

Exploring urban verticality during the 2011 flood in Bangkok, Thailand

Leonie Tuitjer 

Institute of Economic and Cultural
 Geography, Leibniz University, Hanover,
 Germany

Correspondence

Leonie Tuitjer

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Geographers have a long-established research interest in the ways infrastructures shape urban flood vulnerability and how urbanites cope with urban flooding. In this paper, I contribute to this literature by exploring the three-dimensional city during an urban flooding situation. Within a case study (based on interviews and ethnographic observations), I attend to *ad hoc* coping practices of a diverse city population during the 2011 flood in Bangkok. I foreground the vertical direction of these strategies and the affordances of the urban built environment and urban infrastructures that enabled such coping. The paper thus stages a conversation between established literature on urban flood vulnerability and coping with an emerging interest in vertical urbanism literature. Through this conversation between the two literatures, research on urban verticality is probed to consider verticality as a crucial dimension of urbanism during times of flood disasters.

KEYWORDS

Bangkok, coping strategies, floods, vertical urbanism, vulnerability

1 | INTRODUCTION

The year 2011 was a turbulent time in the Kingdom of Thailand, as a devastating flood wreaked havoc in much of the country (Marks & Lebel, 2016). This paper explores *ad hoc* flood practices in relation to urban infrastructures and housing. In my analysis, I especially foreground the ways in which verticality influenced these coping practices during the inundation.

Scholars researching urban flood vulnerability and coping (e.g., Bose, 2016; Kelman & Rauken, 2012; Padawangi et al., 2016; Werritty, 2006) have already noticed the importance of the vertical direction within urban flood scenarios, however, without explicitly articulating the potential politics of exclusion, risk, and safety within them. Thus, I draw on recent debates on vertical urbanism (Adey, 2010; Elden, 2013; Graham, 2004, 2014, 2016; Graham & Hewitt, 2012; Harker, 2014; Harris, 2015, 2018; Lawton, 2019; Rosen & Charney, 2016) to broaden our understanding of flood experiences as vertical, while simultaneously probing vertical urbanism literature to take into account urban disasters and human responses to them.

The paper proceeds as follows. First, I briefly situate my research within discussions on urban flooding, focusing on the ways in which this literature (implicitly) perceives the spatiality of floods. I then introduce my methodology and empirical material before offering insights on how verticality mattered during the 2011 flood. I conclude that attending to the vertical dimension of coping during urban floods may contribute new impulses to the study of urban verticality, as well as to the study of urban flood vulnerability and *ad hoc* coping strategies.

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2 | COPING WITH URBAN FLOODS

Urban flooding events have received considerable academic attention, especially within human geography (Ajibade & McBean, 2014; Akmalah & Grigg, 2011; Braun & Aßheuer, 2011; Few, 2003; Jabeen et al., 2010; Padawangi & Douglass, 2015; Padawangi et al., 2016; Pelling, 1999; Santha et al., 2016; Whittington, 2016; Wisner et al., 2004). Repeatedly, researchers have pointed out that floods pose differentiated risks and vulnerabilities to diverse urban inhabitants. For example, class (Marks, 2015), citizenship and ethnicity (Santha et al., 2016; Tuitjer, 2019), and gender (Ajibade et al., 2013; Hwang & Chung, 2018) all differentiate people's experiences of urban floods.

2.1 | Flood risk and the built-environment

In addition to socio-economic categories, unequal flood risk also arises within the cities themselves, through the built environment. For centuries, urban planners and architects have thus tried to create urban flood barriers and sewers, separating people from water (Kelman & Rauken, 2012). Gandy (2014) attends to the construction of the Paris sewers in the 19th century as a paradigmatic symbol of the progress within urban planning and civil engineering and by that as the paradigmatic symbol of urban modernity and progress itself. The obsession of planners and architects with the taming of urban water has been called a 'fetish' by Kaika and Swyngedouw, writing: "Dams, water towers, sewage systems and the like were celebrated as glorious icons, carefully designed, ornamented, and prominently located in the city, celebrating the modern promise of progress" (2000, p. 121). Attending to these infrastructures also shows how urban space becomes increasingly vertical, with tunnels now reaching deep below the city and dykes towering far above ground level (Graham, 2016).

