

On the horns of a dilemma: Experts as communicators for property-level flood risk adaptation measures

Peter R. Davids¹  | Sally Priest² | Thomas Hartmann¹

¹Chairgroup of Land Policy and Land Management, Faculty of Spatial Planning, TU Dortmund, Dortmund, Germany

²Flood Hazard Research Centre, Middlesex University, London, UK

Correspondence

Peter R. Davids, Centre for Mobility and Spatial Planning, Ghent University, Ghent, Belgium.

Email: peter.davids@tu-dortmund.de

Funding information

Joint Programming Initiative Urban Europe, Grant/Award Number: 693443

Abstract

This paper investigates the role of flood risk experts in supporting homeowners to implement property-level flood risk adaption (PLFRA). Homeowners can reduce their flood risks by implementing PLFRA. However, oftentimes they need advice on what sort of and how to implement PLFRA. This means that tailored experts advice is necessary to inform homeowners on such measures. But experience shows that mere information is often insufficient to motivate homeowners to realise measures. This contribution explores the reasons for the ineffectiveness of expert advice by investigating how expert advice responds to homeowners' rationalities. Based on a case study from Flanders, Belgium, this paper reveals how the relation between experts and homeowners differs related to different rationalities of homeowners. The paper uses Cultural Theory to discuss strategies on how experts, providing advice on property-level risk adaption, could move beyond engineering skills by also using risk communication skills in order to involve homeowners in flood risk governance.

KEYWORDS

Belgium, Cultural Theory, flood risk communication, flood risk experts, homeowners, property-level risk adaption

1 | INTRODUCTION

Flood risk is increasing in recent decades and its management is shifting towards flood risk governance (Driessen et al., 2016) resulting in a changing role of expertise in flood risk management (Van Den Brink, 2009). Water managers find themselves 'on the horns of a dilemma' being technical experts on flood risks and providing knowledgeable input, but at the same time moving beyond this technocratic working style, being mediators that negotiate and balance flood risks management interventions against other societal and political issues (Van

Den Brink, 2009). This dilemma is a result of a major ongoing shift from flood protection to flood risk management over the past decades (van Ruiten & Hartmann, 2016). This shift is triggered by more intense, more frequent, and more damaging flood events in Europe (Guerreiro et al., 2018). Flood risk management is a risk-based approach (Hartmann & Juepner, 2014), which is increasingly complemented by concepts of flood resilience (Liao, 2012). The wider adoption of flood risk management and flood resilience is that protection against flooding is no longer regarded as solely a governmental responsibility (Butler & Pidgeon, 2011; Hoss

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2023 The Authors. *Journal of Flood Risk Management* published by Chartered Institution of Water and Environmental Management and John Wiley & Sons Ltd.

et al., 2011; Snel et al., 2020), but is evolving towards more shared responsibilities among multiple actors (Begg, 2018; Forrest et al., 2019; Johnson & Priest, 2008; Rauter et al., 2020), including in particular homeowners (Snel et al., 2020).

Homeowners can indeed reduce their flood risk with dedicated property-level flood risk adaptation measures (PLFRA) to protect their homes (Attems, Thaler, et al., 2020; Lamond et al., 2018; Mees et al., 2016). PLFRA encompass a variety of actions including the sealing of building openings, installation of back valves, mobile flood barriers, or dry-proofing basements. With the introduction of domestic PLFRA, homeowners increase their flood resilience (McClymont et al., 2019; White et al., 2018) by reducing some damages and allowing for the quicker recovery of those damages which do occur (Disse et al., 2020).

Despite the existence of PLFRA being present for many years, the implementation of these measures, is still somewhat in its infancy (Attems, Thaler, et al., 2020) and thus their contribution to flood risk resilience low. Although many homeowners could adapt their homes to reduce their flood risk, the progress so far at individual homeowner level has been slow, and homeowners seem to be less willing or able to adapt their homes. Many reasons are proposed for this, such as the assumption of homeowners that flood risk management is purely a governmental task (Lechowska, 2018), a lack of awareness on individual flood risks, not recognising the benefits of these PLFRA (Joseph et al., 2015), or a lack of capacities to reduce these risks (e.g. Bubeck et al., 2012; Kuhlicke et al., 2020; Snel et al., 2019). In addition, false incentives from financial flood recovery schemes are discussed as a reason for the inertia of homeowners in improving their flood resilience (Slavíková et al., 2020). Furthermore, research shows that risk-based insurance premiums as an incentive to adapt in many situations is currently not effective (Hudson et al., 2016). These incentives build on the assumption that a homeowner is well-informed. However, information deficit(s) prevent many homeowners from taking action (Attems, Schlögl, et al., 2020; Kellens et al., 2013; Snel et al., 2019). Therefore, flood risk communication strategies are widely considered as a way to raise awareness of PLFRA.

Many past and current flood risk communication strategies relating to PLFRA are often limited to brochures, flyers, apps, and websites, which may contain important information, though rarely effectively target the individual needs of homeowners (Snel et al., 2019). In the past, flood risk communication is often perceived by public authorities as a process of knowledge transfer and education, and there is little follow up to ensure messages are clearly received and understood (Rollason et al., 2018). Moreover, these communication tools are

