while most attention is given to the physical aspects of risk-event impacts.

It is clear to all inhabitants what we want them to do when a flood occurs. We have taught them over the past years that they should pack their goods and evacuate to the shelter immediately after a flood warning. They also know that they must stay together as a group, so that officials can count who is safe and who is not, and so that kampong leaders can offer help quickly. I repeat those two messages to the community time and time again. My residents can dream such safety-constructions! But while in theory all seems safe and organized here, in practice very few obey our safety advice. Many choose to ignore our warnings; some go and play hero; yet others lock themselves in the house. It doesn't matter what you tell people or how often you warn them of the dangers of disobeying safety instructions, every time we have a flood, they all insist on handling it in their own way. There is no coherent action at all!

So while flood-management policies that bureaucrats try to implement in Bantaran Kali are largely homogenizing, people's responses are certainly not. At present, formal risk managers understand little about the factors underlying people's heterogeneous risk-handling styles, and hence, not much is understood about the potential reasons for the ineffectiveness of homogenous risk policies either.

Perhaps as a consequence of this lack of knowledge, policy makers generally interpret the ineffectiveness of their policies as the result of the 'chaos' or 'anarchy' that is said to exist in riverbank communities during flood events. For example, a civil servant at the *kelurahan* in Jakarta describes the problem of ineffective policies as follows:

It is difficult for a government to stop flooding, but it is even more difficult to stop flood victims from behaving dangerously during floods. Over the past years, we regularly instructed them how they should respond to flood-warning messages. They must all know our safety advice by heart now, but still, the riverbanks turn into anarchy as soon as the water rises! All of them prefer their own way of responding! I can only fear a future in which more floods are expected.

The concerns of the above quoted policy maker become more pressing if we consider them in the context of two broader problems. First, as touched upon above, not just formal risk managers are puzzled by the reasons underlying heterogeneous risk behaviour, but also scholars of risk handling have been unable to this point to understand what brings about human heterogeneous risk behaviour. I will discuss this academic problem further in chapter 1. Second, the concerns of policy makers about their present inefficient flood risk management policies need be considered in the context of a fast urbanizing and modernizing Indonesia in which the number and severity of natural hazards are ever increasing; simultaneously a growing number of the urban population in Jakarta is becoming more and more vulnerable to these dangers.

In the next paragraphs I show how the threat from natural hazards and the increase in urbanization are related; I then elaborate on the specific situation of floods in Jakarta.

Natural hazards in the city

The year 2007 marked a so-called 'urban turn' (Kraas, 2007, p. 8) when, according to the United Nations (UN), for the first time in human history the majority of the world population was expected

to live in urban areas (UN, 2004, p. 13). The joint World Bank-United Nations publication *Natural Hazards, UnNatural Disasters: The Economics of Effective Prevention*, predicts that growing urbanization will increase the risk of natural hazards for urban citizens (World Bank & United Nations, 2010). By 2050, the number of people exposed to natural hazards in large cities could more than double to 1.5 billion, with the largest concentration of at-risk people living in Asia and the Pacific (World Bank, 2011, p. 3).

There are two reasons why experts believe that the risks in these urban environments are increasing. One is related to the exposure of cities to greater hazards, the other to the high vulnerability of specific segments of an urban population to these hazards. According to the Intergovernmental Panel on Climate Change, more than two-thirds of the world's largest cities are currently exposed to rising sea levels, posing millions of people at risk of extreme flooding and storms (Yohe et al. 2007). Asian cities, especially, are threatened by potential floods and other environmental hazards, such as Tsunamis and hurricanes, because of their large numbers of inhabitants. Asia accounts for two-thirds of the world's urban population, and almost three-quarters of the region's total population live in so-called 'low elevation coastal zones'— in areas located less than ten meters above sea level (Emilia, 2009; Firman, Surbakti, Idroes & Simarmata, 2011).

