Reimagining Ways of Living with Water: An Exploration of the Responses to Reoccurring Floods in the Mangkang Wetan Kampong in Semarang, Indonesia.

Master thesis

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Abstract

Floods have been a frequent occurrence, especially in the global south. This thesis examines the realities of responding to floods from the perspectives of formal actors like governmental agencies and residents affected. It argues that there is a certain "disconnect" between these two, in which policies regarding flood management do not align with the lived experiences of residents. Consequently, certain policies have not been sufficient in mitigating the situation and vulnerability of marginalized groups are deepened further. The study suggests that solutions should be found that lie beyond traditional flood management paradigms that seek to control where water flows and in which exclusion is normalized. These solutions may be within the way residents experience floods and respond, also known as informal city making. These practices are exercised by oneself and in collaboration with other (often non-political) actors. Ultimately, this thesis is a call to reimagine flood occurrences, favoring an approach that makes us reconsider our relationship with water and argues for an ideology that seeks to live *with* water instead of *against* it. In that way, inclusive flood management could be realized. A case study of Mangkang Wetan, a neighborhood in Semarang, Indonesia, is taken. Data is derived in a qualitative manner, by conducting interviews both from various actors on a governmental, intermediary and residential level.

Keywords: Floods, Flood management, inclusive governance, informal city making, urban development.

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List of abbreviations

BAPPEDA: Badan Perencanaan Pembangunan Daerah (governmental department)
IKAMat: Yayasan Inspirasi Keluarga (NGO)
KeSEMat: Kelompok Studi Ekosistem Mangrove Teluk Awur (NGO)
Bintari: Yayasan Bina Karta Lestari (NGO)
EWS: Early Warning System
NGO: Non-governmental organization

Chapter 1. Introduction

1.1. Floods in the global south

Floods happen when a body of water is overflowing and pours itself onto land that most of the time would be considered dry (Whitfield, 2012). Around 1.81 billion people worldwide are experiencing flood risk, which is about 23% of the world population. 89% of those reside in low to middle income countries (Rentschler et al., 2022). There are different types of floods, each with their own causes and impacts, such as river floods, flash floods, coastal floods and storm surges. These floods can be caused by climate events, like heavy long-lasting rainfall but also by urbanization processes causing pre-existing land conditions to change. Then there is also the event of a sudden collapse of infrastructure like a dam, clogging of drainage systems and seasonal glacier melt (the latter often used for agricultural purposes) (Kundzewicz et al., 2012). Much attention by policy makers, academics and the news are given towards the "disastrous" side of floods. Infrastructure is damaged, lives are lost, financial losses and diseases are spreading. However, new normals are unfolding in which communities, especially in the global south, are experiencing almost daily flooding or even permanent inundation in certain regions. Examples can be seen in the concept of "loss and damage". The idea that certain climate situations have become irreversible despite mitigation and adaptation. At the COP27 in 2022, countries agreed to establish a fund, to financially support countries who are vulnerable (UN Environment Programme, n.d.). Floods in that sense have become an integral part of life. These realities might challenge the way in which floods are perceived and interactions with water are understood (Mach et al., 2022). This prompts us to consider how we should address potentially irreversible climate realities and explore ways to coexist with water instead.

1.2. Indonesia and flood management

This thesis documents the responses of communities facing so-called "new realities" in Indonesia and the local government. This is also known as flood management, a term that covers all activities that are involved with the prevention, reduction and mitigation of floods and its impacts (Burrel et al., 2009). Indonesia is a tropical archipelago in the Indian ocean, consisting of 17000 islands and with a population of approximately 237 million people. This makes them the 4th most populated country in the world. Together with climate change effects, processes that accompany that big of a population makes Indonesia quite vulnerable to flooding. It is therefore not surprising that Indonesia ranks 3rd in the world for flood occurrence (Hapsari & Zenurianto, 2016). In response, the government mostly acts based on policies favoring technocratic solutions. This manifests itself in the form of infrastructure, such as dams, dykes, canals, and sluices (Ogie et al., 2019). In that way, it aims to decrease the vulnerability to flooding of those affected based on exposure. However, a pattern can be seen in which most people affected belong to marginalized communities. These communities, for example, are bound by socio-economic mechanisms and development that force those living in poverty to reside in flood-

prone areas, often in informal settlements. Flood-prone land is relatively cheaper to live on due to their lesser perceived value than “dry” land for residential and urban spaces. Simultaneously, these communities also face an unequal distribution of power within the urban space in which they have less of a voice within decision making processes regarding their flood situation and in some instances are even perceived as the cause of the floods, due to insufficient use of waste management (Padawangi and Douglass, 2015). Within a community itself, differences in capacity to cope and overall experience can also be found. Women could be more vulnerable within a community, as opposed to their male counterparts due to different roles they take on in the household and how these roles are perceived. Now, people can be part of multiple social categories which deepens this rift even further. A woman who is ethnically a minority might have fewer opportunities for her livelihood than other women who are in the majority (Sultana, 2010).

This means that the realities of those who experience floods goes beyond the concept of being vulnerable through exposure alone. Traditional flood management policies in that regard might not fully grasp the context in which these floods occur and as a result, not be effective in all aspects (Padawangi & Douglass, 2015). As life goes on, residents have to secure their livelihood through other ways. This form of informal city making is often overlooked within policies but could tell something valuable about the communities who actually have to experience this flood situation and how to “deal with it”.

1.3. Problem statement

The problem therefore, lies within this disconnect between formal actors, like governmental bodies and informal actors, hereby defined as “residents”. This is rooted in the complex interplay between historical trajectories and sociocultural dynamics that perpetuates and continues to reinforce the social exclusion of certain groups, thereby engendering disparities in access to resources, opportunities, and decision-making power (de Goër de Herve, 2022). Much of flood management responses are based on the concept of control, i.e., dictating where water should flow and who or what should be protected. Yet, this does not grasp the multidimensional context in which floods take place. In that way, the city government and water planning agencies fail to adequately recognize and acknowledge the realities of living near and with water. As a result, interventions in the field of flood management create new patterns of inequality, and planners fail to consider the possibility of new innovative approaches to "city making" that draw from the lived experiences of residents affected by recurring floods.

1.4. Thesis aim and question

This thesis aims to uncover such dynamics and analyze this disconnect, ultimately to provide so-called “lessons-learned” that advocate for inclusive and sustainable approaches to flood management for countries facing flood-related issues in the present and future. At the same time, this thesis also aims to foster new ways of looking at flood situations that go beyond perceiving floods as a natural hazard that

need to be controlled or even fought against. To operationalize this, a case study of the city Semarang is taken. This city is situated on the northern coast of central Java. Semarang is a city that faces flash floods once a year in almost all parts of the city and daily floods in neighborhoods that are located next to the coast. Due to the complexity of all variables involved, the scope of this thesis is narrowed down to one particular neighborhood: Mangkang Wetan. Suitable for the aim of this thesis, Mangkang Wetan is a neighborhood in which many interests by multiple actors are pursued, from all levels of society, to act on the flood situation. This thesis takes on a qualitative approach, by interviewing actors from the neighborhood itself as well as the government and relevant intermediaries. Consequently, the research question is formulated as follows:

"How does the community of Mangkang Wetan respond to the daily occurring floods? And are these realities considered within the urban planning policies of the local government?

To guide the analysis and provide answers for the research question, sub questions have been formulated as well:

1. What are the responses by formal actors regarding the flood situation in Semarang and in specific Mangkang Wetan?
2. How is their flood situation perceived by residents of Mangkang Wetan?
3. What are the responses by residents of Mangkang Wetan to the recurring floods in their neighborhood?
4. Do the government and residents collaborate? and are other actors, such as intermediaries involved in these processes?
5. Are there any social, economic and political factors that are of influence on the experience of both the government and residents with the flood situation?

1.5. Relevance in the larger debate

This thesis takes a qualitative approach by conducting in-depth interviews to get to the bottom of these lived experiences with floods both by residents, governmental representatives and all others that are involved in Mangkang Wetan. Pre-existing literature by academics, experts and policymakers most often analyzes these cases from a one-sided actor perspective (Mai et al., 2020). For example, collecting survey responses of residents regarding their economic standing. When addressing vulnerability, not only is a quantitative method preferred, vulnerability is seen as something linear. These employ variables that hold the same weight and indicators, no matter the context (Rufat et al., 2015). In contrast, this thesis takes on a relational approach, as vulnerability is experienced differently based on interpersonal relationships, even among people that belong to the same social group. In this way, this thesis seeks to address current knowledge gaps in literature regarding the topic and strive for more inclusive and equitable flood management by actors involved.

Chapter 2. Theoretical framework

2.1 The intricacies of water governance

So how can it be that these errors occur within flood management? As explained in the introduction above, matters regarding water are not only of natural concern, but also possess a social quality to it. Even on a governance level. The term governance describes the institutional and organizational entities within the decision-making process. Decisions made by these actors do not exist in isolation, but are situated within a larger scheme consisting of a plethora of actors that are either involved with its creation or are affected by the outcomes of it. Interactions between these actors are determined by their socio-political environment and thus raises questions regarding the equal distribution of three elements: water, voice and authority, and knowledge and expertise (Zwarteveen et al., 2017).

According to Zwarteveen et al (2017), the equal distribution of water refers to how flows of water are distributed across society and how certain policies shape and justify these allocations. Richer residential and industrial areas might be given priority for (better) water access than poorer areas due to their perceived value by the government and other service providers. When allocating water to a certain place, it has consequences for another. Therefore, the distribution of water should be mapped in a way that takes into consideration the way in which water flows to a certain place, how this is decided and what it means for other parties. Decisions regarding the distributions of water, like mentioned previously, are created within a socio-political environment by actors stemming from different backgrounds and capacities, which in turn determine their level of influence. Persisting institutional and technological frameworks are entrenched within larger power structures. This can make it difficult to initiate reform of voice and authority within processes of decision making. For example, vestiges of colonial perceptions about certain social groups could still have its effect on the determination of who's authority and voice is considered. Even when actors in positions of power in the present were once part of those oppressed under the colonial regime. Meaning that over time, often habitual practices have become deeply ingrained in how people and the environment are perceived. This distribution of voice and authority is in its turn linked with questions regarding who's knowledge and expertise is considered and holds dominance over others. This could for example be seen in the way in which knowledge and expertise from foreign actors such as the Netherlands (who's rhetoric is based on the superiority of their delta's) are applied in decisions regarding water in the global south. In addition, looking at the entity of floods itself, most of the chronic flood problems cannot be only described as a problem of climate change. Much of these issues happen due to drastic changes to the land such as poor residents being forced to reside in places near water, excessive groundwater extraction causing the land to sink, urbanization in natural drainage areas, pollution and real estate in upstream areas. Therefore, these matters should be taken into account when reflecting on processes of unequally distributed benefits and burdens (Padawangi & Douglass, 2015).

