The policy landscape and challenges of Disaster Risk Financing: navigating risk and uncertainty

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Abstract

More anticipatory, pre-agreed disaster response is a shared goal for many in the disaster management and humanitarian communities. This paper considers the emerging policy landscape of Disaster Risk Financing (DRF), which here I define as including mechanisms which allow agencies to act in advance of disasters occurring, as well as those which aim to respond earlier to disasters which have already occurred. What they have in common is no longer waiting for disaster needs to become apparent before responding, however, this creates a challenge for practitioners because of the potential for acting erroneously. The paper explores the policy landscape around DRF and provides a more cohesive way of understanding approaches in this policy area through the shared challenge of decision-making under uncertainty. Drawing from expert interviews and science and technology studies theory, the paper provides recommendations for how practitioners can better navigate risk and uncertainty in DRF in a more nuanced way.

Key words: anticipation; anticipatory action; disaster risk finance; decision-making; risk; uncertainty;

1. Introduction

Historically, disaster risk reduction and preparedness have made up a small proportion of overall spend on disaster response (Kellett and Caravani, 2013). In recent years, however, moving towards a more anticipatory, pre-agreed approach has become a key goal for many in the disaster response and humanitarian sectors, which I refer to broadly in this paper as Disaster Risk Financing (DRF).

These shifts culminated in 2021, which saw a series of key events and significant new commitments to fund risk financing. During the G7 meeting hosted in the United Kingdom in June 2021, the governments of the UK and Germany committed GBP 120 million and GBP 125 million of new financing (approximately USD 160 million and USD 140 million, respectively) for pre-arranged disaster risk financing for vulnerable communities (G7 Statements and Communiqués, 2021). In September 2021 the UN Office for Coordination of Humanitarian Affairs (UN OCHA) convened a high-level event focussing on Anticipatory Action, in partnership with the Governments of Germany and the United Kingdom, at which a number of countries and agencies further escalated their commitments to these approaches (United Nations and the Governments of Germany and the United Kingdom, 2021). For example, Germany announced their aim to double their contribution to anticipatory action by 2022, whilst the Government of Ireland committed to directing approximately 25 percent of its humanitarian funding directly to mechanisms that support anticipatory action (ibid: p. 2). The sentiment of the current policy shift towards more anticipatory disaster financing was summed up by the current Under-Secretary-General for Humanitarian Affairs and Emergency Relief, Martin Griffiths, speaking at the High-Level Event on Anticipatory Action, that: ‘The humanitarian system must be as anticipatory as possible, and only as reactive as necessary’ (UN OCHA, 2021).

This significant growth in momentum behind anticipatory and risk financing approaches has resulted in an emergent and rapidly evolving policy area. One noticeable characteristic of this sector is the complex terminology for particular mechanisms. The two most common terminologies used are ‘anticipatory action’, which usually refers to anticipatory financing mechanisms implemented by...
humanitarian agencies, and ‘disaster risk financing’, which usually refers to mechanisms used by development financing institutions to provide rapid financing in the aftermath of disasters.

While there are differences between the mechanisms in this area, they also have a great deal in common, specifically relating to the challenge of decision-making when agencies are no longer waiting for disaster needs to become apparent before responding. This is critical, because it opens decision-making up to interpretation and raises important questions relating to how decisions are made, as well as the possibility of making decisions in error. Underlying this is the challenge of navigating risk and uncertainty in decision-making, which is the central focus of this paper.

For reasons that I further explain in Section 2, I adopt a broad definition of mechanisms which fall within the scope of DRF, defining them as mechanisms which are based on: i) information about, or measures of disaster risk, ii) pre-arranged finance and plans and iii) a mechanism to enact response. This definition is purposefully broad, and for example does not refer to ‘anticipatory’ use of forecasts, but rather information and measures of risk, whether that is a forecast, an expert advisory alert or a proxy measurement of a hazard such as windspeed in order to inform and trigger response. This allows diverse policy mechanisms ranging from index-based insurance to Forecast-based Financing (FbF)\(^1\) to be understood as different tools within the same policy landscape.

In this paper I explore the policy landscape of DRF and provide a more cohesive way of thinking about the different mechanisms in use, spanning both mechanisms which allow agencies to act in advance of disasters occurring, as well as those which aim to respond earlier to disasters which have already occurred. I unpack the central policy narratives supporting DRF, relating to efficiency and effectiveness, showing tensions and differences across the sector in how agencies approach and define these central arguments. I then discuss some of the challenges of implementing DRF in practice. As a result of acting based on information which is inherently incomplete, acting in the face of uncertainty is a critical challenge for practitioners in this field. I bring to bear literatures from science and technology studies (STS) to outline some ways in which both risk and uncertainty could be better understood and outline some recommendations for practitioners in this field.

1.1 Methodology
This paper draws from qualitative research, including 27 expert policy interviews, combined with participant observation during key events in the DRF community and desk-based reviews of policy literature.

Interviews were semi-structured in nature and gathered through a mixture of purposive and snowball sampling to ensure that key agencies were represented. It is important to note that participants are categorised in a broad way as: humanitarian practitioner, donor, DRF specialist, catastrophe modeller and researcher. This is necessary for two reasons. Firstly, DRF is a small sector, so broad categories are important to maintain participant anonymity and to ensure that interviews are non-identifiable. Secondly, this sector is composed of new collaborations of expertise, spanning policy, climate science, finance and humanitarian practitioners. Table 1 lists the organisations represented in empirical data by broad descriptive category and exemplar job titles from within those categories of interview participants.