The second reason for the increased chances of urban inhabitants being affected by natural disasters has to do with the fact that most urban areas are located in developing countries. In 2000, two-thirds of the world's megacities were located in developing countries (UN, 2004, p. 89). In these urban areas, the poor masses are particularly vulnerable to natural hazards because they often have to reside in high-risk areas and faulty shelters, have limited access to basic and emergency services, and have a general lack of economic resilience (World Bank, 2011, p. 3). Studies on natural hazards in cities often identify poor and marginalized city dwellers as the group most exposed and vulnerable to acute risks such as landslides, earthquakes, hurricanes or floods (e.g. Pelling, 2003; Wisner & Pelling, 2009; Dyson, 2006). Moreover, an often-stated characteristic of megacities is a pronounced socio-economic inequality within the population. This also comes with a lopsided distribution of influence and power. Likewise, there is a highly unequal sharing of exposure to and vulnerability to natural hazards among the city population. In sum, poor and marginalized population groups with relative little political power are often found to be especially vulnerable to a variety of hazards.

Of all urban areas at risk worldwide, Indonesia's capital, the megacity Jakarta, is deemed one of the most vulnerable in terms of exposure to natural hazards (Marfai, Yulianto, Hizbaron, Ward & Aerts, 2009; Ward, Pauw, van Buuren & Marfai, 2013). Flooding (*banjir*) of the city's rivers is one of its main risk problems. In Jakarta, floods are now occurring more often and they are more severe

than ever before (Steinberg, 2007; DeltaDialogues, 2008; Ward, Pauw, van Buuren & Marfai, 2013). Even in an average year, 10,000 to 15,000 inhabitants are forced to flee from medium-sized floods, but experts are predicting that the severity of floods will increase by about 5 to 10 per cent in the next years as compared to earlier years (Brinkman & Hartman, 2009). Simulations of possible future flooding events foresee inundations of up to a quarter of the city, thereby threatening the physical and social security of over five million inhabitants. In line with the above-mentioned considerations about the increased vulnerability of the urban marginalized, it is predicted that future urban floods will be felt most severely by Jakarta's many poor inhabitants (Brinkman, 2009, p. 50).

Below I explain more about the causes of the current increasing flooding in Jakarta, but first it is important to consider the consequences of floods for the city's inhabitants. While in rural areas flooding often brings ecological benefits to households (Blaikie, Cannon, Davis & Wisner, 2003, p. 203; Few, 2003, p. 45), urban floods are usually overwhelmingly negative events. First of all, floods can lead to the destruction or damage of property. Second, according to Few (2003, p. 46), the impact on health is 'one of the most significant [...] effects of flooding.' That is not only because strong currents and electrocution can cause injuries or death, but also because floods often pose a high risk of the rapid spread of communicable diseases, such as diarrhea, influenza and skin infections (Few, 2003, p. 46; Blaikie, Cannon, Davis & Wisner, 2003, p. 220). Besides, floods may induce severe mental stress and anxiety (Green, Tunstall & Fordham, 1991, p. 234). Such effects of flooding on health are complex and difficult to measure (Few, 2003, p. 46); however, the impact of floods on urban livelihoods is more direct – for people with informal occupations and no fixed income, the interruption caused by floods can be very costly (Zoleta-Nantes, 2000, p. 77).

Flooding in Jakarta

Part of Jakarta's flood problem can be explained by its geographical exposure to natural hazards. Jakarta is prone to flooding from water draining through the city from the hills in the south, and also from coastal tidal flooding. Jakarta is located in a deltaic plain criss-crossed by thirteen natural rivers and more than 1,400 kilometres of waterways that were constructed at the orders of the colonial Dutch.¹¹ About 40 per cent of the city, mainly the most northerly area near the Java Sea, is below sea level. Periodical floods were already a common phenomenon during colonial times; however, in recent years the severity and frequency have seriously increased, due to local environmental and infrastructural issues (Brinkman, 2009; Caljouw, Nas & Pratiwo, 2005).¹²

¹¹ Soon after the founding of Batavia (Dutch colonial name for Jakarta) in 1619, a canal system was constructed similar to those of Dutch cities at the time (Caljouw, Nas & Pratiwo, 2005; Ward, Pauw, van Buuren & Marfai, 2013). I return to this topic of (colonial) water management later in this dissertation.

¹² See Table 1 for an historical overview of flooding in Jakarta.

There are three main reasons for the increase of flood risk. First, rapid urbanization has aggravated the situation over the course of time. In 1811 Jakarta had a population of about 47,000. By the early twentieth century the city had expanded further south, and that number had increased to about 500,000. In 2010 Jakarta had an official city population of almost ten million and a metropolitan area with more than twenty million inhabitants.¹³ It is now the world's fourteenth largest city and is likely to move into the top ten by the year 2015, with a projected city population of more than seventeen million (McCarthy, n.d.).¹⁴ In recent years the population growth rate has declined, but Jakarta's population is still estimated to increase by about 130,000 to 250,000 per year (World Bank, 2011). These urbanization dynamics lead to more extensive use of the built environment, more garbage clogging the sewerage system, and greater numbers of humans potentially affected (Kadri, 2008).

