



# A bridge over troubled water? Flood insurance and the governance of climate change adaptation

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## ABSTRACT

Floods are one of the most commonly occurring natural hazard events globally, and present a significant threat to the UK from climate change. Operating since 2016, Flood Re is an industry-government initiative, set up with the goal of reforming the flood insurance market in order to provide universal, affordable cover for UK households. Principally providing reinsurance services to insurers and including mutualisation arrangements, it aims to withdraw from the market in 2039, having paved the way for risk-reflective pricing without subsidy. Drawing on the theoretical work of Francois Ewald, and empirical data from interviews with 12 key stakeholders and documentary analysis, this paper traces a shift in Flood Re's insurantal imaginary, exemplified by the development of several solutions which go beyond its initial remit of providing reinsurance to private insurers. Findings show that this shift has been driven by the growing realisation that climate change is not merely a complicating factor for the ability to achieve a thriving insurance market, but demands a paradigmatic change in the governance of flood risk. We argue that Flood Re has an opportunity to adopt a leadership role in the governance of climate adaptation, but that it must be expanded to include a wider variety of stakeholders covering land-use planning, housing, consumer and community representatives. That a market for flood insurance that delivers on risk reduction and affordability for all can be brought about without structural reform to the industry nor a strong role for the state, is a delusion in light of climate change.

## 1. Introduction

As the effects of climate change accelerate, there is a need for more attention on adaptation amongst the research and policy communities, as well as the general public (Oels, 2013; Rauken et al., 2015). Flooding represents the most direct and significant climate risk to individuals and communities in many parts of the world, and its impacts are due to worsen in coming years (Jongman et al., 2012; O'Neill et al., 2017; Otto et al., 2018). Devastating floods in Germany and Belgium in summer 2021 indicate how many places which have been hitherto considered to be low risk are becoming sites of danger.

Floods are one of the most commonly occurring natural hazard events globally (Shah et al., 2018), and affect large parts of the UK (Stevens et al., 2016). Recent flooding events have affected south-west England (winter 2013–14), Cumbria, Lancashire and Scotland (winter 2015–16), London (2016), Yorkshire and the Midlands (winter 2019–20). Around 5.2 million properties (1 in 6) are at risk of flooding in England (Environment Agency, 2009), where the government has

recently announced plans to spend £860 m on flood defences annually over a five-year period (DEFRA, 2021). Under climate change scenarios forecasting a 2 °C rise in global mean temperatures, the UK could see a 50 % increase in expected annual damages and a 41 % increase in the number of people living in properties which are at a high risk of flooding by 2080 (Sayers et al., 2015). In the UK, catastrophic floods can attract significant media attention and political debate. The 2014 floods in Somerset generated a furore that became focused around a media campaign to increase river dredging, despite poor evidence for its efficacy (RRC, 2020). Calls were also made to reallocate international climate-related aid budgets to domestic flood victims (Groves and Cohen, 2015).

Policies focused on flooding adaptation have conventionally centred around attempts to limit adverse effects through large-scale public investment in infrastructure and engineering projects (Mai et al., 2020). An expensive approach, such schemes are set to become more costly due to higher levels and more intense rainfall predicted to be driven by climate change, and the continued development of homes in high-risk

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areas (Jones and Murphy, 2009). The findings of the ‘Making Space for Water’ initiative (DEFRA, 2005); the recommendations of the Pitt Review of the summer 2007 floods (Pitt, 2008); and the formation of the ‘Flood Re’ scheme (Flood Re, 2016) indicate that policymakers and industry stakeholders are increasingly acknowledging the need for non-structural adaptation strategies, such as flood warning systems, property-level flood resilience (PFR) measures, public engagement, advisory services, and flood insurance (Penning-Rowsell et al., 2014; Geaves, 2016; Howarth, 2019; Climate Change Committee, 2021). Given the complex interdependencies of these measures, the number of actors involved, as well as the uncertainties relating to flood risk in light of climate change, there is a need for effective, cross sectoral governance structures and practices (Forrest et al., 2017).

This paper focuses on one key component of flood risk governance: insurance. In the UK and elsewhere, the industry is undergoing fundamental change, as conventional markets for private insurance are being reconfigured by increased risks, technological innovation and rising premiums (Tanninen, 2020). Flood Re is the world’s first public–private partnership aimed at providing reinsurance to private insurers, established in response to the failure of the industry to provide widespread and affordable insurance to UK householders (Flood Re, 2018). Launched in 2016 by a consortium of industry and government stakeholders, it aims to address a series of issues in the flood insurance sector, including affordability, universal coverage and risk reduction. Its hope is to restore an effective insurance market over a 25-year period, eventually withdrawing from the sector in 2039. A limited amount of research has been conducted on Flood Re, and this paper is the first study to gather detailed qualitative evidence on Flood Re through 12 interviews with key stakeholders. We supplement these findings with close analysis of key policy and industry documents.

Since Beck’s seminal work on risk society (Beck, 1992a), there has been substantial debate about the nature of catastrophe risk and the suitability of insurance as a response (Jaffee and Russell, 1997; Bulkeley, 2001; Beck, 2002; Ericson and Doyle, 2003; Ericson et al., 2003; Ericson and Doyle, 2004). Beck asserts that whereas conventional risks can be calculated, classified and securitised, in the context of *unnatural* disasters, such as terrorism, the conventions of risk calculus are dismantled, as institutional authority and scientific rationality is undermined (Beck, 1992b; Sørensen, 2018). This has prompted responses which have highlighted the ways in which insurance, as a technology of governance, has rendered apparently ‘uncalculable’ risks governable. Building on these, this article investigates the ways that insurance is being mobilised in response to the impacts of climate-change. It contributes to scholarship which Collier, Elliott and Lehtonen call describe as being concerned with “the plasticity of insurance as an abstract technology that may be taken up in various governmental assemblages” (2021).

In doing so, we draw on theoretical work produced by François Ewald and other Foucauldian-inspired scholars in order to analyse Flood Re as a technology of governance (Dean, 2009; Oels, 2013; Tanninen, 2020). We demonstrate how ideas developed from this theoretical tradition help to reveal ways in which the extant flood insurance market is constructed and problematised, and how these discursive techniques influence the nature of the solutions proffered. These include the deliberate characterisation of failures relating to lack of affordability, universal coverage, ineffective action on risk reduction, and lack of horizontal governance. While concurring with critical assessments of Flood Re as a project of neoliberal governance (Christophers, 2019; Lucas and Booth, 2020), our empirical data allow us to show that the public and private stakeholders are beginning to recognise the limitations of ‘pure market’ solutions (Lucas and Booth, 2020), and develop alternative interventions: new in the British context.

The next section discusses the theoretical contributions made by Ewald and developed in critical insurance studies. In section 3, Flood Re is introduced alongside a review of the recent critical literature it has generated. The methods section outlines how our empirical data were gathered and analysed. Section 5 presents our findings, structured

around three key problematisations of the extant flood insurance market, and the implications of emerging trends are critically discussed in sections 6 and 7. We conclude by reflecting on prospects for climate compatible flood insurance in the UK, and potential future directions for Flood Re.

## 2. Ewald and insurance as a technology of governance

François Ewald has written extensively on the development of insurance with a particular focus on its proliferation across social life in 19th century France (Ewald, 1991, 1993, 1999, 2019, 2020). A student of Michel Foucault’s, he adopts a critical historical perspective in deconstructing insurance as a ‘political technology’ of governance (Behrent, 2010).