often one-directional, while evidence suggests that effective tailored risk communication needs to be bidirectional (Attems, Schlögl, et al., 2020; Scolobig et al., 2015; Snel et al., 2019). To support bilateral communication, information on PLFRA needs to be tailored to individual homeowners (Botzen et al., 2019; Snel et al., 2019). This implies that successful risk communication that triggers homeowners to implement effective PLFRA involves specific expert advice (Árvai, 2014; Lamond et al., 2016). The role of experts in tailoring advice for homeowners about PLFRA warrants further study to consider its content and effectiveness. Although 'the flood risk expert' includes a wide range of professions and businesses that homeowners consider for advice (e.g. handymen and construction workers installing PLFRA, or surveyors providing advice on PLFRA) (Lamond et al., 2016), this paper refers specifically to the advisor type of expert. It seems that these experts—like the water managers described in Van Den Brink (2009)—are on the horns of a similar dilemma. These experts provide specific technical knowledge and expertise, but also need to move beyond this technocratic approach and perform as communicators and mediators by being more responsive to the perspectives of homeowners. The aim of this research is to explore the role of the expert in tailored flood risk advice in order to make communication between experts and homeowners more effective. Therefore, this paper presents a unique case study from Flanders, Belgium, and draws evidence from where expert tailored advice was offered to homeowners in their home as part of a pilot initiated by the Flemish Environmental Agency. In particular, rather than solely focussing on an evaluation of the advice provided, it also considers the process of communication and relations between the experts and homeowners. This enables a better understanding of how expert advice needs to be provided to effectively trigger homeowners' action. Particular attention was paid to the multiple approaches or roles needed to be adopted by experts to respond to the different rationalities of homeowners. The assumption is that homeowners will have different characteristics and needs from the advice process; if the expert can respond to these varying needs, the homeowner will be more willing to implement PLFRA. For this reason, theories on roles of experts are employed as well as social-constructivist approaches to understand plural notions of risk perception of homeowners.

2 | CHALLENGES IN TAILORING FLOOD RISK ADVICE

Challenges for experts in tailoring flood risk advice are not only limited to the content of any advice provided

but also depend on the mediating skills of the expert (Terpstra et al., 2014). This mediating or facilitating role is often not fully recognised, when dealing with the needs of homeowners, and, for those homeowners receiving advice directly, may be partially responsible for the low uptake of PLFRA. Indeed, Davids et al. (2019) show that only 11% of the homeowners considered the implementation of measures after receiving advice from an expert. To improve this situation, we need to consider the multiple roles of an expert in these circumstances to provide more insight into the effective ways of offering tailored flood risk advice. This paper focuses on what such an expert can offer when dealing directly with and how this can be best tailored to homeowners' needs.

2.1 | Multiple roles for experts

An expert can be considered to be an independent specialist, deriving her or his knowledge from science or profession, and possesses technical skills and experiences (Grundmann, 2017). Experts transfer existing knowledge to 'those who require and seek advice: those who are forced to this step due to their particular circumstances, whether out of time pressure and ignorance; because of urgent problems that quickly must be solved; out of respect for knowledge; or simply out of uncertainty' (Stehr & Grundmann, 2011, p. 39). The transferred knowledge combines resources, is an interpretation of the expert, and is action-oriented (Grundmann, 2017). These characteristics fit with the one-directional intermediary role of the expert (Boelens, 2010, 2020); however, this may not be completely effective for initiating the uptake of PLFRA.

To tailor expert advice to the homeowners' needs, the expert needs to be deployed in a more reciprocal relationship. In these situations, the expert cannot function solely by providing information one-directionally—for those with flood experience that are already eager to adapt (Davids et al., 2019)—but also needs to act as a mediator, conveying meaning by adding, changing or adjusting information according to the needs of the homeowners (Boelens, 2010, 2020). Thus, the challenge for the expert in being as effective as possible in initiating PLFRA, is to fulfil these multiple roles of expertise (Stehr & Grundmann, 2011), and mediate between various interests and needs of homeowners, government, and other actors in flood risk governance (Boelens, 2010, 2020).

In a more mediating role, expertise is considered relational (Boelens, 2010, 2020). This means that the expert-homeowner interactions influence the behaviour of both parties. Mediation can happen through a range of

different ways and different roles. Herein, we have adopted and adapted the four roles of the expert presented by Stehr and Grundmann (2011) and highlighted how they can be considered in the context of tailoring advice to encourage PLFRA uptake.

Table 1 illustrates the possible roles of the expert as a mediator, yet the needs of the homeowners are not yet considered.

2.2 | Homeowners and their needs

To identify a homeowner's needs, Protection Motivation Theory is often used and shows a diversity in the willingness to take precautionary actions (Rogers, 1975). This theory is also often applied in flood risk management to clarify the motivations of homeowners to implement PLFRA (e.g. Botzen et al., 2013; Bubeck et al., 2012; Grothmann & Reusswig, 2006; Poussin et al., 2014). Following this model, components can be identified that contribute to the protection motivation of a homeowner. First, threat appraisal explains the perceived probability and perceived severity of a negative consequence; with an increase in threat appraisal also the willingness to act is increasing. Second, there is coping appraisal, including protective response efficacy (do property level flood risk adaptation measures have an effect?), perceived self-efficacy (can I instal these measures in my home?) and protective response costs (can I afford these measures?). When answers to these questions are positive, again the willingness to act also increases. Finally, there are external barriers beyond these two socio-psychological mechanisms, such as dynamics in climate, population and wealth (Barendrecht et al., 2020; Grothmann & Reusswig, 2006). These are diverse, but include external limitations acting on the implementation of PLFRA, such as the presence of limiting laws (Grothmann & Reusswig, 2006). Threat appraisals seem to have only minor effect on the willingness to implement PLFRA, while coping appraisals seem to have a larger impact (Poussin et al., 2014) highlighting the need for experts to focus on these and recognising that these appraisals can differ between different groups of homeowners and that therefore the willingness to implement PLFRA also differs. This provides a clear rationale for the need for expert advice to better reflect these appraisals and their differences, both in what advice they provide, but also in how they communicate it; a one-size-fits-all approach to messaging and communication to homeowners is not effective (Snel et al., 2019). Instead communication can be organised into four groups of homeowners with each having different perspectives on flood risk management:

TABLE 1 The possible roles of the expert as a mediator in the uptake of property-level flood risk adaption (PLFRA) by homeowners

