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Introduction

A research agenda for an evolving branch of law

Dug Cubie

Disasters, law and definitions

Before one can even consider what a potential research agenda for disaster law might entail, the complex issue of what constitutes a 'disaster' must be addressed. This is not such an easy question to answer. While many people will instinctively recognise the devastating impacts arising from natural hazards such as earthquakes, volcanic eruptions or hurricanes, the health implications of pandemics such as Ebola or COVID-19, or the long-lasting consequences of industrial or nuclear accidents, determining whether a specific event should be classified as a 'disaster' is not always so clear-cut. For example, a core message that has been promoted in recent years has been the recognition that there is no such thing as a 'natural' disaster. As Kevin Blanchard and others have explained, a natural hazard only becomes a disaster when it intersects with societal vulnerabilities, exposure and resilience.[1] A commonly used example is that a hurricane developing in the Pacific Ocean is not a disaster unless it makes landfall and hits a community that is not well prepared.[2] As succinctly noted by the UN

[1] DRR Dynamics, '#NoNaturalDisasters' (n.d.) www.drrdynamics.com/-nonaturaldisasters. For an in-depth interdisciplinary analysis, see: Marie Aronsson-Storrier and Rasmus Dahlberg (eds), *Defining Disaster: Disciplines and Domains* (Edward Elgar, 2022).

[2] Hurricanes, cyclones and typhoons are essentially the same weather phenomenon (powerful rotating storms). However, the terminology differs based on geography, with the name 'hurricane' used when they develop over the North Atlantic, central North Pacific and eastern North Pacific; 'cyclone' when they form over the South Pacific and Indian Ocean; and 'typhoon' when they develop in the Northwest Pacific. See: National Geographic, 'Hurricanes, Cyclones, and Typhoons Explained' (n.d.) https://education.nationalgeographic.org/resource/hurricanes-cyclones-and-typhoons-explained/.

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Office for Disaster Risk Reduction (UNDRR): "Hazards may be natural. Disasters are not."[3]

It is therefore understandable that the legal definition of a 'disaster' also remains contested, since this may trigger the obligations of states and liabilities of other stakeholders (such as private corporations or insurance companies) to prevent, respond to, or compensate for the deleterious consequences. At what point does a situation of localised flooding become a disaster? How widespread do the impacts of an industrial accident have to be before it is deemed an issue of regional or international concern, as opposed to a domestic emergency? Is a disaster defined by its geographic spread, the severity of its impacts, or the number of people affected? Moreover, what are the rights of individuals and communities harmed by such events, and who are the duty bearers? These types of questions pose complex legal issues that have only recently started to be tackled.

Despite the adoption of the Convention establishing an International Relief Union in 1927 under the League of Nations[4] and the 1984 draft UN convention on expediting the delivery of emergency assistance,[5] the field of disaster law is still a relatively new branch of national, regional and international law. Arguably, modern disaster law as a discipline can be traced to the call by the International Federation of Red Cross and Red Crescent Societies (IFRC) in 2000 for a common frame of reference and cohesive approach to 'international disaster response law' that focused specifically on the mechanisms for international cooperation between donor and affected states.[6] The subsequent devastation caused by the 2004 Indian Ocean tsunami highlighted many of the complex challenges relating to the prevention of, response to, and recovery from major disasters, which in turn led to the UN International Law Commission's 10-year programme of work between 2006 and 2016 to develop a set of draft articles on the protection of persons in the event of disasters.[7]

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3 UN Office for Disaster Risk Reduction (UNDRR), 'Why Are Disasters Not Natural?' (n.d.) www.undrr.org/our-impact/campaigns/no-natural-disasters.

4 League of Nations, *Convention Establishing an International Relief Union* (adopted 12 July 1927, entered into force 27 December 1932) 135 LNTS 247.

5 United Nations (UN), *Draft Convention on Expediting the Delivery of Emergency Assistance* (18 June 1984) UN Doc. A/39/267/Add.2 – E/1984/96/Add.2.

6 International Federation of Red Cross & Red Crescent Societies (IFRC), *World Disasters Report: Focus on Public Health* (Geneva, 2000) Chapter 8 'Towards an international disaster response law' pp. 144–157.

7 For an overview of the International Law Commission's work on this topic, see: 'Analytical Guide to the Work of the International Law Commission: Protection of persons in the event of disasters' https://legal.un.org/ilc/guide/6_3.shtml. For a critique of the 'emergence' narrative regarding international disaster law, see: Işıl Aral, 'Mapping the Terrain: The Role of Public International Law in Shaping International Disaster Law', Chapter 4 in this volume.

