

**OVERVIEW**

# The shifting position of homeowners in flood resilience: From recipients to key-stakeholders

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**Abstract**

The academic debate on flood risk governance is paying increased attention to the shifting position of homeowners. Homeowners are increasingly expected to adapt their homes to protect against possible floods. Although an overall agreement seems to exist on the involvement of homeowners in flood risk governance, the academic literature is dispersed in its argumentation on why homeowners should be involved. Therefore, this article provides a coherent overview of the transition from flood protection to flood risk management, and subsequently of the arguments that unfold regarding the shifting position of homeowners within this debate. This overview, based on a systematic review of the academic literature, helps to shed light on the changing role of homeowners in flood risk governance and contributes to categorizing the arguments used in current academic reasoning on homeowner involvement in flood risk governance. We use a conceptual distinction between macro-level and micro-level arguments, and between individual and collective efforts to structure our results. This conceptual overview illustrates the potential gap in convincing homeowners of the urgency to take action, because the connection between the macro-level arguments (i.e., climate change and responsibility) and the micro-level arguments (i.e., minimizing flood damage on privately owned properties) is generally not made. We, therefore, suggest that a stronger coherence in the argumentation would contribute to increase homeowner awareness of their changing responsibilities, which might bring about a future shift toward a new phase in flood risk governance, in which the responsibilities of homeowners are more explicitly acknowledged and integrated into climate adaptation strategies.

This article is categorized under:

- Engineering Water > Planning Water
- Human Water > Water Governance

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**KEYWORDS**

flood protection, flood resilience, flood risk governance, flood risk management, homeowner involvement

**1 | INTRODUCTION**

The debates of the last three decades on how to deal with flood risk have increasingly allotted more responsibility to homeowners in striving for flood resilience (Holub & Fuchs, 2009; Mees et al., 2012; Osberghaus, 2015). In these debates, it is generally stated that homeowners can, and increasingly must, prepare their homes against possible flooding. Such preparation usually implies relatively moderate and low-cost measures with the aim of minimizing flood damage (e.g., installing back water valves or mobile barriers). In addition, research on the role of homeowners focuses mainly on their flood risk awareness, risk perception, preparedness to take adaptation measures, and their willingness to pay. Aside from the academic debate, this shift is also recognized in policy as homeowners are increasingly expected to take personal measures to protect and prepare their homes against flooding (Begg et al., 2017). This contribution adopts a Eurocentric perspective on flood risk governance and task divisions between government, market stakeholders, and civil society. Even though within Europe there are differences between countries regarding the approaches to flood risk, the overall trends are generalizable for the continent. Non-European countries, on the other hand, have varying traditions in flood protection and homeowner involvement, therefore they are excluded from this analysis.

Policymakers and academics are increasingly questioning whether it is a governmental responsibility to manage flood risk and whether full protection against floods can be provided (Krieger, 2013; Vis et al., 2003). They call on the general principles of governance to be employed in the processes of managing floods, that is, collaborative arrangements and a shared distribution of power between governmental organizations, market stakeholders, and civil society (Alexander et al., 2016). This emphasis on governance resembles the larger societal discussion on the shifting role of governments (i.e., “from government to governance”), that is discussed in various disciplines (e.g., Jessop, 1998; Rhodes, 2007; Nuissl & Heinrichs, 2011). In the context of this shift toward governance, homeowners are sometimes involved in local participation processes, but are also increasingly expected to implement adaptation measures on their own privately owned properties to protect themselves against floods. Homeowner involvement generally entails both the private implementation of adaptation measures, as well as participating in decision-making processes (Meijer, 2016; Wamsler, 2017). In this article, we specifically focus on the former and delineate homeowner involvement as more actively and practically involved actions of homeowners in solving the actual, practical issues that flood risks generate, usually on their own properties. This involvement can consist of taking specific adaptation measures to their homes or being generally more prepared for a flood event.

The increased expectations of the role of homeowners—both from policymakers and within academic literature—highlight a gap between the role of governmental organizations in flood risk management and protection in practice, and the expectation that civil society should be increasingly involved by implementing measures themselves. The starting point of this article is therefore the question: “Why should homeowners be more involved in flood risk governance?” By analyzing the current academic debate, this article intends to clarify the varying answers provided to this question. The aim of this article is, therefore, to provide an overview of the argumentation for homeowner involvement in the flood risk governance literature and to highlight how this relates to the larger shifts in managing flood risk over time. The concept of flood risk governance is here understood as an approach to direct flood risk management (Alexander et al., 2016). Flood risk governance is most successful when collaboration among governments as well as market stakeholders and civil society is achieved to collect, analyze, communicate, and make decisions about flood risk (Renn et al., 2011).

To this end, we will first explain the wider debates that have led to the call for more homeowner involvement in flood risk governance approaches, starting with the paradigm shift from flood protection to flood risk management (Section 2). Section 3 provides a structured overview of arguments for homeowner involvement in flood risk governance approaches. In the final discussion (Section 4), we will show how the ongoing shift in flood governance is moving toward advocating for homeowner involvement too.

## 2 | AN OVERVIEW OF TRANSITIONS IN FLOOD RISK GOVERNANCE

Before extensively discussing the argumentation for homeowner involvement in contemporary academic literature (Section 3), it is essential to highlight the previous changes flood risk governance has undergone and how this has affected the perspectives on the role of homeowners over time. Approaches to minimize floods have not only evolved “from government to governance”, but are reflective of a wider societal shift toward more governance-oriented processes.

