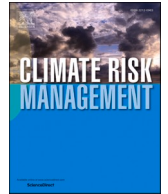




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The Australian housing affordability trap – How environmental, institutional, and structural factors can immobilize Australian households in the face of extreme weather events – A case study on flooding

Julia Plass^{a,*}, Jens O. Zinn^b

^a Chair for Cultural Geography, University of Bayreuth, Universitätsstrasse 30, 95440 Bayreuth, Germany

^b School of Social and Political Sciences, University of Melbourne, Parkville VIC 3010, Australia

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ABSTRACT

With climate change a growing number of increasingly severe hazards such as floods and bushfires affect populated regions in Australia. As a result, insurance premiums rise, and hazard-prone regions might even become uninsurable. Using the example of floods, this article examines how under conditions of the Australian housing crisis these risks affect households unequally. After major floods, un- and underinsured households often lack the capacity to recover. At the same time, they become immobilized because they cannot afford to move out of regions at risk. Based on 26 semi-structured interviews with (re-) insurance, legal, financial and urban planning experts conducted in 2022, the article provides empirical insights into the under-researched interconnection of household immobilization and vulnerability to extreme weather events from an expert perspective. The experts identify four factors which combine in producing vulnerability and at the same time immobilizing people: location and urban planning, the privatization of risk, socio-economic factors as well as awareness and the distribution of information. Current political strategies address the challenge of moving people out of at-risk locations but do neither sufficiently address the housing and insurance situation nor how people's personal attachment to a region affects their housing decision.

1. Introduction

According to the IPCC (2023) “every increment of global warming will intensify multiple and concurrent hazards.” For Australia rising temperatures are predicted to intensify heavy rainfall and associated floodings such as the Queensland floods in 2019 that impacted more than 116.000 individuals (Queensland Government 2022) and resulted in insured losses of around AUD 1.2 billion (Australian Institute for Disaster Resilience 2019). Even though we are presenting a case study on flooding, climate change also contributes to increasing heatwaves, droughts and related bushfires, which provide important insights into the effects of extreme weather events on society. The Black Summer fires in 2019/2020 (Cresswell et al. 2021) affected large parts of the country, especially the eastern part, and more than 3000 homes were destroyed (Natural Hazards Research Australia 2023). The harm, extreme weather events are causing, is exacerbated by the ongoing housing crisis (Daley and Coates 2018), which forces especially low-income

* Corresponding author.

E-mail addresses: julia.plass@uni-bayreuth.de (J. Plass), jzinn@unimelb.edu.au (J.O. Zinn).

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households to move into cheaper, hazard-prone areas (Rolfe et al. 2020; Sewell et al. 2016). To reduce household risks – defined as the interconnection between vulnerability, exposure and hazard (IPCC 2022)¹ – in relation to increasing extreme weather events, climate adapted housing in high-risk areas is required and local and state governments play a central role for the decisions and implementation of prevention and preparedness measures. In the context of flood risks, examples include land-use-planning, building levees or the implementation of building codes that entail requirements for (re-) building in areas of risk (Deloitte Access Economics 2017). Whilst insurance policies generally provide coverage for bushfires, flood insurance is commonly optional (Booth and Tranter 2018). However, past events show that many households lack adequate house and contents insurance as well as flood cover, which leaves many households without adequate insurance (see Booth et al. 2022 on bushfire and the ACCC 2019 on flooding). The growing frequency and severity of extreme weather events leads to a situation in which homes will not be insurable, or premiums will become unaffordable for many homeowners. By 2030 around 521.000 properties are projected to be located in high-risk areas of extreme weather events – such as bushfires, severe wind as well as flooding – and therefore become uninsurable (Climate Council, 2022).

Ongoing housing development in high-risk areas increases the exposure of properties and households whereas inadequate house and contents insurance increases their vulnerability. These households will experience greater financial stress when unable to rebuild after a flood, or rebuilding is prolonged (Booth and Tranter 2018; IAG and SGS Economics and Planning 2016). Nevertheless, households that have been displaced might be equally vulnerable to future extreme weather events than the ones that stay and try to rebuild (Zickgraf 2021).

To help people moving away from regions at risk of flooding, the NSW government, for example, introduced voluntary buybacks and planned relocations (NSW Government 2024). However, existing research in Australia found that most households are unlikely to consider relocating either due to place attachment or the lack of (financial) resources and alternatives (Boon 2014; King et al. 2014). The issue of affordable housing has been further exacerbated by the country's housing crisis, which conflicts with the "Australian dream" of home ownership (Daley and Coates 2018).