Role and description (Stehr & Grundmann, 2011)		Relation to PLFRA uptake
Creating trust	Being independent	The expert helps to construct a trustworthy relationship between homeowner and flood risk managers, or between the homeowner and contractors by providing neutral objective information and providing a network of contractors and identifying effective property level reducing measures
Defines situations and sets priorities	Showing the scope of choice that their client has.	The expert explains the urgency of action and prioritises the most suitable PLFRA for a homeowner, e.g. through an overview of costs and benefits specifically for this homeowner
Creates legitimacy	Collecting credible expertise to convince the public	The expert explains why the homeowner should implement PLFRA next to the actions of the local government, e.g. through an overview of local measures taken by the government and by illustrating the residual risks that remain
Reduces complexity	Selection of relevant expertise among all available expertise, and therewith contributes to certainty in the decision-making process	The expert explains that a homeowner should not despair and that a homeowner's action can have effect, e.g. by listing possible PLFRA, or by showing 'best practises' of PLFRA implementations, and link these to a homeowner's risks

- A homeowner that feels insufficiently connected to a network (Snel et al., 2019) that provides the information and tools he needs to implement PLFRA. This homeowner is aware of the risks, and has a high threat appraisal. Moreover, this homeowner believes in community-based solutions, common values, and is willing to 'take one for the team'. However, the homeowner may lack the context, network or knowledge to adapt, and therefore has a low self-efficacy and is unlikely to adopt PLFRA independently.
 - A homeowner who conceives himself as an acknowledged expert (Snel et al., 2019). This lay expert is experienced and aware of the flood risks, and acts proactively by considering PLFRA. This homeowner has a high threat appraisal, and has the knowledge (self-efficacy) and financial means (adequate protective response costs) to reduce risks. However, this homeowner may be indecisive about which PLFRA to implement and tries to identify the best solution.
 - A homeowner who is self-assured omniscient (Snel et al., 2019). This homeowner counts on the rules and regulations, and governmental responsibilities. Although this homeowner may have a high threat appraisal, the homeowner is likely not considering coping appraisals nor taking action if the government is not acting accordingly. The homeowner will place trust in government action and rely upon them to take action to reduce the risk.
 - A homeowner who is an insusceptible confident (Snel et al., 2019). This homeowner considers the world to be too complex to manage, or tends to withdraw themselves from further action. This homeowner may consider their house to be well-protected and feels overwhelmed by any past flood experiences. Overall, this homeowner is not recognising that the flood risks can be reduced at his home and this will create a barrier to taking action.
- To deal with this pluralism in how homeowners perceive flood risk and their perspectives on action, expert advice and its communication need to reflect these differences in order to be effective. These challenges are now studied in the context of Flanders, Belgium.

3 | METHODOLOGY

This study focussed on a pilot project providing tailored expert flood risk advice for homeowners in flood-prone areas organised by the Flanders Environmental Agency (VMM) in Belgium in 2017, aiming to increase flood prevention and adaption. The strategy builds on that of 'Multi-Layered Water Safety' (CIW, 2015), which suggests that an increase of PLFRA reduces future flood damage at individual building level (CIW, 2020; Kaufmann et al., 2016) in conjunction with the

implementation of other measures of flood risk management by governments and other actors. Experts of the VMM visited 209 households and provided tailored advice (Hydroscan, 2018).

House visits took place in the municipalities of Sint-Pieters-Leeuw (~30,000 inhabitants), Lebbeke (~19,000) and Geraardsbergen (~33,000) between April and July 2017. These municipalities are situated the urban fringe of Brussels, and suffered from pluvial floods during recent years. Sint-Pieters-Leeuw experienced floods in 2010 and 2016, and Lebbeke and Geraardsbergen were selected by the VMM after flood events in 2010, 2014, and 2016. All households had experienced recently (mainly flash) flooding and severity ranged from a flood up to the doorstep, with others experiencing water levels up to 50 cm in depth inside their properties. Consequently, all participants were open to listening to the advice of experts. Two experts visited each house, one having a background in insurance loss-adjusting and the second having expertise in urban water management. During the house visits, recent flood damages and experiences were initially discussed, associated water level measurements taken in and around the house and observations made concerning proximity to the nearest stream and sewer system. These expert visits took 60–75 min, and mostly couples were present during the visit. The meeting was semi-structured and open for questions and discussions from both experts and homeowners. Preliminary advice was discussed during the house visits, and tailored PLFRA were suggested and explained. A final advising report followed later. Participation was voluntary and free of charge (VMM, 2017). Average costs for the introduction of PLFRA suggested per household were €5578 (Hydroscan, 2018). So, based on the experts' visit at home, a group of homeowners with flood experience received all information needed to adapt their houses.

This study focussed on a subset of the house visits in the pilot project of VMM which were studied in depth. A qualitative approach was used to gain a deeper understanding of the interplay between homeowners and flood risk experts in the tailored advice process. During the 13 house visits, the interaction between experts and homeowner was observed. To learn about the expert–homeowner interactions, a participant as observer stance was taken (Dewalt & Dewalt, 1998), allowing the researcher to observe and participate during the house visits. Semi-structured interviews, lasting about 60–75 min, were also held directly after the visit to gain insight into their characteristics, needs and perspectives of the advice they had been given and the process. The selection of homeowners was largely outside of the control of the researcher and based on the scheduling of the expert. All interviewees were homeowners; tenants were

participating in the pilot but not among the selected interviewees. Interview topics included the reasons of participation, interaction with the expert, flood experience, and the willingness to adapt. Interviewees had the chance to speak freely on their flood experiences at the start and end of the interview. Interviews were recorded and transcribed, and were inductively coded and analysed using a thematic analysis (Creswell & Creswell, 2017). The individual answers of the respondents are discussed in the following section.

4 | ROLE OF THE EXPERT IN THE PLURALISM OF EXPERT–HOMEOWNER INTERACTIONS

The participants all have similar risk experiences: they recently experienced one or multiple floods and they show interest in adapting their homes as they participated in the pilot. Another similarity is that the expert advised on largely similar PLFRA, namely the introduction of a pump to remove incoming water, or floodwalls, or back-up valves, or a combination of these. Yet, when considering expert–homeowner interactions, differences were experienced: We observed that there were difference in interactions between the homeowners and experts. While some interactions were quite stiff where homeowners had a passive wait-and-see attitude, in other visits we observed an open curious interaction going on where homeowners and expert engaged in a dialogue about possible solutions. The interviews and analysis shed light on the reasons for this difference and associated lessons for tailoring advice of the experts. Four groups of expert–homeowner interactions could be identified.