Overall, traditional flood protection approaches, consisting of large-scale measures like dikes and dams, has represented the dominant perspective on dealing with floods since the start of industrialization (Tempels & Hartmann, 2014). The measures mainly entail technical defenses aimed at reducing the probability and intensity of flooding (Mees et al., 2016; O'Neill et al., 2016). Such technical infrastructures are based on an engineering perspective that claims that floods can be prevented and that land, people, and property can be protected against this force of nature (Hartmann & Juepner, 2014; Johnson & Priest, 2008). These structural protection measures are developed to withstand a potential flood of a certain statistical return period. The number of flood events that can exceed this design standard is considered neglectable (Kuhlicke, 2019). As a consequence, most (urban) living areas are separated from water and, indirectly, from flood protection processes. In general, this traditional flood protection approach is a state-centered approach. In other words, governmental institutions (e.g., the water boards in the Netherlands) are solely responsible for protection against floods (Johnson & Priest, 2008; Wiering et al., 2014; van Buuren et al., 2012). It is their main role to ensure that floods do not severely impact national security and economic growth or welfare standards (Penning-Rowsell et al., 2006). Therefore, homeowners are merely recipients of flood protection, which is provided as a public service. They have not been involved in the related planning processes and have been assured that flooding will be prevented. The role of homeowners in traditional flood protection has therefore been marginal.

From the 1990s onwards, at least within Europe, the perspective of traditional flood protection has gradually been complemented by a more governance-oriented perspective on flood risk management. This governance-oriented approach within flood risk management can be seen as illustrative of the societal transition from government toward governance that is more widely discussed in other disciplines in that time period as well (see e.g., Hartmann & Driessen, 2017; Rhodes, 1996; Jessop, 1998). The notion of flood risk management is guided by the perception that “we cannot engineer our way out of this problem” (Penning-Rowsell et al., 2006), because floods cannot be fully prevented. This line of thinking is a response to the failure of traditional technical flood protection measures during major floods in Central Europe in 1993, 1995, and 2002 along the rivers Rhine, Elbe, Danube, and others. Technically oriented flood protection measures have since then been recognized as one aspect of flood risk management instead of the main defense strategy (Bradford et al., 2012; Hartmann & Scheibel, 2016; O'Neill, 2018). It is nowadays widely accepted that floods cannot be defended through technically oriented measures alone (O'Neill, 2018) and absolute protection cannot be provided (Kuhlicke, 2019). This recognition points toward a shifting governance approach to flooding in which floods are perceived as manageable instead of preventable with an increased focus on probabilities and effects (Johnson & Priest, 2008). This is a more holistic perspective, as also called by some authors a river-basin wide approach, that takes into consideration the riverbed, the flood protection measures in place, as well as the flood-prone areas beyond the dikes or flood walls (Hartmann & Juepner, 2014).

In addition, increased attention is paid to nonstructural measures, such as flood warnings, raising awareness, household preparedness, insurance, and relocation (Birkholz et al., 2014; Bradford et al., 2012; O'Neill, 2018). Flood impact can be decreased by such nonstructural measures, but cannot be completely prevented. The risk-based approach of flood risk management allows for combinations of structural and nonstructural measures to reduce flood risk by managing the frequency and impact of floods (Penning-Rowsell et al., 2006).

Within this paradigm, the role of governmental organizations is undergoing change. The river-basin wide approach implies that nongovernmental stakeholders are to be increasingly involved in planning processes. Moreover, the emphasis on nonstructural measures also explicitly includes communication with market stakeholders and civil society. According to Penning-Rowsell et al. (2006), a balance is therefore needed between state action and self-protection by other stakeholders, including homeowners.

## 3 | WHY HOMEOWNERS SHOULD PREPARE FOR FLOODS

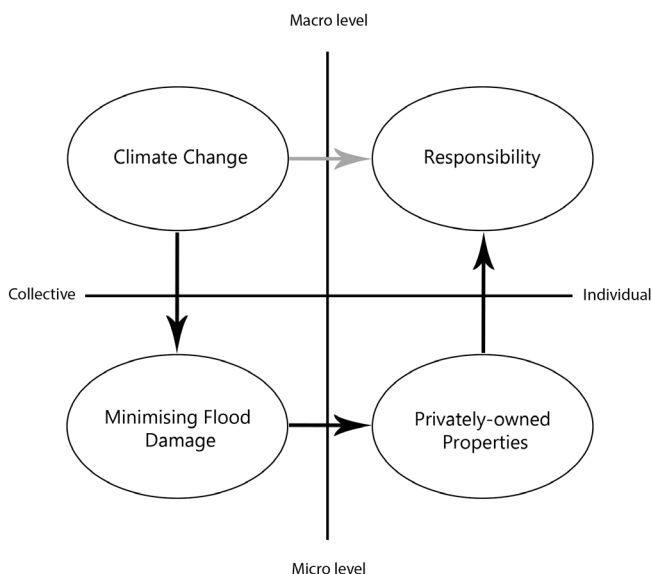
This section provides an overview of the arguments in the academic debate on homeowner involvement. As the perspectives on how to manage floods are in transition over time, as described in the previous section, many authors have provided various reasons for an increasing homeowner involvement. Since there is not a “core” scientific publication

that marks the starting point of this shift toward more homeowner involvement, or that outlines clearly why they should take on a larger role, this article aims to provide this overview based on a systematic inventory of the argumentation used in many research articles to date.

### 3.1 | Methodological approach

This overview of arguments is based on a systematic and in-depth analysis of existing academic research on flooding and in particular on the involvement of homeowners in flood risk governance. Over 125 international peer-reviewed academic journal papers were the result of our initial inquiry on the online academic search engine Scopus using the following keywords: Flood, homeowner, resident, citizen, household, risk, adaptation, mitigation, management, and responsibility. The next step in the selection process included selecting articles which were published between 2005 and 2019 and had a geographical focus on European countries. Articles published before 2005 were assumed to be mainly focusing on flood risk management approaches and less on homeowner involvement, therefore less relevant for our analysis. We choose Europe as our geographical focus because we noticed that the overall trends in flood risk governance and responsibility divisions between governments, market stakeholders and civil society are generally taking place among European countries. Although the approaches differ between the countries, they are more comparable than non-European countries, that have more varying traditions in flood protection and homeowner involvement.