2.2. Formal strategies and policies

These actors within governance create strategies and policies for flood management and as Zwarteveen et al. (2017) mentioned, are dominated by institutional and technological frameworks of power. Policies are shaped in an environment that favors technical solutions who seek to control the way in which water flows. Pahl-Wostl et al (2010), call this the prediction and control paradigm, in which there is a governance style that is centralized and hierarchical. Most of the finance allocation is concentrated on infrastructure projects and mostly other formal actors are included within the design and execution. Perceptions who hold different forms of knowledge and perspectives are often not included within the whole process. In addition, Mach et al. (2022) argues that much of flood management focuses on protecting economic activities, prevention of the disastrous side of floods and recovery to pre-existing conditions. This is all rooted in the perception of floods itself. Rather than viewing floods as dynamic, it is reduced to something natural and quantifiable. This popular view can for example be seen in the way floods are framed: "According to the organization for economic cooperation and development (OECD), flooding is one of the most common, widespread and destructive natural perils, affecting approximately 250 million people worldwide and causing more than $40 billion in damage and losses on an annual basis" (UN-SPIDER, n.d. para 2).

In reaction to floods, formal actors such as governmental planning agencies and engineers construct strategies who can typically be divided into two types: structural and nonstructural. Structural measures typically use infrastructure to physically protect and/or minimize the impact by the floods or the use of technology and engineering to alter existing structures. These can be the construction of dykes, normalization of rivers, canals, wave barriers, pump stations etcetera. Non-structural measures rather use a non-physical approach through law, policy and education such as land use planning, research, building codes, providing subsidies, training and public awareness (UNDRR, n.d.; Wang et al., 2022). Actors from different administrative levels and society are involved within the policy cycle. Hierarchies between these actors depend on whether the governance system is either centralized or decentralized. Within a centralized system, actors on the highest level formulate strategies, which are implemented by lower levels. Unlike decentralized systems, in which actors can develop and carry out strategies more independently. The more centralized a governance system is, the less adaptive and flexible it becomes (Dieperink et al., 2018). As mentioned, most formal actors operate under a centralized regime, although both Pahl-Wostl et al. (2010) and Mach et al. (2022) did mention a paradigm shift that is slowly occurring and necessary based on a more holistic and inclusive approach due to the fact that the prevent and control paradigm seems to fail to address the complexities in which human and ecological dimensions are affected and new vulnerabilities are created.

2.3. Informal “city making”

2.3.1. Realities on the ground

In the event of shortcomings of formal actors, residents opt for “informal” ways to pursue their interests. As van Voorst (2016) puts it: “It is not (just) formal rules and regulations that shape cities; instead, a large part of ‘city-making’ is done by ordinary, non-political actors, who often work around the formal rules and find their own ways to cope with problems” (van Voorst, 2016, p. 6). Even when formal actors provide support before, during and after floods, at the same time, residents can face negative consequences of other formal actions. For example, mass evictions of informal settlements to make space for infrastructure projects. Moreover, promises by formal actors are not always delivered. Consequently, sometimes people opt to take matters into their own hands, often motivated by notions of distrust and faced inequality. Other times, people are forced to do so, as support is lacking overall (van Voorts, 2016).

How these informal actors (residents) cope, can be divided into four forms according to Twigg (2004): (1) Economic/material, (2) Technological, (3) Social and organizational and (4) Cultural. Economic/material refers to the economic means someone possesses during a time of need. For example, saving up money and food or looking for different income streams when their current occupation cannot be practiced because of the hazard. Technological are the practical mechanisms such as the construction of hazard proof buildings. Social/organizational are people’s relationships with others that could provide support, such as sharing resources or conducting collective labor. At last, cultural is about risk perception and religious views that are of influence how a certain threat is perceived, such as its origin and severity (Twigg, 2004).

2.3.2. Influence of social capital

Within Indonesian society, Twiggs (2004) third form of the coping mechanisms: social/organizational, is a key component. Mutual assistance among neighbors, family and friends is ingrained within daily life and called ‘Gotong royong’ (Mardiasmo & Barnes, 2015). This concept is identified by multiple scholars (Hudson et al., 2020; Rustinsyah et al., 2021) as a common occurrence to enhance the capacities of people in the before, during and after stage of floods. Social capital theory encapsulates this concept, in which social relationships are central to accumulate resources and assets (Waseem et al., 2023). Defining this theory is a bit complex, as there are multiple interpretations. But most definitions have common concepts at their core, so one could say that in general, social capital refers to a network of social relationships based on norms of reciprocity, trust and the greater good. In the context of floods, social capital enables a community to share resources, support and knowledge to overcome hardships (Waseem et al., 2023).

As promising as it may be, the success of social capital on resilience is determined on various variables within a certain situation. Scholars agree that there are potential limitations or even a "dark side" to social capital, but much of this examination is conducted outside of the context of natural hazards, e.g., crime related fields (MacGillivray, 2018). To avoid the risk of over-romanticism and theoretical homogeneity, various dimensions concerning social capital need to be critically researched.

2.3.3 Residents as lawmakers

Besides Gotong Royong, another Indonesian specific element is of concern. Mass evictions are every day's business. Lund (2023) argues that pieces from Indonesia's colonial history have left their mark on their governance today. This manifests itself in characterizing land and the environment as an object and citizens as more inferior in their right than those in power. It is a gateway to bend rules and rights when deemed necessary for the acquisition of land. Marginalized groups who already have a precarious standing to begin with are especially vulnerable. Even in this injustice, citizens in reaction find ways to oppose this threat of dispossession of land through representations of the law itself. Due to the general consensus that law exceeds everything. People in that sense become lawmakers themselves, even without any legal resources. By these actions, they create an air of legality that provides de facto legal support to their cause. This is for example done through having your informal settlement street name on google maps (Lund, 2023). In that sense, this is a tool that could defend people's livelihood and positively impact one's vulnerability. But this also shows the way in which law and the perceptions regarding entitlement and status are used to enforce occupation of land.

2.4. Co-creation

There are instances in which various actors come together in their responses, i.e., co-creation. The term co-creation can be used to describe when multiple actors from different layers of society interact and collaborate with each other towards a desired outcome. It seeks for an integration of knowledge, stemming from both these actors. (Rădulescu et al., 2020). Hence, distinctions between what is called a bottom-up and top-down approach cannot easily be drawn in reality. Co-creation aims to "achieve multiple benefits for society by involving a broad spectrum of stakeholders not only in the planning but also in the design, implementation, monitoring, and evaluation as well as the maintenance stages of projects" (Zinggraff-Hamed et al., 2020, p. 3). It is noteworthy to mention however, that not all systems co-create and even when its goal is to make a positive impact, this process is not free from conflicts, challenges and issues due to different interests and motivations (Zinggraff-Hamed et al., 2020).

2.5. Vulnerability

Another important concept when researching and responding to floods, is the term vulnerability. Vulnerability and in specific the reduction of it, is frequently taken as the goal to be achieved within official policies, documents and strategies. For example, in a policy note on disaster resilience by the

World Bank on Indonesia, vulnerability reduction is at its core: “Particularly, this note seeks to raise awareness of some of the opportunities to reduce the vulnerability of Indonesia cities and their dwellers” (World Bank, 2019, p. 4)

There is no clear definition of vulnerability. Adger (2006) defines it as the “degree to which a system is susceptible to and is unable to cope with adverse effects [...] the key parameters of vulnerability are the stress to which a system is exposed, its sensitivity and its adaptive capacity” (Adger, 2006, p. 269). In that sense, vulnerability is a state of susceptibility to harm derived from the exposure to socio-environmental distress and the lack of adaptive capacity (Siagian et al., 2014). So, three elements are important: exposure, susceptibility and resilience (in the definition stated as adaptation ability). The combination of these three elements is repeatedly used (Nasiri et al., 2016) and assembled in the following formula:

Vulnerability= exposure + susceptibility - resilience (Balica & Wright, 2010).

However, words like “degree”, “parameters” etcetera, suggest that vulnerability is a linear concept. While this concept is commonly used, because of the need for generalization, this thesis rather uses a relational approach to the understanding of vulnerability, as this captures how social relationships shape vulnerability and provide deeper insights in lived experiences, rather than reducing these to static elements in a formula. For instance, one’s vulnerability is not determined by the element of poverty but by *how* people are poor and in relation to others. This explains how there are differences in vulnerability within a nation and community itself. An indicator of poverty does not fully measure the full multidimensionality of vulnerability. Factors of access to resources, networks and obligations to one another etcetera should also be taken into consideration (Turner 2015). Otherwise gaps within knowledge remain as groups of people are different in the way they experience flood situations and policies that aim to mitigate them. This is also clearly demonstrated in the category of gender, which often intersect with other axes of social categories (like class) and exposure (residing in flood prone areas) (Sultana, 2010).

2.6. Floods as opportunities?

Much of the described theory above suggests the adverse impact of floods on people’s livelihoods. Floods are issues to be dealt with and risks and vulnerability need to be reduced. Both from a formal and informal perspective. While it is true that people’s lives are negatively impacted by the intrusion of water. It would also be interesting to see if there are instances in which, especially local residents, make use of their situation in a positive manner, as there are instances where there is a pattern of floods in which people have grown accustomed to. The flood cycle is used to their personal advantage. For example, to use the excess water and new nutrients for agricultural purposes. This is considered a

"normal" flood in contrast to a "bad" flood that negatively impacts people's livelihoods (Langill & Abizaid, 2019). Including this approach, might sketch a more nuanced flood situation that would reveal a more complete picture on how floods are perceived, responded to and which dynamics are of influence on daily life.

2.7. Conceptual framework

To visualize all the concepts used within the theoretical framework, a figure is created. Within an area that is impacted by floods, the government responds in a way that is technocratic and centralized, i.e., the control paradigm. This is determined in the way the exposure to water, voice and authority regarding the subject and knowledge and expertise is distributed. On the other side, you have responses and experiences of residents, these are telling about the way people cope with the situation. These coping mechanisms are influenced by the capacities to respond and the way people are affected by these floods, i,e., relational vulnerability. However, these responses are not separate entities and can meet others within the concept of co-creation. Here, intermediary actors also play their part and meet with local residents in the form of informal citymaking. Ultimately, this by examining these concepts, it will provide an overview of the flood situation and make it possible to analyze the data to provide recommendations for inclusive flood management practices. See table 1. below.