While *immobilization* is a key factor in vulnerability, research around the world shows that immobility in the face of climate change is still insufficiently addressed in policy discourse (Farbotko et al. 2020; Robins et al. 2024). Current research on insurance, and a wider range of scientific studies that focus on extreme weather events in Australia, have also not given sufficient attention to immobilization (see Booth and Tranter 2018; van den Honert and McAneney 2011). Instead, much of the existing literature concentrates on the experiences and decision-making of homeowners themselves (Boon 2014; de Vet et al. 2019; Keogh et al. 2011; King et al. 2014). In contrast, this article explores the perspective of experts' and how they see the connections between (im-) mobility, vulnerability and insurance in the context of flood events to answer two crucial research questions: (1) How is immobilization addressed and understood by experts that are involved in and are shaping the (political) debates around insurance and housing affordability? (2) Which key factors contribute to household (im-) mobilization in the context of flood events in Australia? The results show that, (im-) mobility is a central but often neglected element of household vulnerability to extreme weather events in Australia and that, from an experts' perspective, four key factors contribute to the process of immobilization: location and urban planning, risk privatization, socio-economic factors as well as information distribution and awareness.

This article begins by exploring the concepts of (im-) mobility and vulnerability, as well as their interconnections (Section 2), before examining the current situation in Australia (Section 3). Section 4 outlines the study's methodology, which is based on semi-structured interviews with experts who identify four key factors influencing household immobilization and vulnerability to extreme weather events (Section 5). Section 6 discusses how these factors may contribute to involuntary household immobilization and the challenges this poses to existing political adaptation strategies, such as 'buybacks' and 'planned relocation.' Finally, we conclude that current strategies fail to adequately address different forms of immobilization or recognize how several key factors can combine in perpetuating a cycle of involuntary immobilization.

2. Connecting vulnerability and (im-) mobility

To explore how experts address the issues of household immobilization and its effects on (social) vulnerability a deeper understanding of the concepts 'vulnerability' and '(im-) mobility' is needed (Virokannas et al. 2020; Zickgraf 2021). 'Vulnerability' is a complex and multifaceted concept, with numerous definitions and analytical frameworks (e.g. Adger et al. 2018; Chambers 1989). O'Brien and colleagues (2007) distinguish broadly between two approaches: *contextual vulnerability*, which considers the dynamic interactions between society and climate, and *outcome vulnerability*, which is based on causal relationships. While the experts interviewed in this study primarily frame vulnerability through an outcome-based lens, our analysis demonstrates that household vulnerability to flooding in Australia is far more intricate. This complexity necessitates an approach grounded in contextual vulnerability, which we explore in this article.

To this end, we adopt the widely used definition of vulnerability as "a function of exposure, sensitivity and adaptive capacity" (Adger et al. 2018) in the context of climate-related hazards. In particular, incorporating adaptive capacity—encompassing factors such as policies, personal networks, and economic resources like insurance (Lanlan et al. 2024)—allows for a more nuanced understanding of the key determinants of household vulnerability. Some conceptualizations of vulnerability also emphasize *coping capacity* as a central factor, though it is sometimes viewed as a contradictory or even opposing concept to adaptive capacity (Schipper and Burton 2009). However, in our research, we do not understand coping and adaptive capacity as mutually exclusive. Instead, we

¹ However, risk calculations have often not a sound statistical-probabilistic basis. We therefore more generally understand 'risk' as the possibility of an undesired event putting something of value at stake (SRA 2018).

conceptualize them as existing on a spectrum, where subjective factors (e.g., lifestyle and place attachment) interact with both practical (adaptive) and cognitive (coping) responses.

Research shows that extreme weather events such as floods can negatively affect the availability of and access to different resources and contribute to human mobility as an adaptation strategy (Adger et al. 2018; McLeman and Hunter 2010). However, Zickgraf (2018) suggests, “those left behind may be equally if not more vulnerable than the people who are able to leave environmental risk zones [...]”. Nevertheless, mobility can also increase vulnerability (de Haas 2021). This ambivalence of mobility is connected to resources (Cresswell 2010) but is also shaped by the “affective bond or link between people and specific places” (Hidalgo and Hernández 2001). It is not solely contingent upon the presence of personal networks (Boon 2014), but the recollection of past experiences and a strong historical connection with a place, sometimes spanning generations (Chen et al. 2021). Households with strong place attachment might not move, even though they have the resources to do so (voluntary immobility). Others might aspire to leave due to their vulnerability to extreme weather events but lack the resources to do so (involuntary immobility). Therefore, mobility occurs along a spectrum (Schewel 2019) and “not everyone has an equal relationship” (Skeggs 2004) to it (Fig. 1).