Second, the city's governmental services cannot keep up with the demands of the fast growing population. For example, the provision of housing for the poor and lower-middle class continues to be inadequate relative to demand. Skyrocketing land prices and rampant private sector development that is under-regulated has resulted in a booming real estate market that excludes the poor. Consequently, large informal settlements have grown over many years along waterways, natural rivers, sluices and reservoirs, contributing to the pollution and clogging of these flood-prone areas.¹⁵ Moreover, the city's drainage system has been poorly maintained by the government and hence cannot channel floodwater to the sea fast enough during heavy rains (Sagala, Lassa, Yasaditama & Hudalah, 2013). Another area in which governmental services prove to be largely inadequate is the provision of piped water (Kooy & Bakker, 2008, p. 383). The lack of piped water is driving large multi-use developments and small residential communities alike to drill wells to access groundwater. This extraction of groundwater is causing areas of Jakarta to sink, particularly in the north of the city. Along with sea level rise, land subsidence is one of the greatest challenges facing Jakarta and further increasing the risk of flooding.

Third, while some authors describe the economic development in Indonesia as 'booming' (Hussain, 2013), poverty and income gaps between the population persist. In fact, despite a growth of 6,5 per cent in Indonesia's economy in 2012, inequality has increased (Hartono & Irawan, 2011, p. 44; Hussain, 2013).¹⁶ I have already posed above that marginalized and poor inhabitants of urban

¹³ http://www.bps.go.id/eng/tab_sub/view.php?kat=1&tabel=1&daftar=1&id_subyek=12¬ab=1 Retrieved 11 October 2013 from the website of Statistics Indonesia (Badan Pusat Statistik, BPS). It needs, however, be noted that the official census figures only tell part of the story. How many people actually live in Jakarta is a matter for speculation (McCarthy, n.d.).

¹⁴ This ranking is based on a comparison of city populations. Other lists include metropolitan population and rank Jakarta as second largest city in the world with a metro population of approximately 26 million. For example, see <http://www.worldatlas.com/city pops.htm> (retrieved 11 October 2013).

¹⁵ See Figure 1 for a map that includes the sluices and waterways in and around Jakarta.

¹⁶ Retrieved 11 October 2013, from <http://databank.worldbank.org/data/views/reports/tableview.aspx>

areas are generally the population groups most vulnerable to natural hazard; but we must now also conclude that this marginalized part of the Jakarta population is increasingly vulnerable to flooding.

This dynamic can already be felt during flood events. During former large floods – in 1996, 2002, 2007 and 2013 – the effects were certainly spread unevenly over the city, with poorest neighbourhoods affected most severely (Schonhardt, 2013a; Texier, 2008; Vltchek, 2013).¹⁷ The last major flood that occurred during the writing of this thesis was in 2013. The water engulfed around 30 per cent of the city, including its business district centre and the presidential palace. But again the poorest neighbourhoods were most severely affected. In the neighbourhood under study, the water level reached three to five meters high, and all houses were damaged by the flood. Many riverbank settlers lost their assets and became ill afterwards.¹⁸

It is becoming harder for poor people to protect their well-being against flood water that is continually increasing in volume. The recurrent floods worsen the economic situation of the poor, which in turn increases their physical vulnerability to floods. This vicious circle is extremely hard to break out of. Unfortunately, it is likely that the expected increase of floods in the future will worsen the vulnerability of the poor (Haryanto, 2009; Haryanto, 2010) – especially when the flood interventions of the Jakarta government remain as ineffective as they are.

Since flood victims together form an enormous voter bank for Jakarta's politicians, it comes as no surprise that the issue of flooding has become a major concern for policy makers in Jakarta. The recently-elected city governor Joko Widodo (popularly known as Jokowi) has called the issue of flooding in Jakarta one of the major problems that needs be solved in order to achieve the 'new Jakarta' that he has promised his supporters: a city where residents are safe from floods. For him to achieve this 'new' city, it is crucial that the flood intervention programmes of Jokowi's political institutions become more effective than those of previous governors.