Ewald’s most renowned work on the topic describes four elements, or ‘categories’ of insurance (1991). The first are the *institutions* of insurance, such as private sector or nationalised companies, social security schemes and mutualist societies which provide a wide variety of contractual services to individuals and businesses. While these institutions form the basis of normative conceptions of insurance, Ewald points to their breadth and diversity to indicate that insurance is also an *abstract technology*: an art in which elements of economic and social phenomena are arranged around a set of specific rules. Emphasising the multiplicity of insurance as a concept, Ewald argues that ‘institutions are not the application of a technology of risk; they are always just *one* of its possible applications’ (1991, p. 198, emphasis in original). As institutions configure insurance as abstract technology, particular ‘forms’ of insurance become crystallised in specific spaces and times, entering the market as contracts, policies and schema. These forms depend on an *insurantal imaginary*. This critical fourth category concerns the ways in which risks are constructed amongst networks of actors, and influenced by institutional, and broader social, political and market norms and conditions.

This four-part deconstruction allows Ewald to provide a genealogy of insurance which destabilises simple historical accounts of its emergence in the maritime and terrestrial industries (1991). Whilst insurance is noted to have emerged as a way to commercially underwrite long-distance cargo ships in the 17th century (Dean, 2009), Ewald shows that, historically, institutions of insurance were built up from multiple practices of actuarial science and the governance of risk by individuals and the state, practices ‘of which they were more effects than causes’, without definite shape, and continually shifting in form and function (1991, p. 198).

Without explicitly aiming to apply Foucault’s work to insurance, his work shares several characteristics of his mentor’s (Behrent, 2019). Ewald’s genealogy of insurance is achieved by analysing the dynamics of individual, society, the market, and the state, through which insurance is constituted as a technology of governance. As such, governance is referred to in this paper as the sets of *techniques* and *practices* which influence the management of flood risk. This differs from more normative interpretations of governance, which can be characterised by the increasing influence of non-state institutions; the role of coordinating networks; and the re-scaling of governance upwards (to supranational networks), and downwards (involving community groups and grassroots campaigns (Ostrom, 1990; Rhodes, 1997; Jessop, 2000; Bulkeley and Betsill, 2005). We follow Ewald in conceptualising governance as fluid and emergent, while retaining a normative dimension: analysing the rules, structures and institutions which constitute insurance, such as private insurance companies, policies and agreements (Ewald, 2019).

Ewald stresses that insurance has both individualising and socialising effects (Ewald, 1991; 1999). Whilst accidents, damage, suffering and loss are understood to be individual phenomena (Booth and Harwood, 2016; Tanninen, 2020) and insurance has traditionally functioned to financially protect *individuals* from losses in exchange for a specifically calculated and individually determined premium, Ewald considers how, in an ‘insurance society’, accidents are reframed as

possibilities: whereby they become risks that affect and are borne by, and shared across, the population as a whole (1991). Indeed, it is through the payment of an insurance premium, that Ewald argues that individuals are prompted to take responsibility and ‘be aware of ourselves both individually and collectively’ (Ewald 1999, p372).

Ewald’s work also highlights the epistemological and ontological transformations induced by an insurance society (Behrent, 2019; Taninen, 2020). In contrast to the legal system in which arguments about fault and responsibility take centre stage, technologies of insurance foreground probabilistic assessments and technical knowledge (Ewald, 1991). In doing so, insurance reconfigures events such as house fires, car crashes or burglaries as accidents which are understood, and made governable, through the laws of probability and calculations of chance (Ewald, 1991). Insured individuals thus become freed from the constraints of potential disaster, to take risks and fulfil their (economic) potential. Insurance provides the foundations for economic and scientific development, as accidents become marginalised as mere by-products of progress (Ewald and Utz, 2002). Further still, insurance has the power to invert the course of time. Whereas juridical society looks backward with forensic techniques, *responding* to risks and events, an insurance society looks forward, *generating* risks, ‘disciplining the future’ (Ewald, 1991, p. 207) by giving it form, value and meaning. Insurance, for Ewald, has the power to produce worlds, transform the relationship between the individual and society, and control the future.

In the 21st century however, the power and ubiquity of the insurance society is being threatened (Beck, 1992a; Ewald and Utz, 2002; Behrent, 2019; Ericson et al., 2003; Ewald, 2019; McFall et al., 2020). Having traced shifts from individual responsibility to solidarity and mutualisation, Ewald and Utz (2002) outline the development of the precautionary principle, in response to threats such as global environmental change. This marks a further paradigm shift, away from compensation towards protection. They write that as contemporary man ‘discovers in himself the power to commit suicide as a species’, he is embarking on a ‘quest to find the rules of a morality that will limit his powers’: a return to the ethics of responsibility (*ibid*: p292).

Bound up in this paradigm shift is a resurgence of political and moral conflict between social welfare and the insurance industry, at the centre of which remain questions of individual versus collective responsibility, and the role of government and the market (Ewald, 1999, 2019, 2020). This conflict is particularly relevant in the context of climate change: who should bear the costs of climate risks? Does the insurance industry have a role in achieving a just transition? Ewald goes as far as to say that global environmental change and the emergence of the precautionary principle may even ‘bring us out of the age of insurance companies’ (Ewald and Utz, 2002, p. 301). Clearly this shift towards the age of precaution is uneven and incomplete, as insurance remains one of the principal technologies of environmental governance. This paper seeks to uncover how this transition is playing out in the context of UK flood insurance.

### 3. Flood insurance in the UK and the emergence of Flood Re

In the UK, residential flood insurance is voluntary, and bundled into home and buildings insurance. It is internationally distinctive: underwritten solely by the private insurance market with no *direct* government involvement (Penning-Rowsell, 2015; Surminski and Eldridge, 2017; Surminski, 2018). This differs notably from countries such as the US, Spain, The Netherlands and Hungary, where the state plays an active role in providing insurance directly, and regulating the industry (Atreya et al., 2015).

While there may not be a substantive role for the UK government as a formal institution in the insurance industry, this is not to say that the state does not play a critical role in its *governance*. In Ewald’s terms; it has long influenced how the *forms* of insurance as a technology of governance. Between 1961 and 2001, an informal ‘Gentleman’s Agreement’ between insurers and the Government constituted the principal

form of insurance governance, unofficially committing insurers to offering flood cover to all permanent dwellings in the UK. This was enabled by the use of cross-subsidies, where households at low-risk would help to subsidise the premiums of those at high-risk (Crick et al., 2018). In exchange for universal coverage, the Government agreed not to introduce formal regulations into the market (Penning-Rowsell et al., 2014). This arrangement had the benefit of providing access to insurance for all UK households, which differs from the situation in Australia for instance, where the private market for flood insurance is nascent, and at-risk householders have conventionally turned to public insurers (Atreya et al., 2015).

However, due to growing losses faced by the insurance industry from severe flood events towards the end of the twentieth century, a more formal agreement, known as the ‘Statement of Principles’, was struck between the Government and the insurance industry in 2003 (Surminski and Eldridge, 2017). This provided the means for more competition in the market, as insurers agreed to cover only 75 % of homes and businesses situated in flood plains, and premiums would vary according to risk. For the remainder (roughly 500,000 properties), the industry agreed to provide cover where flood defences were planned for completion by 2007 (Association of British Insurers, 2008; Crick et al., 2018). This agreement was renewed in 2008, but in 2013 the industry called for new governance arrangements, due to several new insurers entering the home insurance market who were not bound by the Statement of Principles, and who chose to insure only lower risk and more profitable properties (Penning-Rowsell et al., 2014).