This initial selection process led to 25 documents. We have supplemented this selection with nine documents from outside the initial search scope by applying the snowballing method on relevant references in the initially selected articles. This leads to a total of 34 documents, which include leading peer-reviewed international journal articles and relevant academic research reports. Based on a systematic analysis of the identified literature, an overview of over 50 arguments for homeowner involvement was compiled. These arguments were then further grouped into four all-encompassing categories of arguments; namely arguments related to (a) climate change, (b) minimization of damage costs, (c) privately owned properties, and (d) division of responsibility. We have categorized the arguments based on their overlap and distinctive characteristics. Moreover, following the reasoning of the connection between the macro level and micro level in the model by Coleman (1987)—that is, “Coleman’s boat”—the arguments can be distributed in macro level and micro level arguments. Additionally, we distinguish the scope of collective and individualistic arguments. As will be further explained in Section 3.6, the categories of climate change and division of responsibility are at the macro scale, whereas minimization of damage costs and privately owned properties contain arguments at the micro scale (Figure 1). In general, the four categories are all connected, they do not stand alone and some of them are more closely linked than others. The next sub-sections (3.1 to 3.5) will outline the argumentative categories in more detail.



**FIGURE 1** Integrated overview of macro-level and micro-level arguments for homeowner involvement in flood risk governance (based on Coleman, 1987)

### 3.2 | Climate change (macro scale, collective level)

The first category comprises arguments related to climate change, which are in the literature mostly used as “introductory statements”. The central argument for homeowner involvement in this category is that climate change increases the impact, intensity, and frequency of floods. This is often supported by reports such as the IPCC (2014). Previous research points to the physical, societal, and economic impacts of flood events as a result of climate change and emphasizes that floods will occur more frequently and severely under climate change scenarios (among others: Richard & Kazmierczak, 2012; Bubeck, Botzen, & Aerts, 2012; Johnson & Priest, 2008; Kreibich et al., 2011; Kundzewicz et al., 2018; Mees, 2017; O'Neill, 2018; Raška, 2015; Terpstra, 2011). As flood events likely increase in the near future, it is argued that sufficient protection cannot be guaranteed solely by traditional flood protection measures such as dikes and retention polders (Hartmann, 2011). Therefore, traditional flood protection does not provide total flood security (Grothmann & Reusswig, 2006). The improvement of these public protection measures is necessary, but will likely be insufficient as well. Consequently, it is expected that homeowners take on a role in flood risk adaptation through bottom-up processes (Begg, 2018; Raška, 2015; Terpstra, 2011).

Most studies state that because the environmental conditions are changing and solely flood protection measures are not sufficient to prevent flood damage, homeowners need to take action to complement the current traditional protection measures. It is depicted as an all-hands-on-deck-situation. The specific reasoning for why homeowners should take action, however, is often insufficiently substantiated. Essentially, it is only one of a wide array of possibilities to minimize future flood damage and more floods does not automatically justify more responsibility for homeowners. The climate change argument is therefore considered by us as a macro-scale argument, stressing the responsibility of homeowners at the collective level (Figure 1).

### 3.3 | Minimizing flood damage (micro scale, collective level)

The second category is based on the reasoning of multiple authors who indicate that, when homeowners implement personal measures, they are able to reduce flood-related damage and therefore increase their own resilience (e.g., Begg et al., 2017; Bubeck, Botzen, & Aerts, 2012; Everett & Lamond, 2013; Grothmann & Reusswig, 2006; Kreibich et al., 2011; Thurston et al., 2008). Flood adaptation efforts at the micro scale account for most of the collective differences in monetary losses in case of a flood event (Fink et al., 1996). Moreover, flood damage to private properties has been considerable in recent flood events, which indicates that existing flood prevention schemes and drainage systems have not been substantial enough to cope with rising water or heavy rain fall events (Soane et al., 2010).

It is argued that residents of flood-prone areas can reduce monetary flood damage by 80% through implementing flood risk adaptation measures themselves (Grothmann & Reusswig, 2006). Other studies show that adaptation measures that were implemented reduced damage ratios by 50% for the 2002 Elbe floods in Germany (Kreibich et al., 2011). In the UK, Thurston et al. (2008) found that protection measures are worthwhile for households that have a 2% chance of flooding and that temporary protection measures can reduce damage by 50% (Everett & Lamond, 2013). It has been demonstrated that private flood adaptation measures can significantly reduce flood damage and thereby contribute to risk reduction (Bubeck, Botzen, Kreibich, & Aerts, 2012). In the long term, adaptation measures can significantly reduce the need for public risk management (Grothmann & Reusswig, 2006).

In sum, the studies underlying this argumentative category demonstrate that measures at the home level have a positive impact on limiting the collective (financial) consequences and aftermath of a flood event (i.e., Everett and Lamond 2013; Grothmann and Reusswig 2006; Kreibich et al. 2011; Thurston et al. 2008). Therefore, this argument is considered by us as a micro-scale argument, stressing the collective effects of homeowner measures in terms of damage reduction (Figure 1).

### 3.4 | Privately owned properties (micro scale, individual level)

The third category emphasizes that homeowners can play a role in providing adaptation benefits, in particular due to the private ownership of their property. According to Tompkins and Eakin (2012), adaptation benefits are specific benefits resulting from actions homeowners have taken for themselves (e.g., limiting home flood damage through sand bags) and/or for their communities (e.g., contributing to the water buffering capacity of neighborhoods by reducing soil

sealing on their properties). Private properties are particularly at risk of flooding as traditional protection measures generally are implemented in public space and aim to provide protection on a large-scale. Since the implementation of adaptation measures reduces flood damage significantly, the added value of these measures is obvious, as was shown in the previous sub-section. Homeowners ought to and are able to adapt their private properties because they own the land where these measures are needed. Their initiative or consent is often needed for these adaptation measures (Hegger et al., 2017; Mees et al., 2012). As such, homeowner involvement is crucial for implementing adaptation measures in and around private residences (Hegger et al., 2017), mainly because governmental institutions lack the legal authority to do so. For instance, only owners of the properties have the right to remove the surface pavement in their gardens to increase the level of infiltration.