The fetish of urban hydraulic infrastructures was tied to the colonial quest to "civilise" cities across the globe. Until today, colonial legacies of fragmented infrastructures amplify urban inequalities in times of floods within postcolonial cities of the so-called Global South (e.g., Padawangi et al., 2016; Pelling, 1999). As an example, Ranganathan (2015) explores the dams, dykes, and sewers that make up the aging and misaligned hydro-infrastructure of Bangalore, India. The colonial legacy is still manifest within the limited provisions of flood defence throughout the former "native quarters" of the city. Yet, the modernist dream of a hydrological city, free from flood risks but sanitised and serviced by fresh water, has never been realised in many postcolonial cities (Gandy, 2014; Kooy & Bakker, 2008). Historical injustices, manifest in the built environment, still cause inequalities today and can negatively affect future urban planning (e.g., Padawangi et al., 2016; Whittington, 2016). The postcolonial city with its (often misaligned, partial, and aging) underground pipes, canals, and sewers and its high rising condominiums, dams, dykes, and flyovers then encourages us to perceive of an urban flood as a profoundly vertical and unequal event.

2.2 | Flood experiences and vertical coping

Portraying urban spaces of the Global South as spaces with non-functional infrastructures and housing provisions risks perpetuating the stereotypical image of non-Western cities as sites of chaos and failure (Robinson, 2002). Hence, it is also important to pay attention to the actual, lived flood experiences to make visible the agency of people living in these cities (Akmalah & Grigg, 2011).

Anjaria (2008) highlighted the improvised and *ad hoc* coping practices of Mumbaikers, based on local knowledge and past flood experiences, when their city flooded in 2005. Spontaneous gestures of solidarity and generosity emerged when the urbanites started to cooperate and support each other during the crisis, transcending class, caste, and religious divides. Research from Lagos has similarly emphasised the agency of urban communities: "Coping strategies employed in the communities included the construction of temporary bridges with sandbags and transportation of victims to safer sites by canoes" (Ajibade & McBean, 2014, p. 83). Thus, when official flood infrastructures are scarce, people not also sink into chaos, but rather tend to protect and support each other. Jabeen et al. (2010) argue that taking a closer look at the coping mechanisms of the urban poor helps to generate insights into how to develop more community-led adaptation and resilience measures.

Researchers have also alerted us to the multi-dimensionality of such coping practices. Cardosi et al. (2018) emphasise the multilevel spatial development of informal housing in Nairobi, stressing that urban verticality is not limited to the urban designs of star architects, but also plays an important role within informal coping mechanisms. Similarly, Jones (2017) explores the vertical adaptations of homes in an Indonesian informal settlement where people struggle for access to light and air circulation by incrementally stacking new floors on top of their houses. The vertical axis of the city may thus also

be seen as a repository for “getting off the ground” (to borrow Graham and Hewitt’s (2012) phrase) in more informal, *ad hoc* ways.

In particular, during times of urban floods, the city’s built environment may be seen as a repository of potentials to escape from the submerged ground (Bose, 2016; Kelman & Rauken, 2012; Padawangi et al., 2016; Werritty, 2006). Thus, this paper continues to unpack the flood vulnerabilities arising from the vertical city and the vertical coping practices of diverse Bangkokians.

3 | METHOD

Harker (2014) and Harris (2015) have pointed out the need for more diverse, qualitative, and ethnographic research that attends to the specific practices embedded in the socio-spatial uses of the city. They particularly call for an attention to the verticality of urban life. In this paper, I am therefore drawing attention to the vertical coping practices during the 2011 flood and show how vertical infrastructures and living arrangements enabled or undermined these practices.