4.1 | Creating trust in expertise and PLFRA

The first group of interviewees emphasised that the recent flooding experienced in the locale and, for some of them, in their houses was the primary motivation for participating in the pilot, and receiving expert advice and wanting to take action to reduce their risk. For instance, homeowner 13 stated that ‘above all, we have the fear that a flood would happen again. After the previous flood, we had everything renovated, but it could happen again in no time’. This quote illustrates that this respondent recognises the urgency of the problem and wants to react and adapt the house. It is for this reason that they became interested in the experts' opinion; ‘The advantage of the project is that experts tell us what we can do, which craftsmen are needed, which techniques. This is

an opportunity, all of a sudden experts come by who know a lot about our flood problems ... but all the information we have received today, I think it's fantastic, now we know how to act'. The main benefits of asking a flood risk expert according to this interviewee are to receive trustworthy tailored advice. He explains: '[So far] any people advised us anything; the insurer, the architect, and the professionals of the water supply company, they all provide various, even contradictory advice. We just didn't know who to believe. That's why it was nice to get some solid advice now'. Homeowners articulated that despite wanting to act, they were unsure what action to take and where to start; so for this group, motivation is not a concern, knowledge and confidence are lacking. The aforementioned interviewee reported that after the expert's visit he remains willing to adapt the property, but is also more confident to act. The quality of the advice is considered important for instilling confidence, as well as the degree of tailoring: 'Beforehand, I did not expect us to get so much tailored information, I thought it would remain more general' (Homeowner 13, experienced 1 flood).

Similar findings were revealed in the interviews with homeowners 3, 5, 7 and 12. Homeowner 12 already wanted to protect his house but did not know who to contact to adapt his house: 'What kind of expert does such a job?' (Homeowner 12, experienced 8 floods). Homeowner 5 placed more weight on the independence and objectivity of the advice received and the trust in those providing it; 'We want independent neutral advice. We had already received several suggestions from constructing companies, but now we understand the problem much better. Moreover, the problem is different than we thought, than what we were told by third parties'. (Homeowner 5, experienced 1 flood). Homeowner 3 was convinced by the advice and wanted to start as soon as possible: 'Hopefully they suggest some contractors. We will continue to work with the parties they recommend. If someone can install a back-up valve, they may do so, and the sooner the better' (Homeowner 3, experienced 3 floods). In summary, for this first group who already have motivation for taking action, the independence of the expert is the outstanding quality, and as such, the expert needs to create trust in the measures and supports homeowners in the implementation of PLFRA by providing access to a trustworthy network of contractors.

4.2 | Prioritising the most suitable PLFRA for a tailored fit

A second group has already been able to adapt their houses and implement some PLFRA. For example, interviewee 9, who adapted their house after having experienced three floods and continuing to expect flooding to

happen more frequently. This homeowner was interested in confirming the measures which have already been implemented and to explore where additional losses may be saved: 'I would like to know whether the investments I have already made have been the right ones. And perhaps there are additional ideas'. The experts could show some alternative ideas next to the original ideas of the homeowner, and improve cost-effectiveness: 'turn [ed] out to be more expensive than the suggestions [the experts] now come up with. So apparently, we wanted to invest more than necessary. It is nice that they confirmed possible solutions, and even come up with simpler and cheaper ideas' (Homeowner 9).

Similarly, homeowners 1, 4, 8 and 11 were also seeking confirmation of their own ideas. These homeowners already implemented property-level adaptations, or through their own investigations identified a number of measures they planned to implement. One interviewee proudly said: 'We are famous in the neighbourhood. Neighbours visit us to see our solutions. And I created it all myself! If I still get confirmation from these experts, that would be nice' (Homeowner 1, experienced 5 floods). However, this homeowner did not implement a back-up valve yet as he doubted about the effectiveness of this measure: 'It is just a piece of plastic, would it work? But now these experts do suggest it. They say it does the job. So that is the main reason why we participate. I would like to ask a few people who have the expertise, are we doing a good job or not...?'. However, interviewee 8 responded more sceptically about the experts' visit: 'The advice is not an extra stimulus, nothing new has been told. Maybe I expected different advice' (Homeowner 8, experienced 2 floods). Despite not receiving any additional advice, this has not impacted the implementation of their options: 'Our ideas seem to be right, useful. We just give it a try'.

The evidence illustrates = for this group how an expert may confirm the homeowners' choice for PLFRA; thereby validating the selection with expertise. Experts were also able to assist in prioritising the implementation of a group of selected measures and/or suggest alternatives (e.g. by offering a cost-benefits analysis or a more tailored fit from discussing from a catalogue of measures). For this second group of interviewees, the key qualities of an expert is in the expert's evaluating role and ability to inform about a tailored fit and setting priorities for action.

4.3 | Creating legitimacy for homeowner action

Dissimilar to the previous group, the third group of interviewees appeared much less willing to adapt their homes.

These homeowners indicated how PLFRA investments are unaffordable, while others suggested how local flood problems should be solved elsewhere in the neighbourhood. Interviewee 2 explained that the costs of measures should be balanced with the flood risk: ‘I am especially worried about the costs, so if the costs are low, I will consider it. The floods also do not happen very often...I don’t want to make large investments’ (Homeowner 2, experienced 3 floods). Interviewee 3 also elaborated on the costs of PLFRA, and pointed out how subsidies could be an extra stimulus: ‘My refurbishments have also been made with subsidies, so I’m going to search for that. Before I begin these works, I need to know more about possible subsidies (Homeowner 3, experienced 3 floods). Moreover, some interviewees mentioned the role of the government. Homeowner 4, for instance, sees flood risk adaption at his house as a game of give and take. The interviewee pointed out how multiple parties should be involved to manage the flood risks locally: ‘The residents, the municipality and the people from the water companies, they can all contribute’ (Homeowner 4, experienced 3 floods). He continued: ‘We could install a back-up valve and disconnect the rainwater [from the sewer]. But what we expect is that the problems will be tackled upstream, where the flood comes from. Then, perhaps we are also willing to look for solutions here at our home’. He in particular participated in the project since: ‘All the parties involved had been brought around the table by the municipality to jointly look for solutions’.