This reasoning regarding who has the ability and right to minimize flood damage is of great importance and builds on the previous—and following—categories of arguments. In each context facing, a risk of flooding, homes exist that are unprotected by large-scale public protection measures. Even if governments aim to prevent all flood damages, a governmental organization cannot implement any measures on private properties without consent of individual landowners. Large-scale flood protection measures can only do so much in a flood situation, especially with pluvial floods. This argumentative category therefore encompasses the individual right and obligation of homeowners for protecting their own properties (i.e., micro scale, individual level). It thus distinguishes itself from the other categories by being a legal argument aimed at a legal entity (i.e., individual property rights) rather than a collective argument aimed at collective goods (Figure 1).

### 3.5 | Division of responsibility (macro scale, individual level)

The fourth and final category covers arguments regarding the societal division of responsibility, between government and citizens. The government has been seen as primarily responsible for flood protection, and the governmentally implemented structural forms of defense are favored (Bichard & Kazmierczak, 2012; Werritty et al., 2007). This is clearly the case in Dutch flood risk management, where national-, regional-, and local-level governments are primary actors in terms of adaptation planning and have many formal responsibilities, including those for flood management and civil protection (Hegger et al., 2014; van Buuren et al., 2012). It is also the case in many other European countries, such as Germany, France, and UK, where flood risk management is foremost perceived as a governmental responsibility (Hartmann & Juepner, 2014; Thaler & Priest, 2014). This category's main argument is that the sharing of responsibilities between government and citizens will lead to additional benefits thereof, particularly with regard to governmental capacity issues, lack of public funding and legitimacy and awareness issues.

Governments will have to communicate actively that public flood protection does not provide total security (Grothmann & Reusswig, 2006) and that flooding presents a challenge that affects society as a whole. A solution from a governmental perspective is the sharing of responsibility and, in addition, sharing the cost for risk management (Hegger et al., 2017). Begg (2018) states that the reductions in public funding have increased the pressure on the state to move toward sharing of responsibilities. Additional benefits of more homeowner involvement and less governmental responsibility are also mentioned by various authors. The main benefit is that the legitimacy of flood risk adaptation approaches can be increased by including citizens in both private implementation of measures and collective decision-making processes (Kundzewicz et al., 2018). Moreover, changing the division of responsibility can lead to increased awareness, more innovative capacity, and enhanced mainstreaming of adaptation into other activities (Hegger et al., 2017; Runhaar et al., 2012; Uittenbroek et al., 2013).

Sharing responsibilities significantly changes the role of the involved stakeholders and leads to the assumption that homeowners are obliged to take more flood adaptation measures (Bubeck, Botzen, & Aerts, 2012). For instance, Soane et al. (2010) and Begg et al. (2017) analyze the division of responsibility between government and homeowners and study what encourages homeowners to take more responsibility. Soane et al. (2010) highlight how homeowners can accept their individual responsibility and become more involved in flood risk governance. Moreover, homeowners are often expected to have the greatest incentives to take action (Everett & Lamond, 2013), but it has been widely concluded that people living in flood-prone areas often fail to act or do very little to lessen their risk of death, injury, or property damage (Grothmann & Reusswig, 2006; Peek & Mileti, 2002).

From the perspective of governmental organizations, the involvement of homeowners in flood risk management seems like a logical consequence of a lack of funding. However, as Begg (2018) and Bickerstaff, Simmons, and Pigeon (2008) state, the role of homeowners depends on how responsibilities are perceived by both the state

and by the homeowners. Therefore, homeowners should also be included in the dialogue on responsibility. By not including them in the dialogue, the government assumes that homeowners share the same flood-related goals as the state, which might not be the case (Begg, 2018; Butler & Pidgeon, 2011). Hence, before a homeowner will actually implement measures, they need to first accept it is their responsibility to protect their home—rather than assuming that it is the prime responsibility of the state—and believe that their actions will have a positive, meaningful effect (Soane et al., 2010). They need to possess a sense of self-efficacy, that taking adaptation measures has a positive impact (Bickerstaff et al., 2008). However, various studies show that homeowners do not perceive implementing adaptation measures as their responsibility (Bichard & Kazmierczak, 2012; Everett & Lamond, 2013). On the contrary, one could argue that private adaptation by homeowners will be redundant if public agencies successfully prevent flooding of living areas, because if the residents at risk rely on the efficacy of the public flood protection, they will most likely take less precautionary action themselves (Grothmann & Reusswig, 2006). Consequently, the general tendency in academia is, as Kundzewicz et al. (2018) and Tullos (2018) also argue, that it is necessary to overcome the current public perception that the government is able to control flood risk and is solely in charge thereof. Therefore, this final category of arguments is seen as a growing sense of responsibility at the individual level, affecting what can be achieved with shared responsibility at the macro scale (Figure 1).

### 3.6 | Integration of argumentative categories

We have distinguished four main categories that are used in the academic debate as arguments to include homeowners in flood risk governance (Figure 1). These four types of arguments are not unrelated, but build on each other and lead to a larger debate on the division of responsibility between governments and citizens. All four categories together make a more solid case for homeowner involvement, but none of the cited publications actually used all categories collectively to clarify why homeowners should be more involved. Most of the cited authors mention the consequences of climate change (i.e., macro-collective), followed directly by considerations of responsibility division (i.e., macro-individual). However, the arguments regarding minimizing damage (i.e., micro-collective) and private properties (i.e., micro-individual) are hardly used in the argumentation.

