

## Resilient Cities and Homeowners Action: Governing for Flood Resilience Through Homeowner Contributions

Homeowners and the Resilient City

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# Resilient Cities and Homeowners Action: Governing for Flood Resilience Through Homeowner Contributions

*Barbara Tempels*

## 2.1 INTRODUCTION

In academic debates and policy making alike, discourses are shifting from traditional flood protection approach, in which state-funded engineering works provide public protection to flooding, towards sharing responsibilities in managing flood risks. Taking into account the limited resources of governments, climate change and the inherent limitations of flood protection, sharing responsibilities in flood risk management among all stakeholders can become an important part of the solution (Kreibich et al., 2011). More and more, residents, spatial planners, architects, etc. are expected to contribute to the management of flood risks in one way

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or another (Matczak & Hegger, 2021; Penning-Rowsell & Pardoe, 2012; Rufat et al., 2020).

This redistribution of responsibilities requires an increased homeowner involvement, among others. It is believed that by activating homeowners, complementary measures to traditional flood protection can contribute to a diversification of measures and thus overall resilience to flooding (Hegger et al., 2016). However, these discourses are in sharp contradiction with homeowners' expectations, and while individual adaptation measures to reduce the impact of climate change exist, for the moment homeowners do not widely implement them. Homeowners often still assume that managing natural hazards is a governmental responsibility and governments and engineers are technically and financially capable of preventing flooding.

This chapter focuses on the role of homeowners in reaching the goal of urban resilience from a governance perspective. It explores the effects of this shift towards increased homeowner contributions on distributions of responsibilities. Based on literature, it discusses how homeowners can contribute to flood resilience, and what are the technical, economic, legal and social rationales to do so. Then some of the challenges and dilemmas that arise when considering the effectiveness, efficiency and legitimacy of increasing the role of homeowners in flood risk governance are unpacked. Tying together the rationales for increased homeowner contributions and the challenges and dilemmas that it generates, the chapter concludes with an outlook on the technical, economic, legal and social conditions and triggers within flood risk governance that might encourage increased homeowners' involvement in flood risk management.

## 2.2 HOMEOWNER CONTRIBUTIONS TO FLOOD RESILIENCE

Flood resilience is commonly operationalised as the capacity to resist, the capacity to absorb and recover and the capacity to transform and adapt (Hegger et al., 2016; Tempels, 2016). To achieve flood resilience, it is believed that flood risk management strategies need to be diversified (Hegger et al., 2016, 2018; Matczak & Hegger, 2020). Such diversification includes combining flood prevention, flood defence, flood risk mitigation, flood preparation and flood recovery. Water managers, who are traditionally responsible to manage flood risks, do not have the capacity nor the mandate to take all these different types of measures,

such as avoiding the presence of assets in flood-prone areas or preventing damages through measures on land. Diversification can only be attained if different stakeholders actively contribute. This leads to the sharing of responsibilities among water managers, disaster managers, spatial planners, local governments but also individual citizens, civil society and homeowners to manage flood risk as an important second principle in building flood resilience (Henstra et al., 2019; Mees et al., 2016b; Rauter et al., 2020).

In this context, a lot of attention goes to the role of homeowners, in particular in relation to flood protection on private land. It is generally believed that homeowners not only can contribute to flood resilience, but are crucial in achieving flood resilience (Hartmann & Jüpner, 2020; Snel et al., 2020). In principle, citizens and households can—and to a certain extent already do—contribute to all aspects of managing flood risks: prevention, protection, preparation and recovery. They do so both individually and collectively, and through structural (or physical) and non-structural (or organisational) measures, using their resources such as money, time, physical labour, knowledge and other human capital. For example, they can prevent flood risks through their location choice or by buffering or infiltrating water on their private properties, they can protect themselves against flooding by taking protective measures in and around the house (property-level protection), they can prepare for flooding by removing valuable assets from the ground level, engaging in early warning systems and training and planning for an emergency situation, and they can contribute to recovery through volunteering. However, academic literature on citizen involvement mainly focuses on homeowners adapting their houses—similar to the prevalence of flood protection over other types of measures in public flood risk management. Attems et al. (2020) provide a comprehensive overview of property-level flood risk adaptation measures and discuss the costs and technical feasibility for new and existing buildings. They distinguish five main property-level strategies to protect properties at risk: (a) avoidance of flood discharge (stay clear of flood waters), (b) wet flood-proofing (accepting flood waters), (c) dry flood-proofing (rejecting flood waters), (d) barriers, (e) emergency measures, and (e) other mitigation measures.