\(^1\) Detailed information on the methodology for different mechanisms within DRF are beyond the scope of this paper, but for a broad typology and explanation for different mechanisms see Willitts-King et al., 2020.
<table>
<thead>
<tr>
<th>Interview #</th>
<th>Category</th>
<th>Organisations included within this category</th>
<th>Example job titles within the category</th>
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<tbody>
<tr>
<td>1</td>
<td>Humanitarian practitioner</td>
<td>FAO; WFP; IFRC; The START Network; Red Cross Red Crescent Climate Centre</td>
<td>Crisis Anticipation Adviser</td>
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<td>Senior Officer</td>
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<td>Global Coordinator FbF</td>
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<td>2</td>
<td>Humanitarian practitioner</td>
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<td>Humanitarian practitioner</td>
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<tr>
<td>10</td>
<td>Catastrophe modeller</td>
<td>World Bank; Private Consultants; Oasis Loss Modelling Framework</td>
<td>Financial Sector Specialist</td>
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<td>Catastrophe modeller</td>
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<td>Catastrophe modeller</td>
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<td>6</td>
<td>Donor</td>
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<td>Humanitarian Affairs Officer</td>
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<td>16</td>
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<td>Donor</td>
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<tr>
<td>14</td>
<td>DRF Expert</td>
<td>World Bank; Centre for Disaster Protection; START Network</td>
<td>Technical Lead on Crisis Anticipation and Risk Financing Consultant</td>
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<td>IFRC; German Red Cross; University of Reading</td>
<td>Manager Adviser for Policy and Advocacy</td>
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Interviews were supplemented with attendance at key events relevant to the sector between 2018 - 2021. These included:

Note that organisations and job titles are grouped in this way to ensure that individual interviews are non-identifiable.
• The Red Cross Global Dialogue Platform for Forecast-based Financing, and later Anticipatory Humanitarian Action\(^2\), in Berlin in 2018 and 2019;
• Global Facility for Disaster Reduction and Recovery (GFDRR) Understanding Risk conference in Mexico City, in May 2018;
• UN Global Platform for Disaster Risk Reduction in Geneva, in May 2019;
• United Nations Framework Convention on Climate Change (UNFCCC) Conference of the parties in Madrid, in December 2019

I participated in 2 further multi-day virtual conferences held during 2020 and 2021, the Red Cross Virtual Global Dialogue Platform for Anticipatory Humanitarian Action and the Insurance Development Forum Virtual Summit in June 2021. Attending conferences and public sessions allowed triangulation of key narratives, in particular through attending conferences that spanned the climate, disaster risk reduction and humanitarian communities. It also enabled me to follow the emergence of new approaches, vocabularies and particular mechanisms within the DRF space.

2. DRF Background and Policy Landscape

DRF comes at a time when global humanitarian needs are reaching the highest level they have been in decades (UN OCHA, 2020), a situation which has been further exacerbated by the Covid-19 pandemic. Over several years the total value of unmet humanitarian appeals has been increasing, from USD 8.9 billion in 2016 to USD 13.1 billion in 2020, excluding the total value of Covid-19 relevant appeals in 2020, of which a further USD 5.7 billion was unmet (Development Initiatives, 2021: 33). This sits against the backdrop of a long-term trend of increasing global humanitarian funding over the last decade, but despite this, the percentage of humanitarian appeal requirements that are met by funding has declined from 63 percent in 2011 to 52 percent in 2020 (ibid).

Even prior to the Covid-19 pandemic, key actors were making the case that more anticipatory financing was the only way to resolve the ongoing problem of humanitarian needs outstripping financing, as was argued by Mark Lowcock, who served as the UN Under-Secretary General for Humanitarian Affairs and Emergency Relief Coordinator from March 2017 – June 2021:

‘We are now seeking almost US$27 billion for 2019, for the appeals from the UN, NGOs and others that I coordinate. We have raised almost $16 billion so far. That’s a record... But it leaves a large gap. It would be nice to think we can fill the gap just by raising more money. But we can’t. We also have to make the money we have go further. The best way to do that is to change our current system from one that reacts, to one that anticipates’ (UN OCHA, 2019, p. 2).

Most recently, the confluence of Covid-19 with existing drivers of humanitarian crises such as conflict and climate change has served to underline calls for more anticipatory financing, as well as increasing the coherence between development and humanitarian assistance.

While these recent pressures have increasingly drawn attention to the need to change the status quo of disaster response, there is a longer trend of events which have catalysed calls for changing the paradigm of disaster response. Among participants interviewed in this research, the 2011–2012 Horn of Africa crisis was seen as a key example of the perceived failure to respond to disasters in a

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\(^{2}\) This event changed name during this research, to represent the shifting focus from a particular methodology of Forecast-based Financing towards ‘Anticipatory Humanitarian Action’, but the content of the conferences spanned both anticipatory action and risk financing more generally.
timely way, even when there had been credible warning information available (Bailey, 2012). The slow response to this event was seen as a systemic failure across the humanitarian sector and one of the recommendations to follow from the crisis was that agencies should do more to act despite uncertainty, no longer ‘waiting for certainty before responding’ (Hillbruner and Moloney, 2012, p. 1). Wider lessons learned included the need to ensure scientific information is better used in decision-making, and that decisionmakers act on that information (Humanitarian Emergency Response Review, 2011). One research participant referred to the period of time after this event as representing a ‘step change’ (Interview 8, DRF specialist) that led to a focus on a more anticipatory approach and arguably laid the groundwork for DRF. Indeed, some of the findings led to the use of triggers for action, which is one of the key characteristics of DRF, as one interview participant explained: ‘What we have seen in the history... of humanitarian actions is there’s a lot of early warning systems that have absolutely no consequence because there is no obligation to take an action based on a warning. So, what we’re trying to do is to force that...’ (Interview 18, Donor).