Overall, the costs and benefits from mobility and immobility vary considerably. A lack of mobility can therefore be indicative of insufficient but also high levels of resources that can contribute to household vulnerability and resilience (de Haas 2021; Zickgraf 2018).

3. Housing affordability, insurability and flooding

Rapid urbanization is observable worldwide with an increasing concentration of the population in urban areas. This trend results in extensive urban development in areas that are at risk of environmental hazards (Serre and Heinzl 2018). Australia is no exception including housing development in flood and bushfire prone regions (Young et al. 2022; Ziegelaar and Kuleshov 2022). Due to population growth and density in some areas, the pressure on Australia’s housing market increases and prices are rising, especially in the capital cities (AIHW 2023). This trend has made housing increasingly unaffordable, specifically for low-income households (weekly income below 789 AUD). Many are compelled to relocate to more affordable areas, which are often prone to extreme weather events (ABS 2023; Bailie et al. 2022; Sewell et al. 2016). The disproportionate exposure of low-income households is a globally observable pattern. Compare for example Winsemius and colleagues’ (2018) study on the interconnection of poverty and exposure to flood and droughts in various countries such as Colombia, Indonesia or Namibia and Qiang (2019) on similar developments in the U.S.

Despite living in at-risk regions various studies found that many people in Australia would not consider moving after an extreme weather event due to their strong place-attachment (Boon 2014), a key factor that is addressed in various studies around the world (see Piggot-McKellar and McMichael 2021 on Fiji, Haney 2019 on Canada or Holley et al. 2022 on the U.S.).

King and colleagues highlight for Australia that there are more reasons for people’s immobility: “People may desire to move to a less flood prone location but finances, and for older residents, age and lack of alternatives, reduce their options” (King et al. 2014). People reported when they tried to move after an event, due to high demand from others affected, they could not find affordable housing (Bailie et al. 2022). Household immobility due to lacking financial resources is also an internationally well-known issue (e.g. Logan and colleagues 2016 for the U.S.).

In Australia, people who try to sell are affected by declining housing prices in at-risk regions and therefore might decide to stay since they cannot afford a similar property elsewhere. As Rajapaksa and colleagues (2016) showed, property prices in affected regions dropped by around 6 % after a flood event. Affordable housing as an obstacle for moving out of at-risk regions is also supported by the Actuaries Institute (2022) and Wenger and colleagues (2013) who found that “there is a lack of affordable alternatives” (Wenger and

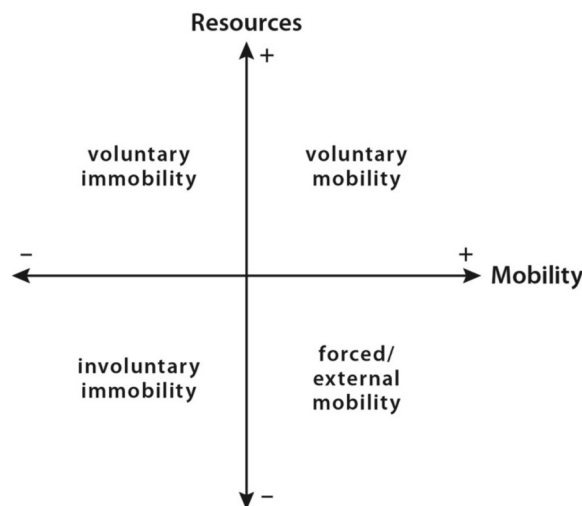


Fig. 1. Mobility and Resources.

colleagues, 2013) for people, and that many are “forced into this situation” (Wenger and colleagues, 2013), an issue which is widely reported in the Australian press: “As soon as it happened, I said ‘I’m out of here [...]’. But I don’t have enough money or equity [...]” (The Guardian, 2022).

Insurance plays a crucial role in safeguarding against the financial impact of flooding. Yet, inadequate insurance coverage or the absence of insurance remains a known challenge for Australia (Booth and Tranter 2018). For example, the Victorian State Government Department of Health and Human Services (2017) asserts 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. According to Booth and Tranter (2018) one of the main reasons for the vulnerability to extreme weather events is the decreasing availability of affordable insurance.