Also interviewees 6 and 10 expected the Municipality to act, for example by intervening in the nearby retention basin. ‘The municipality has to tackle the problem, one kilometre from here’ (Homeowner 6 in ‘possible flood-prone area’, experienced 4 floods). Interviewee 10 underlined this: ‘I will also take measures, but not the extreme one’s. I thought 50 cm high bulkheads were a rather extreme proposal from the experts, while if the municipality takes measures for the neighbourhood at the basin, then those bulkheads are no longer necessary. Then I do not need extreme measures and ditto investments. I also make my decision on costs, aesthetics and feasibility’ (Homeowner 10, experienced 1 flood). All in all, interviewees 2, 4, 6 and 10 expected a kind of governmental involvement, before these homeowners tend to adapt their houses. The evidence illustrates a clear reluctant to implement PLFRA; both due to the costs but also because they perceive flood risk management as a governmental responsibility. To deal with these barriers, the expert has a dual task: to convince homeowners why they have to implement PLFRA (instead of or next to more governmental interventions) and to emphasise how the government also takes their responsibility. In terms of communication, this is a challenging role for the expert

since he has to explain about residual risks and about how the domain of flood risk management is evolving towards shared responsibilities.

4.4 | Reducing complexity

A last group of interviewees show us that they are overwhelmed by the recent flood experiences and therefore doubt whether their flood risk can be reduced at all. For example, interviewee 2 sees the floods as ‘an act of God’, and doubts if the experts can solve the problems: ‘I hope that there will be a solution, that there will be no more water in the basement. Or at least less. But we do live in flood plains, so I think we won’t be able to solve the problem at all’ (Homeowner 2, experienced 3 floods). On the role of the expert, the interviewee said while sighing: ‘Well, inviting the experts, there is no harm in trying, but I have yet to see if they can change anything at all. These floods just happen’. Other interviewees also showed a sceptical and reluctant attitude. Interviewee 6 was convinced that they could not reduce their flood risks with PLFRA, but participated in this pilot project: ‘to continue the discussion with the municipality so that they will solve the problems in the neighbourhood’.

These homeowners perceive flood risk as an insolvable problem. In this context, the expert’s role is to emphasise that past experiences are no reason to despair, building trust in the efficacy of PLFRA options and that flood risks can successfully be reduced by individual homeowners.

4.5 | Plural perspectives in flood risk management

Our study confirms the four roles of experts by Stehr and Grundmann (2011) and shows how these roles materialise in flood risk management. In short, the homeowners’ quotes show a plurality of perspectives in the expert–homeowner interactions. Moreover, it illustrates that homeowners perceive various challenges in reducing their flood risks. Some homeowners are willing to act but are challenged to find a trustworthy expert or construction company. Some are willing to take action and have some ideas after own investigation but seek confirmation on these ideas. Others are less willing to act, and they question themselves why to adapt at all. They feel limited by the costs or rather see the government to intervene. This low willingness to act can also be triggered when homeowners perceive flood risks to be unsolvable.

To deal with this plurality of perspectives, the expert is required to perform and switch between these multiple

roles. Yet, the question remains how the expert can recognise this plurality, adopt a fitting role and optimise communication accordingly.

5 | RECOGNISING THE MULTIPLE RATIONALITIES OF HOMEOWNERS

In the previous section, we identified a plurality of homeowners' perspectives which is in line with protection-motivation theory (Grothmann & Reusswig, 2006; Rogers, 1975) and our results indicate that different coping appraisals dominate among certain discussions between homeowners and expert. Even though the content of advice can show similarities, communication strategies need to be tailored to the homeowners' perspective. Therewith expert-homeowner interactions may differ quite markedly.

To identify and structure certain dominant patterns among this plurality of expert-homeowner interactions, Renn (2008) suggests to use Cultural Theory to relate the four groups of expert-homeowner interactions. Cultural Theory tells us that all perspectives are true in their own way, yet differ from each other (Schwarz & Thompson, 1990). None of these irreconcilable perspectives is better or worse than another. These rationalities illustrate various perceptions of reality, and the expert has to take all seriously and be able to react in order to affect most change. Cultural Theory of Risk (Douglas & Wildavsky, 1983) offers a perspective to deal with people acting accordingly to one of these rationalities in risk management, without discarding certain perspectives (Hartmann, 2012). It can explain how four rationalities are shaping the perceptions of people and how certain behaviours evolve. The four rationalities are egalitarianism, individualism, hierarchism and fatalism (Hartmann, 2012; Schwarz & Thompson, 1990):

- Egalitarianism describes a rationality of people that preferably operate collaboratively. They value trust, morals and ethics, and believe that a strong community is able to handle problems collectively.
- Individualism describes a rationality of self-determination, of people having distrust in the state or community and therefore operate individually, believing that the strongest survives.
- Hierarchism describes a rationality that includes a strong belief in authority, and to obey the rules and institutions that come with it.
- Fatalism describes people that perceive the world as complex and unpredictable, and therefore do not act at all.