Politics of flooding in Jakarta

Jokowi, sometimes called the 'Obama of Jakarta,' (Vaswani, 2013) was elected governor of Jakarta in September 2012, thanks to overwhelming support from the city's urban poor and middle classes. Many voted for him because of his clean reputation and his promises to listen to the poor. Mr Jokowi's main challenge, analysts say, will be finding solutions to the flood problems that previous administrations failed to address. In an interview that was published in the *New York Times*, Jokowi

¹⁷ For a detailed description of the effects of the 2002-floods, see Caljouw, Nas & Pratiwo (2005); for a detailed description of the effects of the 2007-floods, see Texier (2008); for a report on the 2013 floods, see OCHA (2013); for a critical article on the unequal consequences of the floods, see Vltchek (2013).

¹⁸ This flood event took place after the fieldwork for this thesis had already been completed. Data about the flood experiences in Bantaran Kali were derived through personal communication by the author with respondents over the Internet. I have interviewed five young key-respondents over email and through Facebook on 21, 23, 29 January and 5 February 2013.

emphasizes that flood problems are among his main concerns and was quoted as saying that he is 'full of hope and optimism. These problems can be settled' (Schonhardt, 2013a). He has taken several steps towards a solution; for example, some parts of the city's rivers have been dredged, and different riverbanks have been cleared in order to widen the river. Furthermore, he has made an effort to improve the effectiveness of the Provincial Disaster Management Agency (Badan Penanggulangan Bencana Daerah Tingkat Kabupaten/Kota, BPBD), the institution that coordinates and mitigates disasters such as floods on the city level.

Despite the fact that the flood problem currently receives much attention from policy makers, and some first structural measures to decrease flooding have been taken over the past few years, it seems that a solution to the flood problem is nowhere near. One reason why the flood problem in Jakarta has not yet been solved is the aforementioned ineffectiveness of flood-management policies. Additionally, despite recent government promises to increase spending on infrastructure in order to decrease floods, most structural flood-management projects have been held up by corruption, political infighting, problems with land acquisition or by public resistance (Schonhardt, 2013b). A third reason why governmental measures have not yet led to an actual solution to the city's flood problem is that its urban risk planning has largely been concerned with physical infrastructural measures, such as engineering, while there have been limited efforts to reduce the vulnerability of poor inhabitants (Texier, 2008; Sagala, Lassa, Yasaditama & Hudalah, 2013).¹⁹ Finally, the functioning of BPBD remains inadequate despite of governmental efforts to improve it (Marfai, Yulianto, Hizbaron, Ward & Aerts, 2009); Indonesian scholars concerned with urban risk have called the institution 'powerless' and 'incapable' of implementing effective flood interventions (Firman, Surbakti, Idroes & Simarmata, 2011; Sagala, Lassa, Yasaditama & Hudalah, 2013).

That the flood problem is still acute in Jakarta became clear in January and February 2013, when governor Jokowi was challenged by the worst flooding that hit Jakarta in six years. At least forty people were killed in this flood; more than 40,000 people were displaced; and more than 100,000 homes were under water (Philip, 2013; Schonhardt, 2013a). It thus seems fair to state that the promises of Governor Jokowi to his voters on the riverbanks are not easy to fulfil.

Next to floods, a second major concern for the city government revolves around the possibility of social unrest, which is feared to arise from a growing dissatisfaction among masses of

¹⁹ For example, after the floods in 2013 president Yudhoyono of Indonesia told reporters that the national government would spend the equivalent of 208 million US Dollars on the flood problem. Of this amount spent, 300 million Rupiah would be spent on mobile toilets and water pumps; another 500 million Rupiah on improvements to the channeling of the Ciliwung river and the east flood canal; and the remaining 1.2 trillion Rupiah on dredging. See <http://www.thejakartapost.com/news/2013/01/20/president-promises-rp-2-trillion-flood-mitigation.html> (Retrieved 11 October 2013).

poor flood victims. In 2013 H.S. Dillon, the presidential special envoy for poverty alleviation, remarked in an interview that the current economic inequality in Jakarta is 'socially corrosive and socially divisive', and feared this would instigate 'social unrest' (Hussain, 2013). A similar argument can be made about poor and flood-prone neighbourhoods versus those that are wealthier and less flood prone. Dillon's observations must be a worry for the city's recently-elected governor, especially since residents of Jakarta have openly blamed the government for mismanagement in relation to past flooding. Social scientists Caljouw, Nas and Pratiwo (2005, p. 12) reported about a large flood that occurred in 2002 that 'corruption and flooding were portrayed side by side in every event during the tragedy. Flooding was considered the result of the mismanagement of the city that has been taking place for decades.' Jokowi still remains fairly popular in Jakarta, but the media reported public dissatisfaction with the flood interventions in 2013 (Dewi, 2013).