Additionally, socio-economically disadvantaged communities are likely to live in areas that are prone to environmental hazards (Sewell et al. 2016). Therefore, mainly low-income households are likely to struggle paying insurance premiums (Climate Council, 2022). In the face of climate change, insurers also withdraw from insuring certain regions. The Climate Council (2022) states that by 2030 around 521.000 properties are projected to be declared as high-risk areas and therefore uninsurable. There are similarities between current developments in Australia and the USA where around 13 % of the population are located in flood prone areas (Wing et al. 2018). These areas are in many cases inhabited by low-income households (Lee and Jung 2014) which are unable to afford insurance against extreme weather events (Kousky and Kunreuther 2013).

To reduce people’s vulnerability to floods, for example, the Queensland government offers home buybacks to households that are most affected by flooding. After the buyback of a house, the land will be declared as uninhabitable (Queensland Government 2024). Additionally, planned relocations have been discussed widely after severe floodings (IAG and Rhelm 2023; Rugendyke et al. 2022). For example, Grantham (Queensland) had been relocated to a higher location close by (Queensland Reconstruction Authority 2011). However, there are statements in newspapers that show that households would like to take relocation offers but, despite the money from the buybacks, they could not afford moving anywhere else: “What we’ve been offered, it isn’t enough to get back into the market” (ABC News 2023a).

This indicates that housing affordability, in addition to place attachment, household vulnerability, insurability as well as political decisions are key factors which can hinder households from moving out of regions of risk and therefore reduce their exposure to extreme weather events. However, the process of involuntary immobilization and its underlying factors are still under-researched in scientific literature, especially in the context of Australia. Therefore, this article addresses this gap by interviewing relevant experts about the key factors that immobilize households.

4. Methodology

This article is interested in how different experts, who are involved in the broader debate around the adaptation to climate change and (un-) insurability within Australia, understand the problem and possible solutions. This is important to keep in mind since expert views are shaped by their role and institution they represent. They might therefore differ from lay-person knowledge and perspectives on the issues (Abels and Behrens 2009).

The semi-structured interviews with policy, legal, financial, (re-) insurance and urban planning experts have been conducted by the first author in Australia in 2022. Her study targeted experts who work with people affected by extreme weather events, experts who work for governmental agencies as well as experts who work in the free market. Interviewees have been selected based on their years of experience related to insurance, the housing crisis and extreme weather events, especially flooding and bushfires (Meuser and Nagel 2009). Experts were identified through publications, the media and different scientific conferences. They represent institutions with specific interest in the issue but are also able to identify the limitations of their work. A total of 51 experts have been approached, 26 (appendix 1) were willing to participate in anonymized face-to-face or online interviews which took in average one hour. Anonymization was essential since many of the contacted experts, especially from the (re-) insurance and urban planning sectors, declined an interview due to concerns about confidentiality and the sharing of sensitive information in regard to economic competition. To still reach a reasonable sample size a snowball sampling approach was used (Waters 2015).

The anonymous character of the interviews increased participation and allowed the experts to express their personal opinions rather than opinions in line with the official policies and statements of their companies or organizations (Meho 2006). Consequently, every interview started with a series of questions pertaining to the length of time the expert had been engaged in their respective field and what has changed regarding the role of extreme weather events. Most of the interviewees discussed major challenges related to insurance and housing affordability in Australia. When they did not, the follow-up questions prompted further discussion.

To identify common and contradictory statements of the experts, a qualitative content analysis was applied following Kuckartz (2019). These started with thematic and in-vivo coding to initially categorize the expert statements followed by the identification of broader categories in an inductive process. Subsequently, these categories were broken down into more detailed sub-categories to allow in-depth analysis of the interview material. Based on the categories, a thematic matrix has been developed that included relevant quotes from the interviews to specific topics and allowed a systematic comparison of expert statements (Kuckartz 2019). The process resulted in the identification of four key factors of vulnerability, all of which are related to immobility.

5. The process of immobilization as a cause of vulnerability

This section follows the four themes identified in the expert interviews closely connected to people’s vulnerability and exposure to flooding in Australia: Location and urban planning, risk privatization, socio-economic factors, as well as information distribution and awareness.

5.1. Location and urban planning

Location is an essential factor in the exposure to an extreme weather event and its effects. In Australia, the increased demand for housing developments leads to settlements extending further into risky locations that are prone to flooding or bushfires.

The issues of housing demand, affordability and housing development in risky locations are also raised in the expert interviews. According to Urban Planning Expert A the affordability challenge has been further exacerbated by the Covid-19 pandemic. People “escaped from the cities that were locked down into the regions and now you cannot live affordably anymore” (Urban Planning Expert A).

