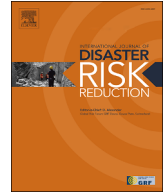


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## Shifting risks back to the state? Flood insurance and responsibility in the face of climate change in Australia

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## ABSTRACT

In Australia, with its neoliberal policy tradition, responsibility for dealing with severe and extreme weather events such as floods and bushfires has mainly been left to individual households and insurance markets. With the growing number of extreme weather events, existing institutional arrangements and behavioral patterns are challenged. Individuals have difficulties to reliably assess and manage knowledge about such climate change related hazards. In response to the growing uncertainties of rising costs due to increasing flooding and bushfire events, insurers raise their premiums for house and contents insurance or even withdraw from insuring high-risk areas altogether. Based on semi-structured interviews with 26 (re)insurance, legal, financial, and urban planning experts conducted in 2022, the study provides empirical insights in the still under-researched question of how responsibilities are understood and attributed amongst different stakeholders in the context of changing climate. The findings show that extreme weather events and the individualization of risk lead to new, complex patterns of sharing responsibilities amongst banks, insurers and the different governmental levels with a stronger emphasis on state regulation.

### 1. Introduction

Australia has a long history of floodings, and bushfires, but with climate change the intensity and frequency of such events have significantly increased [1]. As a result, long established regulations and behavioral patterns have come under pressure, including the division of responsibilities between the state, businesses, and the citizens [2]. Public policy in Australia is characterized by a focus on individual responsibility to keep regulatory costs for the state low and to allow choice and foster competition for efficient solutions [3]. There are some indications for a new division of labor between different stakeholders (e.g. insurers, banks and different levels of government) with a stronger emphasis on the role of the state [2]. Stakeholders in the context of the article can be, based on Freeman [4], understood as “any group or individual who can affect or is affected by the” [4] insurance situation in Australia. Since climate change has made it more difficult to calculate the future based on the past, the insurance industry has responded with increasing premiums or even with exiting an incalculable and less profitable market [1,5]. With a growing number and intensity of extreme weather events, house and contents insurance has become unaffordable or unavailable for more and more households. The lack of adequate insurance against extreme weather events contributes to household vulnerability – “defined as the [...] sensitivity and susceptibility to harm and lack of capacity to cope and adapt” [6]- and negatively affects household recovery in high-risk areas [1,7]. As a result, the state steps in as *last insurer* to compensate for household losses. In addition, with the implementation of the Australian Governmental

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Cyclone Reinsurance Pool in 2022, the state has taken on a new role within the (re)insurance sector [8]. When it comes to household vulnerability and the implementation of resilience strategies, this new role implies a shift of responsibility away from households and businesses back to the state. Our qualitative exploratory study aims to identify changes in responsibilities by identifying main stakeholders as well as their current and future responsibilities when dealing with the effects of climate change. In doing so, the article offers a conceptual contribution and provides empirical insights in the under-researched area of how responsibilities are understood and attributed amongst different stakeholders in the context of a growing number of extreme weather events and how these affect the vulnerability of households. A large part of the existing literature on insurance and extreme weather events in Australia focusses on the experiences and decision-making of affected households [9–11]. This paper takes on a complementary approach by exploring the views of a range of stakeholders such as urban planning, (re)insurance, legal, financial and policy experts.

In the following we first position our research conceptually in the broader debate on insurance and responsibility (section 2) before outlining the current situation of house and contents insurance in Australia (section 3). Based on qualitative expert interviews, which the first author conducted in Australia in 2022 (compare section 4 on methodology and methods), the article identifies six main stakeholders (households, banks, insurers, three levels of government). Section 5 reviews the literature on current responsibilities of these stakeholders. Based on the interviews, possible future responsibilities of each of the stakeholders are analyzed in section 6. In a next step we discuss how responsibilities should be allocated in the future to deal with the increasing complexity of extreme weather events (section 7). The article concludes by arguing that the findings point to a shift away from the focus on the individual households towards complex patterns in which responsibility is shared between households, economic stakeholders and the state (section 8).

## 2. Responsibility and insurance

For understanding the ways how insurance is utilized as a way of managing floodings amongst other social problems it is important to see it in a broader social context.<sup>1</sup> Decades of scholarship in interdisciplinary risk studies including risk regulation, public and social policy has emphasized a *risk shift* from the state to the individual particularly in countries with neoliberal policy traditions such as Australia [13–15]. This work highlights a general trend towards a new prudentialism shifting responsibility for risks from the state to individuals, considered autonomous and rational decision makers. Authors often seek conceptual support in the work of Foucault on the historical shift of power and control from direct enforcement and punishment to indirect forms of governmentality, which encourage people to follow expert advice and make prudent decisions autonomously [16,17]. Empirical scholarship on changes in insurance suggested that such a trend to shift responsibility to the individual was observable in (social) insurance. For example, policies now not only differentiate and calculate premiums according to risk indicators such as age and gender but also open opportunities for securing better premiums when behaving responsibly, such as driving safely and having fewer accidents or encourage regular health checks and healthy lifestyles to contribute to improve the health status of a population [15]. This would also help to manage the notorious problem of moral hazards, in which people behave less responsibly since costs are covered by insurance [18].