Figure 1 shows how the most applied reasoning, from climate change to responsibilities arguments (gray arrow), is actually passing over the arguments that address the micro level (black arrows). Climate change and responsibility are arguments that operate on a macro level, as they encompass reasons that are more abstract to grasp. In contrast, the arguments of minimizing flood damage and privately owned properties are addressing homeowners at a micro level hands-on, by emphasizing flood protection measures that can be taken directly by themselves. We argue that, in accordance to “Coleman’s boat”, at the macro level, climate change and its consequences for the division of responsibilities in flood risk management can be further strengthened and substantiated, by connecting these arguments to the micro level arguments of minimizing flood damage by adaptations on privately owned properties (Figure 1). In other words, to convince homeowners to become more involved, which is becoming more urgent due to climate change, one can point out the effect of minimizing flood damage by taking adaptation measures on their own properties and indicate that it is something that only the property owner can decide, which would likely benefit a greater uptake of responsibilities by the homeowners at the macro-level. This could in turn lead to greater participation of homeowners in collective decision-making and/or enhanced legitimacy of planning outcomes.

We acknowledge that not every article can and should go into the same level of detail on the debate regarding homeowner involvement and division of responsibilities. Still, it is striking that most of the literature referred to here does not provide more clarification of why homeowners’ involvement is necessary, and how to effectively accomplish that. As the overview of categories shows, a wide array of disciplines contributes to the debates on flood risk governance, which might be the underlying cause for the lack of an overall convincing and integrated argumentation. For instance, the category of climate change mainly portrays a natural sciences way of reasoning, which is dominant in traditional flood protection approaches. Minimization of flood damages is an economic argument, which can be part of cost benefit analyses that are underlying risk-based approaches of flood risk management. The category of private properties depicts a legal argument, whereas the responsibility category is a policy-oriented type of reasoning.

## 4 | DISCUSSION

The changing role of homeowners in flood risk governance is related to the different approaches to dealing with floods over time. When the main strategy was traditional flood protection, the government was in general the sole problem-holder, while individuals were merely recipients. Changing toward the perspective of flood risk management, awareness rises that protection cannot be 100% guaranteed, and governments are consequently more open to the involvement of other stakeholders in the management of floods. This indicates the first step toward flood risk governance, in which governmental organizations move away from centralized power toward the involvement of market stakeholders and civil society (Walker, Tweed, & Whittle, 2014). However, civil society members (i.e., homeowners) are not yet actively involved in flood risk management processes.

This article has shown how homeowner involvement is currently substantiated in academic literature and what the opportunities are to improve this involvement in flood risk governance, particularly through stressing their potential individual, micro-level contribution in this. Of course, to a certain extent, residents are also involved more collectively by participating in decision-making processes of new flood risk management plans in which there is some room for involving the public that might be affected by these new plans. Moreover, the management of natural hazards in general has always consisted of the participation of a variety of actors, including community organizations (Walker et al., 2014). However, this is not the same as their active involvement in flood risk governance as adapters and implementers. We argue here that the increase in academic attention paid to the specific role of homeowners in flood risk management indicates an even further step within flood risk governance, namely, the sharing of responsibilities between government, market, and civil society. This would lead to even more involvement of non-governmental stakeholders that are self-motivated to engage in the planning process.

We observe a tendency in academic literature to gradually shift toward a new approach in flood risk governance, in which homeowners are further expected to prepare themselves and take adaptation measures. We tentatively address this latest shift as “flood resilience”. Flood resilience is not an isolated strategy. Flood resilience requires society to be able to reduce the vulnerability to floods while maintaining the basic functions of living areas in the face of climate change (Klijn & Koppenjan, 2012). The concept extends flood risk management by separating three capacities; (a) the capacity to resist, (b) the capacity to absorb and recover, and (c) the capacity to transform and adapt (Hegger et al., 2016). Doing so, it is an approach that builds on the protection and management approaches to floods, but further clarifies the current emphasis on homeowner responsibility in flood risk governance. Flood risk management accounted for a lot of beneficial flood risk measures, policy and funding. With a gradual shift to flood resilience, it might be possible to lead to a similar set of benefits (both in academia and practice), in which the position of homeowners is getting more prominent. By acknowledging that flood risk management is in transition to flood resilience, this potentially new paradigm opens possibilities for homeowner involvement in flood risk governance, not just in academic research or policy documents, but in open, public discussions on the division of responsibilities.

This transition to flood resilience potentially gives meaning to the unfolding changes in flood risk governance regarding the redistribution of responsibilities between governmental organizations, market stakeholders, and civil society (Kuhlicke, 2019; Welsh, 2014). To achieve flood resilience, the added value of participation and decentralized governance approaches are emphasized in establishing a society that is more receptive to transformation and adaptation (Hegger et al., 2016). The involvement of homeowners in the actual responsibility debates is most essential in this transition. Now that the debate in flood-related academia and policy is moving toward involving individuals, an additional step is taken to complete the governance triangle of government, market stakeholders, and civil society. By broadening the scope, the flood risk governance discussions can gain insight from debates in the wider context of natural disasters (e.g., Collier, 2014). As a transition from government to governance is being undertaken, all actors are meant to take part in the governance processes in order to establish flood resilience.

## 5 | CONCLUSION

The presented overview of arguments demonstrates how dispersed the topic of flood risk governance is across multiple disciplines and it signifies gaps that can be overcome if it is better understood why homeowners are necessary stakeholders in flood risk governance. First, with the shift to flood risk management, the tendency has been to aim at involving homeowners more. However, in practice, homeowners have not been part of this shift and were not consulted or actively informed about this possible change, even though various researchers claim that it is essential to include them in the dialogue regarding the division of responsibilities (e.g., Begg, 2018; Bickerstaff et al., 2008; Butler & Pidgeon, 2011; Terpstra & Gutteling, 2008).