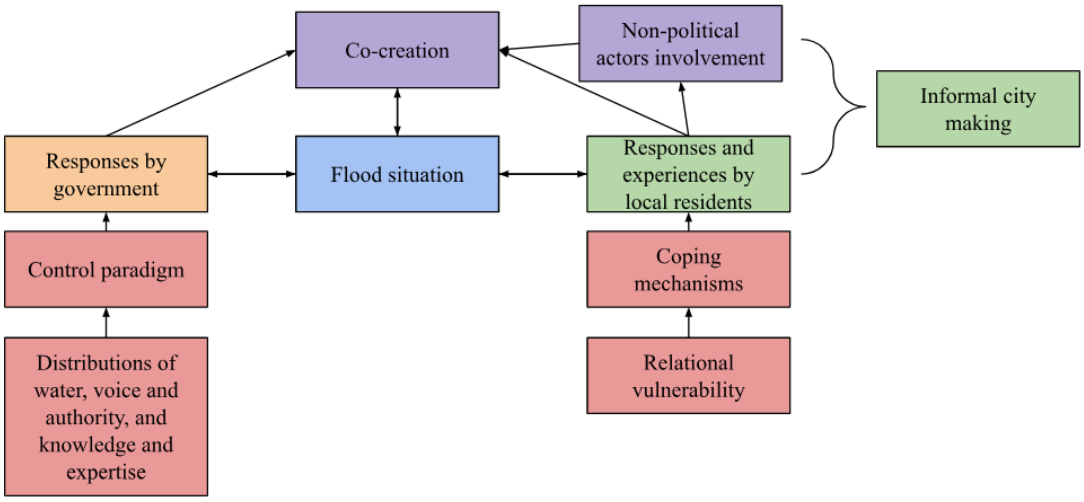


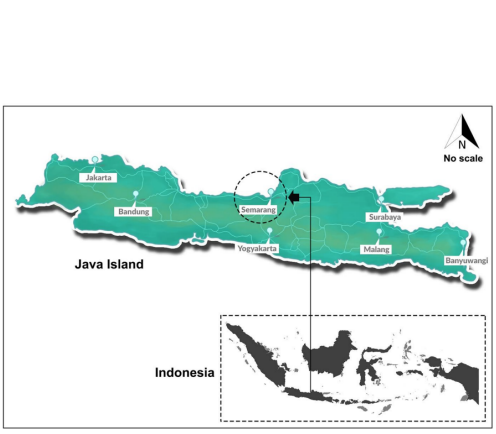
Table 1. Conceptual framework

Chapter 3. Research area

3.1. Semarang

3.1.1. Background

Semarang is the capital city of the province of Central Java and is one of the largest cities on the northern coast of Java Island with a population of 1.7 million residents. Geographically, Semarang consists of two areas: the northern downstream area (Semarang Bawah) near the coast and the southern upstream area with hills (Semarang Atas). The northern part has more residential and industrial infrastructure than the southern part. Two rivers run through the city, one in the west and one in the east (Andreas et al., 2016). Because of its location, Semarang serves as an important commercial region for trade to other places in Indonesia. The growing economic development of the city calls for an increase in both formal and informal urbanization such as an expansion of the harbor, industrial areas, planning of gated communities and the construction of large settlements (known as Kampongs). Due to multiple factors, Semarang experiences a complex flood situation. First, the city experiences significant levels of land subsidence in multiple areas near the coast. On average, the most affected areas are subsiding with eight centimeters per year (Water as Leverage, 2018). These areas consist of young alluvium soil, which together with excessive groundwater extraction and the weight of buildings and infrastructure, causes the land to sink (Andreas et al., 2016). Second, the coast of Semarang used to be protected by mangrove trees, acting as a natural barrier to break up the tides. However, today, much of it is lost to make room for aqua farming, gray infrastructures and industrial complexes (Water as Leverage, 2018). As a result of these two events, the inland intrusion of seawater is increased (Andreas et al., 2016). Local residents call this phenomenon “rob”, which refers to the almost permanent coastal inundation they experience (Buchori et al., 2018). At last, due to pollution (both by industries and residents) and sedimentation, river beds are struggling to drain excess water, especially during high tide and weather extremes. The gravitational process is blocked and water is being accumulated and pours into residential areas near the river and/or the sea. Then there is also the concern of the slow-onset process of sea level rise (Water as Leverage, 2018). In essence, three types of floods occur: local flood, river flood and coastal flood (Marfai & King, 2008).



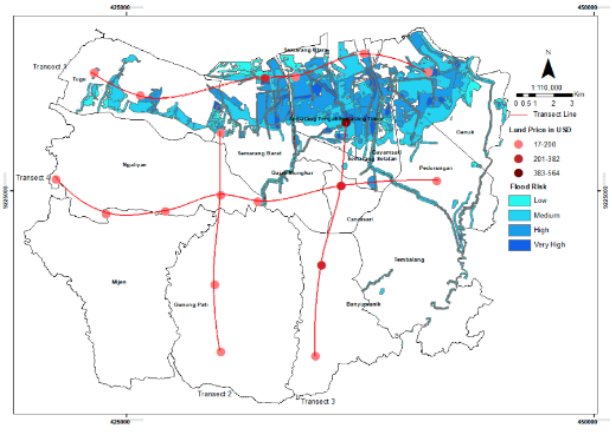


Fig.1 Location of Semarang on Java Island (left), source: Dameria & Indradjati (2022) and Fig. 2 Outline of Semarang and flood risk (right), source: Saputra et al. (2021)

3.1.2. Responses to floods

To combat the different types of floods, certain measures by the government have been put in place. Semarang has a long history with flood management, stemming from the Dutch colonial era until now, in "Post-Reformasi". What began with simple canal constructions, seeking to improve drainage in the area, has now led to multiple policies and strategies which aim to mitigate the floods. These policies are still very much characterized by infrastructural activities (Kurniawan & Suharini, 2021), which are vestiges of the imperial science that dominated Indonesia in the colonial era over native methods (Octavianti & Charles, 2019). See table description of policies and infrastructure by Kurniawan and Suharini (2021, p. 191).

Policies	**Infrastructure**
Semarang Mayor Regulation No.7/2006 on Standard Procedures for Implementing Disaster Management in Semarang City	Retention ponds in Muktiharjo, Kaligawe Low-cost Apartment (Rusunawa), Baru Traditional Market and Banjar Dowo
Semarang City Regional Regulation No. 13/2010 on the implementation of Disaster Management in Semarang City	Forty-one water pumps
Semarang Mayor Regulation No.39/2016 on Guidelines for Providing Unplanned Social Assistance due to Disaster	Coastal (rob) embankment on the north coast of Semarang City (2019)
Semarang City Regional Regulation No. 7/2014 on Master Plan for Semarang City Drainage System 2011-2031	Polder Banger (2014)
	Jatibarang Reservoir

Table 2. Policies and infrastructure by the government in Semarang. Source: Kurniawan & Suharini, 2021, p. 191)

However, the livelihoods of many Indonesians remain impacted by floods, even when there is an effort made by the government. In order to mitigate these impacts, residents find solutions for themselves, sometimes acting on their own or with other non-political actors but sometimes also invoking the

Javanese cultural concept of Gotong Royong. Gotong Royong has its roots in traditional Javanese language and villages where labor was exercised in a mutual exchange between inhabitants to serve a common good. Depending on one's interpretation, Gotong Royong means ‘mutual assistance’ or ‘cooperation with social networks. Gotong Royong ranges from festive events such as weddings to the reparation of damaged infrastructures. It is therefore not merely a coping mechanism, but an integrated part of the lives of many (Javanese) Indonesians (Mardiasmo & Barnes, 2015).

3.1.3. Actors

According to Isa et al., (2019), in Semarang, actors in flood management be categorized into three dimensions:

- Policy makers: Provincial Disaster Management, City Disaster Management, Regional Disaster Management agency, Regional Development Planning Agency (BAPPEDA), Public Health Office, Public Works Service (DPU) and Environmental services.
- Intermediaries: Search and Rescue team, military, police, NGOs and Universities.
- Civil society: Individuals, village chiefs and communities experiencing floods (Isa et al., 2019, p.5)

This division of responsibility and authority, especially among different governmental departments, has not always been the case. It was only around 1999, that the authoritarian and centralized regime of Indonesia slowly became more democratic and decentralized. Cities and provinces gained more governmental control in order to increase transparency of funds and development of local regions. In that way, bridging the gap between governmental bodies and civil society was aspired. Some of these aspirations have been met. There are democratic elections, freedom of press and a multi-party system. The same decentralization can be seen in flood management. While the national government used to be responsible for flood management decisions, it has been transferred to city levels and various departments. However, it should be pointed out that decentralization does not mean more inclusive governance, as Indonesia remains having inequality among social, economic and political dimensions (van Voorst, 2016).

3.2. Mangkang Wetan

According to Belland and Kausan (2022) Mangkang Wetan is a village located on the west side of Semarang at the coast, with a peri-urban landscape. The village is divided by the Beringin river that flows into the Java Sea. Many residents of Mangkang Wetan therefore depend for their livelihood on fishing and fish related services. However, this was not always the case. Before 1990, Mangkang Wetan had more diverse economic opportunities such as paddy fields and aquaculture ponds. Yet, due to an increase in informal settlements, urbanization and industrialization combined with coastal abrasion, many of these ponds and fields slowly disappeared. This land change also caused natural spring water

-used for clean water- to be lost. Pipes to supply water have been built by the government, yet, this clean water only flows to wealthier neighborhoods. To still provide poorer residents of Mangkang Wetan with water, groundwater is extracted from deep wells. In addition, the many industrial companies located near Mangkang Wetan, are excessively pumping groundwater for their own activities. This long-term extraction of groundwater, however, is argued by many scientists to be the lead cause of land subsidence in the village. When houses are sinking and become lower than the road, they are vulnerable to tidal and river floods in the area (Belland & Kausan, 2022). These floods are caused- like other parts in the city- by insufficient waste management, environmental degradation, land subsidence, inland saltwater intrusion, insufficient drainage of the river and weather extremes (Belland & Kausan, 2022; Utami et al., 2021; Dewi et al, 2021). See fig.5. The green lines represent ground, the blue lines represent the sea, the river coming from the upstream area and groundwater that is being pumped.