In response to this, and following extensive negotiations and several public consultations, Flood Re emerged as a joint government and industry partnership and was established as a not-for-profit company in 2016. Its primary objective is to ensure that affordable flood insurance is made available to all UK households by providing a reinsurance service to the industry (Surminski and Eldridge, 2017; Crick et al., 2018). Reinsurance, which is the insurance of insurance companies, provides insurers with a means of protecting themselves from particularly high losses by passing the risk through to a reinsurer for a premium (Kuecheyan, 2018). As a result, the rates reinsurers charge can have a significant impact on the premiums charged to households by primary insurers. Although, unlike similar reinsurance schemes such as the California FAIR Plan which issues policies to householders as a last resort, Flood Re does not provide a consumer product. Instead, a levy paid by all insurers offering home insurance in the UK, amounting to £180 million per year, is used to provide a stable and guaranteed income to Flood Re to enable it to spread costs and achieve its stated objective of providing ubiquitous insurance ‘affordable for all’ (Flood Re, 2016). Levy costs are passed onto UK households at an estimated average ‘increase of £10.50 in the cost of home insurance policies across the market’ (Flood Re, 2018: 34). As an attempt to distribute costs according to the ability to pay, Flood Re raises further funds by collecting a premium from insurers based on the Council Tax Band associated with the property being ceded to Flood Re. In the UK, bands are based on a national household valuation conducted in 1991 and dwellings constructed in the last 30 years are then retroactively valued (Giles and Ridge, 1993). Crucially, this bears no relation to flood risk, setting the UK apart from many international contexts (Atreya et al., 2015). In the USA’s National Flood Insurance program (NFIP), for example, interventions to assist those unable to pay are made *after* the calculation of risk-reflective premiums (Elliott, 2017). By using Council Tax Bands to price its reinsurance premiums, Flood Re offers primary insurers cheaper reinsurance rates for high-risk properties than they could find with reinsurers basing their premiums on risk, enabling them to charge lower premiums to homeowners (Flood Re, 2018). As a result, Flood Re aims to achieve universal affordability by offering discounted reinsurance premiums for those at high-risk rather than by regulating the market.

Flood Re has been explicitly established as a temporary intervention. It aims to withdraw from the market in 2039, having helped to manage a transition to risk-reflective insurance premiums (Hudson et al., 2016).

This approach is not unique. In Florida, extreme winds associated with Hurricane Andrew in 1993 and after multiple storms 2003–2005, led to a variety of market failures. The Florida State Wind Pools were created to address problems of availability and affordability, intended to be temporary interventions while private insurers resolved issues such as under-investment in mitigation and information deficit. Withdrawal has proven difficult however, due to high exposure, insufficient mitigation, and the dominance of small providers in the Florida disaster insurance market (Medders et al., 2014; Medders and Nicholson, 2017).

Flood Re has specified two criteria which need to be met in order to justify its market withdrawal in 2039: 1) household insurance premiums and excesses for the majority of at-risk properties must not significantly increase; and 2) the penetration of household insurance does not significantly reduce in flood risk areas (Flood Re, 2018). The meaning of ‘significance’ in these criteria is so far undefined and remains open to interpretation (Surminski, 2018). The primary means by which Flood Re aims to support this transition is through its core reinsurance offer, but in recent years it has begun to develop and propose several additional interventions, which are analysed in this paper. Several commentators have already expressed scepticism about the chances of these criteria being met and Flood Re withdrawing from the market, given the ambitious aims of achieving risk reflective premiums, ubiquitous provision, and greater mutualisation (Christophers, 2019; Lucas and Booth, 2020).

Research on Flood Re has attracted interest from specialists in flood risk management, with emphasis on evaluating the potential success and suitability of the scheme (Geaves, 2016; Jenkins et al., 2017; Surminski and Eldridge, 2017; Surminski, 2018; Crick et al., 2018). In their 2017 assessment, Surminski and Eldridge’s main concern is that the scheme lacks adequate emphasis on the reduction of risk, and that climate change is likely to exacerbate the issue of affordability. Surminski’s 2018 article provides a series of recommendations for incorporating risk reduction, including raising public awareness, rewarding measures taken by homeowners, involvement from stakeholders outside of the insurance industry, mandating flood resilient repairs in claims, and reviewing market design. Surminski agrees with Flood Re’s goal of market withdrawal, but calls for a detailed phase-out plan including estimates of realistic investment levels needed (2018).

Other researchers have levelled more fundamental criticisms at Flood Re, and insurance as a technology of governance more broadly. Christophers (2019) characterises the scheme as an archetypal project of neoliberal governance, premised on a constitutional but misguided faith in the market. He suggests that its planned withdrawal in 2039 is based on an abstract ideal, betraying the UK government’s reluctance to accept the need for long-term solutions beyond financial interventions such as reinsurance, including some of those recommended by Surminski. Lucas and Booth (2020) concur with Christophers, arguing that while financially efficient, pure-market insurance approaches (such as reinsurance schemes) counteract solidarity, fairness and do little to protect the most vulnerable (see also Lehtonen and Liukko, 2015, 2011). They privilege technocratic and economic rationalist rationalities, while underplaying the importance of lay knowledge, community and non-financial forms of adaptation.

While many critiques of flood insurance lament the neoliberal ideology which underpins the industry (Christophers, 2019; Lucas and Booth, 2020), Gray illuminates the issues associated with one alternative, which is to rely to a greater extent on government intervention by leveraging public finance for climate adaptation (Gray, 2021). Analysing the state’s ambitious coastal protection plans in Louisiana, US, he identifies how such approaches can serve to secure the dominance of extractive industries such as oil and gas. Collier and Cox (2021) highlight how public institutions and the insurance industry can work effectively together in developing disaster planning and recovery strategies, such as New York City’s resilience plan following Superstorm Sandy in 2012. Whereas Ewald critiques reinsurance as a ‘special type of alchemy’ which serves to abstract and commoditise risk (1991, p200),

Collier and Cox (2021) point to several merits, including pooling and distributing risks within the industry, and providing ‘knowledge leadership’ with regards monitoring and measuring climate-related hazard events, quantifying risks and estimating investments required. They argue that these contributions are crucial for the effective governance of climate adaptation.

These contributions offer critiques which go beyond a simplistic conceptualisation of insurance as a *pure* or *free* market. While it can be conceptually alluring to distinguish between the market and forms of governance such as regulation, the history of catastrophe risk insurance tells us that such distinctions are not borne out in practice. In the UK context, it would be inaccurate to assert that flood insurance prior to Flood Re operated according to the principles of the ‘free market’. While informal, the Gentleman’s Agreements constituted forms of market regulation, strongly influencing inter-firm competition, and ultimately profit.