The interviews reveal that geographical results of these pressures have a direct impact on vulnerability: “[H]ousing at the edges of cities is cheaper but is also more exposed to bushfires” (Insurance Expert A). In addition, cheaper housing is “built to less resilient standards” (Legal Expert A) which increases people’s vulnerability to extreme weather events even more. To address this issue, building codes are in place, which change from time to time and differ from state to state. But building codes should not be considered as the only solution to the problem.

“[T]here are [sic] plenty good options with adaptation in terms of building the resilience up of the houses. [...] Cyclone proofing, flood proofing. There is a lot within that, but there is a limit because at a certain point, adaptation becomes too expensive” (Insurance Expert A).

This hints to the deeper issue of why housing development in bushfire or flood prone areas is still allowed. Reasons may vary, but as indicated by existing literature and Insurance Expert A, the combination of pressure on the housing market and the increased tax revenue local governments can expect from new housing developments play a role in Australia as elsewhere (Alm et al. 2011; Insurance Expert A; Mangioni 2019). Awareness and data availability for local councils and planners is also a concern of the experts interviewed.

“So, 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). According to this interviewee, a lack of information results in insufficiently future-oriented urban planning.

Yet information alone is not sufficient, as one expert amongst many others argued. Councils that are aware and try to prohibit developments in regions at risk face other challenges, such as commercial interests:

“[C]ouncils sometimes trying to do the right thing and say no development here any-more [...] and then the property owners object to that and they go to court, and they often win because councils cannot refer to a state regulation that says you need to plan for [...] climate change” (Urban Planning Expert A).

5.2. The privatization of risk

Risk in Australia is privatized, which means that insurance of private property lies in the hands of insurers in the form of house and contents insurance (Booth and Tranter 2018) while homeowners are responsible for calculating their sum insured themselves (de Vet and Eriksen 2019). This is a classic example for “responsibilization”, the offloading or devolution of responsibility for the well-being of the population from state and other institutional actors onto individuals (Dean 1998).

According to the expert interviews, such risk privatization leads to several challenges for individuals. When trying to buy house and contents insurance, they must be able to calculate the value of their house and contents to decide on the sum insured (more on this in section 5.4). Contrary to the necessity to evaluate risks and costs beforehand, most homeowners only start thinking about insurance and possible risks of the location after they have bought a property and then realize that they cannot afford flood cover or that there is no flood cover available due to the high flood risk in the region (Urban Planning Expert A). However, there is little or no responsibility by governments, insurers or banks to encourage house buyers to seriously consider questions of taking out flood insurance or inform themselves of insurance costs when settling in particular regions. The reason might be that in Australia, insurers are legally prevented from giving financial advice. That is why “[a] lot of consumer advocates have called for more responsibility being shifted to industry. Basically, to advise people on how much sum insured they need. And the industry says we can’t do that it will be considered financial advice, and [...] we aren’t licensed to give financial advice” (Legal Expert A).

According to Legal Expert A, there is a need for governments to rethink and clarify what is considered as financial advice to reduce the responsibility of individuals, since due to the in-creasing extreme weather events and complexity of insurance products, individuals struggle to understand their risk as well as their insurance options.

Interestingly, these problems are beginning to prompt a reconsideration of the neoliberal premises behind Australia’s housing insurance system. “Governments in Australia have been generally happy to leave it [the insurance situation] to the market” (Insurance Expert A). But this approach might be changing as indicated by the recent establishment of the Governmental Cyclone Reinsurance Pool (CRP). In response to the increasing insurance premiums for house and contents insurance, the government provides “an annual guarantee of \$10 billion to cover damage from cyclones” (Jarzabkowski et al. 2022). With the establishment of the CRP, prices for insurance are likely to decrease because insurers do not have to access reinsurance from the regular market (Jarzabkowski et al. 2022).

Among the institutional actors interviewed for this research, there is a common under-standing that governments need to consider central causes of the insurance challenge and change policies as well as urban planning legislation:

“There’s a lot governments do and can do before events in mitigation, in long-term land use planning, and deciding who can build where, and what the building code is and what’s, you know, the standard against which houses need to be designed and built. Is mitigation building levees, or is it not building in places that are flat floodplains in the first place, or relocating properties out of those vulnerable places? All those things absolutely have to be looked at; I think. [...] we are a far way behind” (Policy Expert B).