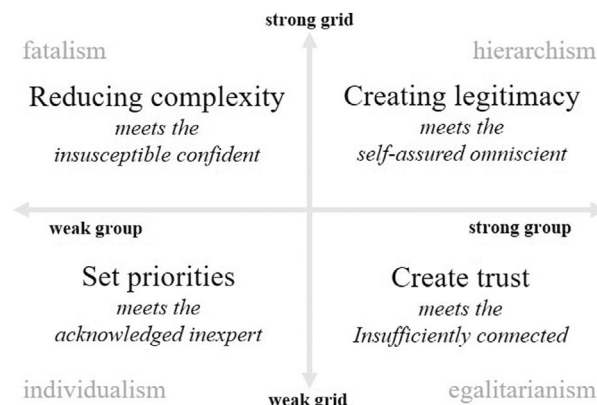


FIGURE 1 Linking expert roles and homeowner perspectives to the rationalities of Cultural Theory

These rationalities and their relation is visualised in a matrix based on levels of 'grid' and 'group' (see Figure 1). The grid embodies a level of incorporation and describes to what extent a person trusts and relies on the system of science, control, institutionalisation, whereas the group embodies the adhesion of an individual in a group including frequency of interaction, social values, and equality (Mamadouh, 1999). In sum, these rationalities shape the perceptions of people and their communication preferences. If the expert becomes aware of these different rationalities, they can tailor their advice and approach to communication. In this way, communication can increase the implementation of PLFRA among participants of tailored flood risk advice.

Stehr and Grundmann (2011) indicate possible roles for an expert to deal with these different rationalities in expert-homeowner interactions. If the expert observes a lack of trust (i.e. egalitarianism), then they counter this by offering neutral advice and connecting the homeowner with suiting contractors. This way creating trust contributes to motivating a homeowner. If the expert observes a need for confirmation or alternative advice (i.e. individualism), they counter this by providing an overview of possible solutions that fit the specific problem. Here, the expert provides more background information about the solutions and prioritises the best solutions tailored to the situation at the household. If the expert observes distrust in the government (i.e. hierarchism), the expert emphasises what the government is already doing, as well as how certain problems cannot be solved by the government alone. In some cases, these statements were emphasised, for instance, by calculations of the needed sewers that would be wider than the street to discharge flood water. If the expert observes an overwhelmed homeowner, the expert has the role to emphasise the simplicity of the solutions and introduces possible PLFRA. The expert explains how the

solutions are tailored to the house and to the budget of the household. As such, the expert reduces the complexity of taking action for this group of homeowners.

This way, the expert creates a bilateral relation. The homeowner can discuss their challenges. By doing so, the expert transforms from an intermediary into a mediator. Being a mediator, brings many advantages. The expert informs about PLFRA, tailors his communications to individual homeowners' behaviour, and this way motivates homeowners to implement PLFRA. Based on this bilateral communication, the expert should tailor both solutions and his communication strategies for a better fit.

In fact, Cultural Theory confirms this experts' dilemma when experts try to handle the plurality of homeowners' perspectives. Cultural Theory explains how specific advice tailored to only one of the rationalities will only trigger adaptive behaviour of one group of homeowners. Other groups may often misunderstand and reject the advice if it does not meet their needs. Advice that takes more care to serve all four rationalities will be more likely to be understood by higher numbers of homeowners. However, as Cultural Theory illustrates some of the aspects of the four rationalities are mutually exclusive. It is thus extremely difficult to serve all groups of homeowners optimally with the same advice. So, the dilemma is whether to provide technical advice one group, or to find a 'happy medium' serving all groups semi-optimal with what has been called 'clumsy solutions' (Hartmann, 2012). It is for the experts to decide whether they serve one specific group of homeowners, balance the advice to serve some of the needs of all, or develop very specific and tailored advice. If experts are aware of the plurality and the different needs of homeowners, they are able to adopt an open and flexible approach so that they can make the most appropriate decision to best assist homeowners and will be more likely to enact change. Moreover, and in line with the mediating position of the expert according to Boelens (2010, 2020), the role of an expert can go even further. When governments involve homeowners in flood risk management, this consequently also changes the role of the governments (Mees et al., 2019). This means that, for experts to become more competent mediators, they could also intervene with the actors and institutions involved in PLFRA to provide these actors with feedback from homeowners. This requires, according to Scolobig et al. (2015, p. 1): '...courage for the expert to question existing institutional arrangements, and not only devolve power'.

6 | CONCLUSION

This study links research on the role of the expert (Grundmann, 2017; Stehr & Grundmann, 2011),

homeowner perspectives (Snel et al., 2019), and tailored flood risk advice (Davids et al., 2019). Davids et al. (2019) illustrated how the engineering skills of experts alone are insufficient to increase at-home flood resilience. Therefore, the objective of this study was to provide a better understanding on the potential role of experts in tailoring flood risk advice. Based on a specific and unique case of tailored expert advice in Flanders, this study shows plurality in expert-homeowner interactions on the implementation of PLFRA. Expert-homeowner interactions vary based on certain rationalities, as described by Cultural Theory, which helps to identify and value each type of interactions as relevant. Therefore, to optimise expert advice, experts need to become more aware of the various multiple roles they need to have in the interactions with all four groups of rationalities.

By combining expert roles (Stehr & Grundmann, 2011) and homeowners' perspectives (Snel et al., 2019), advice can target the individual needs of homeowners more effectively than using each of these approaches separately. A combined approach helps to recognise certain homeowners' behaviours and links to specific expert actions for these perspectives. To provide more effective expert advice, the expert can create bilateral relations by listening to and understanding a homeowner's perspective and expectations, instead of just transferring information. As such, tailored expert advice on flood risks is not only tailored in the selection of measures, but tailored in its communication as well. In turn, a tailored expert-homeowner interaction may overcome the common barriers preventing the implementation of PLFRA among homeowners in flood-prone areas. Future education of 'the flood risk expert' should therefore not only focus on technical engineering but also pay explicit attention to developing tailored communication. Indeed, the expert is in a dilemma. The expert can contribute to the flood resilience of homeowners only if they combine their engineering role with the role of a mediator and expert communicator.

ACKNOWLEDGEMENTS

This article contributes to the EU COST Action network LAND4FLOOD: Natural Flood Retention on Private Land, CA16209. The work described in this publication is part of FLOODLABEL, a JPI Urban Europe project that was supported by the European Union's Horizon 2020 research and innovation programme under grant agreement No. 693443. We thank the Flanders Environmental Agency for allowing us to participate in their pilot project on tailored flood risk advice. Open Access funding enabled and organized by Projekt DEAL.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author, Peter Davids, upon reasonable request.