Already at the turn of the century Baker and Simon [15] had argued that such trends seem to challenge or even contradict the *solidarity principle*, which, in many countries, underpins comprehensive insurance schemes such as health, disability and unemployment insurance and spreads the costs and burdens fairly amongst the insured. For example, Francois Ewald [19] in the mid-1980s had famously argued for France, that the development of an *Insurance State* was fostered by a shift in managing workplace accidents. Formerly mainly commercial insurance had shifted to an instrument of state intervention towards comprehensive social insurance. The key rationale was that workplace accidents would take place as a side-effect of industrialization even when workers would behave responsibly. The new system of social insurance guaranteed by the state would come with a new understanding of social solidarity and had shifted responsibility from the workers to society and the state [19]. However, this sharing of responsibility has been eroded in the last two to three decades as neoliberal policies have gained ground and have forced growing cost pressures upon welfare states [13–15].

Turning to technological and environmental risk, Ulrich Beck in his path breaking work on the *Risk Society* [20] has suggested that new catastrophic risks would hollow out the insurance principle as a way of managing risk. When there is little past knowledge available to calculate the costs and when major accidents become catastrophic in character, the insurance principle would no longer work, forcing the state to jump in as *last insurer*. Key examples in this respect would be extreme weather events which ended up in major disasters such as the Black Friday Bushfires in Australia (2009) or the Ahr Valley floodings in Germany (2021) [21,22]. Beck's position was strongly opposed by governmentality scholars who argued that insurance never covered the true cost of an incident but provide products offering some compensation even for terror attacks or climate change [23]. However, risk society scholars such as Beck [20] still insist that when the insurance industry can only partly cover the costs, the state must jump in as *last insurer* since (private) insurance on its own is not able to manage and compensate for catastrophic risks. There is some evidence for both when it comes to increasing flooding and bushfire events in Australia. According to Jarzabkowski and colleagues increasing risks and therefore costs for insurance affect (re)insurers' market behavior. They are likely to leave the market or to push the premiums to a level which cannot be met by parts of the affected population [24]. If risks become too expensive, (re)insurance becomes uneconomically and therefore both uninsurable and unaffordable. As the Climate Council and the Institute of Actuaries of Australia stated, this is already the case in Australia [1,7,25] as we will outline in more detail in the following section.

<sup>1</sup> For an historical overview compare for example Masci [12].

### 3. Floods, insurance and responsibility in Australia

The Australian continent is regularly affected by extreme weather events such as severe floodings, especially in the states of Queensland and New South Wales (NSW), or bushfires, especially in Victoria and NSW (Fig. 1) [26].

Due to the frequency and intensity of these events house and contents insurance has become unavailable or unaffordable to some, especially the ones that are socio-economically disadvantaged [1,7]. Sewell and colleagues [27] show that in Australia “socio-economically disadvantaged communities” [27] are likely to be located in areas that are prone to floods or bushfires. Especially low-income households with a weekly income below AU\$ 789 [28] are likely to have trouble affording insurance [1], which contributes to rising numbers of people having no insurance cover or being significantly underinsured [9]. The Victoria State Government Department of Health and Human Services [29] for example states that 46 % of the households in the state of Victoria have adequate home and contents insurance, whereas 26 % are not insured and 28 % are underinsured. In cases where households affected by extreme weather events do not have house and contents insurance or are underinsured, the state is under pressure to take over as *last insurer*. Therefore, the national government introduced the so-called *disaster recovery payments* [30]. As a result, new complexities for people's insurance decisions emerged. Lo [31] for example argues that, when costly insurance coverage is difficult to afford, people might not insure, but rely on the state instead. It may be more rational for the affected households to speculate that the state will be obligated to step in than to shoulder the increasingly high costs for house and contents insurance. As suggested elsewhere, such state regulation and compensation patterns may support *individual irresponsibility* in contrast to the dominant normative paradigm of a new prudentialism [32]. As O'Hare and colleagues have argued “insurance regimes reinforce exposure and vulnerability through underwriting a return to the ‘status-quo’ rather than enabling adaptive behavior” [33].

This situation produces new challenges for the state. Growing numbers of extreme weather events [6] question current regulative structures due to household exposure and vulnerability. When risk is highly privatized, households are mainly responsible for mitigation and recovery [9]. But with climate change extreme weather events become more frequent and severe, which makes it more difficult for households to assess their risk and to act accordingly [2]. At the same time, with the increasing number of extreme weather events, insuring certain regions becomes uneconomical for private and commercial actors. This development is already observable in Australia where by 2030 one out of 25 properties are expected to be uninsurable due to increasing insurance premiums [1]. Additionally, Jarzabkowski and colleagues [25] suggest that more extreme weather events can lead to the withdraw of insurers from certain regions. When individuals face the threat of insurers no longer offering them policies, the state can try to encourage the insurance industry to stay in the market even when flooding or bushfire insurance becomes less profitable. This amounts to a shift of responsibility from individual households and private insurers to the state, a development already observable in Australia with the introduction of government's *cyclone reinsurance pool*. The reinsurance pool aims to reduce insurance premiums for businesses and households by lowering reinsurance costs. In this case the government acts as reinsurer, making it compulsory for insurers to “reinsure the risk of claims for eligible cyclone events by joining the cyclone pool” [8].