The paper is based on qualitative research (in-depth interviews as well as ethnographic observations) conducted during five months of fieldwork in Bangkok from October 2015 to February 2016. Much of the ethnographic work was done during repeated visits to an informal settlement situated in the northern district Bangkok, Huay Kwang. The community built their houses along Khlong (Canal) Bang Sue and were severely affected by the 2011 flood. Furthermore, I conducted 34 interviews with various urban inhabitants (e.g., expatriates, local academics, leaders of urban poor communities, NGO workers, environmental activists, and government officials). Within 15 interviews, I was able to discuss personal experiences of the 2011 flood. All of these 15 interviews touched on the theme of urban verticality during the flood in various ways. I am focusing on excerpts from six of these in-depth interviews, as they articulate the particular vertical practices of *ad hoc* coping most directly. As Thailand has been under military rule since the latest *coup d’état* in 2014, interviewees are either anonymous or – whenever given explicit permission – are introduced by their first names (Thongchai and Porpla) or nicknames (as in the case of “Auntie Lek,” which translates into “Little Aunt”). The help of interpreters was used during some of the interviews. Despite the small sample size, the explorative nature of in-depth interviews and the ethnographic observations allow to illustrate various aspects of verticality and how it was made useful by Bangkokians during the flood.

4 | VERTICALITY AND FLOOD INFRASTRUCTURE

The city of Bangkok is located in the Chao Phraya River Basin and is no stranger to floods. Built only about a metre above sea level and in close proximity to the river, much of the city’s terrain is threatened by yearly inundations during the monsoon season (McGrath, 2007). In 2011, a combination of heavy rainfall in upland Thailand and the Chao Phraya Plains and five tropical storms brought immense amounts of rain across the country. Yet, meteorologists found that the amount of rainwater does not explain the magnitude of the losses within the greater Bangkok Metropolitan Area (BMR) caused by the flood (Gale & Saunders, 2013). Political choices and failing infrastructure exacerbated the flood and turned it into a disaster (Marks, 2019). Human activities like substantive land use change, the filling of canals and rapid urbanisation particularly contributed to the devastating effects of the flood (Marks & Elinoff, 2020). Within the BMR, industrial estates suffered massive losses and global supply chains within the automobile and hardware sector were disrupted (World Bank, 2012), while within the capital itself the outer districts to the north and east of the city were particularly hard hit. Due to rapid urbanisation, inadequate urban planning, and little respect for urban planning zones, the city’s flood infrastructure now resembled a bricolage of towering dams, dykes, floodgates, retention basins, and a few remaining historical *khlongs* (canals), as well as underground pumps and tunnels (Blake, 2015). Research has shown that the Thai government continues to favour such partially aligned engineering solutions to curry favour from powerful actors without adequately integrating new and existing measures, thus severely compromising the effectiveness of the city’s flood defence (Marks & Elinoff, 2020).

Within the interview with Thongchai (Interview 1), a senior officer at the Ministry for Urban Planning, the lasting adoration of engineered solutions for flooding within the population and among his colleagues was discussed. Here he specifically foregrounded the emotional and affective dimension of these structures, triggered by their physical presence and height:

Mostly they [flood infrastructure in Bangkok] are concrete structures [...]. Because people love these structures. They can touch them! Even though they are ugly structures. [I think this is] because the engineers have

convinced the people that such structures can protect them ... because you can see them! They are so high, these walls. (Thongchai, January 2016, Bangkok)

Concrete and steel project images of strength and durability here. The towering walls, no matter how aesthetically unpleasing, are functioning as promises of protection. Having a wall between oneself and the water appears to be comforting for many Bangkokians, Thongchai suggests.