Fig. 3 Hydrology scheme of Mangkang Wetan. Souce: personal sketch

Many residents experience these floods in their home or experience difficulty in accessing roads and services (Sofaniadi et al., 2015). So, residents have to regularly elevate their houses and roads to keep up with the subsidence and protect themselves from being submerged by the floods. This is a costly and time-consuming process. At the same time, since 2021, normalization of the Bringin river has started and some residents residing on the riverbank are forced to move (Belland & Kausan, 2022). In addition, Mangkang Wetan has the highest poverty rate in the Tugu District (Dewi & Kurniati, 2022). Fishermen often have less access to resources to improve their accumulation of product. Banks also are more hesitant to provide loans to people with this occupation and laws/regulations deployed by the government are felt to be not in the interest of the welfare of fishermen. Fishermen are also dependent on the climate that can influence fish availability (Primawati et al., 2023). In one study, a fisherman even felt that his fish haul had been reduced by the floods. Most residents do not have sufficient income

to set aside for savings. Despite these hardships, residents remain residing in this location due to the proximity to their work (fishing grounds), social ties in the area and cultural significance of the fishing trade (Sofaniadi et al., 2015).

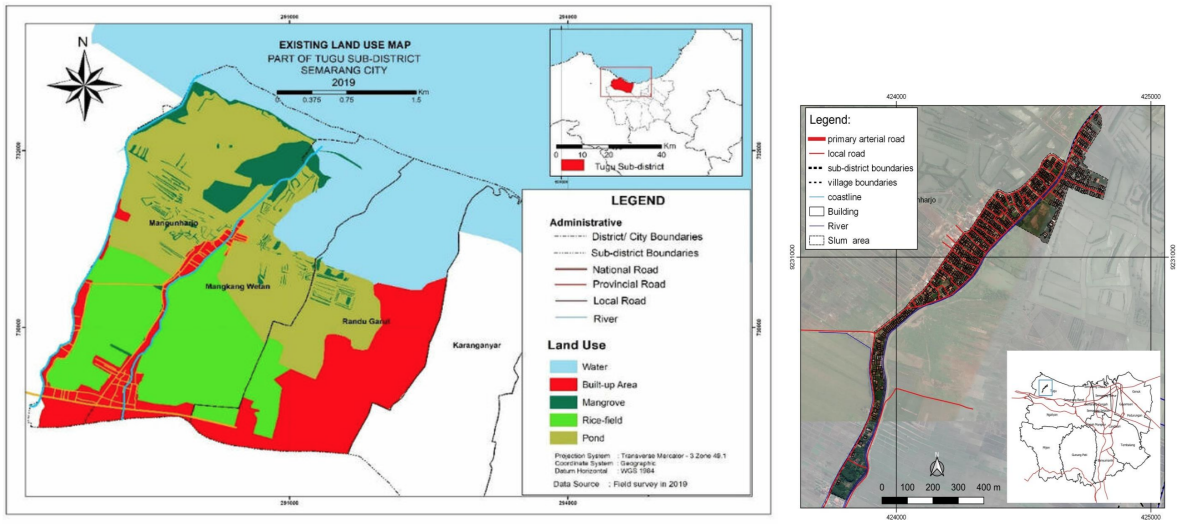


Fig.4 Mangkang Wetan. Source: Utami et al. (2021) and Fig. 5 Outline of Mangkang Wetan Source: Astuti et al. (2021)

Chapter 4. Methodology

4.1. Research approach and data collection

This research is conducted in a qualitative mixed methods manner. By choosing a qualitative design, it allows the researcher to explore and further investigate rich details of certain phenomena. It is especially suitable when researching human behavior and informality, as it is more difficult to quantify and not always documented. Subtle cues can also be hidden and expressed beyond words. In this way, emotions, thoughts, feelings and narratives regarding the subject of this thesis can be gathered and analyzed (Tenny et al., 2022).

Research was conducted over a period of almost 3 months (February- May 2024). Firstly, a personal network consisting of experts was established. This is mainly done through the contacts of professors at Universiteit Utrecht and Universitas Gadjah Mada. Various meetings with these experts were conducted to provide the necessary background information that was needed to conduct the interviews and supplement already gathered information. In these meetings, topics about the various issues Semarang and in specific Mangkang Wetan were discussed, as well as situations that should be considered when conducting research in Mangkang Wetan. Afterwards, contact with community leaders and intermediaries was established through this personal network, and through them, the researcher could access local residents living in Mangkang Wetan. This snowballing method (see sampling for search criteria) was preferred, especially to create a certain level of trust with the residents,

as the researcher was collaborating with people they knew. Through an intermediary, the researcher came in contact with a representative from the government.

In total, 19 in-depth interviews were conducted with actors from different backgrounds (see research methods and sampling). A translator was used when interviews had to be conducted in Bahasa Indonesia or Javanese. Interviews that could be conducted in English were done without a translator. The data gathered from these interviews were compared with the literature research done beforehand, conversations with experts and personal observations, i.e., triangulation. In this way, a thorough understanding could be made about the dynamics in Mangkang Wetan and how different people are affected by floods and said dynamics.

4.2. Research methods

4.2.1. Semi-structured in-depth interviews

Semi-structured in-depth interviews were conducted. An interview guide with a set of questions was used to provide focus within the interviews, yet by being semi-structured and in-depth, there was room for flexibility and questions could be either added or left out depending on the answers by the participant. In this way, participants' unique perspectives could be captured (Adeoye-Olatunde & Olenik, 2021). The interviews were also open-ended, there was no time-limit, and interactive through follow-up questions and visualizations when needed. These interviews took place face to face in someone's home, office and coffee shop. On 1 occasion, the interview took place online, through a video call service (google meet).

4.2.2 Observations and informal conversations

During the fieldwork, attention has been given to the surroundings in which the interviews took place. Pictures were taken (with permission) and personal thoughts have been written down. Not only did this provide a visual representation of the matter at hand, it also supports the data that has been given orally through the interviews, which fosters a better understanding of the topic of this thesis. From time to time, informal conversations with experts took place. This was mostly done to gain some local insights about Mangkang Wetan and its residents. In a later stage of the research process, these conversations were used to further analyze data in a broader context of Semarang (and Indonesia) and to explain certain situations that were unclear to the researcher.

4.3. Sampling

Acquiring participants was done through the method of snowball sampling. In this method, participants are acquired through referrals of other participants until the desired sample is reached. This method suits this research due to the geographical and social characteristics of the desired participants. Participants were purposely selected by the researcher and contact persons based on occupation, gender,

income and geographical location, as a strategy to attain a diverse sample. The sample size is 19 participants (N=19). Data saturation was reached at 10 participants. Participants consist of representatives of organizations, government, head of households and spouses. The gender of the participants is almost equally divided, with 9 participants being women (47%) and 10 participants being men (52%). List of occupations of the participants:

1. Representative of the local government
2. Representative of IKAMat (NGO)
3. Representative of KeSEMat (NGO)
4. Representative of Bintari (NGO)
5. Female moslim group organizer
6. Fishermen group organizer
7. Fishermen's wives group organizer
8. Mangrove batik and snack maker
9. Student
10. Professor
11. Housewife
12. Shop Owner
13. Fishermen
14. Fish/shrimp pond farmer
15. Fish seller
16. environmental activist
17. Mangrove plantation owner
18. Mangrove coffee maker
19. Industry worker
20. Elementary teacher

4.4. Ethical considerations

Before the interviews, an explanation was given regarding the purpose of this research. The researcher also explicitly stated to the participant that they could opt out of the research at any given time. If they wish to do so, their data will be erased completely. Participants were not obliged to answer questions they did not feel comfortable with. The interviews were recorded by phone with the oral permission of the participants. From these recordings, anonymous transcripts were made. Specific descriptions which could trace back to a participant were erased. The data files are not shared with third parties and used for other purposes than research and examination by Utrecht Universiteit.

4.5. Limitations

While generalizations and conclusions can be made from the case study in line with the body of literature, one should be wary of taking the exact contents and applying it to other settings, due to the platitude of influencing factors that shape the experiences of the participants. This makes the case study complex and inherently unique. This claim is further strengthened by the qualitative nature of the research approach and the relatively small sample size. Besides, the methods of snowballing and purposive selection are used for sampling. Participants are chosen according to social categories and occupations in line with the theory that is presented, however, these methods also rely on the judgment of the researcher and their contact persons. Therefore, these methods are at risk of bias, as preconceptions can be of influence on participant selection. Ultimately, this could lead to skewed and

unrepresentative data (Stewart, 2024.). The researcher aimed to eliminate this bias by selecting participants based on different backgrounds, but these risks should be considered.

Interviews were conducted face to face, participants might have felt that they needed to answer in a way that is desirable for the researcher. Especially since power dynamics are unequally distributed between interviewer and interviewee, who in turn are influenced by social categories and the culture around it (Wan & Yan, 2012). The researcher is a white Dutch woman, which gives her, especially given the colonial history between the Netherlands and Indonesia, a privileged social status. This status and the perception towards it, may have been of influence on the interaction with participants, the research process, data interpretation and outcomes. At last, a translator was used for interviews that were conducted in Bahasa Indonesia or Javanese. During translation, the meaning of words could be altered and nuances and emotions lost. Long sentences were summarized, which might not hold all the data that was provided.

Chapter 5. Flood related dynamics in Semarang

In this chapter and the next, all results will be discussed from the interviews. Quotes are written down verbatim.

5.1. Policies and infrastructure by the local government

The government has put responses in place to ease the living situation for those residing in Semarang and Mangkang Wetan. The following responses were mentioned by interviewees (governmental, NGOs and residents:

- Normalization of the Beringin river
- Heightening the road
- Elevating people's rooftops
- Providing food after floods of more disastrous impact
- Communicating with representatives and activists of the community.
- Grey infrastructure like dykes, canals, walls and water pumps

Within the city of Semarang, numerous so-called gray infrastructures have been built. On both the west and east side of the city, there are two main canals, who stretch from the upstream area all the way to the coast. These are supplemented by 138 water pumps, one mobile pump, retention ponds and a dam in one of the upstream areas of the city. There is also the construction of a toll road that will act as a sea wall in front of Semarang, which already has been constructed on the eastern part of the city and is planned to be completed by 2027.