To deliver this there has been a significant growth in the policy landscape of DRF initiatives. In 2017, the InsuResilience Global Partnership for Climate and Disaster Risk Finance and Insurance Solutions was launched by the G7 to provide climate risk insurance for 400 million people in developing countries by 2020 (InsuResilience, 2018). In 2017, the UK Government launched the Centre for Disaster Protection, to provide technical advisory for DRF, although this was not fully operational until 2019. The Centre’s work spans sovereign disaster financing mechanisms to working with humanitarian agencies on risk financing (DFID, 2017)3, which highlights some of the increasing interconnections between sovereign and humanitarian disaster financing through DRF. Meanwhile in 2018, the Global Risk Financing Facility was launched in partnership with the InsuResilience Global Partnership, to pilot further disaster risk financing tools, implemented by the World Bank and GFDRR (World Bank and GFDRR, 2018).

2.1 Defining DRF: Complex terminology

This policy area has rapidly diversified and is now a complex landscape of agencies, mechanisms and projects often with their own methodologies and vocabularies, leading to a complex and sometimes confusing debate around terminology. The two most common definitions used in this wider sector are ‘anticipatory action’ and ‘disaster risk financing’. In this section I discuss some of the background to the different terminologies and explain why I adopt the term DRF in this paper.

‘Disaster risk financing’ as a term was initially used by the World Bank and can be traced back to the programme name for a World Bank and GFDRR stream of work on sovereign insurance, market development and partnerships with the private sector, entitled ‘Disaster Risk Financing and Insurance Programme’ (DRFIP), which was launched in 2011. Subsequently, in the influential 2016 book ‘Dull Disasters’, Daniel Clarke and Stefan Dercon, who had both been affiliated with the DRFIP, argued for a more rules-based approach to financing disaster response, through what they defined as combining: ‘A coordinated plan for post-disaster action agreed in advance; A fast, evidence-based decision-making process, and Financing on standby to ensure that the plan can be implemented’

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3 It was announced in June 2020 that the UK’s Department for International Development (DFID) would merge into a new department, the Foreign, Commonwealth and Development Office (FCDO), which launched in September 2020. Here I refer to and reference ‘DFID’ when the issue at-hand pre-dates this change, or when the document being cited was published by DFID prior to the merger. More information about the merger is available here: https://publications.parliament.uk/pa/cm5801/cmselect/cmfaff/809/80902.htm

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(Clarke and Dercon, 2016, p. 3). In so doing, they provided one of the first overarching definitions that could be used to define emerging mechanisms across the sector.

In terms of definitions, it is notable that many practitioners who work in this sector use the terms DRF and anticipatory action interchangeably. This was the perspective of one humanitarian research participant who argued that FbF should be seen as one tool within a broader landscape of DRF, on the condition that wider considerations of disaster risk management are recognised: ‘The current definition of DRF from the World Bank, only focusses on the response element – a bunch of instruments to ensure liquidity for response. But this is changing, it’s really... looking towards holistic perspectives on disaster risk management .... that’s what I hope DRF will become in the future, and in that principle, in that definition, I will say that FbF is a tool within DRF...’ (Interview 2, Humanitarian practitioner).

Many other participants interviewed for this research insisted that the difference was really a semantic one. For example, one participant argued: ‘...if you talk to a government or you talk to people at risk, they don’t give two craps about what you call it. They care about what you’re trying to do for them. And when...’ (Interview 8, DRF specialist). Another contended: ‘...we’re all for having an open definition of it (referring to anticipation) ... I think it’s good for all of us in the sector to have something loose ...’ (Interview 1, Humanitarian practitioner).

Despite these perspectives, there has been an ongoing debate about terminology in the sector, and significant resources have been invested in trying to find consensus. For example, a number of agencies including the Centre for Disaster Protection, the Red Cross Red Crescent Climate Centre and UN OCHA commissioned a joint ‘thesaurus’ of anticipatory action to: ‘enable reflection on the similarities and differences in the way organizations use language associated with the concept of anticipatory humanitarian action’ and to enable mutual understanding (De Wit, 2019, p. 5). In September 2021 the newly formed Anticipation Hub 4, hosted an event entitled ‘Linking Anticipatory Action to Risk Financing’, in order to discuss the connections between anticipatory action and risk financing (InsuResilience Global Partnership & the Anticipation Hub, 2021). Despite concluding that the sector needed: ‘to stop silo-approaches across the disaster management and crisis response spectrum’ (ibid., p. 1), the event was clearly premised on there being a clear distinction between anticipatory action and risk financing.

As noted in the introduction, the main distinctions that are usually drawn between the two approaches are:

- the temporality of the mechanism, whether it anticipatory or is 'ex-ante', and
- what type of agency it is implemented / funded by, and whether that is an agency with a humanitarian mandate

However, I argue that this is not the most useful way to think about the mechanisms in this sector. On the first point, while 'more anticipatory' (or less late) response is a key policy objective for the sector, it is not a clear defining characteristic because temporal distinctions are often difficult to apply in practice to disasters. For example, it has long been pointed out that phases of mitigation

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4 The Anticipation Hub aims to share knowledge and experiences to jointly enhance and scale up anticipatory action globally, and brings together the German Red Cross, the International Federation of the Red Cross and the Red Cross Red Crescent Climate Centre: https://www.anticipation-hub.org/
and preparedness ‘pre-disaster’, and response and recovery ‘post-disaster’ are rarely as neatly defined in practice as they seem in the disaster management cycle depicted in the disaster studies literature (Contreras, 2016; Neal, 1997). Moreover, it is difficult to ascertain the onset of impacts for many slow onset hazards such as droughts, which feature prominently among hazards responded to through such mechanisms, which blurs the boundary between early action and early response (Wilkinson et al., 2018). Thus, whilst anticipatory response is a key policy objective, this research cautions against relying on ‘anticipation’ as a defining characteristic, even though the objective of ‘less late’ response is clear and important.