As the foregoing summary of the situation suggests, the relevance of the distribution of responsibilities in the context of extreme weather events is growing. However, there is still a lack of empirical analysis of perceptions regarding changing responsibility allocations in the context of environmental risks which require further investigation [34].

### 4. Methodology and methods

In 2022 the first author conducted an explorative interview study in Australia to learn about the different stakeholders' views on flood insurance and responsibility related to climate change. Reaching out to key decision makers in private and government organizations was difficult [35] since it is often not possible to contact them directly. Some of the companies approached did not respond at all or declined the interviews due to confidentiality concerns. To secure the required number of interviewees, the study shifted to a snowball sampling method to identify additional experts from relevant domains [36]. Anonymization was important not only due to confidentiality concerns. It was also necessary to allow experts to talk openly about their personal views rather than reproducing official organizational positions. For these reasons, the data cannot be made openly available.

The study used qualitative semi-structured expert interviews [37] (in-person and online) to generate rich knowledge on experts' views and experiences about the debate in their domain. Therefore, the experts (appendix Table 1) were selected based on their specific expertise and many years of experience related to the topics that are relevant for this article [38]. The interviewees are currently employed or have previously worked in the private and public sectors (compare appendix, Table 1 for an overview). The study showed that interviewees' insights and knowledge often went beyond their specific role and personal views reflecting broader debates in their professional domain.

To secure high quality results the study aimed for a diversified sample [39], which includes a range of different (re-)insurance, urban planning, financial, legal as well as policy experts. Overall, 51 experts were contacted of which 26 agreed to participate. The aim was to secure a high-quality sample for generating robust results [40]. As a qualitative study, it follows a reproduction logic as outlined by Yin [41] who argued for case study research that further research may complement or confirm findings.<sup>2</sup>

The semi-structured interviews started with personal questions on how long the interviewed expert already works in his or her field of expertise (for the questionnaires see Plass [42]). Based on the given information they were asked to reflect on changes related to the role and impact of extreme weather events that have taken place within their field of work. This also helped assess changes in the different sectors (insurance, finance, legislation, policy, and urban planning) over the last 5–25 years and identify the topics re-

<sup>2</sup> This contrasts with statistically representative probability samples.

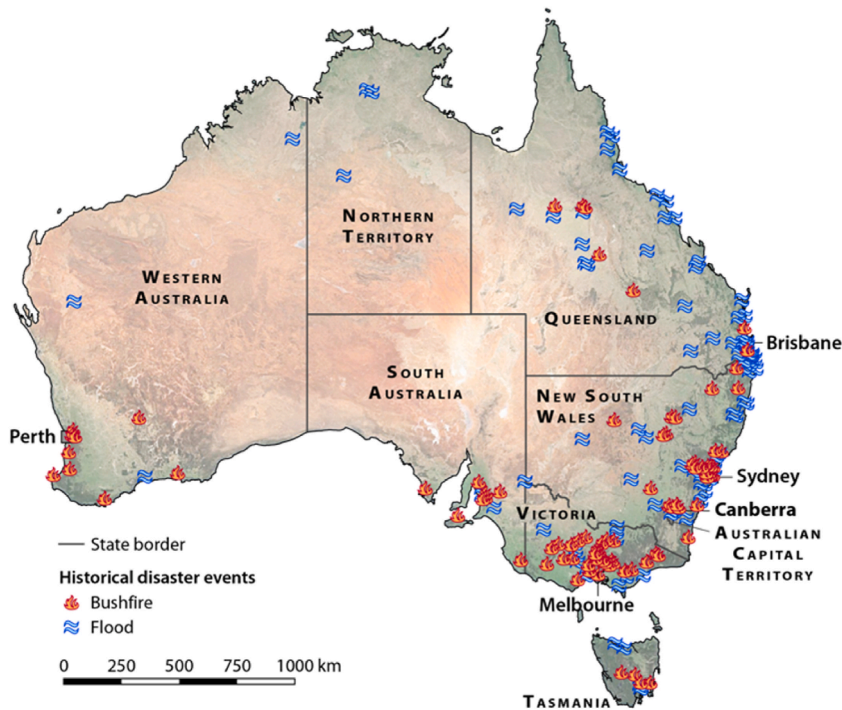


Fig. 1. Flooding and Bushfires in Australia (1872–2021). Plass and Blauhut, 2023, adapted from Australian Institute for Disaster Resilience [26].

lated to extreme weather events in Australia that the experts consider most relevant. Most of the experts started to identify main stakeholders and key challenges when responding to the second question. In the case that the experts did not reflect on relevant stakeholders or main challenges, the next questions covered those topics. Otherwise, the interviewer followed up on the role of each stakeholder and key challenges that were addressed by the interviewee. At the end of each interview, the interviewee was asked to reflect on the topics addressed in the interview and to identify topics that they felt were relevant but had not (sufficiently) covered yet. This helped to identify new and relevant topics related to the insurance challenge in Australia [43].