In this context, understanding motivation of protective behaviour has gained particular interest (see Chapter 4). Such insights further support an increased involvement of homeowners in flood risk management by

formulating incentives for protective behaviour (Kazmierczak & Bichard, 2010; Kreibich et al., 2011; Oakley et al., 2020).

Depending on the social context, resilience takes on a different meaning, and ‘giving meaning to the concept of resilience in adaptation strategies requires making normative choices’ (Keessen et al., 2013, p. 45). Indeed, while resilience was introduced as an analytical concept, its application in spatial planning, flood risk management, etc. has taken on a normative role (Davoudi et al., 2012; Tempels, 2016). When using resilience, it is hence important to consider the political choices that underly resilience discourses (Dewulf et al., 2019). By discussing the challenges and implications involved in increasing homeowner contributions, this chapter aims to unravel the normative choices that underly the role of homeowners in the resilience debate.

## 2.3 RATIONALES FOR HOMEOWNER INVOLVEMENT

Over the last decade, an increased role for homeowners in flood risk management has been advocated in academia and practice alike. Different arguments are used as to why homeowners should take up an active role in flood risk governance. Based on literature review, Snel et al. (2020) identified four lines of argumentation used in academic work to justify the need for homeowner adaptation to flooding, linking it to different scientific traditions.

### 2.3.1 *Technical: Climate Change and Urbanisation*

Stemming from the natural sciences reasoning, it is often stated that under current conditions of increasing flood risks, flood protection alone is not sufficient. These risks are increasing due to climate change and urbanisation, and flood protection systems have inherent limitations in terms of the degree of protection offered. This means that strategies that have worked in the past are no longer sufficient to manage current risks. This is supported by the fact that substantial losses remain despite extensive flood protection being in place (Rauter et al., 2020). Therefore, complementary strategies and measures are necessary.

### 2.3.2 *Economic: Minimisation of Damage Costs*

Secondly, governments are not financially able to provide public flood protection to everyone, as flood protection has high implementation and maintenance costs (Rauter et al., 2020). As homeowner adaptation can minimise (collective) flood damages, it is more economically efficient to complement public protection with homeowner adaptation. In other words, this economic argumentation focusses on minimising damage costs.

### 2.3.3 *Legal: Privately Owned Properties*

The third line of argumentation relates to legal aspects of land ownership. It states that private lands are necessary to manage flood risks, since large-scale protection measures alone cannot protect everyone. Since public bodies have very limited access to and control over private lands, it is up to landowners to contribute to flood risk management by implementing flood protection measures on that land (Forrest et al., 2021).

### 2.3.4 *Social: Division of Responsibility*

Lastly, flooding presents a challenge that affects society as a whole, which is why it could be argued that managing flood risks is a shared responsibility between government and citizens. In practice, however, citizens are often not aware of flood risk and/or their responsibilities in managing them.

Especially the technical limitations of flood protection (natural sciences argumentation) and need for sharing responsibilities (social argumentation) are widely echoed. Economic and legal argumentations are less prevalent. Snel et al. (2020) argue that these economic and legal argumentations in particular might resonate better with individual homeowners and thus might better contribute to homeowner activation, as they appeal to the micro-scale and are more directly linked to the specific situation of individual homeowners, rather than relying on macro-level rationalisations.

## 2.4 EFFECTIVE, EFFICIENT AND LEGITIMATE FLOOD RISK GOVERNANCE

Now that we have established how and why homeowners can contribute to managing flood risks, we delve deeper into the governance considerations involved in this shift. Here we address whether the shift from public protection to homeowner involvement in flood risk management is effective, efficient and legitimate. Effectiveness encompasses the question of whether property-level measures by homeowners can successfully achieve flood resilience by lowering flood risks. Efficiency is about achieving the management of flood risks by using as little resources as possible. The question here is whether property-level protection is cost-efficient (in a wide sense), and how it relates to traditional flood protection approaches. Legitimacy addresses the question of responsibility, fairness and justice. In the following section, we discuss how achieving flood resilience through homeowner adaptation might challenge these governance aspects of flood risk management.

### 2.4.1 *Effectiveness*

It is widely accepted that private flood mitigation measures lower individual flood damages (Kuhlicke et al., 2020). Kuhlicke et al. (2020) provide an overview of studies looking into the effectiveness of private measures. They have found that depending on the specific type of measure and the annual probability of being flooded, different levels of effectiveness are found. In other words, homeowners can contribute to resilience by complementing existing flood risk management strategies and thus diversifying these strategies (Hegger et al., 2016).