Memories of the economic crisis of the late 1990s – which led to massive protests, riots and violence, and eventually to the fall of President Suharto – are still not forgotten by Indonesia's elite. It may be because of such memories that small uprisings of tens of poor people protesting the flood problem at the Manggarai sluice in Jakarta in 2002 and 2007 were immediately beaten down by the military.²⁰ An advisory of the then governor, Fauzi Bowo, explained in an interview that it was a political decision to intervene harshly in these uprisings, because social unrest was feared:

Small groups of poor riverbank settlers came to protest the fact that their neighbourhood was under water. They demanded a solution to the flood problem. We ordered the military and the police to chase them away. We need to take hard action before such small groups of protesters grow and the protest gets out of control [...] Poor flood victims have nothing to lose, so they are willing to fight and die if they become overly dissatisfied with their situation. It is a big problem for the government to stop those people from creating anarchy along the riverbanks. They might start war in the city all over again.²¹

With this information in the back of our minds, let us reconsider the words from the earlier-quoted policy maker who is directly involved in flood management in Bantaran Kali: '[these riverbank settlements] turn into anarchy as soon as the water rises! I can only fear a future in which more floods are expected.' It now becomes clear that Jokowi's government is threatened not only by floods but also by the ways in which Jakarta's poorest flood victims may respond to the local government's flood management. Will an increase in the number of floods further aggravate their dissatisfaction with the Jakarta government's mismanagement? Or will Jokowi be able to overcome the problem of flooding, either by decreasing floods or by making flood-management policies more effective and thereby decreasing the potential risk to himself of social unrest in his city? While

²⁰ We will meet one of the protestors in chapter 6.

²¹ Personal communication with senior bureaucrat (name withheld), working as a flood risk manager for Jakarta's Public Works (PU), 14 July 2011, in Jakarta.

Jokowi's plans for a 'new Jakarta' are certainly ambitious, it remains uncertain what will happen to his popularity if floods increase over the next years.

What has become absolutely clear from the discussion thus far is that for flood-management policies to become more effective, politicians at least need to know what drives riverbank settlers to a certain action in the face of floods; they need to understand what drives so many of them (all in different ways) to disobey formal safety advises. And in order to answer such complicated questions, it is necessary to grapple with what might explain the *plurality of risk-handling styles* within groups at risk. This dissertation aims to contribute to an understanding of human behaviour when faced with risk and natural hazards, by analyzing in detail how and why Jakarta residents handle flood risk in such heterogeneous ways. While the elite in Jakarta generally interpret the behaviour of riverbank settlers as 'disobedient behaviour' or even as 'anarchy,' I wish to point out that little is in fact known – by both policy makers and academic scholars of risk – about the perceptions of the riverbank settlers themselves. Perhaps as a consequence, flood management policies remain homogenous and largely ineffective. This thesis aims to contribute to a solution to this problem by offering a perspective from below; that is, by describing how riverbank settlers view, experience and handle the increase in floods in their living environment. These descriptions are based on one year of empirical fieldwork in one of the most flood-prone neighbourhoods in Jakarta.

In the next chapter I consider to what extent the current dominant theories of risk are useful in answering my questions – and why I believe that we must eventually move beyond them to understand the heterogeneous risk-handling practices of Jakarta's riverbank settlers. Next, I describe and analyse in the empirical chapters the heterogeneous risk-handling practices that are exhibited by inhabitants of Bantaran Kali in relation to floods. Before we head into these chapters I want to introduce the reader to this research area and explain which methods have been used to obtain relevant data.

Photo 1: Risk-warning message as received by author for the medium-sized flood described in this book. The name of the kampong as well as the name of the person who sent me this message have been erased in this picture in order to protect the anonymity of my respondents (unless otherwise indicated, all photos by author).



Photo 2: Impression of the medium-sized flood described in this thesis.