The study applied a qualitative content analysis according to Kuckartz [44]. In a first step, the interviews have been analyzed by using a combination of thematic and in-vivo coding. Subsequently, the first author identified central, more general themes inductively for different passages within each of the interviews. To enable a more in-depth analysis of the interviews, these themes and the related text passages were then broken down into more detailed sub-themes until saturation was reached. Based on the more detailed themes, the researcher developed a thematic matrix which contains relevant quotes from the different experts on a specific topic. This facilitated comparison of the statements on a certain topic that has been addressed by interviewees [44]. The process resulted in the identification of the distribution of responsibility being considered as key element for the challenges Australian households are facing with increasing extreme weather events. Within the theme of responsibility, six main stakeholders (three levels of government, banks, insurers, and households) and three sub-themes (geographic location, access to data and information as well as affordability) which impact the shift of responsibilities of the stakeholders have been identified. The inductive approach was chosen since it allowed a largely unbiased analysis of the interviews and lead to a deeper understanding of key challenges and topics that impact the current situation in Australia according to the experts' views [45].

The findings were then put into the context of existing literature. Therefore, based on a literature review, the following section 5 presents the current formal responsibilities of the stakeholders that have been identified by the interviewees. Section 6 presents future responsibilities envisioned by the interviewed experts. The section is divided into three subsections, each focusing on stakeholder responsibilities related to one of the identified themes (geographic location, access to data and information, as well as affordability).

## 5. Context analysis of formal responsibilities

Managing the impacts of extreme weather events involves various stakeholders who take on different responsibilities and tasks. After the Black Saturday bushfires in Victoria in 2009 the need for collaborating and sharing responsibilities to manage such hazards has been recognized in Australia [46]. This study identified three domains (businesses, state, private households) of altogether six central stakeholders which are involved in the governance of flooding: Regulators (federal governments, state governments, councils), businesses (insurers, banks), and households, especially homeowners. The following subsections provide an overview about their current responsibilities based on existing literature.

### 5.1. Regulators

The government in Australia is divided into three levels, each with its own responsibilities and powers [47]. Regarding extreme weather events such as flooding or bushfires the **federal government** is mainly responsible for providing the funding for disaster relief and recovery (*National Disaster Relief and Recovery Arrangements*) as well as providing information and strategic guidance on severe and extreme weather events (e.g. *National Flood Risk Information Program* or the *Enhancing Disaster Resilience in the Built Environment Roadmap*) [47,48]. The role of the federal government is limited “unless it is invited by state governments or chooses to legislate using its powers to regulate corporations or to fulfil national obligations under treaties, such as those related to wetlands and climate change” [47]. The **territory and state governments**, however, have the main responsibility regarding flood and bushfire management in Australia [48]. Detailed responsibilities can differ from state to state or territory to territory since they implement their own disaster risk policies and management plans [49,50]. In Australia states and territories are responsible for the endorsement of legislations and for developing planning strategies in areas such as land-use and hazard prevention planning. Additionally, they **provide local governments** with resources and expertise so that they can meet their political targets and legal responsibilities [51]. Unlike federal and state/territory governments, local governments are not addressed in the Australian constitution, even though this level is “potentially the most sensitive to the diverse regional and local interests” [51]. However, every state and territory has laws setting out the rules for the establishment and work of the councils [52]. Local governments oversee the implementation of land-use plans and mitigation strategies in line with existing state policies and legislations, which also includes the responsibility for the different stages of emergency management: prevention, preparedness, response, and recovery [48,53]. Despite local responsibility for prevention and preparedness, housing development still takes place in high-risk areas where homeowners struggle to afford insurance and are responsible for mitigating the effects of extreme weather events [10]. Since the Black Saturday Bushfires in 2009 responsibilities have been shared beyond the three levels of government. Based on the *National Strategy for Disaster Resilience* other actors such as businesses and individuals were still given prominent roles [48,54].

### 5.2. Business

According to the *National Strategy for Disaster Resilience* businesses play a crucial role for disaster resilience because businesses such as insurance companies provide “resources, expertise and many essential services on which the community depends” [54]. Even though businesses are addressed quite generally in the strategy, insurers are explicitly mentioned [54] since insurance has become the default form of disaster management for individuals [55]. In general, insurance is seen as a mechanism that transfers a certain risk “from one party to another for the payment of a premium” [56]. This can for example include a risk transfer between households or businesses, nationally and globally. At the same time, insurance can be seen as a risk indicator because it sets a price for the probability of occurrence of a certain risk [19].

In Australia “the insurance of private property lies solely in the hands of insurers in the form of house and contents insurance” [9] and includes the protection against environmental hazards. However, this does not necessarily include flood coverage [57]. Since insurance companies are, in the first place, businesses and thus must make a profit, they might decide not to insure certain regions against certain weather events anymore when the risk becomes too high or uncertain [25]. This is currently the case in Australia with regions considered uninsurable or premiums for home and contents insurance increasing to an extent that some households can no longer afford them - especially flood cover [1,7].