However, since this is a relatively new field, knowledge and expertise are still missing to ensure a systemic rollout of such measures. On the one hand, traditional flood protection can count on well-established safety standards that have been tested through time and trained engineers that are capable of providing protection. They are therefore perceived to be reliable. On the other hand, standards for property-level protection are either lacking or immature. Property-level protection in many countries is still a niche, that represents a fragile market with few providers. This hampers confidence in the effectiveness of these measures. In fact, anxieties about the effectiveness of property-level protection might actually lower the uptake.

### 2.4.2 *Efficiency*

As academia and experts question the efficiency of traditional measures considering their substantive fixed costs linked to the exclusive implementation of structural measures with high maintenance costs (Rauter et al., 2020), there is an increased academic interest in the efficiency of private adaptive measures. Based on literature review, Kuhlicke et al. (2020) find that while the measures can be expensive for homeowners, the use of property-level protection can still be cost-effective in the long run, since the benefits in terms of damage reduction financially outweigh these costs. Especially small investments and flood-adapted uses produce more benefits than costs (Kuhlicke et al., 2020). The financial efficiency can be further improved by linking up private adaptation efforts with recovery investments (Slavíková et al., 2020).

Cost-benefit analysis which model and weigh the most efficient options are often used to evaluate the economic efficiency of flood risk management strategies. However, what are the most optimal adaptation measures on an individual-building level depend highly on the specific flood risk on that plot of land (i.e., depth and frequency). Individual adaptation measures require a different approach than the conventional, spatially aggregated area-based approach (de Ruig et al., 2020). This makes it harder to integrate property-level protection measures into conventional models used to justify the selection of flood risk adaptation measures.

Furthermore, the voluntary nature of property-level protection further complicates the integration of the contribution of property-level protection into wider flood risk management strategies. Private flood protection measures for properties at risk are often not mandatory and uptake varies widely. Since there is little control over the implementation of these measures, it is hard to count on homeowner contributions to lower overall flood risk levels in flood risk management models, even if they can be (more) efficient in lowering flood risks. Private flood protection measures are often seen as complementary to classic public protection, as a matter of individual choice and not strictly necessary. It is important to mention here that while efficiency is always an important goal, especially in public policy, overlaps between measures and approaches might actually positively contribute to flood resilience, as redundancy increases a system's dependability and thus resilience.



Another element that plays into considerations of efficiency is the fact that floods not only produce monetary damages, but also wider subjective well-being or mental health impacts or indirect welfare consequences (Kuhlicke et al., 2020). This means that it can be assumed that the efficiency is even higher than the purely monetary cost–benefit balance, although it is currently unclear how property-level protection performs in relation to public protection on this aspect.

### 2.4.3 *Legitimacy*

The shift towards increased homeowner contributions raises questions on the distribution of responsibilities across the different stakeholders in managing flood risks. The choice between large-scale protection and property-level protection is not merely a matter of technical soundness or cost–benefit ratios, but also has important implications for the locus of responsibility and investments between state and individual.

Based on extensive literature review, Alexander et al. (2018) identify three core themes to conceptually clarify legitimacy in the context of flood risk management: (1) representative deliberation, (2) equity and justice and (3) socio-political acceptability. In relation to representative deliberation, studies have found that increased responsibilities for homeowners are often not accompanied by increasing participation rights or resources (Kuhlicke et al., 2020; Thaler & Hartmann, 2016).

The behavioural turn in flood risk management is built on the assumption that homeowners have the capacities to engage in disaster risk reduction (Kuhlicke et al., 2020; Rufat et al., 2020). However, there is an increasing criticism on the lack of regard for social and spatial justice issues in the development of policies that shift responsibility for flood risk reduction onto individuals and homeowners (Rufat et al., 2020). A thorough consideration of this assumption opens questions on social vulnerability, environmental justice and (discursive) power structures (Kuhlicke et al., 2020). For example, in relation to the distribution of costs and benefits (Penning-Rowsell & Pardoe, 2012), it is the question of to what extent the government or homeowners should and can be liable for flood damages, and managing the risks related to floods. These questions become increasingly relevant, considering the fact that due to climate change and the historically heavy reliance on government-led flood protection, areas that were previously considered safe from flooding are increasingly affected by floods. Property-level protection in

such areas requires high investments. Furthermore, as buildings affected by flooding become less valuable, vulnerable populations might move into flood-prone parts of the city (Nagenborg, 2019), relying on property-level protection might in some cases put the responsibility on the most vulnerable of our societies.