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Disaster law was not a subject on the curriculum when I was studying at university many years ago. Even today, very few law schools have dedicated programmes or courses addressing the legal implications of disasters. However, as a fast-developing field of legal research and practice, there is an increasing interest from academia, states, and humanitarian actors in understanding the foundations of disaster law and the associated legal rights and obligations that apply in a disaster context. At the same time, the boundaries of disaster law as a discipline remain to be defined. For instance, there are clear connections (and overlaps) with other branches of law, such as environmental law, human rights law, and forced displacement law – as explored by various contributors to this book. Disaster law is also still establishing its place in the broader field of disaster studies and related fields such as climate justice.[8]

Therefore, this research agenda for disaster law aims to provide a wide-ranging analysis of the gaps in knowledge and potential avenues for academic and practitioner research on disaster law for the coming years. Across each of their areas of expertise, the contributors provide insightful and critical scrutiny of the current state-of-the-art in disaster research and identify key gaps and opportunities for future research projects, activities, and writing. While the research agenda advanced in these pages has a clear focus on disaster law as a specific field of study, the iterative process and peer-to-peer networking that has occurred during the writing of these chapters have provided an opportunity for interdisciplinary learning, both across academic disciplines and between academia and practice. Indeed, preparing for and responding to disasters is an inherently interdisciplinary process, as noted by several contributors to this volume, so it is important that disaster law does not become a closed or inward-looking disciplinary silo. Nevertheless, a book of this nature entails choices, and consequently not all aspects of disaster law or interdisciplinarity could be addressed. For example, case studies of national legal systems can provide important insights into the practical application of law and policy at the domestic level. Likewise, the fundamental role played by local communities in disaster risk reduction and response, not least their legal rights to participation and accountability, deserves greater analysis.[9]

The contributors to this volume span a variety of academic disciplines and approaches to the law, as well as drawing on expertise from humanitarian actors and intergovernmental institutions at the regional and global levels. The book also benefits from

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[8] See, for example: Paul G. Harris (ed.), *A Research Agenda for Climate Justice* (Edward Elgar, 2019); Steve Matthewman (ed.), *A Research Agenda for COVID-19 and Society* (Edward Elgar, 2022).

[9] For example, international agreements such as the Aarhus Convention can provide a comparative template for interpreting the rights of individuals and communities in disaster contexts. See: United Nations Economic Commission for Europe (UNECE), *Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters* (adopted 25 June 1998; entered into force 30 October 2001) 2161 UNTS 447. See also: Dina Lupin and Leo Townsend, 'The Right to Consultation is a Right to be Heard' in: Dina Lupin (ed.), *A Research Agenda for Human Rights and the Environment* (Edward Elgar, 2023), pp. 103–122.

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the critiques, indeed provocations, of both early career researchers and those of us who have more years of experience than we care to mention. This diversity provides contrasting arguments and analysis of the information gaps and research priorities in the field of disaster law. Indeed, the contributors' wealth of knowledge and analysis provides a rich and varied suite of research topics to be addressed over the coming years. Throughout the chapters, a cross-cutting theme can be discerned regarding the need to understand the legal implications of disasters so that states, civil society, and the international community can minimise the risks and prevent some of the serious harms that individuals, families, and societies face. The central focus of reducing human suffering caused by disasters should never be lost in legalese or technicalities.

The following section will briefly summarise each of the chapters, starting with four chapters interrogating the basis and foundations of disaster law.

An overview of the research agenda

Part I: Exploring the foundations of disaster law

A poorly constructed building, which has not been built according to the required legal code, poses a serious risk to the inhabitants in the event of an earthquake, landslide or severe storm. The foundations of the emerging discipline of disaster law must also be well constructed and logically coherent. But is this actually the case? The first four chapters of this book explore and dispute core foundational elements of the concept of disaster law and its placement within the broader field of international law.

Indeed, W. John Hopkins opens the book in Chapter 2 by posing the deceptively simple question of how we define both 'disaster' and 'law'. Starting from Emile Durkheim's premise that law is a sociological concept, Hopkins argues that 'disaster law' is an unusual term since its meaning varies dramatically depending upon the context – for example, between international and domestic legal systems. Hopkins notes that while 'international disaster law' or IDL is an accepted term, there is no equivalent 'domestic disaster law' or DDL. Consequently, academics and practitioners may be using the term 'disaster law' to define different things. Through an analysis of the differences between international disaster law and domestic disaster law, Hopkins highlights the potentially damaging focus by domestic legal scholars on the 'response' component of disasters, encapsulated by the concept of an 'emergency'. In particular, the risk of conflating all phases of the disaster cycle, including disaster risk reduction, with the immediate response phase can lead to the imposition of emergency powers in domestic legislation that may not be appropriate. Similar risks exist in the siloisation of hazards into different categories such as climate-related, pandemics and earthquakes. Drawing on experiences in New Zealand during the 2010–11 Canterbury Earthquake Sequence and the 2020 COVID-19 pandemic, Hopkins argues that disasters are both social events and processes, and so disaster law needs to be conceptualised as part of the means by which resilience is developed in a community – otherwise, disaster law research risks being "100% accurate and 0% useful".