Secondly, part of the desire to distinguish between humanitarian and development financing in this sector is linked to understandable concerns about the potential loss of humanitarian impartiality. This sentiment is summed up by Thorsten Klose, at that time a senior policymaker at the German Federal Foreign Office, speaking during a panel session at the 2018 Global Dialogue Platform conference, where he recommended that different approaches of risk financing: ‘...be kept separate so that all approaches are not mixed up... Ultimately, humanitarian financing is obligated to human needs and not political considerations.’ (German Red Cross, 2018, p. 19). However, the hybridisation of mechanisms that has occurred in the years since suggests it is now increasingly difficult to neatly distinguish between ‘humanitarian’ and ‘development’ finance. This is exemplified by the potential use of the World Bank’s Crisis Response Window to fund humanitarian response through UN OCHA’s Anticipatory Action Frameworks, a partnership that was developed through the first UN OCHA Anticipatory Action pilot in Somalia in 2020 (Getcliffe, 2021). Other examples of ‘hybrid’ mechanisms have also developed, such as partnerships between insurance and humanitarian response through the START Network’s ARC Replica insurance policy (START Network, 2020), and the newly launched START Ready framework (START Network, 2021). Because of this, the type of funding or implementation agency is no longer a helpful way to distinguish between anticipatory action and disaster risk financing.

As such, the definition I adopt here is a broad approach to DRF as approaches and mechanisms which apply the following principles of requiring: i) information or measures of disaster risk, ii) pre-arranged finance and plans and iii) a mechanism to enact response.

3. Understanding DRF policy objectives and narratives: Efficiency and effectiveness

The notion of quicker response to disasters – anticipating rather than reacting - is strongly intuitive. As the saying goes, ‘prevention is better than a cure’, and this theme was often repeated by participants in this research. Here I discuss the key policy narratives in DRF: that it leads both to more efficient and effective disaster response and is therefore the way to ‘square the circle’ of increasing humanitarian response costs. I explore these narratives and how they are understood across the sector to show some of the underlying contestation relating to the objectives of DRF, as well as practical challenges in implementation.

Firstly, the financing gap between growing humanitarian need and available financing is often found in policy and advocacy materials as the central driver for requiring more efficient and effective response through DRF. It was a key point in the speech from Mark Lowcock referred to in the Introduction, that we can no longer simply raise more money to meet humanitarian needs: ‘We ... have to make the money we have go further. The best way to do that is to change our current system from one that reacts, to one that anticipates.’ (UN OCHA, 2019, p. 2)
Certainly, DRF is an evolution from the status quo of ‘ex-post’ disaster response, which has been likened to the passing of a ‘begging bowl’ around donors to raise funds after a disaster happens (Clarke and Dercon, 2016). This contributes to a fragmented and politicised response that is poorly matched with post-disaster needs, which are often contingent on funding cycles in donor countries with little relevance to needs on the ground (Talbot and Barder, 2016). Moreover, earlier response can avert harmful coping strategies and protect livelihoods contributing to long-term development gains (Wilkinson et al., 2018).

However, the link between disasters and humanitarian financing needs is, in practice, more complex. As Swithern (2018) has written, there are many reasons why disaster impacts do not correlate directly with the scale of humanitarian funding appeals. Moreover, a recent meta-review by the World Meteorological Organisation (2021) concluded that while weather-related disasters have increased over past 50 years, they have caused more damage but fewer deaths, mostly as a result of improved forecasting and disaster risk reduction activities.

The relative importance of the rationales around more effective and efficient response is also complex and varies between actors in the DRF sector. For example, there has been significant investment in ‘cost-benefit’ research into various aspects of resilience programming, early action and preparedness by several bilateral donors, in particular the UK and the US. For example, Cabot Venton et al. (2013) were commissioned to conduct a report into the ‘The Economics of Early Response and Disaster Resilience’ for the Department for International Development, and later a similar report was commissioned by USAID (Cabot Venton, 2017). Another report on ‘Return on Investment for Emergency Preparedness Study’ was written for UNICEF and WFP by Boston Consulting Group and funded by DFID in 2015 (UNICEF and WFP, 2015). However, some agencies otherwise very active in the policy space are notable by their absence in funding such reports – in particular the German Federal Foreign Office who were an early funder of the Red Cross Forecast based Financing work (German Red Cross, 2015).

The robustness of such ‘cost-benefit’ evidence has been more carefully scrutinised as the sector has evolved. A later policy paper which reviewed the evidence base for anticipatory action raises the point that easily reproducible and catchy numbers produced by return on investment and cost-benefit studies: ‘...can obscure the quality of and underlying assumptions behind these numbers’ (Weingärtner et al., 2020, p. 34). Despite this, findings from such reviews were cited to me by interview participants, even if they were sceptical about them, which demonstrates how much these studies have cut through. For example, one participant stated: ‘I’m a bit sceptical about ... the numbers like the data that says you can act ... what is it five or six times you say before it’s worse than a late response...’ (Interview 6, Donor) This interview participant was referring here to the key figure from the Cabot-Venton et al. (2013) review, that ‘for every early response to a correctly forecast crisis, early responses could be made 2–6 times to crises that do not materialise, before the cost of a single late response is met’ (Cabot Venton, 2013, p. 1).

Efficiency was also a subject of debate among participants in this research. Overall, humanitarian practitioners were cautious, arguing that ‘the interesting thing about aid money is we want to give it away.’ (Interview 4, Humanitarian practitioner). Another research participant who worked at the interface between different specialisms in DRF outlined the differences in view between humanitarian practitioners and others in the sector: ‘If we talk to humanitarian actors... in my experience some of them get the bang for the buck argument... They get it but they’re like “no, that’s...'}
not what we’re here for, we’re here to help people”. So, you have to frame it as you could help more people with the same ... amount of money’ (Interview 15, DRF expert).