ORCID

Peter R. Davids  <https://orcid.org/0000-0002-5349-8813>

REFERENCES

- Árvai, J. (2014). The end of risk communication as we know it. *Journal of Risk Research*, 17(10), 1245–1249.
- Attems, M., Schlögl, M., Thaler, T., Rauter, M., & Fuchs, S. (2020). Risk communication and adaptive behaviour in flood-prone areas of Austria: A Q-methodology study on opinions of affected homeowners. *PLoS One*, 15(5), e0233551.
- Attems, M. S., Thaler, T., Genovese, E., & Fuchs, S. (2020). Implementation of property-level flood risk adaptation (PLFRA) measures: Choices and decisions. *Wiley Interdisciplinary Reviews: Water*, 7(1), 1–19.
- Barendrecht, M., Sairam, N., Cumiskey, L., Metin, A. D., Holz, F., Priest, S., & Kreibich, H. (2020). Needed: A systems approach to improve flood risk mitigation through private precautionary measures. *Water Security*, 11, 100080.
- Begg, C. (2018). Power, responsibility and justice: A review of local stakeholder participation in European flood risk management. *Local Environment*, 23(4), 383–397.
- Boelens, L. (2010). Theorizing practice and practising theory: Outlines for an actor-relational-approach in planning. *Planning Theory*, 9(1), 28–62.
- Boelens, L. (2020). Opening up new planning landscapes; an introduction in the actor-relational approach of planning. In B. Boonstra, P. Davids, & A. Staessen (Eds.), *Opening up the planning landscape—15 years of actor-relational approaches to spatial planning in Flanders, the Netherlands and beyond*. InPlanning.
- Botzen, W., Aerts, J., & Van den Bergh, J. (2013). Individual preferences for reducing flood risk to near zero through elevation. *Mitigation and Adaptation Strategies for Global Change*, 18(2), 229–244.
- Botzen, W. W., Kunreuther, H., Czajkowski, J., & de Moel, H. (2019). Adoption of individual flood damage mitigation measures in New York City: An extension of Protection Motivation Theory. *Risk Analysis*, 39(10), 2143–2159.
- Bubeck, P., Botzen, W. J., & Aerts, J. C. (2012). A review of risk perceptions and other factors that influence flood mitigation behavior. *Risk Analysis: An International Journal*, 32(9), 1481–1495.
- Butler, C., & Pidgeon, N. (2011). From ‘flood defence’ to ‘flood risk management’: Exploring governance, responsibility, and blame. *Environment and Planning C: Government and Policy*, 29(3), 533–547.
- CIW. (2015). *Informatienota Meerlaagse Waterveiligheid*. https://www.integraalwaterbeleid.be/nl/kalender/infonota_Meerlaagse%20Waterveiligheid.pdf
- CIW. (2020). *Meerlaagse waterveiligheid*. <https://www.integraalwaterbeleid.be/nl/beleidsinstrumenten/meerlaagse-waterveiligheid>
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage Publications.
- Davids, P., Boelens, L., & Tempels, B. (2019). The effects of tailor-made flood risk advice for homeowners in Flanders, Belgium. *Water International*, 44, 1–15.
- Dewalt, K. M., & Dewalt, B. R. (1998). Participant observation. In H. Bernard (Ed.), *Handbook of methods in cultural anthropology*. AltaMira Press.
- Disse, M., Johnson, T., Leandro, J., & Hartmann, T. (2020). Exploring the relation between flood risk management and flood resilience. *Water Security*, 9(100), 059.
- Douglas, M., & Wildavsky, A. (1983). *Risk and culture: An essay on the selection of technological and environmental dangers*. University of California Press.
- Driessen, P. P., Hegger, D. L., Bakker, M. H., van Rijswijk, H. F., & Kundzewicz, Z. W. (2016). Toward more resilient flood risk governance. *Ecology and Society*, 21(4), 1–9.
- Forrest, S., Trell, E. M., & Woltjer, J. (2019). Civil society contributions to local level flood resilience: Before, during and after the 2015 boxing day floods in the Upper Calder Valley. *Transactions of the Institute of British Geographers*, 44(2), 422–436.
- Grothmann, T., & Reusswig, F. (2006). People at risk of flooding: Why some residents take precautionary action while others do not. *Natural Hazards*, 38(1–2), 101–120. <https://doi.org/10.1007/s11069-005-8604-6>
- Grundmann, R. (2017). The problem of expertise in knowledge societies. *Minerva*, 55(1), 25–48.
- Guerreiro, S. B., Dawson, R. J., Kilsby, C., Lewis, E., & Ford, A. (2018). Future heat-waves, droughts and floods in 571 European cities. *Environmental Research Letters*, 13(3), 034009.
- Hartmann, T. (2012). Wicked problems and clumsy solutions: Planning as expectation management. *Planning Theory*, 11(3), 242–256. <https://doi.org/10.1177/1473095212440427>
- Hartmann, T., & Juepner, R. (2014). The European flood risk management plan: Between spatial planning and water engineering. *Journal of Flood Risk Management*, Virtual Special Issue, 1–2.
- Hoss, F., Jonkman, S. N., & Maaskant, B. (2011). *A comprehensive assessment of multilayered safety in flood risk management—The Dordrecht case study*. Paper presented at the ICFM5 Secretariat at International Centre for Water Hazard Risk Management (ICHARM) and Public Works Research Institute (PWRI), Proceedings of the 5th International Conference on Flood Management (ICFMS), Tokyo, Japan.
- Hudson, P., Botzen, W. W., Feyen, L., & Aerts, J. C. (2016). Incentivising flood risk adaptation through risk based insurance premiums: Trade-offs between affordability and risk reduction. *Ecological Economics*, 125, 1–13.
- Hydroscan. (2018). *Het implementeren van individuele beschermingsmaatregelen tegen overstromingen in drie pilotgebieden*.
- 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.
- Joseph, R., Proverbs, D., Lamond, J., Joseph, R., Proverbs, D., & Lamond, J. (2015). Homeowners' perceptions of property-level flood risk adaptation (PLFRA) measures: The case of the summer 2007 flood event in England. *International Journal of Safety and Security Engineering*, 5(3), 251–265.
- Kaufmann, M., Mees, H., Lieferink, D., & Crabbé, A. (2016). A game of give and take: The introduction of multi-layer (water) safety in the Netherlands and Flanders. *Land Use Policy*, 57, 277–286.