Second, climate change is mentioned by all cited references, but the argument for action is often described too abstract to grasp. The climate change argument seems a solid reason for taking action, yet it is foremost a long term and large-scale trend for which consequences are usually portrayed as a collective problem. This potentially negatively affects the sense of self-efficacy of homeowners, as they might perceive that their individual behavior does not result in a meaningful contribution to the collective (Bickerstaff et al., 2008). Moreover, climate change has already often been used to convince homeowners to change their behavior (e.g., CO<sub>2</sub> neutral-energy, recycling, eating less meat). Flood risk can be added to this list and wait in line for other more pressing issues in daily life to pass.

Third, the potentially more convincing arguments are currently insufficiently used in the debates. The arguments based on empirical research and the more practical benefits to individuals of adapting homes to floods, are under-referenced. Homeowners are likely to relate more to for instance the argument that taking adaptation measures leads to serious reduction of flood damage. On the contrary, the category of responsibility is the one that is most often mentioned in literature. Generally, research states that the division of responsibility should be changed and that homeowners should take on a larger role, but why this change should take place is not specifically addressed. This all leads to the conclusion that, ironically so, the arguments that homeowners can most likely identify with are those that are until now least applied to them.

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## CONFLICT OF INTEREST

The authors have declared no conflicts of interest for this article.

## AUTHOR CONTRIBUTIONS

**Karin Snel:** Conceptualization; methodology; writing-original draft; writing-review and editing. **Patrick Witte:** Supervision; writing-review and editing. **Thomas Hartmann:** Supervision; writing-review and editing. **Stan Geertman:** Supervision; writing-review and editing.

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O'Malley, P. (2004). *Risk, uncertainty and government*. London: The GlassHouse Press.

## REFERENCES

- Alexander, M., Priest, S., & Mees, H. (2016). A framework for evaluating flood risk governance. *Environmental Science & Policy*, 64, 38–47. <https://doi.org/10.1016/j.envsci.2016.06.004>
- Begg, C. (2018). Power, responsibility and justice: A review of local stakeholder participation in European flood risk management. *Local Environment*, 23(4), 383–397. <https://doi.org/10.1080/13549839.2017.1422119>
- Begg, C., Ueberham, M., Masson, T., & Kuhlicke, C. (2017). Interactions between citizen responsabilization, flood experience and household resilience: Insights from the 2013 flood in Germany. *International Journal of Water Resources Development*, 33(4), 591–608. <https://doi.org/10.1080/07900627.2016.1200961>
- Bichard, E., & Kazmierczak, A. (2012). Are homeowners willing to adapt to and mitigate the effects of climate change? *Climatic Change*, 112(3–4), 633–654. <https://doi.org/10.1007/s1058401102578>
- Bickerstaff, K., Simmons, P., & Pidgeon, N. (2008). Constructing responsibilities for risk: Negotiating citizen–state relationships. *Environment and Planning A, Economy and Space*, 40(6), 1312–1330. <https://doi.org/10.1068/a39150>