Nonetheless, the ideals of the free market have strongly influenced the governance of flood insurance. In her analysis of the NFIP in the USA, Elliot traces the evolution of the social contract around natural hazards (2017; 2021). It is a story of repeated attempts to unshackle the potential of actuarial science and a competitive market to deliver affordable premiums, risk reduction, and to reduce the need for mutualisation. Created in 1968, the NFIP marked a shift towards greater individual responsibility compared with previous arrangements, which had seen the Federal government invest substantially in physical protections, subsidies and disaster relief. And yet the scheme has continued to involve substantial subsidies where issues of affordability and lack of coverage have persisted. A major reform to the programme was implemented in 2012 to support the use of actuarial science to address its fiscal deficit, and Elliot traces the backlash to these reforms. This is a morally charged debate which is characterised by the same themes as when the NFIP was created: universal coverage, affordability, mutualisation and risk reduction. Our paper builds on this body of literature by critically examining Flood Re as an *assemblage* of governance technologies, enacted by the ontologically mutable entities of the market and the state. Flood Re is a site in which the pervasive tensions described by Elliott are playing out in the contemporary UK context. We provide insights into the attitudes and objectives of those directly involved in navigating these tensions.

Ewald’s genealogy of insurance traces how its success as a technology of governance has hinged on the reframing of disasters and accidents, as probabilities, risks and (even) opportunities. This paper follows this attention to (re)framing by paying critical attention to ways in which the UK flood insurance market has been depicted and constructed as problematic by stakeholders in the industry, tracing how these problem framings have helped to shape the scope and remit of Flood Re. It is beyond the scope of this article to contribute to the conceptual literature on problematisation (Deacon, 2000; Callon, 2009; Nichols, 2010). Rather, we draw on the relatively pragmatic work of Bacchi (2009; 2012) and others (Gouldson and Bebbington, 2007; Dean, 2009) to ‘think problematically’; paying close attention to the ways in which technologies of governance (policies, interventions, solutions) are rendered necessary by the construction of problems. This includes asking questions such as *what is made problematic, and how?*; *what is closed off from debate?*; and *what does this legitimise?* The next section sets out the evidence to which we applied this *problematical* lens, and how it was gathered.

#### 4. Methods

This study draws on in-depth interviews and analysis of key documents relating to Flood Re. Interviews were conducted with 12 individuals with prominent and senior roles in the flood industry, insurance sector, and with direct involvement in the development of Flood Re. Participants were identified and approached via the online professional networking website *LinkedIn*. Conducted in 2020, 10 of the



interviews took place online over either Microsoft Teams or Zoom due to COVID-19 related restrictions and lasted between 40 and 60 min each. The 12 interviewees consisted of three senior employees at Flood Re; and six individuals from private insurance firms, four of which were senior leaders each with over 20 years' experience. These senior professionals all responded to questions by referring to both their current and previous roles, including in three cases, experience working in the USA. The two other individuals from private firms were flood risk modelling specialists, who contributed insights into how advances in actuarial technology were reconfiguring the market. The three remaining respondents included a Policy Advisor from the Association of British Insurers, a senior manager from the National Flood Forum, and a steering group member of a local community campaigning group (the Oxford Flood Alliance).

The interviewees expressed a variety of opinions about the role of insurance moving forward, government intervention in the flood insurance market, the relative fairness of risk-reflective and cross-subsidised flood insurance premiums, and who bears the responsibility for incentivising flood risk reduction and management. On the whole, expert respondents were supportive of insurance taking on a greater role in the future governance of flood risk. However, different perspectives on the various challenges facing the industry were detected, largely reflecting specific expertise (technical, managerial, strategic) and experience (international, policy, advisory roles).

All contributions are anonymised, although only two of the interviewees declined to be named in published research. Throughout our paper, interviewees are referred to using abbreviated codes I01, I02... I12. A limitation of this study is that despite attempts being made, no respondents were interviewed from the UK Government's Department for Environment, Food and Rural Affairs (DEFRA), nor representatives from the housing development and planning sector.

Elite interviews can provide unparalleled insights into stakeholder-dynamics, trends and logics of technologies of governance such as Flood Re, they can also present challenges to social scientific researchers. These include practical issues of reaching out to and securing time from senior professionals, and the need to build trust and assure confidentiality (Harvey, 2011). In this case, the need for technical knowledge of insurance and an awareness of the history and governance of the industry added a further challenge. As geographers at an early career stage without insurance expertise, there was an imbalance of experience and sector-specific knowledge in the interview dynamic. Recommendations from Aberbach and Rockman (2002) and Harvey (2011) were adopted to help address these inherent challenges. These included using concise and precise language when recruiting participants, offering to share interview questions by email prior to consent being given, limiting discussions to no more than 1 h, and offering to receive written rather than verbal responses. The researchers also produced a written interview guide for their own use (Ayres, 2008), with sets of questions matched to themes, so that if elite responders chose to deviate or decline to answer specific questions, alternative questions could be asked to cover similar themes. All real-time interviews were audio recorded with the interviewee's permission, and transcripts were produced using online transcription software and additional editing.

Document analysis is used to supplement interview findings, to provide context and to compare insights from respondents with official statements (Arribas-Ayllon and Walkerdine, 2008; Bowen, 2009; Deros and De Roeck, 2019). Close analysis of three DEFRA publications goes some way towards addressing the lack of interview data from government officials. Eight publicly available documents, published between 2008 and 2020 were analysed. This allowed for the introduction of a degree of genealogical sensibility into this research and ensured that the documents analysed help to provide a 'history of the present' (Foucault, 2021). The documents analysed and their individual reasons for selection is displayed in Table 1.

Interview transcripts and selected passages from documents were coded using a deductive method (Benaquisto and Given, 2008; Mihas

**Table 1**  
Key documents relating to Flood Re.

Short code	Author	Title of document	Summary
D01, 2016: <i>First Transition Plan</i>	Flood Re	The first Flood Re transition plan	A statement of the initial aims, strategies and operations of Flood Re
D02, 2018: <i>Our Vision</i>	Flood Re	Our Vision: Securing a future of affordable flood insurance	An updated statement after two years of operation
D03, 2019: <i>Quinquennial Review</i>	Flood Re	Regulation 27: The Quinquennial Review	A review of Flood Re's performance and a statement of the official proposals made to government
D04, 2020: <i>Annual Report</i>	Flood Re	Annual report and financial statement	Flood Re's most recent annual report
D05, 2008: <i>Revised Statement of Principles</i>	Association of British Insurers (ABI)	Revised Statement of Principles on the provision of flood insurance	Historical context of the situation preceding the creation of Flood Re
D06, 2011: <i>DEFRA Roadmap</i>	DEFRA	Flood risk and insurance: A roadmap to 2013 and beyond	Further historical context by a different author
D07, 2014: <i>Scheme Regulations</i>	DEFRA	The Flood Reinsurance Scheme – Regulations	Regulations controlling the operations of Flood Re
D08, 2014: <i>Gov. Consultation Response</i>	DEFRA	Government response to the public consultation on the Flood Reinsurance Scheme Regulations	Response to the public consultation conducted in the summer of 2014

and Odum Institute, 2019). Data were coded according to the various ways in which flooding, and the structure of the flood insurance industry prior to the creation of Flood Re, where problematised (Higgins, 2001; Bacchi, 2009, 2012; Rosol, 2015; Deros and De Roeck, 2019). Secondly, we grouped data according to Ewald's categories of insurance: institutions, abstract technologies, forms, and imaginaries. Data were sorted into smaller groups within each category, and key quotations and extracts were highlighted. Coding was deemed to be complete when data saturation was reached and no new and noteworthy material was discovered in the documents and transcripts (Benaquisto and Given, 2008; O'Reilly and Parker, 2013). Coding was conducted in an iterative manner whereby findings throughout prompted refinement of existing codes and rereading of texts in a new light (Benaquisto and Given, 2008). Data analysis was also aided by the activity of memoing, to record reflections occurring during the process of coding, for use when conducting more detailed analysis and manuscript drafting (Groenewald, 2008).