The shift towards increased homeowner responsibilities also has important implications for socio-political acceptability, the last core theme of legitimacy. From the perspective of homeowners, the idea of sharing of responsibilities is not predominant. Citizens expect to be protected from natural hazards such as floods, as governments are perceived to be technically and financially capable and responsible of preventing flooding (Raška et al., 2020). This expectation is based on the legitimacy of the welfare state, even if flood protection measures are not an obligatory responsibility of the state (Mees et al., 2016b; Rauter et al., 2020; Tempels, 2016; Thaler & Hartmann, 2016). For example in Belgium where governments have no explicit formal obligations to provide flood protection beyond the general principles of government, such obligations are widely assumed by the public (Mees et al., 2016b). Also in Austria, Rauter et al. (2020) have shown that society holds public authorities responsible for flood risk management. Strikingly, even Austrian governmental stakeholders seem to agree that the government maintains the main responsibility for managing flood risks, and the envisioned increased responsibility for private actors is limited to simple and affordable property-level protection measures (Rauter et al., 2020). This goes hand in hand with a high level of trust in the current state-led system, and more specifically the expertise that governments have and the technical flood infrastructure in place (Rauter et al., 2020). If homeowners are to take up more responsibilities in managing flood risks, the socio-political acceptability of such a shift will still have to increase significantly.

## 2.5 HOMEOWNERS AND GOVERNING FOR FLOOD RESILIENCE: A COMPLEX RELATION

In this section, we discuss what is needed to overcome some of the challenges discussed above to push for an increased homeowner involvement in flood risk management. It does not go into the personal factors that influence mitigation behaviour (as addressed by Chapter 4), but focusses on the situational factors (Attems et al., 2020), and the governance setting in particular.

Research shows that current governance arrangements do not really encourage property-level flood risk adaptation measures. Instead, forces of stability are predominant and hinder change (Rauter et al., 2020). Over the last decades, most West-European countries have invested in government-funded flood protection measures. A sole focus on these measures has led to increased exposure due to the accumulation of people and economic activities in areas which were deemed to be protected (Haer et al., 2020). This further justifies a continuous need investment in flood defences (Baan & Klijn, 2004), leading to a lock-in of a technocratic flood risk management approach.

Furthermore, research suggests that governmental flood protection can reduce the incentive for other types of adaptation, such as autonomous adaptation by local households (Haer et al., 2020). Grothmann and Reusswig (2006) have shown that reliance on public flood protection negatively correlates with homeowners taking flood damage prevention measures. In other words, a strong presence of public flood protection will lower the sense of individual responsibility and the willingness of homeowners to take voluntary action in protecting themselves against flooding.

However, Haer et al. (2020) demonstrate with an agent-based model how policy aimed at stimulating the flood-proofing of buildings can largely counteract the effects of the safe development paradox. Citizens need support to implement private protection measures, in order to overcome currently low precautionary behaviour (Rauter et al., 2020). While Haer et al. (2020) do not go into the particular mix of such policies, some other studies have identified a number of technical, economic, legal and social conditions and triggers that could foster an increased homeowner contribution to flood resilience.

### *2.5.1 Technical Conditions and Triggers: Knowledge and Expertise*

Erdlenbruch and Bonté (2018) show that people-centred risk communication policies that target both risk and coping possibilities are most effective to support the adoption of individual adaptation measures against floods. Information on coping possibilities includes technical knowledge on the implementation and maintenance of potential measures (Rauter et al., 2020). Several policy initiatives are emerging that aim to support homeowners by providing such knowledge and expertise, for example by providing them tailored information (Hartmann & Scheibel,

2016), organising markets with contractors, etc. However, stakeholders that could provide such information to homeowners, such as architects, contractors and engineers, currently lack training to do this, and to some extent, this expertise still needs to be developed (Davids et al., 2019). Rauter et al. (2020) name the development of new expertise as a main force of change, pushing the distribution of responsibilities among public and private actors alike.

However, research suggests that specialised technical knowledge and expertise are only relevant to homeowners that are aware of the flood risks (Davids & Thaler, 2021). According to (Davids et al., 2019), providing technical information on household measures is only effective to homeowners who are already willing to adapt but lacked know-how. The economic, legal and social conditions might be more decisive as triggers for the homeowners' willingness to protect themselves against flooding.