In addition to increasing insurance premiums, Australia is experiencing a housing crisis driven by increasing property prices [58]. Especially for low-income people housing becomes less affordable. These are therefore more likely to move to cheaper areas with a higher exposure to extreme weather events [27,28,59]. Due to the increase in property prices, there are growing numbers of households that must take out a mortgage [60]. According to the Australian Institute of Health and Welfare [61] in 1996 around 43 % of home buyers did not take-out a mortgage to buy a house. This has declined to 29 % in 2019. One requirement for taking out a mortgage in Australia is home insurance [62]. At the same time, there is no requirement to include all types of (geological and hydrometeorological) hazards in insurance coverage [63]. Currently, banks are not explicitly mentioned in the *National Strategy for Disaster Resilience* [54]. This implies that there is no official recognition of the responsibility of banks to estimate the risk for such hazards before giving out a mortgage. Consequently, most of our interviewees suggest that the responsibility is mainly with homeowners and local councils, which will be addressed in section 6.

### 5.3. Households

As noted above, when it comes to mitigation as well as resilience strategies in the face of extreme weather events, the main responsibility currently lies with individual households [9].

One of the main examples for this are the 2009 Black Saturday Bushfires. In the case of bushfires, risk management was mainly characterized by the so-called *stay or go* concept for decades. This meant that households receive information about bushfire risks from, for example, local fire services as well as police. Based on this risk information, households were responsible for deciding whether to stay and defend their property or leave [64]. But the assumption that individuals were able to assess the risks adequately (that is in line with expert recommendations) in the face of climate change, and to respond accordingly, was called into question due to the 2009 Black Saturday Bushfires. New conditions, which include an increasing intensity of extreme weather events, has led to a situation in which former disaster risk management strategies had become too risky. As a result of the devastating bushfires in 2009, the risk management approach has shifted towards a shared-responsibility approach that involves households, businesses as well as the government. This was supposed to shift some of the responsibility away from households and share it to a greater extent among households, businesses, and the government [2,65]. Consequently, governments were responsible for implementing policies to reduce



“impediments to households and businesses choosing risk management options that deliver the greatest net benefits” [65]. However, most of the responsibilities for disaster risk mitigation measures still remain with the individual. The aforementioned dependency on individuals’ mitigation measures reflects a “neoliberal shift toward individualization of risk, or responsabilization through which collective social problems are reframed as resulting from individual choices” [3]. Such choices include place of residence, the identification of risk and its mitigation as well as the purchase of house and contents insurance [66]. The latter is considered a central tool for the individualization of risk but does not necessarily include flood cover [54,57]. With the growing complexity and severity of climate change related hazards, it becomes increasingly difficult for individual households to understand the actual risks and react accordingly [10]. This results in a shift of current responsibilities away from households which will be addressed in the following section.

## 6. Results: challenges and shifting responsibilities

The current ascription of responsibilities related to the social management of extreme weather events outlined in section 5 reflects Australia’s strong neoliberal policy tradition that results in fairly open market structures and individualized risk management [9,67]. This section builds upon these insights and is based on the qualitative expert interviews. It identifies three main themes that challenge the current distribution of responsibilities: geographic location, affordability of housing as well as access to data and information for different stakeholders. The findings from the interviews indicate a gradual shift back of responsibility from the focus on the individual and individual household to a greater emphasis on responsibilities of the state and the private sector.

### 6.1. Geographic location

Location plays a central role for the exposure to extreme weather events. Due to the continent’s geography, almost 9 of 10 Australians live within 50 km of the coast [68]. In addition, personal preferences that include infrastructure and job opportunities lead to intensified development of land, not only in the cities but also in surrounding areas [69]. This results in high pressure on the housing market and, leads to housing developments in high-risk areas that are prone to extreme weather events [68]. One of the main challenges that comes with urban development in locations at risk of flooding or bushfires is that “[a] lot of the land that’s prone to natural perils tends to be cheaper. So, people [who] have bought those properties often end up being more low or mid socioeconomic, that might not have the financial resources to recover as quickly” (Insurance Expert G). Housing in these locations is on average “built to less resilient standards” (Legal Expert A). Even though all interviewees acknowledged that the main responsibility related to living in hazard prone areas lies with homeowners, there is also a consensus among interviewees that compared with other stakeholders’ responsibility, that of households should be much lower when it comes to property location since “lots of people have no clue that they are buying themselves into a risky location” (Urban Planning Expert A). Even if they do, in many cases they have “no choice where they live” (Policy Expert A) due to rising property costs.

Instead, interviewees attributed the responsibility for the choice of location mainly to different government levels and their roles. The federal and state government is legally responsible for regulations and disaster risk management (Insurance Expert G) [2,47,48]. This means that “they need to regulate the building sector and the development sector to make sure things are built to the existing codes and then improve the codes as well” (Insurance Expert G). Based on these regulations, “it’s our local government that has to make a decision about whether they consent to a particular building going ahead” (Insurance Expert G). Despite this, decisions often result in developments in areas that are prone to extreme weather events [11]. According to the interviewees, reasons for this vary from lack of information and expertise as well as data availability to financial and personal interests. On the one hand “there is that issue around councils often not having the information and not having the knowledge and expertise to do the small area hazard mapping and modelling” (Urban Planning Expert A). This indicates that the responsibilities of local counsellors and urban planners currently do not match their expertise, which leads to inadequate urban planning for the effects of climate change. On the other hand, councils push new housing development due to the financial benefits it brings through taxes or stamp duties (Insurance Expert A; D) [70]. However, councils that are trying to make future-oriented development decisions are often hindered by legislations and regulations currently in place: “And even if they do make the right call and try to block development, you know, they’re in for an expensive legal fight because developers will fight them on that” (Legal Expert A). According to Urban Planning Expert A, not only developers but also homeowners take local councils to court if they try to prohibit housing development in certain areas. In these cases, developers, and homeowners “often win because councils cannot refer to a state regulation that says you need to plan for [...] climate change” (Urban Planning Expert A). This implies a “tension between [the] local government and [the] state government where [the] local government might not back a development and then it goes to court and then it gets overruled. And the state government has been able to approve it” (Insurance Expert G). However, according to this interviewee, power structures are currently shifting. The influence of developers is getting weaker, for example in New South Wales, due to an increasing “alignment between a state and a local government in New South Wales, where they are being more determined on things like resilience [...]” (Insurance Expert G). This development implies that the state governments need to take on more responsibilities when it comes to building resilience to extreme weather events in the face of climate change by working more closely together with local councils.