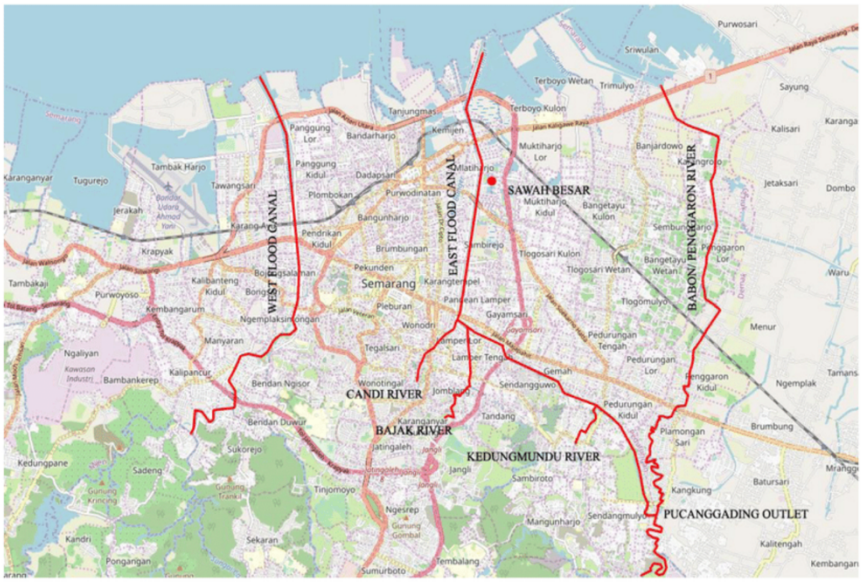


Fig. 6 West and east canal in Semarang

Construction of the toll road. Source: CNBC Indonesia (2023)

In Mangkang Wetan itself, according to local residents, some responses have been put in place. The government has constructed small walls next to some of the roads and fish and shrimp ponds, to prevent coastal inundation. To keep up with the land subsidence, some roads in the neighborhood have been elevated to remain above sea level and the government provides financial aid to elevate rooftops of houses with a floor that had to be regularly elevated. However, this financial aid is only given to 3 people per year, according to one local resident who will now receive this aid next year. According to another local resident, there has been financial investment in a coastal belt made by mangrove trees and concrete. In the event of a flood with great impact (usually once a year), the government will provide materials to those affected in the aftermath, such as food. The river Beringin has also recently been

normalized, to take on bigger volumes of water from both the upstream area and seasonal rain. At last, it is also mentioned by some participants that the government is in communication with local residents that organize themselves, such as the fishermen group and female Muslim group. They have conversations with each other in the form of focus group discussions, proposals and talks. One participant mentioned:

"There's this program by the government [...] and discussion about the planning of the development of the area. It usually is done once a year annually and usually the districts in this area need to give the proposal to the government so that their area can be saved from any potential disasters."

However, sentiment is held by local residents that these talks have not been sufficient, like mentioned by this participant:

"There are some efforts from the government to bridge between them and the fishermen and wives' community. Yeah. But there hasn't really any follow-up for that. So, she was also confused too about how these activities are going to happen. Because there were plans, but the plans are not... They are not done really well".

Normalization of the Bringin River (left) and a small wall next to fishponds (right), source: personal archive (April, 2024).

Moreover, the representative of the government mentioned swiftly how infrastructural responses are preferred over natural based solutions. If all infrastructure is in place, focus could be shifted towards other solutions. This was in answer to a question regarding the mangrove plantations in the area by local residents. His response was:

"The hard infrastructure still needs for us to prevent the flood coming from the upstream, also from the ocean. After we finish with that, we can think with the natural-based solution".

At last, the representative of the government felt that their department could put more flood management infrastructure and aid for residents in place to tackle all of the flood related problems if they were not financially restricted. He said:

"To build all of our flood infrastructure, our annual budget is 5 point something trillion of rupiah, and then two-thirds from that is already used for the other government spending, so we only have less than 1.5 trillion. 1.5 trillion per year for infrastructure, infrastructure not only for flood management, so the total is almost 100 trillion, you can imagine 1.2 or 1.1 trillion and then the plan is almost 100 trillion, so it needs 100 years if you use only our budget".

5.2. Historical background of such policies

During an informal conversation with a fellow researcher attention was raised about the fact that the government of Semarang reproduces ways of responding to floods that have their roots in colonial times. In this regard, little has changed in the last 70-80 years. This is characterized by building and using gray infrastructure. According to this researcher, these responses do not always include residents in the decision-making process and can negatively impact people's lives. An example was given about how some residents were evicted to make space for the normalization project of the Beringin river. These responses are also often funded by foreign actors. The Jatibarang Dam for example, is funded through JICA, an organization from Japan.

In addition, the representative of the government, explained how there is still use of colonial flood management structure, in the form of two canals within the city. Foreign actors are also involved in the form of funding and providing expertise. JICA was mentioned again, as well as the World Bank. A professor has also mentioned the involvement of Dutch organizations such as Deltares. The same researcher also mentioned how foreign investment does not have to be seen as something negative, as long as it involves local people's initiatives to find flood solutions and their needs are addressed. When asked about the involvement of local residents in their projects, the representative of the government responded that locals are not directly involved within the bigger picture of flood management responses. They do have a community empowerment program to educate residents on proper waste management,

which has some influence on the causes of floods. Only in some areas local residents have their own flood management. When asked about community involvement, the representative responded the following:

"In a developing country it is not easy to involve the community as the subject of the program. Mostly, they are as an object of the project, but in the small scale of the community participation, yes, we have, we know that in the Belimael, yeah, Belimael in the central system, they already have the capacity to manage their area, manage their own pump to support our intervention. Besides that, I think if we can put the level of the community participation in, but until 10 maybe, so two or three, something like that."

Thus, from a scale from 1-10, community involvement has been minimal, ranking it a 2 or 3. In correspondence to residents having to move to make space for flood infrastructure projects, the representative of the government responded:

"Normally, people don't want to live near by the river, but in the developing countries, especially in Indonesia, they don't care about the flood prone, as long as we can live there without paying, without buying the land, so we can easily occupy the riverbank. Yeah, we also still struggle with that, always educate them that it is a flood prone area, you cannot live here, the land belongs to the government."

Remnants of a colonial history can be seen directly from observation. In the old part of the city center, also known as Kota Lama, many colonial buildings are intact. Some restaurants and street signs are also in the Dutch language and various "Dutch " food is sold, like kroketten and poffertjes. See pictures below.

Kota Lama, Semarang (left) and Dutch street sign (right). Source: personal archive (March, 2024)

Chapter 6. What is happening on the “ground”?

6.1. Hydrological situation in Mangkang Wetan

According to both representatives of NGOs, researchers and residents of Mangkang Wetan, numerous causes of the floods in the neighborhood can be found. See scheme above. There are causes from both the upstream and downstream era. The factors that were most mentioned were land subsidence, coastal abrasion, high tide (also indicated with the local word “rob”) and pollution. Interestingly, according to residents, pollution was caused by the private companies and factories located near their neighborhood. While NGOs and the government also mentioned the role of improper waste management by the community itself. Despite efforts to counteract these causes, residents have mentioned how their flood situation has worsened over the years. One participant argued:

“So, since 1978 until now, the flooding problem has intensed. So, it wasn't really from the 2000s, it was since back then [...] the flood intensity has increased and the negative impacts have also increased”

Coastal inundation in Mangkang Wetan. Source: personal archive (April 2024)

6.2. Lived experiences by residents

6.2.1. People’s responses to the intruding water

Residents respond in the following way in relation to the floods. These results are derived from data provided by both residents themselves and personal observations:

- Elevation of their house
- Elevation of furniture
- Mangrove planting
- Selfmade embankments
- Selling ponds that have been lost to the water
- Religion and normalization as a coping mechanism
- Changing occupation
- Diversification of income streams

Almost all the participants (residents) have had to elevate the foundation of their house between two and three times in the last decades to keep up with the land subsidence and to ultimately ensure water will not enter their homes. Furniture sometimes also has to be moved or placed in higher places in order not to be damaged (especially electronics), although floods cannot always be noticed as one participant expressed:

"So, what she does is that they have this elevated, like, table here so that they can put a refrigerator, like, for example, up on this table. And maybe some other wood, stuff made from wood is also put on an elevated space like that. But during the night, it's usually not known whether or not it floods or not. So, it does create an expense, another expense for them [to replace broken belongings]."

Sinking of houses due to land subsidence. Source: personal archive (April 2024).

Multiple participants have also been involved in the mangrove plantations together with other actors to create a green belt, use it for alternative income streams and improve the environmental condition of the land close to them. From observations it has also been seen that self-made embankments are created around fish and shrimp ponds to stop them from overflowing. Some of the ponds that are not usable anymore have been sold to brokers of private companies. When asked about how the participants deal intrinsically with occurring hardships, some expressed the importance of religion (Islam) and how they have normalized the situation for themselves. One participant mentioned how it helps her calm down:

"It helps her to calm herself. Usually during prayers, it makes her more calm. So, she doesn't really feel stressed anymore about her hardships." and *"She's used to it. Used to the floods and, well, the other stuff that is happening here. She's used to it and she just hopes for the better."*

Most residents of Mangkang Wetan are fishermen, however, fishing has become less and less lucrative due to the floods and increase in pollution. Most older residents want to continue fishing but one participant mentioned she there is a change in daily life in Mangkang Wetan, where most young people choose occupations within the surrounding industrial companies. She said:

It's quite saddening for her. Because it's not the same as before. Before, you can wake up in the morning and then you harvest the shrimps and the fish. Now, the livelihoods are dependent on wages from the companies. [...] The younger ones usually work in the companies"

However, these contracts are only for a short while (3 months), if people are not hired again, people opt for business-like setups. Most of this is selling snacks, according to one participant:

"The younger generation. The younger generation, yes. Some are in the projects. Some are like making a business, selling small things [...] They usually go through entrepreneurship like selling little snacks. Selling little snacks or while searching for another company, another project"

Self-made embankment (left) and mangrove plantation (right). Source: Personal archive (April 2024)

6.2.2. Floods, both a negative and positive occurrence?

Residents of Mangkang Wetan mentioned the negative impact floods have on their livelihood, yet surprisingly, instances of positivity have also been mentioned throughout interviews. Beside it being a nuisance, flood water is often polluted and can become a significant health hazard. By commuting regularly through the water, there is a risk of getting skin infections and mosquitoes use the water as a breeding ground which causes an increase in diseases like Dengue. Some participants have also said that parts of their land have become unusable for agriculture due to the intrusion of saltwater or that their pond has become part of the sea due to abrasion. This has had a negative impact on their income as one participant stressed:

"So, she actually had some, like, banana plantation, mango plantation, and some rice paddies too, rice fields. But because of the rising sea level, the salt water came to her plantation, right? So, she cannot plant anything there anymore. She cannot collect any income from them anymore."

Infrastructure, such as bridges and roads have been destroyed or damaged. In the event of a flood, one participant who works in one of the industrial companies explained how he sometimes cannot go to work and other times not come home when the floods are too high to commute through. Some participants also found it harder to go out to the sea to catch fish when there is a strong flood current.