While the notion that acting earlier can make responses more effective makes sense in principle, it is also notable that this has been harder to evidence across different mechanisms and hazards. In particular, the usefulness of actions that can be employed in the window of opportunity between the warning of a hazard and disaster impacts being felt has been questioned. A working group titled ‘Early Actions: Why do we always end up with chlorine tablets?’ discussed this issue during the 2018 Dialogue Platform on FbF (German Red Cross, 2018). Chlorine tablets are regularly distributed prior to flood or cyclone hazards and are, of course, indispensable for preventing water-borne disease. Participants in the session pointed out, however, that they are distributed as part of agreed protocols because they are small and easy to pre-position within the time available, but as a result they are used in preference to other actions which would be more aligned with long-term risk reduction activities (ibid).

Of course, potential effectiveness of early actions varies significantly between hazards, which is something that practitioners acknowledge. Commenting on this, one humanitarian practitioner noted that while timely action will reduce human suffering: ‘...it doesn’t mean that the disaster will be totally prevented. Of course, it will really depend on the hazard... like for drought I’m more inclined to say that we have enough lead-time... But for a cyclone... I mean Idai5, we could have had the most amazing FbF in place but still the houses will be totally destroyed.’ (Interview 2, Humanitarian Practitioner)

Thus, the use of arguments around efficiency and effectiveness in DRF varies between different mechanisms and hazard contexts and has also evolved over time. There is an underlying recognition that acting in advance is no ‘silver bullet’ to significant efficiency savings, nor to overcoming the challenges of mitigating the impact of major hazards, while the relationships between disaster events, humanitarian financing needs and response are complex. However, the mutually reinforcing narrative of DRF approaches as being both more efficient and more effective is highly intuitive and very powerful, especially in the wider context of pressures on the humanitarian financing system. As one participant put it: ‘there is a clear understanding that disaster risk financing instruments are super essential in the future. It is clear we are going to have more disasters, and the money that is located at this moment for humanitarian action is not going to be enough for the type of events that we will have in 10, 20 years...’ (Interview 23, Humanitarian practitioner).

4. The challenges of decision-making in DRF
Acting based on information rather than existing needs is the key to taking a more anticipatory approach in disaster response, however, it also opens up significant challenges in terms of decision-making. As De Wit argues in her discussion of the language used in anticipatory approaches in this sector: ‘...questions around temporality have moral implications for finding a common understanding of when decisions are taken and actions planned, how you justify those choices, and how they can be funded.’ (2019: 34) This challenge was also articulated by participants in this research, such as one humanitarian who explained that: ‘...early action is ... to a certain extent open

5 Referring to Cyclone Idai, a major tropical cyclone which hit Mozambique, Zimbabwe and Malawi in March 2019.
to interpretation... This is why it’s fundamental to work on coherence and common approaches because that way we govern this, we manage this uncertainty, we manage the questions around the evidence, and we render it credible...' (Interview 5, Humanitarian practitioner). In this section I discuss how questions around decision-making are navigated.

It is understandable that the need to justify actions taken based on information in DRF is a key concern, and this is reflected throughout the defining pillars of DRF mechanisms. Each of the components of the definition of DRF, despite variations in terminology, can be understood as contributing to a robust process for decision-makers to use to take action. For example, the aspect which requires financing and plans be pre-arranged is explained in one policy document as creating ‘certainty about what finance will be available...’ (Montier et al., 2019, p. 4), giving disaster managers and decision-makers confidence to act. This was further expressed during a keynote session at the 2018 Global Dialogue Platform conference, where certainty of finance was expressed as ‘...the “glue” to assure [sic] that early action is taken ahead of a disaster based on a scientific decision-making process’ (German Red Cross, 2018, p. 19). Moreover, the third pillar of DRF, a mechanism to trigger response, is intended to overcome any potential inertia created by uncertainty. For example, the purpose of the trigger component was explained to me by one participant as: ‘the function of triggers is not to tell you what to do, but when to act... you’re changing the default from hesitating and wondering to taking action’ (Interview 18, Donor).

However, the variation in how the pillars of DRF are defined shows the lack of consensus about the specifics of what creates a robust decision-making process. As outlined above, I adopt a definition of DRF as requiring ‘information or measures of disaster risk’. This was chosen as a broad and encompassing definition, and to choose a more specific definition might have excluded some mechanisms. However, there is significant variation in how this component of DRF is defined across the policy literature: for example, Clarke and Dercon adopt a loose definition in their book ‘Dull Disasters’, referring to: ‘A fast, evidence-based decision making process’ (Clarke and Dercon, 2016, p. 3). Others place more emphasis on warning information that provides a quantifiable output, such as a policy document written by practitioners from the START network, whose definition of DRF in this refers to ‘quantifying risks in advance’ (Montier et al., 2019).

These differences point to questions around what makes information sufficiently credible to use in DRF mechanisms. This is especially important when comparing across different types of hazards included within the remit of DRF mechanisms, which range from volcanic hazards to cyclones and drought, and which require insights from diverse physical sciences – not to mention other types of humanitarian crises covered by some mechanisms such as conflict or migration flows. There are no clear answers to this, and the different definitions and methodologies adopted across the sector shows that in many cases each implementing agency is finding their own way to manage these questions.

4.1 From ‘acting on uncertainty’ to ‘acting based on risk’: how risk and uncertainty are understood in DRF policy narratives

An irony in DRF is that one of the original objectives of this policy shift was to overcome the inability or unwillingness of agencies to act in the face of uncertainty, which is perceived as having been a key part of the failure to respond in a timely way to past crises. This was one of the conclusions drawn from the 2011/2012 Horn of Africa crisis, which as discussed in Section 2 was a significant turning point in encouraging more anticipatory, pre-agreed approaches. For example, in an influential
review of that event, Hillier and Dempsey highlighted the failure to act based on available information at the time, arguing that: ‘Early response requires acting on uncertainty’ (Hillier & Dempsey, 2012: 15). In this policy paper the authors discuss quantifying uncertainty and adopting a risk management approach in humanitarian response decisions, but their arguments do not shy away from acknowledging uncertainty in decision-making based on such information: ‘Forecasts involve uncertainty: they are inevitably based on data which is not totally comprehensive and are tinged with judgement; the earlier the warning, the less accurate it is likely to be’ (ibid., p. 15).