Across the globe, dams and dykes, floodgates, and floodwalls speak of the enduring attraction of hard infrastructural measures that are designed to “separate water from people” (Kelman & Rauken, 2012, p. 144). Yet, this separation may not only break down in crucial moments of flooding, but may also produce prohibitive costs for construction and maintenance, as well as lead to new vulnerabilities (Howgate & Kenyon, 2009, p. 329). Thai environmental activist Porpla (Interview 2), whom I met for an interview in January 2016, pointed out that the people living outside the dykes are frequently left in a position to fend for themselves during floods:

We Bangkokians ... we are like a spoilt child, because we are protected by the dykes. We call them the “King Dykes” [because they were designed by King Rama IX] which are built around the city. They [the dykes] are roads built higher around the city. [...] But there are a few areas outside the dykes [...] and they have to face floods and water lock-ins every year because they aren't part of the drainage system. So while they are also a part of Bangkok, they [still] have to fend for themselves. (Porpla, Environmental activist, January 2016, Bangkok)

The elevated flood infrastructures reveal their relational properties here and criss-cross the city, rendering some urban quarters more vulnerable than others. Like a border, the dykes produce new divisions within the city, “spoiling” Bangkokians (as Porpla put it) and rendering vulnerable the people living beyond the dykes and drainage system. By raising the ground at strategic sites within the inner city, a new topography of vulnerability is produced that correlates living in the peripheries of the city with an increase of flood risk (see also Marks, 2015; Marks & Lebel, 2016). The floodwalls and dykes are thus sites of inclusion and exclusion, producing both risks and safety respectively (Graham, 2010).

Furthermore, informal and temporal flood barriers emerged when people started to assemble temporary floodwalls from sandbags around their properties. Around the world, such improvised infrastructures emerge during times of flooding (Bose, 2016; Brown & Damery, 2002; Padawangi et al., 2016; Padgham et al., 2014), introducing temporal and inexpensive barriers across cities, redistributing flood risks and vulnerabilities. Similarly, Bangkokians maximised the safety of their own property by raising such provisional structures around their homes. People also tore down sandbags in some parts of the city, hoping to speed up the drainage of water from their neighbourhoods (Marks & Lebel, 2016). The combination of these uncoordinated efforts made the flow of water more unpredictable during the flood, exacerbating risks and vulnerabilities. The minor differences in height achieved through the informal and temporal stacks of sandbags produced a new type of verticality that altered the course of events. These provisional structures profoundly shaped the experience of the flood, as people hoped and prayed that their improvised flood defences would be effective (Cohen, 2012). Thus, there is a need to think of the submerged territory as vertical, rather than perceiving of it as simply spread out over a flat plain (Marks, 2019). In addition to that, there is a need to also acknowledge how simultaneously the flood itself set in motion a vertical process of *ad hoc* coping practices that further altered the space and flow of the flood.

5 | VERTICAL HOMES

Verticality also mattered within living arrangements in the densely populated city during the flood. Bangkok saw an excessive boom and bust cycle within its condominium housing market, which contributed to the Asian Financial Crisis in 1997 (Sheng & Kirinpanu, 2000). Hence, the city's skyline has been made and remade by increasing numbers of skyscrapers and high-rise office buildings in recent decades (see Figure 1).

Yet, not all condominiums are luxury estates for the urban elite (Baxter, 2017). In fact, research found that an increasing number of middle-class occupants are now pushing into the city's condominiums (Matsuyuki et al., 2013; Sheng & Kirinpanu, 2000). An environmental activist (Interview 3), who preferred to remain anonymous, suggested that there seems to be a growing number of younger Bangkokians who are fed up with long and painful rush-hour commutes to the city. A condominium lifestyle seems to be attractive for an increasingly younger middle class because it provides better mobility and transport options:



FIGURE 1 View from condominium balcony in Asoke area, September 2016.

Source: Own picture

So they [younger Bangkokians] also need to think about how to drop their children at school and how to get them home [...] [by] the BTS [Bangkok Sky Train] and how they can get rid of the car as now the car is a burden. They don't know where to put the car. [...] So [we see] a big change of lifestyle. [...] So what may happen is that the new generation will not buy a car. They will become like New Yorker and just use the BTS and MRT [Bangkok Underground]. And the big bargain for the young people is that [...] getting out of the condo near the BTS is little effort. They can go in and out like 10 times a day. But when you are in the suburb and want to see your friends in town, it is a big effort. [Male environmental activist, February 2016, Bangkok]