5.3. Socio-economic factors

Even when homeowners are aware of significant risks, to what extent they afford to address them, e.g. through the purchase of insurance coverage, depends on socio-economic factors. This again shows the ambivalence of (im-) mobility and vulnerability to extreme weather events. Households with higher incomes can afford to live in regions of risk and paying for insurance. At the same time, they are able to move away if they aspire. Lower-income households in many cases lack these choices and can't afford to take on resilience measures (Boon 2014; de Haas 2021; King et al. 2014).

Income is implicit in the experts' discussion of expansion of housing into riskier regions: "the lowest income people tend to end up in the highest risk areas" (Legal Expert A). In these areas buildings are often less resilient to extreme weather events (Legal Expert A) which additionally increases household vulnerability. This problem is exacerbated by the lack of financial resources for reconstruction and is crucial in regions which are affected by flooding or bushfires on a regular basis.

"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).

As literature and news articles report, the housing (affordability) crisis leaves households with a lower socio-economic status with less choice about where to live, often immobilizing them in more hazard-prone areas (King et al., 2014; The Guardian, 2022). At the same time, house and contents insurance premiums are based on the region a property is located in. The more hazard prone the location is, the more affordable the housing, but insurance premiums increase related to the risk. People who cannot afford to buy a house in an area that is less prone to extreme weather events are at the same time less likely to be able to afford house and contents insurance in the high-risk areas where they do settle.

According to Insurance Expert A, this implies a strong connection between the housing and insurance affordability challenges Australia currently faces:

"[I]n the same way that we see housing as being an essential, I think we cannot separate insurance of homes from homes, right. We have a [...] housing affordability problem and a housing insurance affordability problem is not really that different from that. And so, we need to look at them together" (Insurance Expert A).

In addition to the increase in insurance premiums based on the estimated risks, the experts also highlight the role of taxes, which disproportionately affect households in high-risk areas.

"[A]t the moment in New South Wales, you can pay up to 30 % on top of your premium in GST stamp duty, fire services levy. And that amount of tax is based on the premium. So, it's not based on the insured amount of the property" (Insurance Expert C).

Although an individual may save money by buying a more affordable house in a hazard prone area, they face higher insurance premiums due to the location and accordingly higher tax than a person who might own a house that is twice or three times as expensive but situated in a safer area. Consequently, this is "actually disproportionately disadvantaging vulnerable people" (Insurance Expert C).

All of this can become a vicious circle due to immobilization. If households cannot afford insurance anymore, they end up in greater financial stress after an event. People who deliberately underinsure at least have a minimum coverage against extreme weather events, but this is often inadequate. Additionally, after an event, people still must pay a mortgage for a house that might be destroyed or uninhabitable. They cannot afford to rebuild, or rebuilding will take a few months or years. They cannot afford to move out of the region at risk either.

5.4. Information distribution and awareness

When deciding to purchase housing insurance individuals need to have a full understanding of the risks they are facing, the location they are living in, and the insurance products they are buying. With the increasing uncertainty of the risk due to climate change and the complexity of insurance products, it becomes more difficult for individuals to understand the risks and the insurance products.

As one of the experts explained, because insurance companies are not permitted to advise their clients on appropriate coverage levels, "there is an enormous information bias between who knows what in terms of risks [...]" (Urban Planning Expert A).

The insights of the experts in the challenge of information distribution can be separated into two main categories: awareness of risks associated with different locations, and insurance decisions.

According to Financial Expert C, it starts with the lack of risk understanding of individuals related to moving decisions:

People "really thought that they would be safe because their families and parents have never been flooded. So, although some of those people were aware that there was a percentage, they didn't think that that risk would happen. There definitely is a misunderstanding of the risk, particularly because it has changed" (Financial Expert C).

At the same time, there is a variety of risk information available from governments, councils and insurers. However, people struggle to understand the available information (Financial Expert C; Insurance Expert G). Therefore, from an experts' view, they are less likely to be able to make informed choices. So, "it's not just about the access to information. It's about access to information in a form that is suitable for decision making" (Insurance Expert D).

According to Insurance Expert C, another challenge people face when it comes to insurance is that they must be able to calculate rebuilding costs based on changing building codes, inflation, increasing demand as well as costs for resources and craftsman (de Vet and Eriksen 2019). Therefore, people seem to underinsure without knowing even though they have been using calculators that are provided by insurance companies: "[T]he average person would not have any [...] idea how much the cost of materials is to go and rebuild. So, we do have that sum insured calculator to help. But you know, it's never perfect" (Insurance Expert C).