However, in the years since, it is important to note how the policy space of DRF has taken shape, in many cases moving towards a policy language that focusses heavily on risk at the expense of uncertainty. Indeed, this is codified in part in the term disaster risk financing, and it is no surprise therefore that the idea of acting ‘based on risk’ has become one of the defining characteristics of the paradigm shift. This is even consistent in work which focusses on humanitarian mechanisms and does not use the specific terminology of DRF, such as De Wit’s Thesaurus, where she summarises the paradigm shift of anticipation as ‘acting based on risk’ (De Wit, 2019, p. 6). The notion of ‘acting based on risk’ or a ‘risk-based’ approach is reflected widely in the policy literature, such as policy documents from the START network quoting a donor to the network: ‘We are trying to shift to a risk-based approach instead of needs-based, with more preparedness and early action…’ (START Network, 2019, p. 8). This is also evident in the language used in policy materials from UN OCHA in the statement released after the 2021 High-Level Event on Anticipation: ‘The humanitarian system must shift away from a solely reactive response to crises towards an increasingly proactive, anticipatory approach – acting on risks instead of only reacting to needs.’ (UN OCHA and the Governments of Germany and the UK, 2021, p. 2)

Despite the sense of there being a clear distinction between acting on uncertainty and acting ‘based on risk’, one of the key findings from this research was that when asked about how they thought about risk and uncertainty in their work, practitioners had very diverse understandings and attitudes.

A key difference among practitioners related to whether or not they viewed quantifiable uncertainty as a form of risk, or as a valid form of uncertainty. The former view was more commonly held among economists and social scientists. For example, one research participant who had worked at an economic research institution explained that: ‘...uncertainty would be to describe the fact that you didn’t know what your probability risks are.’ (Interview 15, DRF expert) This reflects a ‘Knightian’ definition of risk and uncertainty, which is named after the economist Frank Knight, whereby risk is associated with quantifiable uncertainty and uncertainty refers to anything that cannot be numerically quantified.

In contrast, modellers and physical scientists often considered ‘quantifiable uncertainty’ as a valid and important type of uncertainty. Indeed, this is what probabilistic modelling is designed to communicate – stating and quantifying predictive uncertainty (Gneiting, 2008). For example, one participant from a technical background explained: ‘there is (sic) two levels... One is the uncertainty you absolutely cannot quantify because mathematically you just can’t do it ... So, there is that box of stuff we can’t quantify. And then there is stuff we can quantify because we actually do have some data and you can use mathematical approaches to quantify uncertainty around that data’ (Interview 13, Catastrophe modeller). Another example was highlighted by a participant from a forecasting background, who described a recent situation in the FbF community where two cyclone models
contradicted each other, arguing that a full understanding of uncertainty required taking into account uncertainty that lies beyond the scope of a forecast model. The participant explained the situation as: ‘You’ve got the uncertainties that you can quantify, a sort of stochastic one, so you can say like a 50% chance of a flood... but you know that there’s the uncertainty that you can’t quantify or characterise ... that the ensemble is not representing... you would have an ensemble forecast of tropical cyclones and you’ve got an ECMWF\(^6\) ensemble that says one thing and a Met Office\(^7\) ensemble that says another thing, and if they were characterising uncertainty well, then the ensembles’ spread would be overlapping in both of them. But if they both say separate things, then what do you do? Because there’s uncertainty that goes beyond what that ensemble is representing...’ (Interview 27, Researcher)

Highlighting these differences is not intended to diagnose a lack of understanding per se, but to show the complexity of these concepts. Risk, for example, is not a singular, objective metric ‘out there’ that can be measured in a uniform way across different contexts or hazards. As I will further explore in Section 5, risk and uncertainty are complex, determined by degrees and forms of knowledge, and specific to particular hazards and contexts, hence they are difficult to convey across disciplinary boundaries.

Finally, this research also identified a sense among practitioners that language around uncertainty was sometimes unwelcome in their work on DRF, particularly among those working in government donor agencies. For example, one participant explained that in their view: ‘...risk is seen in a very clear way in government in particular...you have risk registers etc. There’s a very formalised ... 'how you deal with risk' manual, that we all have to comply with... But uncertainty is seen as “I don’t know the answer” and that tends to paralyse people... even the word still seems to scare people. So, it’s actually better to talk about managing risk, you know, uncertainty being a risk...’ (Interview 15, DRF expert) The view that uncertainty was difficult to talk about in a public sector context was supported by another research participant, commenting from the perspective of the financial services: ‘...the concept of dealing with uncertainty is pretty well ingrained in the finance sector in a way that I think it is not ingrained in the public sector...it is very challenging for the public sector to get its head around.’ (Interview 13, catastrophe modeller)

Taken together, these factors lead to a policy sector which often focusses on risk at the expense of uncertainty. In some cases, this leads to eliminating uncertainty from the policy discourse. This is evident in Mark Lowcock’s two important speeches delivered in 2018 and 2019 on the subject of anticipatory humanitarian financing\(^8\). Combined between the two speeches the word ‘risk’ is used a total of 36 times, but the word ‘uncertainty’ is not used at all (UN OCHA, 2018; 2019). In other cases, such as during the 2018 Global Dialogue Platform conference, session convenors of one side-event

\(^6\) ECMWF refers to the European Centre for Medium-Range Weather Forecasts, an independent intergovernmental organisation that conducts meteorological research and operational forecasting.

\(^7\) Referring to the UK Met Office, the United Kingdom’s national weather service which provides operational forecasting.