Another participant also described how some of his boats and fishing material has been taken away by this current. Some were recovered, but other materials were not. Some boats also have been damaged by the floods, according to one participant:

"Sometimes, when the boat is lost, the fisherman's equipment is also lost. A lot of nets are lost, maybe some motors or something. [...] for the boats, during the uptide floods, when they were really bad, there were like 30 boats that were broken because of that, and two of them can't be fixed entirely".

Now for the positive part, there is a certain playfulness to floods. From observation it was seen that children are playing and swimming in the water, people are fishing and friends are peddling their feet in the water to cool off. Some participants also mentioned, in contradiction with what is previously stated, that floods actually make it easier for them to go with their boats out to sea. At last, sometimes, fish and shrimp escape their ponds, so local residents can catch them. One participant mentioned how floods could also be seen as a "friend":

"Floods were actually a friend of the local community because since it's seasonal, people already know that it will come. And it also brings benefits to the people, such as it eases the workload for farmers, for rice paddy farmers, right? And then for fishermen because they can easily go to the sea. And then the children can swim on the river. There are also some fruits that got brought by the current river, by the river current."

Floods in that sense are actually not an issue inherently. They are part of life. However, in the same breath it was mentioned by that same participant how floods have become more severe and unpredictable due to the changing landscape upstream:

"So, the main cause of it is the building of real estate and industries. Back then, the area there, the hills there [upstream], they can usually protect the lower areas from floods. But since the building of the real estate and stuff, they cannot really protect it. And the water that come from the rains there usually come here to flood here. [...] Before, how it was predictable is that when there's a rain at the start of the river and at the end of the river, at the same time, for one hour, it will create a big flood. And if there is rain for like three hours, the flood will be higher and will create a lot of problems for the community. But now, it isn't really that predictable."

6.2.3. Influence on livelihoods

Two factors that are much of an influence on the experiences and responses to floods of residents of Mangkang Wetan is: poverty and gender. When asked what local resident's biggest worries were, most of these answers were money related. Many residents gain income from fish/shrimp related occupations

if they are not working in the industries or selling food and condiments. These are influenced by not only the season and pollution but floods as well. Some participants think there are less and less fish in the sea and sometimes they cannot go to the sea at all due to a flood. Which impacts their income. In addition, participants have to elevate their houses with their own income, which is felt to be very expensive and cuts a significant amount on their savings. One participant had to borrow money from the bank, which he is still paying back. Even when a few decades ago, a participant actually had a fairly decent income, today, they are experiencing money-related issues as well and had to sell parts of their farmland to get by. One participant described it as a cycle with no ending:

"And because of that, they cannot really save a lot of money. This money will always be spent and it does create some kind of vulnerable position. They will always end up in poverty some way or another. It's really hard to escape from."

Data was not presented regarding financial differences among neighbors and community members. However, through casual conversations and observations it did become clear that some differences can be suspected. Mangkang Wetan is divided in different districts. 7,8 and 9 are the most impoverished districts. Houses are in poorer conditions and have sunken more into the ground. Waste can also be seen more in the surrounding environment. Richer districts/ households in Mangkang Wetan usually have higher elevated houses. These houses are also much larger and sturdier in appearance.

Houses in district 7 (left) and differences in house materials and elevation in one street (right). Source: personal archive (April 2024)

In addition, almost all the female participants have spoken about the difference between women and men who experience floods. Women are traditionally more confined to the house. They carry out housework related duties, such as cooking and cleaning. Simultaneously, they also take care of the children and sometimes also an elderly family member. Because of this, they feel that women are differently burned in the event of a flood. Most often, during a flood, their husbands are away working. The women are left to elevate or move furniture to safer places, which can be physically challenging. They also have to look after the safety of those they take care of. When there is a flood, food vendors are also not present, meaning that sometimes women cannot exercise their cooking activities. They have to be creative with whatever is left for them to cook. They also have to clean up the water if it intrudes into their home, which can be a challenge since the water is polluted, leaving a sticky residue. Overall, female participants felt that it was stressful:

"So since she's the only one at home when the flood comes, she's the only one that can elevate the furniture here, and usually she gets aid from her sister from her younger sister [...] usually when the husbands are out fishing and then the floods came to the house it's distressing for the women,, they also have a lot of kids that are very young in age in the toddler years so it's kind of confusing where they can I mean, to elevate the furniture and then to take care of the kids"

6.2.4. The role of Gotong Royong

Some participants spoke about the concept of Gotong Royong. This concept is a cultural ideology in which helping others is strongly present. One participant tried to explain as:

"So Gotong Royong is a really prevalent thing in Indonesia. Especially in the villages or the countryside. Because in the cities it doesn't really show much anymore. But in places like here, it does show. And she personally feels that it is one of the good things. You can know a lot more about your neighbors. You can converse a lot more. There's one Indonesian saying that says... It literally means that when it's heavy, you lift it together. When it's light, you also lift it together."

This concept came up multiple times on different subjects. One example was given about how one of the bridges was broken due to a very strong current during one of the floods. People came together and repaired the bridge themselves with their own money and materials. Another participant also told an anecdote about how some fishermen boats drifted with the current out to sea because of a flood. Neighbors and family came together to help search for them. The last example that was given is the elevation of the floor of the mosque, located in the neighborhood. People came together and gave an amount of money they could miss to buy materials. The mosque was elevated by the local residents themselves. All participants who talked about Gotong Royong described it in a positive manner, the researcher could not find any challenges or limits to this concept.

The repaired bridge (left) and fishermen boats (right). Source: personal archive (April 2024)

6.2.5. Future of Mangkang Wetan

Another theme that regularly came up during interviews is the increase of industrialization around Mangkang Wetan and therefore the growing focus on economic growth. Almost 90% of the land in Mangkang Wetan has been sold to private brokers. Especially fish and shrimp ponds who have been "lost" due to the floods and abrasion. When asked if homes were sold, all residents responded with "no" and explained how they have a land certificate for their house, which is not appealing for these brokers. There are plans for reclamation projects and use these prospects of dry land for economic activities. Not only has this increase in industrialization made the flood situation worse (environmental degradation and pollution). According to some participants and experts, this industrialization has been a primary focus for the region on an urban planning scale. One participant also stated how he feels that his neighborhood is being closed in by these industries and one expert stated how because of this heavy focus on economic activities in the area, people are left to their own devices. He said:

"Okay So Mr. ... thinks that this area that has been bought it will be changed to another industrial complex [...]l It's going to be a bowl" and *"Industrialize, more and more. Move the people. Maybe force them to. Yeah, I think it's like that. Maybe the government has a plan like that. They just, what is it, planning for the industrial and the people… It's up to you if you can survive."*

In answer to what local residents wished themselves for the future of Mangkang Wetan, some provided recommendations that could positively impact their livelihood. Most participants felt the need for more

collaboration between the government, intermediaries and local residents in addition to more flood management infrastructure. Some participants have felt that the government could be listening more to their needs and concerns. All participants (residents) but one who were interviewed felt not represented at all.

Some participants also wished that the government would buy the "lost" land from private brokers and turn it into more mangrove plantations for the improvement of the environment and reclaim some of this land for cultivation. Another participant stressed the importance of uplifting small family-owned businesses, in order for families to regain their independence. At last, one participant hopes that there would be more attention for neighborhoods like Mangkang Wetan not to be forgotten.

To secure a form of future, some land that has been bought by private companies, residents can still continue their work on that land for an x amount of time. One representative of IKAMat explained how they arranged a contract with a private company (IPU) to give mangrove cultivation rights to local residents:

"Contract with the local people there. [...] like cultivation rights [...] Have the cultivation rights to local persons. Local people. So, we have assigned to local people to... Maybe 10, 15 years to use the land."

Despite all these challenges and unsecure futures, most residents would like to stay in their homes for years to come. Most have been born in Mangkang Wetan, like their ancestors. In a way, residents feel a significant social and cultural tie to their area. Many would also like to stay close to the water to practice their occupation as a fisher. If they move, this becomes lost and they do not have the means to switch occupations easily. One participant stressed:

"Moving is something hard because they can't really search for another income basis. They're mostly fishermen, right? If they move somewhere far from the ocean there needs to be an adjustment, a hard adjustment for them. [...] And they want to stay here as long as they can because it is in the end their birthplace the place they were born and the place they will hopefully spend the rest of their life in."

6.3. Co-creation with other actors

6.3.1. Responding together

Residents do not act solely on their own. In certain ways, they co-create solutions with various actors from governmental agencies, NGOs (IKAMat and Bintari), students (KeSEMat) and private companies. According to interviews and personal observations, the following responses have been created:

- Mangrove plantations
- Early Warning System (EWS)

- Community based disaster management
- Education and training
- Forum
- Buying “lost” land
- Meetings with communities

Both KeSEMat, IKAMat and Bintari finance and aid local mangrove initiatives. According to representatives from these three actors, these mangroves act as a “green” belt for the coastal area in Mangkang Wetan to break up the intensity of the waves, store carbon and restore the ecosystem. Mangroves do not necessarily stop floods, as according to IKAMat, these trees need regular flooding to flourish. However, they do help against coastal abrasion. These mangrove trees also provide a breeding ground for e.g, fish and crab. In that way, biodiversity can be increased and local fishermen can catch more of these animals. From the fruit of the Rhizophora species, coffee, snacks and traditional clothing (Batik) is made as an alternative income stream, especially for women. However, these trees need a long time to grow and sometimes seeds and immature plants get washed away due to heavy flooding. Therefore, a positive impact is not possible in the short term. These mangrove plantations are regularly sponsored by private actors such as Traveloka, Indonesia Power and Gojek.

Bintari has also put in place an Early Warning System, abbreviated as EWS, in the Bringin drainage. This system measures the height of the water. Together with the community, they have organized a community-based disaster management program, in which training and education is provided on topics such as shelter, what to pack in the case of an emergency and to check the water levels. There are also whatsapp groups in place, both in Mangkang Wetan and in the upstream area to warn each other in the event of a flood (mainly when there is heavy rain in the upstream area). There is also a waste management program by Bintari, because often, thrash is being thrown into the river, which causes flood and health risks for local residents:

“If you have garbage, you can organize so you don't put in the river. I think it's one of our activities too, for making the environment, like the river, better [...] And it's making a high risk if the flood is coming, right? So, the garbage is, I don't know, many people can get sick. If you throw the garbage in the river.”

NGOs, researchers and experts are in regular contact with both the disaster and environmental department of the government and the community to identify issues, solutions and lobbying for awareness. There is also a stakeholder forum in which many different actors come together:

"*We need integration, we need communication, we need coordination and actually, Semarang City has a forum [...] We call it FPRB. FPRB is the Forum for Reducing the Risk of Disaster in Semarang City.".*

Then there is also the Corporate Social Responsibility Forum (CSRF), to discuss the impact of the many industrial companies in the area. However, these forums do not have an attendance obligation, so not all actors attend these meetings.