### 6.2. Access to data and information

Related to the decision on where to live and purchase a property is the access to risk data and information. In their discussion of the long history of risk communication on bushfire, Cooper and colleagues [71] suggest that households moving into regions of risk often lack experience with bushfires. In the case of floods, Box and colleagues [72] state that even when information on flood risk is publicly available, “the information needs of different stakeholders [...] are very different” [72]. At the same time flood information and maps are not available in every council and vary in detail and accessibility, making it more difficult for homeowners to under-

stand and access the information that is available [72]. These observations are also supported by several interviewees: Many households “are buying themselves into a situation of risk and they only find out maybe once they want to put in an insurance” (Urban Planning Expert A). Others are lacking the understanding of risk related to moving decisions: “So, although some of those people were aware that there was a percentage, they didn't think that that risk would happen” (Financial Expert C). In addition, “there is an overwhelming amount of information and for the average person, it's probably more that they can fully comprehend and distil” (Financial Expert C). The challenges people are facing related to risk awareness and understanding show the relevance of access to and understanding of risk information. Paired with the individualized responsibility for risk management, it becomes more difficult for households to make informed choices related to moving and insurance decisions. As noted above, households are burdened with calculating rebuilding costs in accordance with, for example, changing building codes, inflation and changing costs of building materials (Insurance Expert C) [10]. This is to some extent exacerbated by the legislations currently in place. According to insurance Expert G, this includes that insurers are legally not permitted to advise their clients on appropriate levels of coverage although insurers “overall understand their risks better than anyone else [...]” (Urban Planning Expert A). Insurers are considered responsible for “helping customers to understand [...] what their policy is covered for” (Insurance Expert C) but are barred from giving advice on whether a specific level of coverage is adequate. Related to the lack of risk knowledge and evaluation, urban planning and insurance experts consider banks as an essential, but still insufficiently recognized sources of relevant information prior to households' purchasing decisions: “So, they just give out a mortgage [and] do not warn those property buyers [...]” (Urban Planning Expert A). This point of view is also supported by insurance and legal experts (Insurance Expert D; Legal Expert A). Due to the housing crisis and increasing prices, more people are taking out mortgages, and thus rely on banks when planning to buy a house, which in the view of some of the interviewees increases the potential responsibilities of the banks [61]. According to the interviewees, the increase in responsibilities of banks can already be noticed since banks have become more aware of the growing risks for their businesses due to climate change. Due to the increase of risks combined with the lack of adequate data, banks have become more interested in the risk modelling of insurance companies (Insurance Expert D; G), but data protection legislations currently restrict data exchange:

“[...] under privacy, we [insurers] can't share that data with the bank. So, I think the bank's challenge is [that] they're having to make assumptions about the climate exposure from the address, but not about how the house is being constructed” (Insurance Expert G).

According to Urban Planning Expert A, the lack of access to data and information also affects urban planners. Even where the information is available, planners sometimes lack the expertise to fully understand it: “[T]hey're not environmental experts, they're not insurance experts, they're not actuarial experts. So [...] we're asking them to make long-term projections in making these development decisions” (Legal Expert A).

Overall, the challenges that the different actors face all indicate that “there is an enormous information bias between who-knows-what in terms of risk and that is a big problem” (Urban Planning Expert A). To address this challenge, a stronger cooperation between banks, governments and insurers is considered as an essential step (Urban Planning Expert A). However, it is not all about the lack of information, but also about strategic decisions and the balancing of different risks between different stakeholders in the face of limited resources, as the next section shows.

### 6.3. Affordability

As mentioned in section 6.1. housing in high-risk areas often is less expensive, which results in more low-income households moving to regions of risk (Insurance Expert G). “[T]hey get cheap land on the floodplains and the premium for the insurance is so high that they can't afford [it]” (Insurance Expert C). The interviews imply that even if homeowners are aware of the risk certain locations pose, low-income households do not feel they have a choice where to live: “So, you hear stories of, okay, ‘I'll just make a deliberate decision to live on the floodplain because I have no other choice. I mean, I have to be housed. It's that or homelessness’. So, people have to make very stark choices” (Policy Expert A).

Like housing, insurance is for many households ultimately a matter of affordability. As insurance serves as risk indicator by assigning a value to a certain risk [19], premiums for house and contents insurance increase accordingly in high-risk areas. This results in high numbers of households living in bushfire and flood prone areas are being under- and uninsured (Urban Planning Expert A). Another factor is tax, especially the Goods and Services Tax (GST), which ranges from 19.9 % up to 45 % on an insurance premium [73] and therefore disproportionately affects people in high-risk areas.