## 5. Findings

Analysis of policy documents and interview transcripts reveals how the flood insurance market was repeatedly described as failing in documents published prior to, and in, the early stages of Flood Re's formation (D06, 2011: *DEFRA Roadmap*; D01, 2016: *First Transition Plan*; D03, 2019: *Quinquennial Review*). Adopting Dean's (2009) approach, our findings are structured according to the ways in which various failings are problematised, as these help to reveal the rationalities of government which underpin those solutions proffered (Dean, 2009; McKee, 2009; Deros and De Roeck, 2019).

### 5.1. Problematisation 1: affordability and universality

Prior to the creation of Flood Re, the cross subsidy which had

hitherto existed in the UK flood insurance market, helping to pool risk and mutualise costs, was beginning to unwind (Geaves, 2016; Ralph, 2016). This change was attributed to the ‘finer positions of models’ by IO5 and the ‘recent advances in flood risk mapping’ in *D01, 2016: First Transition Plan*, which have allowed insurers to accurately quantify flood risk at the scale of the property and increasingly individualise the price of insurance premiums. Interviewees expressed concern over the equitability of these technological advances, as they allowed insurers to ‘discriminate against different parties, maybe at high risk’ (IO3) and ‘avoid some of those at greatest risk’ (IO2). Indeed, concern for justice and social welfare is a theme of our findings, and *D02:2018: Our Vision* makes several references to the emotional strain of facing flooding without insurance. Echoing Ewald’s insights into the power of insurance to eradicate distress, the impact on the psychology of the individual is a key component of Flood Re’s problematisation of the market that it seeks to reform. *D01, 2016: First Transition Plan*, for example, explicitly references the ‘level of comfort’ provided by flood insurance, and the psychological benefits of insurance to homeowners in the UK were echoed by some interviewee responses, such as IO9, who considered this an important aspect of their own role in the industry:

‘One of the biggest satisfactions in my role is where people are saying “I can’t find flood cover. I can’t get it. I can’t get it anywhere”. Then, you can then offer it to them, and [it might] enable house purchases to go through, and help people sleep at night’. (IO9)

It is unusual for the causes of market failure to be attributed to *improvements* in computational modelling and actuarial science, although Gray’s recent analysis of developments in modelling techniques in the US has demonstrated the political nature of such advances, leading to disputes and epistemological debate about the nature of risk and socialisation (Gray, 2021). This analysis helps to show that Flood Re’s framing of such issues as market failures is just one of many possible narrative constructions (Ralph, 2016), and other documents reveal cracks in this logic. For example, *D01, 2016: First Transition Plan* drew attention to the fact that prior to the formation of Flood Re, average household premiums for flood insurance across the UK had been *falling*. This matter was also discussed in *D06, 2011: DEFRA Roadmap*, which recognised that increased competition in the market had led to cost savings for the majority of homes, with a relatively small number forced to pay very high premiums. Against this context, it is clear that principles of equity and justice characterised by the repeated objective of achieving ‘affordability for all’ (*D01, 2016: First Transition Plan*) became crucial for Flood Re in justifying cross-subsidy and universal cover delivered by Flood Re, which is estimated to increase the average cost of home insurance policies by £10.50 (*D03, 2019: Quinquennial Review*).

Contrasting the trends in the global industry observed by Lucas and Booth (2020), collectivism and solidarity have been prominent in the discursive positioning of Flood Re. These principles are not limited to slogans either. Rather than using flood modelling and actuarial science, Flood Re’s reinsurance rates are based on Council Tax bands, which were chosen as a more equitable method. As *D02, 2018: Our Vision* explains, these are used as a ‘proxy to reflect the householder’s ability to pay rather than reflecting the risk faced by the property’. This alternative method of pricing coverage for flood events deliberately subverts contemporary trends in flood modelling and risk-based pricing by focusing not on flood risk but on affordability.

Nonetheless, the principle of ‘affordability for all’ is distinct from a deep-rooted allegiance with mutualism. Flood Re’s reinsurance scheme and the reintroduction of cross-subsidy are explicitly constructed as *temporary* interventions, and its publications and interviewee responses make explicit reference to its legal obligation to withdraw from the market in 2039, having supported a transition to risk reflective pricing without cross-subsidy in the meantime. This planned return to risk-reflective pricing and an insurance market which is no longer supported by Flood Re may indicate the continued centrality of a belief in market-based approaches, or what Christophers (2019) calls the

‘allusory market’, to deliver affordable and universal flood cover in the future.

Our interviews, however, exposed doubt amongst some stakeholders in the viability of achieving universally affordable premiums without continued mutualisation after 2039 due to the impacts of climate change on future flood risk. Two senior decision makers, for example, stated that:

‘Our ability to transition out of the market may be limited... how well we can do that [transition] may be impacted by climate change’ (IO3)

‘There may still be a *small number of properties* [after 2039] that are still struggling to get insurance, and some sort of solution may need to be found. For them, maybe insurance isn’t the solution.’ (IO3, emphasis added)

‘There will be a *group of houses* that will simply not be insurable. There will need to be an alternative solution – probably a non-insurance solution – which might be compulsory purchase, or relocation.’ (IO5, emphasis added)

These quotations show that while those involved in Flood Re acknowledge that the model cannot provide solutions for *all* at-risk homes in the UK, they believe that only a small minority will require additional approaches.

## 5.2. Problematisation 2: risk reduction

The second way in which the flood insurance industry is problematised by Flood Re is related to the failure of existing market arrangements to deliver on flood risk *reduction*. This problematisation was less prominent in the formation stages of Flood Re, but has risen up the agenda in recent years, as those involved have increasingly recognised the limitations of private insurers to deliver affordable premiums, incentivising flood prevention measures, while also providing cover for all. For instance, *D01, 2016: First Transition Plan* focuses on reinsurance and only describes a supporting role for Flood Re in raising consumer awareness, implementing flood-resilience repairs and providing data to support others in deploying physical measures. However, a shift in approach is evident in *D02, 2018: Our Vision*, which concludes that ‘the best way to secure available and affordable household flood insurance is to manage the risk of flooding’. Although marking a shift towards acknowledging the importance of prevention, this statement reveals a market-first logic at the heart of Flood Re. Rather than beginning with the objective of reducing the impacts of flooding, the principal goal is to establish a thriving insurance market. Since that statement in *D02, 2018: Our Vision*, this shift of perspective has continued, as those involved in the scheme explained:

‘Floods Re was a couple of years ago, really, very private sector, led by people from a commercial background. It’s not necessarily the aspirations which have moved, but I think our language has moved a bit and our conversations have moved on – although we’ve all been at home! – from ‘consumers and choice’ to more ‘communities and affordability’. We’ve had a shift in language, internally and externally.’ (IO3)

‘Our language has already started to take in this more complex world, and acknowledge that it is not quite as straightforward. Our objective isn’t just for the insurance industry to carry on, but to have a broader public policy remit as well. It is still the intention that we have a diverse insurance market and it’s successful and thriving, but we also understand that things are more complex.’ (IO5).

Each taking care to emphasise that the shift in approach was primarily a change in language rather than mission, and in the uncertain context of home-working as a result of COVID-19, these quotations imply that institutional shifts within Flood Re are provisional and partial.