Mangrove coffee (left) and waste in the water (right). Source: Personal archive

6.3.2. Relationship scheme

Based on the interviews, the following collaborating relationships between actors has been mentioned. This figure is to visualize such relationships.

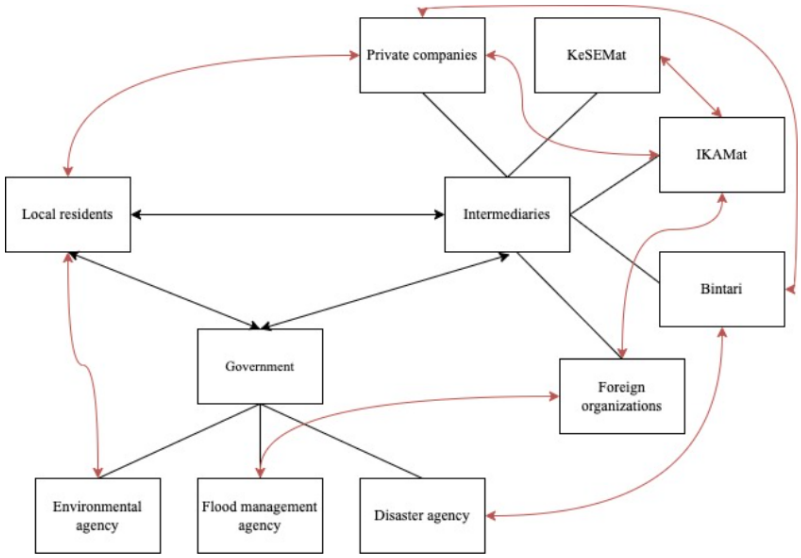


Table 4. Relationships between actors

7. Discussion and conclusion

The results derived from the field indicate an array of responses from both formal and informal actors. Some actors operate on their own, while others opt for collaboration. Some of these responses influence the livelihood of residents in a positive manner while others influence them negatively. Because of the scope of this thesis, it is important to analyze these responses within the context of social, economic and political factors that are of influence on how these floods are perceived, policies are created and on the overall experience of those impacted. Questions regarding what kind of informal city making is happening and how these are related to a governance level are central.

7.1. Discussion

7.1.1 The disconnect

While there are both policies and infrastructural responses by the government mentioned in literature (Kurniawan & Suharini, 2021) when asked in the interviews, from the government there was focus on technological responses, to keep the water at bay. Only one time it was mentioned how there is a community empowerment program concerning waste management. In fact, technological responses were preferred over initiatives from local communities, such as mangrove plantations. Only when all the infrastructure has been put in place, other solutions could be taken into account. The same could be said for the answers given by the local residents when responding to the question concerning what kind of responses have been given by the government. Most mentioned infrastructures of some sort. These responses fit the classical control paradigm by Pahl-Wostl et al (2010). The physical structures, like

elevating roads and building dykes, dictate where the water should go and more importantly, where it should not go. This is also where the most financial allocation is for the city government of Semarang. Lund (2023) also describes this phenomenon of the state being an entity of power over others and the environment. With the normalization of the Beringin river, for the sake of building walls next to the river, it was decided for the residents which households had to move from their land. Even when there is a need for such structural measures, there is the criticism that these responses tend to exclude local residents' needs, knowledge and perspectives (Edelenbos, et al., 2016). This arguably can be applied in this case study. Therefore, taking the theoretical ideas from Lund (2023) and Zwarteveen et al. (2017) it could be considered that Indonesia's colonial past still holds its legacy in modern day flood governance of Semarang. As a result, government policies might not sufficiently address the unique requirements and vulnerabilities of the community in Mangkang Wetan, which would keep the flood control cycle going back to reactive rather than proactive. Furthermore, community members do not hold as much voice and authority in decision making processes to effectively mitigate floods. There are conversations with local residents but much of these have been inefficient. Leading to local residents in this study not feeling represented and heard when they aim to address their needs. In that sense, flood governance in Semarang could be considered being ingrained with bureaucratic processes and power hierarchies that date back to the colonial era. As mentioned, scientific and technological knowledge is considered within these processes, sometimes even from former colonial oppressors of Indonesia such as the Netherlands and Japan. This holds a dominance over knowledge derived from local residents (Pahl-Wostl et al., 2010).

These responses in that way are "disconnected" from the actual realities of those residing in Mangkang Wetan. They do not relate with the needs and positions of residents as there is limited inclusion of residents in decision making processes and execution of flood management solutions. Consequently, people do not feel represented and instead of alleviating the problem, policies further exacerbate it. Moreover, by prioritizing economic growth for this area, floods have become more unpredictable, intense and dirtier. No specific measures were mentioned to take into consideration the social factors that are of influence on people's experiences and coping capacity. Policies regarding poverty alleviation and gender sensitive approaches were absent in that regard. Even though these factors have an immense influence on the experiences of local residents, according to Turner (2015) and Sultana (2010).

It should be noted however that these formal flood management actors are also bound by financial restrictions themselves. There is a certain willingness to relieve Semarang and Mangkang Wetan of their flood situation. Nevertheless, focus remains on finding and financing solutions within infrastructure. While this might alleviate exposure, this way of perceiving the flood situation and in a sense on how people are vulnerable, will never fully grasp the realities of those residing in Mangkang Wetan. Current solutions have failed to adequately help residents and life in Mangkang Wetan has

increasingly become more difficult for residents. Interestingly, however, when asked residents about the future of Semarang, most called for an increase in these infrastructures. Perhaps residents themselves have also internalized these solutions as deemed "best". Which is possible as Zwarteveen et al. (2017) explained how those who have been oppressed, could still have the same values as their oppressor later on.

7.1.2. City making in Mangkang Wetan

Due to this disconnect, residents have to opt for informal alliances with non-political actors to cope with hardships (van Voorst, 2016). They are heavily exposed to floods, as there are multiple dynamics within Semarang that fall in line with Zwarteveen et al., 's (2017) distribution of water. For example, an increase in industrialization and real estate caused excess water to accumulate in Mangkang Wetan. Going back to these alliances, in Mangkang Wetan, a distinction between what could be considered a top-down or bottom-up approach is not so easily drawn as what many might like to prefer. Actors from each category work not with one, but multiple actors to influence the flood situation one way or another. By seeing these relationships, it tells that in the system of Mangkang Wetan, co-creation exists according to participants and it does not provide a clear overview if only one approach was to be studied. In line with the theory of Zinggraff-Hamed et al. (2020) and Rădulescu et al., (2020), multiple actors from different levels of society are involved in many activities revolving around flood related projects. Take for example community-based disaster management programs in cooperation with Bintari and mangrove plantations financed by Traveloka.

However, it should be mentioned that some actors do not collaborate with other actors. Local residents have also acted on their own. When residents do not opt for co-creation, they find other ways to respond to these floods and enhance their livelihood. Sometimes individually, sometimes in collaboration with other residents. For example, by organizing themselves in groups to voice their needs and concerns. Most residents opt for elevating their houses, elevating furniture and creating constructions such as dams. Economic/material coping mechanisms were not as strongly present. This could be attributed to the fact that Mangkang Wetan has the highest poverty rate in the area according to Dewi and Kurniati (2022). However, diversification of income streams was mentioned through cultivating mangroves and changing occupations to industry workers and snack sellers. As multiple scholars have stressed (Twigg, 2004; Waseem et al., 2023; Hudson et al., 2020; Rustinsyah et al., 2021), social capital is an often used response to hardships and used by communities to themselves in reducing their vulnerability. Mangkang Wetan is not an exemption, participants have pointed out specific examples in which social capital was used under the name of Gotong Royong. Such as the construction of the bridge. A possible down-fall to this social capital was researched but not found, so no contributions could be made to MacGillivray 's (2018) quest of critically researching possible limitations of researching social capital

outside crime related fields. In contradiction to Twigg (2004), participants of the study did not view religion as a fundamental part of perceiving the threat and severity of the flood. They rather viewed religion as cultural coping mechanisms to find comfort amiss the stress that is caused. Some local residents organized themselves while others individually as activists aimed to address their needs, concerns and knowledge to other actors, from both governmental agencies and NGOs. Futures have become precarious due to industrial and economic interest in the region. To counteract brokers buying private land and still establishing some kind of livelihood, residents secure their houses and ponds/plantations through land certificates and cultivation rights contracts. Instances in which residents have used de-facto law, which Lund (2023) argues, have not been found in this specific data. However, infrastructure development, the planning for industrialization and perception towards informal settlements in Mangkang Wetan does increase the threat of evictions and residents might have to opt for these routes, if they would like to stay on their land for the rest of their lives. On the theme of vulnerability, relational vulnerability can be seen in terms of gender mostly, women experience floods differently than their husbands, as they occupy different roles within the household. Factors like different financial and social capacity were not present in the data. However, these factors could still be of influence as one observation demonstrated a difference in districts, houses and elevation heights. Suggesting differences in financial capacity to respond to the floods among neighbors. This demonstrated that vulnerability is indeed relational in Mangkang Wetan and cannot be holistically researched if static elements of vulnerability formulas were used as all residents would be classified under one group.

Floods are mostly seen as something negative, which is not surprising given how the livelihoods of people in Mangkang Wetan are influenced. However, the most surprising finding, both through personal observation, are these moments of joy, like children playing in the water and catching fish who escaped the ponds. This strengthens the argument by Langill & Abizaid (2019), that there are instances in which people have adapted to these floods and much more nuance can be found in these situations. For residents in Mangkang Wetan, floods were seen as friends and became “bad” when predictability was lost. This demonstrates the way in which living with water is possible, and challenges the dominating perceptions of floods as something disastrous (Mach et al., 2022).

7.2 Conclusion- Imagining new ways of living with water

The main research question of this thesis is: *“How does the community of Mangkang Wetan respond to the daily occurring floods? And are these realities considered within the urban planning policies of the local government?”.* By researching this, this thesis aimed to analyze realities of daily occurring floods, both from the perspective of formal actors who formulate all kinds of policies to mitigate the impacts and from residents who actually live with this situation. The problem is that often, the former responds in a way that does not correspond with the latter, causing certain policies not to be effective and

exacerbating the vulnerability of already marginalized residents even further. Such as when roads are being elevated but consequently, water pours into resident's houses who cannot keep up with elevating their houses which they have to finance for themselves. To counteract these wrongdoings, one might have to find solutions elsewhere than the dominant flood management control paradigm that distributes water, voice and authority, and knowledge and expertise unequally.