- Birkholz, S., Muro, M., Jeffrey, P., & Smith, H. M. (2014). Rethinking the relationship between flood risk perception and flood management. *Science of the Total Environment*, 478, 12–20. <https://doi.org/10.1016/j.scitotenv.2014.01.061>
- Bradford, R. A., O'Sullivan, J. J., van der Craats, I. M., Krywkow, J., Rotko, P., Aaltonen, J., ... Schelfaut, K. (2012). Risk perception—Issues for flood management in Europe. *Natural Hazards and Earth System Sciences*, 12, 2299–2309. <https://doi.org/10.5194/nhess-12-2299-2012>
- Bubeck, P., Botzen, W. J. W., & Aerts, J. C. J. H. (2012). A review of risk perceptions and other factors that influence flood mitigation behavior. *Risk Analysis*, 32(9), 1481–1495. <https://doi.org/10.1111/j.1539-6924.2011.01783.x>
- Bubeck, P., Botzen, W. J. W., Kreibich, H., & Aerts, J. C. J. H. (2012). Long-term development and effectiveness of private flood mitigation measures: An analysis for the German part of the river Rhine. *Natural Hazards and Earth System Sciences*, 12, 3507–3518. <https://doi.org/10.5194/nhess-12-3507-2012>
- Butler, C., & Pidgeon, N. (2011). From “flood defence” to “flood risk management”: Exploring governance, responsibility, and blame. *Environment and Planning, C, Government & Policy*, 29(3), 533–547. <https://doi.org/10.1068/c09181j>
- Coleman, J. S. (1987). Microfoundations and macrosocial behaviour. In J. C. Alexander, B. Giesen, R. Münch, & N. J. Smelser (Eds.), *The micro-macro link* (pp. 153–173). Los Angeles, CA: University of California Press.
- Collier, S. J. (2014). Neoliberalism and natural disaster. *Journal of Cultural Economy*, 7(3), 273–290. <https://doi.org/10.1080/17530350.2013.858064>
- Everett, G., & Lamond, J. (2013). Household behaviour in installing property-level flood adaptations: A literature review. In S. S. Zubir & C. A. Brebbia (Eds.), *The Sustainable City VIII* (Vol. 1, pp. 511–522). Ashurst, UK: WIT Press. <https://doi.org/10.2495/SC130431>
- Fink, A., Ulbrichl, U., & Engel, H. (1996). Aspects of the January 1995 flood in Germany. *Weather*, 51(2), 34–39.
- Grothmann, T., & Reusswig, F. (2006). People at risk of flooding: Why some residents take precautionary action while others do not. *Natural Hazards*, 38, 101–120. <https://doi.org/10.1007/s11069-005-8604-6>
- Hartmann, T. (2011). *Clumsy floodplains: Responsive land policy for extreme floods*. Farnham, Surrey: Ashgate.
- Hartmann, T., & Driessen, P. (2017). The flood risk management plan: Towards spatial water governance. *Journal of Flood Risk Management*, 10, 145–154. <https://doi.org/10.1111/jfr3.12077>
- Hartmann, T., & Juepner, R. (2014). The flood risk management plan: An essential step towards the institutionalization of a paradigm shift. *International Journal of Water Governance*, 2, 107–118. <https://doi.org/10.7564/13-IJWG5>
- Hartmann, T., & Scheibel, M. (2016). Flood label for buildings—A tool for more flood-resilient cities [Floodrisk 2016]. *E3S Web of Conferences*, 7, 1–8. <https://doi.org/10.1051/e3sconf/20160713006>
- Hegger, D. L. T., Driessen, P. P. J., Dieperink, C., Wiering, M., Raadgever, G. T. T., & Van Rijswijk, H. F. M. W. (2014). Assessing stability and dynamics in flood risk governance. *Water Resources Management*, 28, 4127–4142. <https://doi.org/10.1007/s11269-014-0732-x>
- Hegger, D. L. T., Driessen, P. P. J., Wiering, M., Van Rijswijk, H. F. M. W., Kundzewicz, Z. W., Matczak, P., ... Ek, K. (2016). Toward more flood resilience: Is a diversification of flood risk management strategies the way forward? *Ecology and Society*, 21(4), 52–71. <https://doi.org/10.5751/ES-08854-210452>
- Hegger, D. L. T., Mees, H. L. P., Driessen, P. P. J., & Runhaar, H. A. C. (2017). The roles of residents in climate adaptation: A systematic review in the case of The Netherlands. *Environmental Policy and Governance*, 27(4), 336–350. <https://doi.org/10.1002/eet.1766>
- Holub, M., & Fuchs, S. (2009). Mitigating mountain hazards in Austria—legislation, risk transfer, and awareness building. *Natural Hazards and Earth System Sciences*, 9, 523–537. <https://doi.org/10.5194/nhess-9-523-2009>
- IPCC. (2014). Climate Change 2014: Impacts, Adaptation, and Vulnerability. IPCC WGII AR5. Retrieved from <http://www.ipcc.ch/report/ar5/wg2/>.
- Jessop, B. (1998). The rise of governance and the risk of failure: The case of economic development. *International Social Science Journal*, 50(155), 29–45.
- Johnson, C. L., & Priest, S. J. (2008). Flood risk Management in England: A changing landscape of risk responsibility? *International Journal of Water Resources Development*, 24(4), 513–525. <https://doi.org/10.1080/07900620801923146>
- Klijin, E., & Koppenjan, J. (2012). Governance network theory: Past, present and future. *Policy & Politics*, 40(4), 587–606. <https://doi.org/10.1332/030557312X655431>
- Kreibich, H., Seifert, I., Thieken, A. H., Lindquist, E., Wagner, K., & Merz, B. (2011). Recent changes in flood preparedness of private households and businesses in Germany. *Regional Environmental Change*, 11, 59–71. <https://doi.org/10.1007/s10113-010-0119-3>
- Krieger, K. (2013). The limits and variety of risk-based governance: The case of flood management in Germany and England. *Regulation and Governance*, 7(2), 236–257. <https://doi.org/10.1111/rego.12009>
- Kuhlicke, C. (2019). Risk and resilience in the management and governance of natural hazards. In *Oxford Research Encyclopedia of Natural Hazard Science* (pp. 1–30). Oxford: Oxford University Press. <https://doi.org/10.1093/acrefore/9780199389407.013.299>
- Kundzewicz, Z. W., Hegger, D. L. T., Matczak, P., & Driessen, P. P. J. (2018). Opinion: Flood-risk reduction: Structural measures and diverse strategies. *Proceedings of the National Academy of Sciences*, 115(49), 12321–12325. <https://doi.org/10.1073/pnas.1818227115>
- Mees, H. (2017). Local governments in the driving seat? A comparative analysis of public and private responsibilities for adaptation to climate change in European and north-American cities. *Journal of Environmental Policy and Planning*, 19(4), 374–390. <https://doi.org/10.1080/1523908X.2016.1223540>
- Mees, H., Tempels, B., Crabbé, A., & Boelens, L. (2016). Shifting public-private responsibilities in Flemish flood risk management. Towards a co-evolutionary approach. *Land Use Policy*, 57, 23–33. <https://doi.org/10.1016/j.landusepol.2016.05.012>
- Mees, H. L. P., Driessen, P. P. J., & Runhaar, H. A. C. (2012). Exploring the scope of public and private responsibilities for climate adaptation. *Journal of Environmental Policy & Planning*, 14(3), 305–330. <https://doi.org/10.1080/1523908X.2012.707407>
- Meijer, A. (2016). Coproduction as a structural transformation of the public sector. *International Journal of Public Sector Management*, 29(6), 596–611.
- Nuissl, H., & Heinrichs, D. (2011). Fresh wind or hot air—Does the governance discourse have something to offer to spatial planning? *Journal of Planning Education and Research*, 31(1), 47–59.