The problematisation of the insurance sector as failing to deliver on

risk reduction is aided by three related issues, or sub-problematisations (Table 2). First, the failure of insurers to reward those households installing risk-reducing measures with reduced premiums. D03, 2019: *Quinquennial Review* highlights how ‘voluntary installation of smoke detectors and mortice locks’ offer examples of actuarial responsiveness elsewhere in the insurance industry for which there is no equivalent yet for flooding. Flood Re’s solution is ‘to offer a discounted set of premiums for properties that have installed ‘allowable’ resistance and resilience measures’ (D03, 2019: *Quinquennial Review*). An officially approved list of technologies and measures will allow insurers to offer discounted rates to policy-holders. While endorsed by DEFRA, this solution has yet to be implemented.

The second feature of current forms of insurance that is rendered problematic is the policy that ‘like for like’ (I11) property restoration occurs following claims. This industry-adopted standard means that repairs – a key window of opportunity for risk reduction – do not currently include adaptation measures (D03, 2019: *Quinquennial Review*). Flood Re’s solution is a scheme called ‘Build Back Better’ (BBB) which has also been endorsed by DEFRA but is yet to be operationalised. Up to £10,000 worth of approved measures are set to be funded by Flood Re, which I05 described as an incentive for ‘insurers to put you back into a better state than you were before, so that it [flooding] doesn’t happen again and again and again’. A stipulation for access to this scheme is that ‘insurers will have to offer BBB across their whole home insurance offering, rather than just on Flood Re ceded policies’ (D03, 2019: *Quinquennial Review*). Here, Flood Re is attempting to influence not only the property it reinsures but also the configuration of flood insurance arrangements across the sector.

The third sub-problematisation related to risk reduction is the opacity of flood insurance and information deficit plaguing the market. Incorporated into home and buildings cover, the cost of flood insurance is largely unknown to consumers. Here, the UK is not an outlier amongst European countries, but in the US, flood insurance can be purchased as a stand-alone product. Referring to the UK, I06 expressed concern that such ‘opaqueness... dilutes the signal’ to homeowners about the flood risk they face. Research sponsored by Flood Re acknowledges the hindrance to economically rational consumer behaviours that this market structure creates:

‘Whilst a rational household would take the decision to take up flood resistance/resilience measures, the informational and behavioural barriers to do so are too great’. (Oakley, 2018, p. 68)

This problematisation is contentious however, and Flood Re policy documents do not propose the unbundling of flood insurance from home and buildings policies. Opacity enables mutualised cross-subsidy and universal cover to be achieved without attracting potential opposition from homeowners at low risk. Perhaps recognising that the current arrangements allow for a degree of mutualisation which would not be supported by those householders at low risk – were they to know more about how their premiums are used for cross-subsidy – Flood Re’s ambition is more modest, as it calls for ‘greater information sharing and analysis about flooding and flood risk, [which] could better inform consumers to make better choices in the wider public interest’ (D03,

**Table 2**

Sub-problematisations related to the failure of the insurance market to deliver on risk reduction.

Sub-problematisation	Proposed solution
Unresponsiveness of premiums to the installation of risk-reducing measures	Creation of officially approved measures for insurers to include in actuarial assessments.
The ‘like for like’ convention of restoring properties after flooding events.	‘Build Back Better’ arrangements for incentivising flood risk reduction measures during property restoration.
Opacity of flood insurance and information deficit	Transition to risk-reflective premiums; Flood Performance Certificates

2019: *Quinquennial Review*). Flood Re’s principal hope is that a return to risk-reflective pricing will ultimately provide the ‘incentive for the Government, insurers and households to take the necessary steps to reduce the risks and costs of flooding’ (D01, 2016: *First Transition Plan*).

In the meantime, Flood Re is proposing the creation of Flood Performance Certificates (FPCs) to help overcome the information deficit. I05 explained that these would function ‘like an energy performance certificate, [providing] a statement of what flood risk you are at and what flood resilience you have already got installed’. FPCs would complement the instigation of responsive premiums if householders were to install improved measures. In early stages of development, there is little detail currently available about how these would be implemented and funded. Whether the introduction of FPCs or the return to risk-reflective prices will help flood risk and insurance to become more transparent remains uncertain.

The narrative construction of the insurance market as failing to deliver on risk reduction marks an emerging shift in Flood Re’s insurantal imaginary, as it recognises the need to develop additional interventions alongside its reinsurance scheme. The introduction of discounted premiums, Build Back Better, and FPCs represents a clear broadening of the scope for the insurance industry. For the first time, flood insurers are beginning to address the myriad problems associated with their product, including the need for wider adoption of risk reducing measures, moving beyond like-for-like replacements and overcoming information deficit.

### 5.3. Problematisation 3: horizontal governance

A third problematisation of the extant insurance market is that it lacks the power to influence housing, planning and climate policy. This has emerged since the inception of Flood Re, alongside the emergence of risk-reduction solutions, revealing a gradual acceptance of the need to broaden its purview horizontally and collaborate with stakeholders beyond the insurance industry (Ferguson, 2009).

The development of homes and non-domestic buildings in areas of high flood risk was described modestly by I05 as a ‘headwind’ and by I03 as a ‘big risk’ to the success of achieving affordable flood insurance for all. To date, having ‘limited resources and few direct policy levers’ (D02, 2018: *Our Vision*) Flood Re’s position has been to construct these forces as external and out of scope. It has continued, where the 2008 Statement of Principles left off, to exclude properties built after 1 January 2009, with the hope that this signal would help to discourage high-risk developments. As Christophers (2019) points out however, planners and developers failed to respond ‘rationally’, as housebuilding in high-risk zones continues at pace (Gosden, 2015; Halliday and Barratt, 2020). Interviewee responses indicated that lack of transparency and rigour in local planning review and approval procedures are largely to blame, but tentative attempts are being made by Flood Re to discourage irresponsible development, as they acknowledge that they have a role to play.

In parallel, some senior staff are recognising that the constitution of Flood Re as a public–private partnership is an appropriate vehicle for expanding horizontally. I05 said:

‘[Flood Re] has a really strong... convening power to bring people together to talk about these issues, make them public and call on government or call other policymakers to change things’.

I12 concurred, suggesting that ‘to date, it [insurance] has often worked in a silo [but], with the introduction of Flood Re, we are seeing the beginnings of cross-sectoral discussions’. According to I05, climate change is the principal driving factor behind this turn outwards:

‘If you look at a 2 °C trajectory... the number of properties at risk of flooding by circa 2039 will have increased by 30 % from where it is now... and it [climate change] also means that we have to face into it’

Demonstrating an uneasiness regarding the extent to which Flood Re



could and should seek to tackle climate change however, this respondent added, ‘by we, I don’t really mean Flood Re, I mean, society, government and country’. Nonetheless, the most recent document analysed for this study articulates a change in approach, attributed specifically to climate change:

‘Looking specifically through the lens of climate change, the Board decided to broaden its stakeholder engagement to include potential partners from the planning, development and housing sectors’ (D04, 2020: *Annual Report*).