\(^8\) The two speeches included a ‘A Casement Lecture: Towards a Better System for Humanitarian Financing’, in March 2018, which form part of a high-level series of lectures at Iveagh House, organised by the Irish Department of Foreign Affairs. A follow-up to the Casement Lecture was delivered in December 2019 at the LSE, entitled ‘Anticipation saves lives: How data and innovative financing can help improve the world’s response to humanitarian crises’.

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explained that the use of data and triggers: ‘help us eliminate uncertainty about when and how to act’ (German Red Cross, 2019, p. 22).

5. ‘What do we know? What can we predict? What can we foresee?’: Navigating risk and uncertainty in DRF

As we have seen, DRF depends on using information about potential future hazards and disasters to take action, instead of waiting for such events to happen and responding in the aftermath. As a result, acting in the face of uncertainty is a critical challenge for practitioners, as acknowledged by Hillier & Dempsey in their argument that whilst reducing uncertainty is important: ‘Early response requires acting on uncertainty’ (Hillier & Dempsey, 2012, p. 15). This sentiment was also summarised by a senior DRF practitioner from the Centre for Disaster Protection speaking at a public webinar, who suggested that DRF fundamentally requires reflection about: ‘What do we know? What can we predict? What can we foresee?’ (Sophie Evans, Head of Country Programmes, Centre for Disaster Protection9). However, practitioners interviewed in this research described many challenges and difficulties of talking about uncertainty in DRF, and as observed above, there is a tendency in formal policy spaces to focus on risk at the expense of uncertainty. In this section I draw insights from Science and Technology Studies (STS) to make some suggestions as to how both risk and uncertainty can be better understood in DRF.

Science and Technology Studies (STS) is a diverse discipline which seeks to better understand the role of knowledge, specifically scientific knowledge, in policy and society. STS has particularly explored how knowledge is intimately tied up with risk and uncertainty, determining the boundaries of what we know and what we do not know (Stirling, 2007; 2009; 2010), while also highlighting how knowledge shapes our perceptions of risk and uncertainty (Lash et al., 1998; Wynne, 1998). Both of these points are particularly relevant to building a better understanding of risk and uncertainty as it pertains to DRF, nuancing what is often implied as a binary distinction between risk and uncertainty, as well as allowing for a better understanding of why practitioners from different disciplinary backgrounds and perspectives approach risk and uncertainty differently.

Firstly, it is helpful to trace back common definitions of risk and uncertainty used in both academia and practice today. One of the foundational early definitions came from the economist Frank Knight, who defined risk as anything to which we can assign numerical probabilities, whereas uncertainty is anything that cannot be constrained statistically (Knight, 2006/1921). His original theorisation was tied up with his ‘theory of profit’, in which he argued that making profit required decision-making in the face of uncertainty, because anything which could be constrained numerically could be insured against, and thus any losses could be recuperated with insurance. Knight’s distinction between risk and uncertainty can be found reflected in later theories about risk and uncertainty, most notably the sociologist Ulrich Beck’s ‘risk society’ thesis (Beck, 1992). Beck argued that the shift from an industrial society to a risk society is defined by risks becoming increasingly ‘incalculable’. According to this view, novel ‘modernity’ risks include events such as nuclear fallouts or pandemics are not statistically predictable and cannot be constrained through risk methodologies based on calculating likelihoods, and therefore cannot be insured against. Beck concluded that such non-insurable risks define the modern era as a ‘risk society’ (ibid).

9 Speaking during a recorded public webinar, the ‘InsuResilience Sectoral Community Workshop: Linking Anticipatory Action to Risk Financing’, 20th September 2021. Timestamp 8.56:
https://www.youtube.com/watch?v=W6ZB4p4K5go
Beck’s ideas have proved to be a major provocation around risk, uncertainty and politics despite numerous critiques and iterations in thinking, such as his later work on the ‘world risk society’ (Beck, 2009), which responded to critiques of Eurocentrism and acknowledges the role of governments at a backstop insurer to catastrophes. One of the key aspects of Beck’s argument which is relevant here, however, was his use of Knight’s ideas about whether or not something is numerically predictable, and therefore using ‘insurability’ as a key distinguishing feature between risk and uncertainty.

Other more recent work has challenged this binary distinction between what is numerically predictable, and what is not, focussing on the distinction between risk and uncertainty. Empirically, it has been shown that many modern insurance techniques blur the distinctions between calculative and non-calculative techniques because they include aspects of ‘intuition’ and non-quantitative approaches (Bougen, 2003; O’Malley, 2003; O’Malley 2004). Whilst both Knight and Beck’s thinking sees insurance as a stereotypically ‘risk-based’ practice, many insurance practices are, in practice, characterised by educated guesswork and hunches (Bougen, 2003), where ‘knowability’ is not a clear binary. Recent analysis of the global re-insurance industry further supports this argument. For example, Jarzabkowski et al. (2015) provide an account of re-insurance as a financial market for hedging against ‘unknown unknowns’, based on collective practices which span both technical and contextual expertise.

This complexity and nuance about the distinction between risk and uncertainty was highlighted in this research by participants who had come to DRF from catastrophe modelling and reinsurance. For example, one participant commented that: ‘...there is definitely a sort of, I would say intuition that builds up over time and I think has built up with people in the industry who have been using these models for 20 years or so...’ (Interview 13, Catastrophe modeller). However, another participant interviewed in this research who had come from a modelling background felt that humanitarian practitioners were less comfortable with this complexity in modelling, explaining that to the humanitarian community: ‘...things are often about next year or the next three years... they want a very fixed answer, often people look very much only at the single value output and say “Oh it’s right or wrong”’... (Interview 10, catastrophe modeller).