The interview suggests that age and lifestyle contribute to a sustained interest in vertical living. Interestingly, within the interview this push for the inner city is associated with a car-independent lifestyle that modern New Yorkers supposedly share, as well as with the idea that road-based travel by car is a burden. High-rise inner-city homes may thus contribute to a particular identity as well as specific notions of home and belonging, as Baxter (2017) has argued. Living in a vertically stacked condominium links certain people across the city and allows social networks among them to flourish, as such verticality is part and parcel of urban everyday life (Baxter, 2017; Harris, 2015). In Bangkok, it is furthermore connected to urban vertical transport provided by the new sky train and underground metro service. Harker (2014) has observed for city life in Ramallah that between the vertical and the horizontal an ordinary network of relations must exist that sustain each other. A vertical middle-class lifestyle in Bangkok equally involves a relational network between vertical and horizontal spheres of the city, contrasting with discussions that see vertical living arrangements predominantly as luxurious, isolated homes in the sky pitched against ordinary (grounded) city life (Graham, 2016).

Disruptions like the 2011 flood, predicted to increase in frequency and magnitude due to climate change (Marks, 2011), may further increase the attractiveness of a vertical condominium lifestyle.

A female environmental activist (Interview 4), who also preferred to remain unnamed, speculated about the likelihood of condominiums becoming more attractive after the flood:

I think another result from that flooding is that there are even more condos [condominiums] in the city close to the BTS. Because people are now seeing that their homes in the suburbs are at risk of flooding. So they stick to the city, to tall buildings with access to department stores and BTS. So at least they have somewhere to go. You know as opposed to a home that is harder to protect against flooding." (Female environmental activist, February 2016, Bangkok)

While no official statistics are available that would support her impression, it seems that the tall inner-city buildings and reliable public transport emerge as tokens of protection against the discomforts and dangers of flooding. Certainly, however, this type of protection is only available for the people who have the financial means to make choices about how and where to live in Bangkok. Vertical living, in the activist's perception, then is not only a mechanism to distance oneself from the chaos of the metropolis (Graham & Hewitt, 2012), but also from the unstable hydrology of the city and frequent flooding.

During the 2011 flood, people also exploited much smaller vertical distances. From interviews with people across different income groups, I learned that moving upstairs and securing valuables on upper floors were commonly used *ad hoc* coping practices during the flood. A retired professor from the geography department of Chulalongkorn University (Interview 5) told me that he and his wife refused to move to a government emergency shelter when their house got flooded. Instead, they relocated to the second floor of their townhouse. Here, they spent almost a month, using a small boat to float from one dry patch of their neighbourhood to the next to buy provisions. Their local street markets had quickly converted to floating markets, using boats and rafts to sell goods. Within the conversation, I learned that this time was not only a period of suffering, but also involved joyful, eventful moments when barbeque dinners were assembled on the upstairs balcony.

Auntie Lek (Interview 6), a community leader of an informal settlement, equally refused to leave her house and instead moved upstairs. With the support network of the community and a few boats and home-made rafts, assembled from scrap material, they managed these difficult times together. Moreover, the aforementioned town planner Thongchai (Interview 1) remembered that he felt he had little choice but to remain in the second storey of his house as he would not have been allowed to take his four big dogs with him to an emergency shelter. Together he and his dogs lived through the flood upstairs, relying on friends and neighbours to come by with food and water. Here, vertical coping practices were sustained by *ad hoc* improvisations that entangled horizontal floating devices for transport to make provisions with upstairs living arrangements. What is more, these coping practices involved networks of friends, relatives, and their community and entailed sacrifices of comfort and safety for the sake of either remaining independent of government support or staying together with significant (non-human) others. Crucially, what emerges from these stories is an impression of Bangkok's "inhabited landscapes of vertical urbanism" (Harris, 2015, p. 609). Within the stories emerges a side to Bangkok's vertical urbanism that is irreducible to stories of exclusion and vertical urban expansion. Rather the stories speak about the importance of social relations, emotions, and affect that made possible and shaped vertical living within times of crisis.