Prior to this, climate change has played a peripheral role in the narrative construction and problematisations of flood insurance which paved the way for Flood Re. D05, 2008: *Revised Statement of Principles* makes no mention of climate change, and in subsequent policy documents, it is referred to largely as a complicating factor which gives more justification for industry reform (D01, 2016: *First Transition Plan*; D02, 2018: *Our Vision*). That climate change has become a prominent consideration for Flood Re only in the very recent past perhaps reflects increased public and political concern since late 2018, influenced by the emergence of Extinction Rebellion and the School Strikes movement (Thackeray et al., 2020). Although certainly welcome, it also betrays a myopia that had hitherto compelled it to focus on the insurance market alone. The solutions beyond reinsurance described in this section mark a significant shift in insurantal form and imaginary in the UK context: their viability and effectiveness remains to be proven.

## 6. the market is dead, long live the market!

The emerging shifts described above have been limited in depth and breadth, and despite the problematisations of the existing private flood insurance market as failing in several ways, a philosophical allegiance to neoliberal market ideology continues to underpin the new insurantal imaginary embodied by Flood Re (Ewald, 1991; Christophers, 2019). Put simply, the market comes first. Evident in policy documents and responses from senior individuals is that Flood Re’s principal objective is not to mitigate the impacts of flooding, but to establish a thriving insurance market.

In recent years Flood Re has expanded its remit beyond reinsurance services and is now proposing and developing solutions which will help to deliver risk reduction, including lists of approved mitigation measures, Build Back Better, and Flood Performance Certificates. These are welcome interventions and go some way towards acknowledging that effective risk reduction cannot be delivered by ‘pure-market’ solutions alone (Lucas and Booth, 2020). And yet Flood Re’s alignment with neoliberal ideals is demonstrated by its plan to withdraw from the market in 2039, having removed cross-subsidy, returned to risk-reflective pricing, and achieved ‘affordability for all’. While there is little information on what governance of flood risk will comprise from 2039 onwards, there is no indication that those involved in Flood Re anticipate any major state intervention in the form of physical flood protections.

While this illusory aspiration has been widely criticised (Christophers, 2019; Lucas and Booth, 2020; Surminski, 2018), it is not unique to Flood Re. Similar reinsurance schemes such as the California FAIR Plan, and the Florida State Wind Pools aspire to withdraw from the market, also imagining that the dual, synergistic forces of risk-reflective pricing and mitigation measures will deliver affordable insurance for all. Ewald’s work tells us that this delusion is not just unsurprising, but a foundational characteristic of insurance itself (1991; 1999), which is being undermined by the emergence of global environmental change (Ewald and Utz, 2002; Elliott, 2017, 2021). The vision of a UK flood insurance market in 2039 in which competition thrives, risk is managed, and cover is affordable and universal exemplifies what he describes as the ability of insurance to ‘master time [and] discipline the future’ (1991: p207). Just as the promises of hydrogen, carbon capture and storage, and nuclear fusion in several decades’ time helps to detract from

the need for radical decarbonisation policies in the near term, Flood Re’s focus on 2039 enables an abstracted, idealised imaginary to take centre stage, pushing aside more fundamental governance reforms (Christophers, 2019).

One such reform would be the unbundling of home and buildings policies, to create a consumer market for flood insurance. While the opacity of pricing and information deficit is a key feature of Flood Re’s discursive construction of market failure, it stops short of proposing this structural change. Its proposed interventions already represent an uneasy departure from purely financial measures for the industry, and – perhaps unsurprisingly – aligned with the light-touch interventions of behavioural economics, said to be in-vogue in UK government (Jones et al., 2011; Kattirtzi, 2016). These include choice architecture (approved lists of mitigation measures), changing defaults (Build Back Better), and the provision of information (FPCs) (Thaler and Sunstein, 2008). An extensive body of literature has highlighted the limitations of such approaches in addressing the systemic challenges posed by climate change (Avineri, 2012; Hampton and Adams, 2018; Reid and Ellsworth-Krebs, 2018), including evidence of householder behaviour change, or lack thereof, after the widespread implementation of Energy Performance Certificates, upon which proposals for FPCs are based (Amecke, 2012).

## 7. Prospects for climate compatible flood insurance

The Environment Agency (2020) estimates that at least £1bn a year will be required for flood measures in the UK in the coming decades, and this level of investment will be necessary for Flood Re to be able to satisfy its criteria for market withdrawal. So far, the solutions proffered by Flood Re to deliver on risk reduction fall short of incentivising the expenditure needed to deliver adequate flood protections for at-risk properties in the UK (Surminski, 2018; Christophers, 2019). But they are moves in the right direction. The task of designing an insurance system able to deliver risk-reduction, affordability and security whilst avoiding moral hazard is not an easy task and one which remains an international challenge (Crick et al., 2018), and whilst Flood Re represents a new approach to governing flood risk in the UK, it is not the only novel approach visible in contemporary societies. Other innovative forms of insurance highlighted by a number of scholars include the use of parametric insurance and microinsurance. The former approach fixes payments in the event of disaster to its magnitude, rather than the losses incurred, reducing uncertainty for insurers. Microinsurance aims to provide more simple, affordable and transparent insurance to low-income demographics where insurance cultures are weak and under-insurance can lead to destitution (Keucheyan, 2018; Mills & Lecomte, 2006; Collier, 2014; Van Nostrand & Nevius, 2011; Botzen, 2013; Howarth, 2018).

This paper has highlighted the discursive construction of market failures which paved the way for Flood Re to intervene in the governance of flood insurance in the UK. Starting out with a reinsurance remit only, early documents refer to climate change merely as a complicating factor; not as a force for paradigmatic change. Alongside the growing prominence of climate change in public and political consciousness, stakeholders in Flood Re are gradually awakening to the existential threat that climate change poses to the flood insurance industry, and are responding to new climate-related problematisations by incorporating risk reduction and horizontal governance into its technologies of governance. As well as marking a shift in the insurantal imaginary, the new forms and technologies being adopted by Flood Re are beginning – cautiously and tentatively – to alter the moral role of insurance, echoing Ewald and Utz’s (2002) description of the shift from *prevention* to *precaution*, in light of the existential threat posed by global environmental change.

This shift is clearly incomplete however, and recent trends such as the use of high-resolution modelling of risk at the property-level shows that the ‘age of insurance companies’ is far from over (Ibid, p302). Flood



Re's excursions are partially reconfiguring insurance as a *social* technology rather than a technology of *individualising* the costs of adaptation. With the aim of ensuring affordability for all, solidarity and mutualisation are re-emerging, and interviewees revealed that these shifts are being propelled by the growing awareness that climate change is not merely a complicating factor for the normal functioning of insurance, but poses a fundamental challenge to the meanings, structures and governance arrangements associated with the industry. The discourse of precaution is emerging alongside the promise of prevention.

The flood insurance industry now finds itself in the midst of a series of tensions and contradictions: between individual responsabilisation and mutualisation; liberal individualism and solidarity risk-reflective and subsidised pricing; opacity and transparency; and market-orientation and cross-cutting responsibility (Lehtonen and Liukko, 2015; Ewald, 2019; Elliott, 2021). Flood Re embodies many of these tensions, as it simultaneously and uneasily seeks to foreground social and moral objectives, incorporate risk reduction, and collaborate with stakeholders beyond the insurance industry. Its plans for market withdrawal demonstrate a continued faith in free-market principles, although UK flood insurance market has always, and will most likely continue, to involve regulation and state intervention – informal or otherwise. The development of new *forms* of intervention (Ewald, 1991) and its shift towards outward engagement reveal a gradual acceptance by industry and government stakeholders that purely financial solutions will be insufficient. And yet – demonstrating the partial nature of these shifts – our interviews have shown that senior decision-makers have not yet accepted that more than ‘a small number of properties’ (I03) will require additional support after 2039.