- O'Neill, E. (2018). Expanding the horizons of integrated flood risk management: A critical analysis from an Irish perspective. *International Journal of River Basin Management*, 16(1), 71–77. <https://doi.org/10.1080/15715124.2017.1351979>
- O'Neill, E., Brereton, F., Shahumyan, H., & Clinch, J. P. (2016). The impact of perceived flood exposure on flood-risk perception: The role of distance. *Risk Analysis*, 36(11), 2158–2186. <https://doi.org/10.1111/risa.12597>
- Osberghaus, D. (2015). The determinants of private flood mitigation measures in Germany—Evidence from a nationwide survey. *Ecological Economics*, 110, 36–50. <https://doi.org/10.1016/j.ecolecon.2014.12.010>
- Peek, L. A., & Mileti, D. S. (2002). The history and future of disaster research. In R. B. Bechtel & A. Churchman (Eds.), *Handbook of environmental psychology* (pp. 511–524). Hoboken, NJ: Wiley.
- Penning-Rowsell, E., Johnson, C., & Tunstall, S. (2006). “Signals” from pre-crisis discourse: Lessons from UKflooding for global environmental policy change? *Global Environmental Change*, 16, 323–339. <https://doi.org/10.1016/j.gloenvcha.2006.01.006>
- Raška, P. (2015). Flood risk perception in central-eastern European members states of the EU: A review. *Natural Hazards*, 79, 2163–2179. <https://doi.org/10.1007/s11069-015-1929-x>
- Renn, O., Klinke, A., & Van Asselt, M. (2011). Coping with complexity, uncertainty and ambiguity in risk governance: A synthesis. *Ambio*, 40, 231–246. <https://doi.org/10.1007/s13280-010-0134-0>
- Rhodes, R. A. W. (1996). The new governance: Governing without government. *Political Studies*, 44, 652–667.
- Rhodes, R. A. W. (2007). Understanding governance: Ten years on. *Organization Studies*, 28(8), 1243–1264.
- Runhaar, H., Mees, H., Wardekker, A., Van Der Sluijs, J., & Driessen, P. P. J. (2012). Adaptation to climate change-related risks in Dutch urban areas: Stimuli and barriers. *Regional Environmental Change*, 12, 777–790. <https://doi.org/10.1007/s10113-012-0292-7>
- Soane, E., Schubert, I., Challenor, P., Lunn, R., Narendran, S., & Pollard, S. (2010). Flood perception and mitigation: The role of severity, agency and experience in the purchase of flood protection, and the communication of flood information. *Environment and Planning A*, 42(12), 3023–3038. <https://doi.org/10.1068/a43238>
- Tempels, B., & Hartmann, T. (2014). A co-evolving frontier between land and water: Dilemmas of flexibility versus robustness in flood risk management. *Water International*, 39(6), 872–883. <https://doi.org/10.1080/02508060.2014.958797>
- Terpstra, T. (2011). Emotions, trust, and perceived risk: Affective and cognitive routes to flood preparedness behavior. *Risk Analysis*, 31(10), 1658–1675. <https://doi.org/10.1111/j.1539-6924.2011.01616.x>
- Terpstra, T., & Gutteling, J. M. (2008). Households' perceived responsibilities in flood risk Management in The Netherlands. *International Journal of Water Resources Development*, 24(4), 555–565. <https://doi.org/10.1080/07900620801923385>
- Thaler, T., & Priest, S. (2014). Partnership funding in flood risk management: New localism debate and policy in England. *Area*, 46(4), 418–425. <https://doi.org/10.1111/area.12135>
- Thurston, N., Finlinson, B., Breakspear, R., Williams, N., Shaw, J., & Chatterton, J. (2008). *Developing the evidence base for flood resistance and resilience: Summary report [R&D Technical Report FD2607/TR]*. London: Defra.
- Tompkins, E. L., & Eakin, H. (2012). Managing private and public adaptation to climate change. *Global Environmental Change*, 22, 3–11. <https://doi.org/10.1016/j.gloenvcha.2011.09.010>
- Tullos, D. (2018). Opinion: How to achieve better flood-risk governance in the United States. *Proceedings of the National Academy of Sciences of the United States of America*, 115(15), 3731–3734. <https://doi.org/10.1073/pnas.1722412115>
- Uittenbroek, C. J., Janssen-Jansen, L. B., & Runhaar, H. A. C. (2013). Mainstreaming climate adaptation into urban planning: Overcoming barriers, seizing opportunities and evaluating the results in two Dutch case studies. *Regional Environmental Change*, 13, 399–411. <https://doi.org/10.1007/s10113-012-0348-8>
- van Buuren, A., Klijn, E.-H., & Edelenbos, J. (2012). Democratic legitimacy of new forms of water Management in The Netherlands. *International Journal of Water Resources Development*, 28(4), 629–645. <https://doi.org/10.1080/07900627.2011.627756>
- Vis, M., Klijn, F., De Bruijn, K. M., & Van Buuren, M. (2003). Resilience strategies for flood risk management in the Netherlands. *International Journal of River Basin Management*, 1(1), 33–40. <https://doi.org/10.1080/15715124.2003.9635190>
- Walker, G., Tweed, F., & Whittle, R. (2014). A framework for profiling the characteristics of risk governance in natural hazard contexts. *Hazards and Earth System Sciences*, 14, 155–164. <https://doi.org/10.5194/nhess-14-155-2014>
- Wamsler, C. (2017). Stakeholder involvement in strategic adaptation planning: Transdisciplinarity and co-production at stake? *Environmental Science & Policy*, 75, 148–157.
- Welsh, M. (2014). Resilience and responsibility: Governing uncertainty in a complex world. *Geographical Journal*, 180(1), 15–26. <https://doi.org/10.1111/geoj.12012>
- Werritty, A., Houston, D., Ball, T., Tavendale, A., & Black, A. (2007). Environment Group Exploring the Social Impacts of Flood Risk and Flooding in Scotland. Retrieved from [www.scotland.gov.uk/socialresearch](http://www.scotland.gov.uk/socialresearch).
- Wiering, M., Green, C., Van Rijswijk, M., Priest, S., Keessen, A., & Van Rijswijk, H. F. M. W. (2014). The rationales of resilience in English and Dutch flood risk policies. *Journal for Water and Climate Change*, 6(1), 38–54. <https://doi.org/10.2166/wcc.2014.017>

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