Yet, such practices of vertical coping during the flood are not unproblematic. First, not all people have equal access to vertical space on which to live during a flood, nor does retreating to a higher floor secure the built environment against floods in the first place. Second, such *ad hoc* self-help measures are also posing challenges of accessibility for people with impairments and may potentially prove unsuitable for older people within the aging Thai society. While vertical coping practices remain embedded in wider constraints and opportunities afforded by unequally distributed resources, nevertheless researchers found that such *ad hoc* practices are extremely important during flooding events. In a research project in Jakarta, where flooding is a recurring problem, coping mechanisms of retreating to second floors and building houses on slightly elevated sites are frequently mentioned (Padawangi et al., 2016, p. 147). Historically, as Werritty (2006) observed for the UK countryside, building settlements on marginally raised ground was common and relied on local knowledge of normal flood levels.

In particular, within urban settings a vertical approach to flood risk thus seems necessary. In Bangkok, efforts in urban planning and urban resilience-building might benefit from reconsidering architectural styles that are more accommodating to the hydrological extremes the city is facing. Long before the first skyscraper was built in Bangkok, urban houses were in fact well adapted to local seasonal floods. Once, houses were commonly built on pillars, raising them off the ground a few metres as a way to protect the inhabitants from altering water levels during the monsoon season (Askew, 2002; O'Neil, 2008). A few of these houses can still be found in the informal settlements along some of the canals running through Bangkok (see Figure 2).

Authors have thus stressed the potential for reviving such architecture (McGrath, 2007; Nilubon et al., 2016). A comparative study showed that the 2011 flood caused far greater damage in modern urban houses without stilts than in traditional, stilted houses (Monkonkerd et al., 2013). In Bangladesh, urban informal communities are equally "building houses on stilts, storing goods in upper floors" (Bose, 2016, p. 172). Returning to such a traditional "vertical" architecture might thus support flood adaptation practices.

6 | CONCLUSION

This paper focused on urban verticality to explore *ad hoc* coping practices during the 2011 flood in Bangkok. By doing so, the paper has argued that urban flood research should embrace a more explicitly vertical approach to think about *ad hoc*



FIGURE 2 Informal settlement along Khlong Lat Prao canal, Bangkok.

Source: Own image

coping practices. Simultaneously, the paper has demonstrated that vertical urbanism literature may expand its research scope to acknowledge the more mundane and *ad hoc* practices of vertical coping in times of disaster. By broadening the scope of inquiry of vertical urbanism to more temporary and informal ways in which urban verticality matters, new insights about how cities function in times of disaster can be gained. What is more, through a qualitative exploration of how verticality matters within practices, rather than in architecture, discourse, or planning, new lines of inquiry can emerge, as this paper has demonstrated.

Specifically, the paper analysed how far vertical infrastructures and housing arrangements can be seen as sites where vulnerabilities are produced. Condominiums and flood gates, for example, project safety, yet may produce new vulnerabilities for urban inhabitants who lack access to them or live beyond their reach. In more informal and *ad hoc* ways, verticality was exploited by various urban inhabitants who preferred retreating to the second floor of their homes instead of relocating to government shelters. Crucially, such vertical practices were entangled within horizontally stretched social networks. Exploring such vertical coping practices may contribute insights for urban planning and foster new ways of thinking about urban flood resilience. Thinking vertically about urban flood risks may support a revival of traditional architectures such as stilted homes that may support urban flood adaptation. Vertical urbanism can usefully draw on these *ad hoc* practices and enrich the focus of research by further exploring the liveliness of vertical sites and practices within the urban.

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DATA AVAILABILITY STATEMENT

Due to the politically difficult situation within the research site Bangkok, all interviews are anonymous and no participant consented for the data to be made publically available. For further details on the research project, see the published dissertation the data was initially collected for: <http://etheses.dur.ac.uk/12546/>

ORCID

Leonie Tuitjer  <https://orcid.org/0000-0001-6178-7757>

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