Elliott's work on flood insurance in the US illustrates a further tension surrounding the distribution of costs associated with flooding, according to the *ability to pay* (2017; 2021). The conventional framing of natural disasters is such that victims are not held responsible on the basis of their past choices, while simultaneously, the insurance imaginary treats floods as probabilistic risk, to be commodified and (ideally) mitigated through deliberate and calculated action. The coexistence of these positions is proving ever-more problematic in light of climate change and technological advances in actuarial science. These are foregrounding morally charged questions about individual responsibility and the socialisation of costs. Whereas in the USA such debates have been prominent, playing out in Congress for instance; in the UK they have been dampened down by the governance arrangements. While the risk modellers participating in this study described a range of technological developments which are increasing the capacity of private insurers to model risk on a per-property basis, Flood Re has chosen to adopt the crude, non-risk-based proxy of using Council Tax Bands to ease the burden on those least able to pay. This symbolises the contradictions inherent within the Flood Re approach, and is it is problematic in a practical sense too: house prices in the UK are not correlated with flood risk. Ironically, this is partly due to the opacity and non-risk reflective nature of UK flood insurance.

The root cause of these problematic tensions can be explained in several ways. For Christophers (2019), it comes down to the limitations of neoliberal ideology which pervade government and industry. Lucas and Booth (2020) claim that private interests and the prominence of technocratic solutions are simply incommensurable with climate justice;

while Lehtonen and Liukko (2015) argue that different forms of solidarity are always in tension: exclusion is always present, and actuarial fairness reinforces existing inequalities. Politics and morality are inseparable from insurance as a technology of governance. In his 2019 article, Ewald highlights the need to examine such tensions in the context of the contemporary crisis of the welfare state. Insurance, he says, is an ‘embodied morality’ revolving around four key values: *responsibility, solidarity, justice* and *truth*. He argues that its continued legitimacy – in doubt in the age of *precaution* – depends on its institutions’ ability to explicitly engage with and articulate their position with respect to each.

From its inception, the principles of *justice* and *responsibility* have been at the foreground of Flood Re, demonstrated by the prominent objective of ‘affordability for all’ in its publications. However, the range of solutions proffered by Flood Re highlight the remaining uncertainty over who should take responsibility for bearing the costs of adaptation to flood risk. Should the costs of Build Back Better schemes be met by individuals, or socialised? Should the government take on greater burden through compulsory purchase schemes, state subsidised reinsurance or publicly funded flood defences? Flood Re's position on *solidarity* is also uncertain: cross-subsidy and the direct involvement of government are deemed necessary but *temporary* interventions, as means towards resurrecting a competitive market which may not need these. On *truth*, a belief in the power of subtle market reforms and behavioural nudges appears to be blinkering Flood Re stakeholders to the likelihood that climate change and the irresponsible development of housing in high-risk areas will multiply costs and inequalities. We concur with other commentators that Flood Re must reconsider the viability of disbanding in 2039 (Surminksi, 2018; Christophers, 2019; Lucas and Booth, 2020).

Despite its flaws, Flood Re provides a strong foundation for reforming governance. Bringing together the insurance industry and government representatives, it must be added to by incorporating a wider variety of stakeholders covering land-use planning, housing, consumer and community representatives. Flooding is already an issue of public concern and media scrutiny in many countries, and the campaign for increased dredging of UK rivers following the Somerset floods of 2014 illustrates that this attention can lead to widespread frustration, the misattribution of blame, and misallocation of resources (Hall, 2014). As climate change increases the incidence of flooding and heightens risk, there may be a need to widen participation to include different stakeholders, including householders, in the governance of flood risk and insurance. One model includes the use of competency groups, as described in the case of flood risk management in Yorkshire, UK (Whatmore and Landström, 2011). In any case, in order to effectively respond to climate change, Flood Re stakeholders must overcome the delusion that a market for flood insurance that delivers on risk reduction and affordability for all can be brought about without structural reform to the industry, and the continued involvement of state institutions.

### 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.

## Appendix A

Summary of governance arrangements for the UK flood insurance industry.

Date	Governance arrangement	Description	Rationale for policy change
Pre-1961	Market driven - No specific policy agreement	Despite flood insurance being made part of composite policies in 1922 and total loss flood insurance being available since 1929, penetration remained low as most homeowners chose to go without flood cover. In the event of a flood, the government and local authorities provided financial assistance to the uninsured.	n/a
1961–2001	Gentleman's agreement between government and the insurance industry	Insurers agreed to make flood cover available to any UK household requesting it. A cross-subsidy was created to make flood cover more affordable for high-risk households. Buildings insurance was made compulsory for all mortgage holders in the early 1970 s.	The government was concerned about the rising costs of financial support for uninsured households. The insurance industry hoped this informal agreement would prevent government intervention in underwriting policy.
Feb 2001	Association of British Insurers (ABI) memorandum to government	Four decades after the 1961 agreement, the insurance industry challenged the agreement for universal cover. The memorandum asserted that the industry would continue to cover all homes provided that the government increased spending on flood defences and improved spatial planning in high-risk areas.	The insurance industry felt that it should only offer universal coverage if the government were taking more active steps to manage the risk of flooding.
Jan 2003– July 2013	Statement of Principles (SoP) agreements between government and the ABI	Established in September 2002 and setting the standard from January 2003, the SoP reinforced the key principles of the 2001 memorandum. This included government commitments on flood defence spending and spatial planning. The insurance industry guaranteed to offer protection to properties with a flood risk lower than once every 75 years, or with defences planned which would reduce the risk to this level. The agreement was renewed in 2006 and 2009. However, the 2009 renewal excluded newly built properties from mandatory coverage and stated that prices would be adjusted so that premiums more closely reflected flood risk for all homes. It stipulated that that from July 2013 another solution would be required.	The SoP revealed concerns over the adverse effects on the insurance industry of covering highest risk households. In the mid 2000 s, some new market entrants chose not to abide by the SoP, refusing the obligation to cover high-risk households, enabling them to undercut incumbents. Improvements in accuracy and resolution of flood modelling and risk assessment also enabled more targeted pricing. These developments led to the winding up of the SoP.
April 2016	Flood Re launched	The 2014 Water Act announced the establishment of 'Flood Re' as a joint insurance industry and government initiative to replace the SoP. Whilst a public-private partnership, it was deliberately set-up as an autonomous body with operational independence from the government. To fund Flood Re, the government introduced a statutory levy on all insurers wishing to offer home insurance in the UK. As a result, because it is handling what is in essence public money, Flood Re is directly accountable to parliament and must use its funds for the benefit of UK households. There is no formal public back-up mechanism should Flood Re be made insolvent by claims exceeding its reserves, although, there is an expectation that a secondary levy and financial support would be provided by the government.	The conclusion of the SoP threatened the universal availability of flood cover as insurers were no longer obligated to provide insurance to high-risk households. Furthermore, a shift towards risk-based pricing with more granular flood risk modelling was also driving premium increases for high-risk households. Flood Re was set-up to promote greater affordability and availability of flood insurance in the UK. The scheme was, however, also set up to be responsible for managing a transition towards a risk-reflective flood insurance market over a period of 25 years. As a result, Flood Re will withdraw from the market in 2039.

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