Another point raised by one interviewee has to do with basic trust in insurance as an effective protection. This informant believes that many people "[...] aren't aware, they don't want to be aware, and they feel that they are not engaged in insurance at all. Like they

have felt that it's been a product that has always been historically too expensive [...], not just that it's too expensive, but that it's not going to cover them for the losses that they may have" (Insurance Expert E).

The challenge of adequate information and awareness is faced not only by individuals making decisions on where to move. From an expert's view it also confronts governments, councils, and urban planners:

"Zoning and housing and development are things that get decided on the local level by [...] local counsellors. And [...] they'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).

If councils do not fully understand the risks and further allow developments in high-risk areas, this exacerbates the risks people face.

Overall, the interviewed experts consider the high individualization of risk and along with it, the access to as well as understanding of information related to insurance and extreme weather events as central contributors to household decision-making regarding place of residence and insurance. Therefore, the access to and understanding of risk information are central aspects of voluntary (im-) mobility which will be further discussed in the following section.

6. Discussion

We identified four key issues for insuring against extreme weather events raised by the interviewed experts: location and urban planning, risk privatization, socio-economic factors as well as the distribution of information and risk awareness. From the experts' point of view, these often-neglected key challenges produce and intensify existing inequalities in understanding risks, estimating costs and being able to move out of regions of risk. Due to their interconnectedness, they work together in immobilizing especially low-income households.

According to the interviewees, for some who want to realize their Australian dream of owning a house with limited resources (Daley and Coates 2018), moving to cheaper at-risk regions might become a trap. Not being able to afford higher insurance premiums and not having the resources to move out either, leaves them with no options and dependent on external support while disaster is lurking on the horizon. These findings match existing research that focusses on households' moving decisions due to extreme weather events (e.g. King et al. 2014). In addition, it provides a deeper insight in how experts – some of whom are involved in product and policy development – perceive the challenges households are currently facing.

What may have been calculable risks and costs in the past, now become increasingly uncertain and incalculable conditions due to climate change (McLennan and Handmer 2012). This raises the question about the role of the state in supporting people who are exposed to unexpected and unexpectable situations but lack resources to manage their situation themselves. In response to severe flooding events in Australia some states governments introduced planned-relocations and buybacks to move people out of regions that have been affected by floodings. It remains unclear, however, whether relocation should take place before or after a flood. Because of the traumatic impact of a severe flooding event, Hay and colleagues (2023) recommend relocating households in advance.

Living in at-risk regions is not merely an issue of lacking resources and knowledge. People move to and remain in these areas because of place attachment or location benefits (Boon 2014). These aspects have not been in the focus of the interviews and therefore need to be explored in more detail in the future. Many of the people deciding to stay in these areas may have the resources to manage the risks and therefore might be more resilient than others who leave (King et al. 2014).

Furthermore, a risk-based approach – based on the reduction of calculable risks – must consider the uncertainty of predictions of floodings and to balance long-term relocation against protective measures. These will be politically contested since risk-based decisions do usually not take into account the 'soft' factors such as the psychosocial well-being of people and their families who have lived in a region for generations. As studies from Australia (King et al. 2014) or France (Rey-Valette et al. 2019) suggest, a proactive approach that requires people to move out of an at-risk region before (the next) severe hazard happens is likely to trigger resistance when emotional roots are so deep and central to people's identity and wellbeing that even after catastrophic flooding they are unwilling to leave a region. Moving whole communities might help but 'uprooting' families will come with difficulties, emotional burden and requires time for healing. An example from the U.S. also shows that buyouts negatively affected households' "place identity and bonding social capital" (Binder et al. 2023). At the same time, relocating people has to acknowledge the factors that impact involuntary immobility (see section 5)—in terms of households lacking the resources to move out of regions of risk. It could result in people moving into at-risk regions again since they cannot afford to live elsewhere, as it is discussed by King and colleagues (2014) in the context of Australia.

In the discussion of the experts, risk areas are mostly presented as 'natural' or broadly unaffected by long term planning processes. But regions being affected by floodings are not only related to misleading regional planning practice. They might be at risk because of political decisions made a long time ago. One example is the Northern Rivers Region that has been affected by floods already in the past and struggled with housing affordability and availability (e.g. lack of social housing or rental stress) that impacted household vulnerability in the 2022 floods (van den Nouwelant and Cibirn 2022). Additionally, many of the areas that are currently not at risk might be in the future (Climate Council, 2022). Therefore, urban planning and disaster risk management also need to focus on aspects such as restoring rivers as well as flood plain management to make sure that severe flooding situations are less likely to develop (Serra-Llobet et al. 2022). In this way flooding disasters are humanly produced not just naturally given (UNU-EHS 2024). But who makes the decision when the state should intervene, or who covers the costs that result from investments to the profit of some and the cost of others exposed to severe risks. These are political decisions, which have to be discussed.