- Kellens, W., Terpstra, T., & De Maeyer, P. (2013). Perception and communication of flood risks: A systematic review of empirical research. *Risk Analysis*, 33(1), 24–49. <https://doi.org/10.1111/j.1539-6924.2012.01844.x>
- Kuhlicke, C., Seebauer, S., Hudson, P., Begg, C., Bubeck, P., Dittmer, C., Grothmann, T., Heidenreich, A., Kreibich, H., Lorenz, D. F., Masson, T., Reiter, J., Thaler, T., Thieken, A. H., & Bamberg, S. (2020). The behavioral turn in flood risk management, its assumptions and potential implications. *Wiley Interdisciplinary Reviews: Water*, 7(3), e1418.
- Lamond, J., Rose, C., Joseph, R., & Proverbs, D. (2016). *Supporting the uptake of low cost resilience: Summary of technical findings (FD2682)*, London, UK.
- Lamond, J., Rose, C., Mis, N., & Joseph, R. (2018). *Evidence review for property flood resilience phase 2 report*.
- Lechowska, E. (2018). What determines flood risk perception? A review of factors of flood risk perception and relations between its basic elements. *Natural Hazards*, 94(3), 1341–1366.
- Liao, K.-H. (2012). A theory on urban resilience to floods—A basis for alternative planning practices. *Ecology and Society*, 17(4), 15–29.
- Mamadouh, V. (1999). Grid-group cultural theory: An introduction. *GeoJournal*, 47(3), 395–409.
- McClymont, K., Morrison, D., Beevers, L., & Carmen, E. (2019). Flood resilience: A systematic review. *Journal of Environmental Planning and Management*, 63(7), 1–26.
- 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., Uittenbroek, C. J., Hegger, D. L., & Driessen, P. P. (2019). From citizen participation to government participation: An exploration of the roles of local governments in community initiatives for climate change adaptation in the Netherlands. *Environmental Policy and Governance*, 29(3), 198–208.
- Poussin, J. K., Botzen, W. W., & Aerts, J. C. (2014). Factors of influence on flood damage mitigation behaviour by households. *Environmental Science & Policy*, 40, 69–77.
- Rauter, M., Kaufmann, M., Thaler, T., & Fuchs, S. (2020). Flood risk management in Austria: Analysing the shift in responsibility-sharing between public and private actors from a public stakeholder's perspective. *Land Use Policy*, 99(105), 017.
- Renn, O. (2008). *Risk governance: Coping with uncertainty in a complex world*. Earthscan.
- Rogers, R. W. (1975). A protection motivation theory of fear appeals and attitude change. *The Journal of Psychology*, 91(1), 93–114.
- Rollason, E., Bracken, L., Hardy, R., & Large, A. (2018). Rethinking flood risk communication. *Natural Hazards*, 92(3), 1665–1686.
- Schwarz, M., & Thompson, M. (1990). *Divided we stand: Redefining politics, technology, and social choice*. University of Pennsylvania Press.
- Scolobig, A., Prior, T., Schröter, D., Jörin, J., & Patt, A. (2015). Towards people-centred approaches for effective disaster risk management: Balancing rhetoric with reality. *International Journal of Disaster Risk Reduction*, 12, 202–212.
- Slavíková, L., Raška, P., Banasik, K., Barta, M., Kis, A., Kohnová, S., Matczak, P., & Szolgay, J. (2020). Approaches to state flood recovery funding in Visegrad group countries. *Environmental Hazards*, 19(3), 251–267.
- Snel, K. A., Witte, P. A., Hartmann, T., & Geertman, S. C. (2019). More than a one-size-fits-all approach—tailoring flood risk communication to plural residents' perspectives. *Water International*, 44(5), 554–570.
- Snel, K. A., Witte, P. A., Hartmann, T., & Geertman, S. C. (2020). The shifting position of homeowners in flood resilience: From recipients to key-stakeholders. *Wiley Interdisciplinary Reviews: Water*, 7(4), e1451.
- Stehr, N., & Grundmann, R. (2011). *Experts: The knowledge and power of expertise*. Routledge.
- Terpstra, T., Zaalberg, R., De Boer, J., & Botzen, W. (2014). You have been framed! How antecedents of information need mediate the effects of risk communication messages. *Risk Analysis*, 34(8), 1506–1520.
- Van Den Brink, M. (2009). *Rijkswaterstaat on the horns of a dilemma*. Eburon Uitgeverij BV.
- van Ruiten, L., & Hartmann, T. (2016). The spatial turn and the scenario approach in flood risk management: Implementing the European floods directive in the Netherlands. *AIMS Environmental Science*, 3(4), 697–713.
- VMM. (2017). *Pilootproject preventie overstromingsschade*. <https://www.vmm.be/water/overstromingen/pilootproject-preventie-overstromingsschade>
- White, I., Connelly, A., Garvin, S., Lawson, N., & O'hare, P. (2018). Flood resilience technology in Europe: Identifying barriers and co-producing best practice. *Journal of Flood Risk Management*, 11, S468–S478.

How to cite this article: Davids, P. R., Priest, S., & Hartmann, T. (2023). On the horns of a dilemma: Experts as communicators for property-level flood risk adaptation measures. *Journal of Flood Risk Management*, 16(2), e12881. <https://doi.org/10.1111/jfr3.12881>