### 2.5.2 *Economic Conditions and Triggers: Financial Incentives*

Homeowner contributions to flood resilience can be incentivised through financial support in implementing the measures. Possible incentives mentioned in academic literature are a discount on an insurance policy, reflecting the reduced risk by flood-proofing a home (Haer et al., 2020) and governmental subsidies (Mees et al., 2016a, b). Botzen et al. (2009) highlight that insurance arrangements not only provide financial security against residual flood risks, but could also provide incentives to households to limit potential damages. Based on a survey in the Netherlands, they conclude that offering benefits on insurance policies can stimulate homeowners to invest in mitigating potential flood damage. As for governmental subsidies, Mees et al. (2016b) have found based on a survey, a substantial group of homeowners stated to be willing to take measures if subsidies are available. Additionally, financial recovery schemes can be used strategically to increase resilience (Slavíková et al., 2020).

### 2.5.3 *Legal Conditions and Triggers: Voluntary or Compulsory Measures?*

According to Rauter et al. (2020, p. 7), 'the regulative setting is complex with regulations scattered across laws, acts and expert assessments (law) and often either a lack of legal character of such or missing obligations in the first place.' Indeed, currently most government programmes aimed

at the involvement of homeowners are based on voluntary participation. Therefore, the implementation of private flood protection measures demands self-responsibility (Attems et al., 2020; Kreibich et al., 2015). The question remains if voluntary participation is sufficient to achieve the intended benefits of homeowner contributions to flood resilience, or that uptake of individual adaptation measures would remain too low to have a substantial positive contribution. Since governments have little control over property-level protection uptake, it is hard to count on the critical mass to achieve a substantial systemic effect.

Private protection measures could also be included in spatial planning instruments, such as land use prescriptions related to environmental permits and licensing policies. For example in Flanders (Belgium), the water assessment (*watertoets*) is part of the building licensing procedure and can impose flood protection measures in flood-prone areas (De Smedt, 2014).

#### 2.5.4 *Social Conditions and Triggers: Communicative Instruments*

Snel et al. (2021) argue that insights into homeowners' perceptions on distributions of responsibility provide opportunities to better inform and encourage homeowners to take individual measures. Also Oakley et al. (2020) identified that ownership appraisal and the acceptance of responsibility play a key factor in explaining property-level protection uptake.

In this context, risk communication can play an important role in nudging adaptive behaviours. Flood risk communication can serve different basic purposes, practices and future prospects, depending on the underlying normative and conceptual model of risk communication. In the context of homeowner contributions to flood resilience, especially the risk government model of self-regulation and normalisation and the risk instrument model of behavioural change, are relevant (Demeritt & Nobert, 2014).

## 2.6 CONCLUSION AND DISCUSSION

This contribution discusses how the role of homeowners is imbedded in the larger context of flood risk governance, and how increased homeowner contributions challenge flood risks governance. This chapter starts from the observation that homeowners are not only able to contribute to

flood resilience, but even more, that they are indispensable to achieve flood resilience. Based on literature, it discussed four lines of argumentation behind an increased homeowner responsibility in flood risk management, ranging from climate change and urbanisation (technical rationale), minimisation of damage costs (economic rationale), private ownership (legal rationale) and division of responsibilities (social rationale). However, path dependencies such as existing physical structures and high costs, lack of knowledge on alternatives and limited control over properties hamper the intended shift in responsibilities. More fundamentally, an increased homeowner contributions to flood risk management presents several challenges to the effectiveness, efficiency and legitimacy of flood risk governance. Starting from these challenges and barriers that lie within dominant flood risk governance approaches, we discussed some alternative emergent practices and ideas that might trigger a shift.

The overview provided in this chapter shows that the governance considerations involved in shifting responsibilities in flood risk management to homeowners are not straightforward. As Mees et al. (2016b, p. 24) highlight, ‘distributing public and private responsibilities in flood risk management is consequently not a technical matter of calculating efficiency and effectiveness, but requires a political debate and broad social support.’ While there is a strong belief in increased efficiency and effectiveness of private measures (complementary to public ones), the legitimacy should be publicly and widely debated in order to come to some kind of resolution. Kaufmann et al. (2018, p. 325) found for the Dutch context that the justice implications of flood risk management are only marginally discussed, and argue that an ‘inclusive debate on the distribution of burdens of flood risk management could contribute to more effective and legitimate flood risk management.’ The alignment and support of different stakeholders for the distribution of burdens of flood risk management is critical in effectively and legitimately sharing responsibilities and diversifying flood risk management strategies, which is key in achieving flood resilience. The overview in this chapter provides some fundamental considerations to start such a discussion and ensure flood resilience.

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