Solutions can be derived from the concept of "informal citymaking", in which residents opt for other ways of coping with hardships then relying on the government, often in collaboration with other non-political actors and/or among themselves. From the data it can be concluded that much is happening on the "ground". Residents of Mangkang Wetan aim to take control over their own livelihoods and to achieve some form of integration with those in higher positions of power. This is done through elevating their houses, diversifying their income streams through non-political actors, building infrastructure themselves and mutual assistance among residents in times of need. These experiences of local residents are not shaped by static conditions of vulnerability, but it is rather understood in a dynamic and relational manner. Residents in Mangkang Wetan experience vulnerability regarding these floods, because social and historical trajectories shape relationships between different actors in society. Not only are differences in vulnerability seen in people with a different social standing (e.g. level of voice and authority in decision making processes), but also within a community itself. Especially concerning gender and in some cases financial capacity. These factors are important to take into consideration when creating policies and responses by governmental agencies. If these experiences were only understood as being something static and universal, solutions to flood related issues would be easily solvable through infrastructure. Yet, these control paradigms that dominates flood management in Semarang seem to fail residents in Mangkang Wetan and even make life more difficult. In answer to the second part of the research question, the realities of residents in Mangkang Wetan are *not* considered within flood management policies of the local government.

Rather than controlling the water, we should opt for *imagining new ways of living with water* instead. Inspiration can be taken from the responses, experiences, livelihood accumulation practices of those residing in these irreversible flood prone areas. Life can be difficult for those living in Mangkang Wetan. There is much financial worry and floods are a nuisance. Yet, people also chose to stay in Mangkang Wetan and make the best of it through various ways other than what is deemed "traditional". Floods have become an intrinsic part of daily life and in that sense have normalized their situation as something to be lived with instead of fought against. They find ways to adapt to the situation and sometimes even find joy. Instead of building infrastructure with minimal participation from communities, there needs to be more inclusion of the community's needs, perceptions, knowledge and skills. Differences in vulnerability among residents should also be given attention, to adequately take

into consideration people's capacities and how they are shaped. Inspiration can also be found in the way collaborations are seeked between themselves and other actors.

Now, caution should be given to not over romanticize this view. There are instances in which residents have been part of the flood causes themselves, e.g., inadequate waste management. There are also limitations to mutual assistance and some governmental infrastructure has been proven to be effective. Governmental departments have also been restricted financially, which influences their own capacity to act towards the flood situation in their city. Moreover, residents actually have even been much in favor of these infrastructures themselves and would like to see more. Yet the fact remains that by changing our views and including the experiences and knowledge of those affected the most within our policies, an inclusive and equitable flood management can be realized, both today and in the future.

7.3. Limitations and recommendations for future research

It should be considered however, that there are limitations to this research. Not all topics have been explored as deeply as one would like. Partly, this is due to challenges that arise when using a translator, having to use your second language and not being a member of the community that was interviewed. To combat this, clarifications were regularly used to limit translation errors. The answers of the participants are considered the objective truth, as it is their experience, although these are heavily influenced by subjectivity. Another part that contributed was the vast amount of data to be gathered in a relatively short amount of time.

Due to a lack of data further research is recommended on the exact relationships between different actors, the results cannot provide evidence on the way in which these relationships are equal to another, i.e., one actor might still hold the power of another even when they collaborate. Moreover, the limitations of the use of social capital, relational vulnerability on topics beyond gender and the way certain perceptions have been internalized by residents themselves call for further research as well.

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Appendices

A. Interview guide government

First of all, I would like to thank you for participating in my study. My name is Emma Baas, I'm a master student at Utrecht University in the Netherlands. I'm conducting this research as part of my master thesis. My research is about the way in which people experience and response to the re-occurring floods in Mangkang Wetan (and Semarang). In that way, I would like to understand different forms of flood management, give awareness to the situation in Semarang and Mangkang Wetan and to ultimately provide recommendations for countries experiencing floods in the present and future (such as my home country, the Netherlands). This interview is completely confidential. Answers will be registered anonymously and the data will not be shared to other parties beside employees of Utrecht University who are involved in the examination process of this thesis. If at any point you would like to withdraw from this study, you can notify me through text or e-mail. Your data will be deleted. It is not obligated to answer any questions you are not comfortable with. I will ask your permission now orally to record this interview, these recordings are for transcript purposed only.

Topic	**Questions**
Policy	What specific policies and strategies does the government have in place to mitigate the impact of floods in Semarang? - and in specific Mangkang Wetan?
Flood protection	What infrastructure projects are currently underway or planned to improve flood protection?
Inclusive governance	When creating policies, are other non-governmental actors involved in the decision-making process? - If so, who?
	Does the government engage with the communities in Mangkang Wetan, specifically those who reside near the coast and on river banks?

	- if so, how?
	How does the government address the long-term needs of vulnerable communities affected by recurrent flooding, such as relocation, livelihood support, or infrastructure improvements?

Every interview guide ends with general remarks: Would you like to discuss anything further that we have not mentioned yet? [conversation continues or not] Thank you again for these insightful answers. They are really valuable for my research and I'm grateful you took the time to participate in this study. Like I said, you can always contact me if there is something you would like to discuss.

B. Interview guide IKAMat and KeSEMat

First of all, I would like to thank you for participating in my study. My name is Emma Baas, I'm a master student at Utrecht University in the Netherlands. I'm conducting this research as part of my master thesis. My research is about the way in which people experience and response to the re-occurring floods in Mangkang Wetan (and Semarang). In that way, I would like to understand different forms of flood management, give awareness to the situation in Semarang and Mangkang Wetan and to ultimately provide recommendations for countries experiencing floods in the present and future (such as my home country, the Netherlands). This interview is completely confidential. Answers will be registered anonymously and the data will not be shared to other parties beside employees of Utrecht University who are involved in the examination process of this thesis. If at any point you would like to withdraw from this study, you can notify me through text or e-mail. Your data will be deleted. It is not obligated to answer any questions you are not comfortable with. I will ask your permission now orally to record this interview, these recordings are for transcript purposed only.

Topic	**Question**
General	Could you tell me a bit about the work that you do here? - How do these mangroves protect the area against flooding?
Vulnerable groups	Are there any socio-economic benefits to these mangrove ecosystems for the community?
	Are there specific programs or initiatives aimed at empowering vulnerable groups through involvement in mangrove plantation activities, such as job creation, skills training, or alternative livelihood opportunities?

	What efforts are made to raise awareness among vulnerable communities about the importance of mangrove ecosystems?
Other actors	Do you receive support from the government or other organizations?

Every interview guide ends with general remarks: Would you like to discuss anything further that we have not mentioned yet? [conversation continues or not] Thank you again for these insightful answers. They are really valuable for my research and I'm grateful you took the time to participate in this study. Like I said, you can always contact me if there is something you would like to discuss.

C. Interview guide Bintari

First of all, I would like to thank you for participating in my study. My name is Emma Baas, I'm a master student at Utrecht University in the Netherlands. I'm conducting this research as part of my master thesis. My research is about the way in which people experience and response to the re-occurring floods in Mangkang Wetan (and Semarang). In that way, I would like to understand different forms of flood management, give awareness to the situation in Semarang and Mangkang Wetan and to ultimately provide recommendations for countries experiencing floods in the present and future (such as my home country, the Netherlands). This interview is completely confidential. Answers will be registered anonymously and the data will not be shared to other parties beside employees of Utrecht University who are involved in the examination process of this thesis. If at any point you would like to withdraw from this study, you can notify me through text or e-mail. Your data will be deleted. It is not obligated to answer any questions you are not comfortable with. I will ask your permission now orally to record this interview, these recordings are for transcript purposed only.

Topic	**Question**
General	Could you tell me a bit about the work you do in general and in specific Mangkang Wetan? - What are the programs?
Floods	What are the flood issues Semarang and Mangkang Wetan face? - How is this caused?
Communities	How are communities affected by your programs? - Are communities actively involved in your programs?

	Which people are the most vulnerable in Mangkang Wetan? - How so?
	What are the challenges that you face within your work?
Other actors	Do you receive support from the government or other organizations? - i.e., do you work together with others? - How?
Industralization	Do you see an increase in industrialization within the area? - Does this affect your work and the communities you collaborate with?

Every interview guide ends with general remarks: Would you like to discuss anything further that we have not mentioned yet? [conversation continues or not] Thank you again for these insightful answers. They are really valuable for my research and I'm grateful you took the time to participate in this study. Like I said, you can always contact me if there is something you would like to discuss.

D. Interview guide residents

First of all, I would like to thank you for participating in my study. My name is Emma Baas, I'm a master student at Utrecht University in the Netherlands. I'm conducting this research as part of my master thesis. My research is about the way in which people experience and response to the re-occurring floods in Mangkang Wetan (and Semarang). In that way, I would like to understand different forms of flood management, give awareness to the situation in Semarang and Mangkang Wetan and to ultimately provide recommendations for countries experiencing floods in the present and future (such as my home country, the Netherlands). This interview is completely confidential. Answers will be registered anonymously and the data will not be shared to other parties beside employees of Utrecht University who are involved in the examination process of this thesis. If at any point you would like to withdraw from this study, you can notify me through text or e-mail. Your data will be deleted. It is not obligated to answer any questions you are not comfortable with. I will ask your permission now orally to record this interview, these recordings are for transcript purposed only.

Topic	**Question**
Social categories	What kind of work do you do? - How long have you been doing this work?

	With how many people do you live in your house?
Exposure	How long have you been living in this house?
	What kind of water problems are in the area?
	When was the last time you experienced flooding? - How was this for you? i.e. how did they experience it?
	When was the last time you experienced flooding? - How was this for you? i.e. how did they experience it?
	Does the water have an effect on your life and daily activities? - If so, how?
Coping mechanisms	When there is a flood, what do you do?
	How are you protecting yourself and your belongings/house for when a new flood comes?
	Does the government help you?
	Do other people in the neighborhood or others help you? - How? and who?
	Are there community projects to combat the floods? - Are you involved in any projects?
	Would you ever leave this area to escape from the floods?
	Has a private company offered to buy your land? - if so, did you take the offer or not? and why?
	Do you have enough capacity to deal with the floods? - If not, what should the government do?
	Do you feel represented in governmental decisions regarding the floods?

Every interview guide ends with general remarks: Would you like to discuss anything further that we have not mentioned yet? [conversation continues or not] Thank you again for these insightful answers. They are really valuable for my research and I'm grateful you took the time to participate in this study. Like I said, you can always contact me if there is something you would like to discuss.