Living close to the river is therefore not only an issue of exposure and social inequality but a long-term political decision for regional planning in the face of climate change. Such decisions include whose houses to protect and who to move, and these are not only

technical but political. It extends to who should be bought out in case of a disaster and who has to cover the costs privately. It is also a question of when the state should intervene in the freedom for individual risk-taking (ABC News 2023b; The Age, 2024). To manage such issues better top-down regulation has at least partly be given way to stakeholder involvement in a co-production of knowledge but with significant cultural and institutional variation (Mees et al. 2016).

Housing provision more generally is a task which could decrease pressure for many who do not want to move to risk-prone areas or accept long travel times e.g. to work. The “housing affordability trap” is one key element for the insurance crisis in a climate change world, but households in general have to engage with the changing situation even when they might not yet feel that they live in an at-risk region. That there had been no major floods does not mean that it cannot happen in the future. Because probabilistic risk information comes with a degree of uncertainty, households might decide to wait until a hazard turns into disaster before leaving a region they feel emotionally attached to. The complex patterns of hard and soft factors combining in people’s perception and responses to risk might be better grasped by qualitative approaches than the dominant quantitative survey approach (e.g. psychometric paradigm) that partly results in contradictory and inconclusive results as Lechowska (2018) suggested.

These insights hint to the need for better collaboration between the different stakeholders and long-term (political) regional planning, which also includes the production of accessible knowledge for private housing decisions, a mix of support for unpredictable harm, and the privatization of preparation for the predictable harm. But it also requires considering emotional elements of decision making and the willingness to accept different levels of risk.

7. Conclusion

Our article argued that geographic location and urban planning, the privatization of risk, socio-economic factors as well as the distribution of information and risk awareness are key factors that are interconnected and contribute to a process of household immobilization, we called the “housing affordability trap”. In such cases the lack of resources requires households to live in at-risk regions, if they want to realize their ambition of owning their (dream) home and at the same time limits their options to move away. There are no quick fixes available but different stakeholders such as the different governmental levels, insurers, banks and households, have to work together in long-term planning that addresses the increasing effects of climate change as well as the short-term disaster management (Plass and Zinn 2024). However, current policies still do not acknowledge involuntary immobility sufficiently – e.g. the buyback program in terms of relocation costs and increasing housing affordability challenges (Dzienis 2024) – which is also indicated by the interviews where experts only talked about vulnerability but did not address immobility directly.

Since the housing affordability trap in a climate change world depends on both, institutional planning as well as individual decisions, there is a need to provide more housing opportunities in safe regions, improve the distribution of information so that households can make informed decisions on where to move to as well as the availability of a safety net for households that have limited resources to move out of regions at risk and therefore reduce their exposure to extreme weather events.

Related to this, lifestyle decisions and place attachment are key drivers for housing decisions and risk-taking. Therefore, household decision making does not follow necessarily expert standards of rationality. Households might do not want to leave a region of risk due to their place attachment. On the other hand, households might want to move but lack the resources to do so. Voluntary and involuntary immobility share similar outcomes: in both cases the exposure to extreme weather events is sustained. But the ones who decide to stay, are often more resilient and able to recover than the ones that would like to leave but lack the resources to do so (King et al. 2014). The ones that actively choose to stay might have more (financial) resources to recover, implement mitigation strategies, and might be able to afford insurance (Fig. 1). Given these different factors that impact immobility, strategies to decrease household vulnerability to extreme weather events need to acknowledge both reasons for involuntary and voluntary immobility.

Altogether our study contributes to an understanding of how the climate change world is socially structured. Extreme weather events such as flooding are unequally experienced, and households have different resources to their disposal to respond to them. The *housing affordability trap* is therefore less a question of poor individual judgement or mismanaged resources but an expression of systematic social disadvantage that requires a political response. Responsible decision making in a climate change world is a question of justice where changing living conditions challenge established institutional responses and require sensitivity to the unexpected and complex new *risk-scapes* shaping people’s lives. These require new and innovative collaborative responses (e.g. Shi et al. 2015). Our study contributes to such an enterprise by highlighting how insurance that is traditionally meant to provide protection against hazards might trap people in a vicious cycle of exposure and vulnerability they cannot escape by their own means.

CRedit authorship contribution statement

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

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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.

Appendix

Table 1
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
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

Data availability

The data that has been used is confidential.

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