Going beyond the specific contours of what calculable, and what is not, it is important to focus instead on how knowledge is tied up with how we define risk and uncertainty, whilst being mindful of the complex nature of knowledge itself. Andy Stirling’s work on the condition of ‘incertitude’ is useful here, which he sees as spanning beyond risk and uncertainty to encompass the conditions of ignorance, uncertainty, ambiguity and risk (2009). He argues that the boundaries between these different conditions are distinguished by degrees of knowledge relating to two parameters: first, the extent of knowledge about possible outcomes, and second, the extent of knowledge about the likelihoods of such outcomes (ibid). Like others have shown in terms of the ‘fuzzy’ boundary between risk and uncertainty discussed above, he argues that the difference between what is known, and what is unknown, is not always as clear as we might like to think, because the nature of scientific knowledge is not linear, monolithic or additive. Instead, knowledge is diverse, and often tacit, and in many cases knowing more does not confirm previous knowledge but rather undermines or destabilises what we thought we knew previously (ibid).

Thus, what most scholars on risk and uncertainty share is the view that risk is distinguished from uncertainty by degrees of knowledge. This insight is particularly pertinent to DRF, because it brings into question the binary between risk and uncertainty that is implied in the focus on ‘acting based on
risk’ as opposed to uncertainty. The information and methodologies being used to trigger more anticipatory action might produce a numerical output, but in practice this is a lot ‘fuzzier’ than it might seem, and there is still inherent uncertainty in this process.

Secondly, focussing on the role of knowledge in our understanding of risk and uncertainty in DRF opens up space to consider how practitioners understand risk and uncertainty, and how this is influenced by different disciplinary perspectives and epistemologies, or ways of knowing. This is a particularly important consideration in DRF because the sector requires insights from a wide range of expertise, from hydrologists and climate scientists to actuaries and humanitarian practitioners. The resulting policy landscape is highly interdisciplinary, and this has contributed to different ways of thinking about risk and uncertainty, as discussed in Section 4.

STS theory has again made important contributions to understanding the role of knowledge and positionality in risk and uncertainty. For example, in Brian Wynne’s account of science and policy in the UK in the wake of the Chernobyl disaster, he explores the advice given to Cumbrian sheep farmers and the difference in approach between a farming and scientific perspective (Wynne, 1998). He contrasts lay knowledge with expert knowledge to show how epistemology is crucial to our understanding of uncertainties, demonstrating that the sheep farmers’ tacit knowledge led them to be sceptical about assumptions of predictability, prediction and control assumed by the scientific community (ibid). Indeed, the fact that epistemology and cultural factors play a significant role in determining perceptions of risk has been widely demonstrated in disaster studies literature (Bankoff, 2003; Binder & Baker, 2017; Krüger et al., 2015). However, reflexive analyses of the understanding of risk and uncertainty amongst the disaster studies community itself are much less common (Hewitt, 2015).

The differences identified in this research in terms of how practitioners thought about risk and uncertainty in their work further underlines this. Whilst the different conceptions discussed in Section 4 are all consistent with the overarching definition that the difference between risk and uncertainty is determined by degrees of knowledge, they place emphasis differently in ways that can cause confusion in a sector such as DRF. This research does not suggest that we should try to reconcile these perspectives into a unified way of thinking about risk and uncertainty: different objectives and scopes of work are all good reasons why natural scientists and modelers think about risk and uncertainty in a different way to economists and policymakers, for example.

While there has been significant interdisciplinary exchange and learning in this sector, such as the aforementioned ‘Thesaurus on Anticipatory Action’ (De Wit, 2019), this research recommends that practitioners engage more thoroughly with questions of knowledge and explore how risk and uncertainty are perceived and understood by both different individuals and agencies. This would help to build understanding and awareness of why risk and uncertainty means different things to different people, how this is expressed, and how it can be better managed in DRF.

6. Conclusion
In this paper I have explored the emerging policy area of Disaster Risk Financing (DRF), making three key contributions.

Firstly, the paper provides a more cohesive way of defining the sector, which has a number of different terminologies associated with it, most notably around ‘anticipatory action’ and ‘disaster risk financing’ (DRF). While considerations such as temporality are very important, mechanisms in
this wider sector have a great deal in common because of the way in which they link information about disaster risk to action, in order to facilitate more timely response. This opens up a shared challenge around acting based on information which is inherently incomplete, and therefore acting in the face of uncertainty. Focussing on this common challenge is potentially useful for cutting through some of the terminological complexity of this emerging policy space, and drawing shared lessons, most notably around how risk and uncertainty can be better understood and navigated.

Secondly, the paper discussed and unpacked the policy narratives in the sector, showing some of the underlying contestation relating to the objectives of DRF. While the central policy narratives of more efficient and effective response are highly intuitive and appear to be mutually reinforcing, these objectives are difficult to achieve and vary between hazard contexts and agencies. These complexities point to some of the practical challenges and difficulties of implementing DRF which should not be underestimated.

Finally, the paper focussed on the central challenge of DRF, which relates to acting based on information rather than existing needs. Whilst this is the key to the potential DRF offers in terms of better disaster response, it also opens up significant challenges in terms of decision-making. Despite the obvious importance of managing uncertainty and questions around evidence in DRF, the paper shows there has been a tendency in recent years to replace discussions of uncertainty – at least in formal policy documents and speeches - with a vocabulary which focusses narrowly on ‘risk-based’ decision-making. This is related in part to the sentiment among some participants interviewed in this research, especially those in the donor community, that uncertainty is difficult to recognise explicitly in their work.

In practice, however, the field of risk financing and anticipation necessarily grapples with what we know, and by corollary, what we do not know. Drawing from STS theory the paper concludes with recommendations for practitioners in DRF that we should think about risk and uncertainty through the lens of knowledge, which bounds what is known and what is not known, and recognise that this is often much less clearly distinguishable than we would like to think.

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Due to the nature of this study, participants were assured that any data used would remain anonymous, de-identified and would not be shared.

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