“[T]ax is a huge part of the premium, and in some states it's almost 50% of the premium. And so even if the state government decided to reduce that tax by 20%, 30%, 40%, that would have a massive benefit to the [...] affordability” (Insurance Expert I).

In the case of extreme weather events, the responsibility to support people without (adequate) insurance ultimately falls back upon the national government through, for example, the *Australian Government Disaster Recovery Payment*. This is a one-time payment for eligible people who have been strongly impacted by severe weather events [74]. According to Insurance Expert C, such payouts are considered unfair by homeowners who have house and contents insurance: “[T]here is a bunch of people, customers in the community, who have chatted to us and sort of said, ‘I don't think it's fair that I've paid my premiums all these years and my neighbor hasn't’” (Insurance Expert C). With increasing insurance premiums, the existence of this bailout option could result in higher numbers of people who do not take out insurance and increasingly rely on governmental disaster recovery payments.

To address the insurance affordability challenge, the government has introduced a governmental reinsurance pool (see section 3). The establishment of this pool signifies that “the role of government has changed from helping with legislation and not helping with

taxes and now becoming a reinsurer” (Insurance Expert B). But only reducing insurance premiums is considered problematic by some of the experts:

“I think insurance is an important price signal that should tell ‘you do not live here’. So, if you take that away, you give the wrong incentive” (Urban Planning Expert A).

To keep insurance and housing affordable but still give correct risk signals, the experts interviewed consider shared responsibility necessary. On the one hand there is a need for stronger cooperation between the different stakeholders: “[I]n our own [insurance] sector, making sure that we’re working with government, both at a state and a federal level, to look at mitigation” (Insurance Expert G). On the other hand, changes in the current systems are required. For insurers this means beginning to “recognize people who are taking proactive steps and reward people who are actually trying to make their home more resilient” (Insurance Expert C).

In summary, the relevance of implementing mitigation measures to increase resilience and address rising insurance premiums is also highlighted by most of the interviewees. This would require sharing responsibilities to a greater extent amongst the different stakeholders. As we will argue in the following, this implies a shift of responsibility away from households to the state.

## 7. Discussion: shifting responsibilities

In the neoliberal policy tradition, responsibilities for managing risks are typically transferred from governments to individuals [13]. This is especially the case in Australia where risk is highly privatized [9]. At the same time, existing literature points to the relevance of sharing responsibilities between the different institutional stakeholders through stronger cooperation, a perspective which is also supported by our findings [2,46]. However, sharing responsibilities requires a detailed understanding by each stakeholder of its own responsibilities as well as the responsibilities of others. This understanding can differ based on perceptions, moral obligations, and personal interests (economically or public interests) [34,46]. Box and colleagues [46] found, for example, that insurers do not consider themselves responsible for getting involved in flood mitigation measures or planning. Our findings show that insurers per se consider councils and governments responsible for the implementation of mitigation strategies and revising current urban planning laws. In contrast, our data indicate that insurers increasingly acknowledge their responsibility for sharing risk data and information with councils, governments, and banks. The need for sharing resources is also recognized by other stakeholders in our study since especially councils and banks are considered lacking access to such resources. According to several experts, banks and councils often do not have the expertise to make future-oriented decisions that take the effects of climate change into account. This lack of expertise leads to housing developments in high-risk areas. Even though these challenges are acknowledged, councils are still considered primarily responsible for reducing housing development in high-risk areas [7].

It has become clear that some of today’s high-risk regions might have been considered low risk in the past and it can be expected that the number of regions designated as medium or high-risk areas is likely to rise due to climate change [1]. With housing development already taking place in these areas, the question of who is responsible becomes even more complex. Our findings indicate that the stakeholders see the need of mitigation measures by councils and the government as essential but at the same time acknowledge that mitigation is only possible and sensible to a certain extent, especially in terms of feasibility, cost-effectiveness, and structural realization such as dikes. Further research is required on how responsibilities are allocated when urban planning in areas once considered low risk become high risk in the future. Two of the solutions currently being attempted by the Australian government are buy-back programs and planned relocations, which aim to move people out of flood affected areas. These initiatives imply an even greater shift of responsibility to the government as more areas are officially declared uninhabitable [75]. The declaration of areas as uninhabitable also addresses the legal aspect that was mentioned by several stakeholders from various fields, where councils try to prohibit housing development in high risk areas but get taken to court by developers. Interviewees point out the need for rethinking existing legislation so that councils’ decisions on prohibiting development in certain areas are more difficult to challenge in court. Additionally, our findings indicate that specifically insurers see the need for legal changes when it comes to the sharing of risk data and information as well as allowing financial advice.

The sharing of data and information is also highly relevant in the context of planned relocations and buybacks which enable homeowners to relocate into different areas. Especially in the context of buybacks, homeowners are self-responsible for deciding on where to move. Without adequate access to information, they are more likely to end up in high-risk regions again. Besides the lack of access to information, our results showed that even if information is provided, households often have difficulties to understand them, since they are often not provided in an accessible way. Nevertheless, they are supposed to make informed choices on where to live, taking up of mortgages as well as insurance products without adequate knowledge. Our data does not address these topics in detail, and we suggest further research on homeowners decision-making processes before and after buybacks, since they are still likely to move into cheaper regions of risk based on the amount of money they have available. However, homeowners will require sufficient information and advice in making these decisions. Regarding the distribution of information, most stakeholders consider banks and insurers responsible for raising awareness before giving out mortgages and informing households about the most suitable products. Currently, the responsibility of banks is rarely considered in literature. The Actuaries Institute [7], however, does explicitly (if briefly) mention the relevance of banks. This implies the possibility of a future, partial shift of responsibility onto banks in their capacity to influence the purchasing decisions of home buyers. In addition, the interviews suggest that banks also include flood insurance as a compulsory element for giving out mortgages.

Overall, the interviewed experts believe that the different stakeholders should assume part of the responsibility for protecting the population of Australia from the growing effects of climate change related hazards. Especially insurers are calling for greater mitigation measures and future-oriented urban planning by councils and governments. Most stakeholders would like to see banks take on



more responsibility for informing individuals about the risk prior to giving out insurance. An expanded role for insurers in informing different stakeholders such as legal and urban-planning experts, but also in providing individuals with suitable products and information that can be understood by an average person, would be welcomed by most interviewees. Again, this would require changing existing legislation that prohibits insurers from giving financial advice to their customers. Changes in some of these areas are underway but their pace and ultimate outcomes are currently uncertain [59].

**8. Conclusions**

The article begins to address the under-researched impact of increasing extreme weather events on neoliberal responsabilization in Australia. The research identified six main stakeholders that are involved in the process of disaster risk management (households, three levels of governments, insurers, and banks) as well as three main themes that contribute to the under- and non-insurance challenge in Australia (location, access to information and data as well as affordability). The research indicates that these factors are mutually dependent and together influence the insurance challenge. By doing so, they negatively affect the resilience of households to extreme weather events by limiting the cycle of protection, prevention and recovery [76]. The article showed that the increasing household vulnerability and limited capacity to recover results in a shift of responsibilities that are currently primarily with individuals. Due to increasing prices for housing, individuals with lower socio-economic status are more likely to move into cheaper regions that are prone to extreme weather events. In these areas insurance premiums are skyrocketing. Combined with the privatization of risk, when households must calculate their insurance sum for house and contents insurance on their own, this regularly results in high levels of under- and non-insurance. Such developments increase the vulnerability of Australian households to the effects of growing numbers of extreme weather events due to climate change. The results indicate that due to the unpredictable future and increasing intensity and frequency of extreme weather events, households, that currently bear most responsibilities for disaster risk management, are often no longer able to cope, adapt, and recover. As a result, the privatization of risk is currently being challenged, and experts call for a stronger shift of responsibilities to the government as well as to banks and insurers, for the development and implementation of mitigation and resilience strategies. Especially the sharing of information and data is a challenge in market structures that are based on competition. At the same time, shifting responsibilities require changes in existing legislations to be effective. This includes domains such as urban planning, building regulations, data-sharing and financial advice. For sharing responsibilities in a time where the future remains uncertain and to a certain extent unpredictable, constant assessment and readjustment of responsibility is necessary.

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**CRedit authorship contribution statement**

**Julia Plass:** Writing – review & editing, Writing – original draft, Resources, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Jens O. Zinn:** Writing – review & editing, Writing – original draft, Conceptualization.

**Declaration of competing interest**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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**Data availability**

The data that has been used is confidential.

**Appendix**

**Table 1**  
Overview - Interviewees and Field of Expertise

Number	Interviewee	Field of Expertise
1	Financial Expert A	Finance, resilience
2	Financial Expert B	Finance, reinsurance, climate risk
3	Financial Expert C	Finance, insurance, regulations
4	Financial Expert D	Finance, climate risks, resilience
6	Insurance Expert A	Insurance, reinsurance, climate risks

(continued on next page)

Table 1 (continued)

Number	Interviewee	Field of Expertise
6	Insurance Expert B	Insurance, reinsurance
7	Insurance Expert C	Insurance, regulations
8	Insurance Expert D	Climate risk modelling, adaptation
9	Insurance Expert E	Insurance
10	Insurance Expert F	Insurance, climate risks
11	Insurance Expert G	Insurance, finance, climate risks
12	Insurance Expert H	Insurance, climate risks
13	Insurance Expert I	Insurance, climate risk, pricing
14	Insurance Expert J	Insurance, regulations
15	Insurance Expert K	Insurance
16	Insurance Expert L	Insurance, climate risks, pricing
17	Legal Expert A	Financial rights, policy
18	Policy Expert A	Policy, legislation, finances
19	Policy Expert B	Policy, finance
20	Policy Expert C	Policy, insurance, regulations, climate change
21	Policy Expert D	Policy, climate change, infrastructure, insurance
22	Reinsurance Expert A	Reinsurance, insurance, climate risk
23	Reinsurance Expert B	Reinsurance, insurance, climate risk
24	Reinsurance Expert C	Reinsurance
25	Reinsurance Expert D	Reinsurance
26	Urban Planning Expert A	Housing policy, urban planning, climate change

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