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Following this critique of the concept of disaster law, in Chapter 3 Susan Breau analyses the historical and current codification of disaster law. Central to this chapter is Breau's argument that disaster law emerges not just in treaties but through the growth of customary international law norms, which are influenced by law-making at the domestic, bilateral and regional levels. Commencing with an analysis of the fragmentation of international law and the concept of special regimes (*lex specialis*), Breau proceeds to analyse efforts at coherence in international disaster law led by the International Federation of the Red Cross and Red Crescent Societies (IFRC) and the United Nations Office of Disaster Risk Reduction (UNDRR). Focusing specifically on the obligation to give or receive disaster relief and the obligation to protect the vulnerable in the disaster cycle, Breau examines core disaster law sources such as the IFRC's 'IDRL Guidelines'[10] and the ILC Draft Articles on the Protection of Persons in the event of Disasters.[11] This is followed by an analysis of these obligations across a variety of regional and bilateral agreements on disaster risk reduction and disaster risk management. Breau highlights the lack of research into international and domestic case law relating to disasters, and the central role that the IFRC Disaster Law Database[12] can play as a research tool for projects focusing on issues such as legal coherence, the potential existence of customary international law of disasters, and the relationships between international, regional and domestic legal frameworks.

In Chapter 4, Işıl Aral situates disaster law within the broader field of public international law. By providing a critical overview of the legal scholarship, Aral identifies three main research drivers that have so far guided academic writings on international disaster law. The first is a rich literature that aims to map the hard and soft law documents applicable to disasters as a means of identifying international law norms applicable to disasters. Next, Aral highlights research that has examined the relationship of international disaster law with other special regimes of international law. The third area of research is literature exploring different theoretical approaches and ways of conceptualising international disaster law. Following this analysis, Aral argues that certain trends and blind spots can be seen in the existing research. First, Aral challenges the dominant narrative regarding the negative impact of the piecemeal nature of international disaster law and the lack of a universal overarching treaty (as proposed by the ILC Draft Articles). Next, Aral argues that it is "almost taken for granted that international disaster law is an emerging field", noting that the idea of emergence can be used by scholars to broaden their area of manoeuvre and argumentative power to provide a normative direction to a legal field. This can prompt a managerial mindset, and so Aral identifies that a crucial research gap regards the objectives of this

[10] IFRC, *Guidelines for the Domestic Facilitation and Regulation of International Disaster Relief and Initial Recovery Assistance* (Geneva, version re-issued in 2017 with foreword from then IFRC Secretary-General Elhadj As Sy).

[11] International Law Commission (ILC), *Draft Articles on the Protection of Persons in the Event of Disasters 2016*, Report of the International Law Commission on the work of its sixty-eighth session (2 May – 10 June and 4 July – 12 August 2016) UN Doc. A/71/10.

[12] International Federation of Red Cross and Red Crescent Societies (IFRC), 'Disaster Law Database' https://disasterlaw.ifrc.org/disaster-law-database.

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expansionist agenda in international disaster law. A further gap is the relationship between different special regimes of international law. Aral notes that while existing research has examined the influence of special regimes such as human rights on international disaster law, an equivalent analysis of international disaster law's influence on other regimes has not yet been undertaken.

In Chapter 5, Lauren Traczykowski tackles the question of disaster law from a non-legal perspective. As a disaster ethicist, Traczykowski argues that since disaster law and disaster ethics are both in their infancy, we have an opportunity to create an ethical disaster law. Traczykowski highlights the interdisciplinary nature of disasters and disaster ethics, and notes that law is therefore one profession or discipline within the wider field of disaster ethics. The chapter proceeds by examining the normative (i.e. ideal) underpinnings of disaster law to provide an ethics lens to how disaster operations should play out. Following an analysis of the three main normative ethical theories of deontology, utilitarianism and virtue ethics in the context of disasters, Traczykowski identifies a series of ethical principles for disaster law, namely: rights, vulnerability, governance and institutions, and the environment and non-human animals. Under each of these headings, Traczykowski flags fruitful areas for future research and argues that each of these issues must be ethically accounted for in any new legal framework for disasters. Traczykowski concludes by arguing: "Applying ethics to existing laws and legal institutions, challenging unethical laws, and ethically developing laws is critical to ensuring that justice is served."

Part II: Developing the scope of disaster law

After situating disaster law within the broader field of international law and ethics, the second part of the book proceeds to examine the intersections of disasters with other branches of law and other disciplines to help delineate some of the boundaries of the field.

In Chapter 6, Holly Faulkner examines the interconnections between the law, society and disaster risk reduction. Using the Auckland Volcanic Field as a case study, Faulkner advocates for multidisciplinary research as a means of breaking down silos between different fields of research, between government departments and at the international level. Starting with an analysis of the concept of disaster risk reduction and the constituent components of risk as hazard, vulnerability and exposure, the chapter examines the role of domestic law in promoting legal preparedness across all areas of law – not just areas that focus on emergency management or disaster response. Key challenges identified by Faulkner are the different understandings of terminology (such as disaster risk governance) and perceptions that the law only applies post-disaster for determining liability or is seen as a roadblock to action in times of response. The need to research the relationships between disaster risk reduction, preparation and response within national legal systems is crystallised when considering a potential eruption in the Auckland Volcanic Field. Faulkner identifies key aspects, such as evacuation routes and ash clean-up modelling, which incorporate significant legal issues requiring further research from a multidisciplinary perspective and which are indicative of other hazards that exist in New Zealand and other countries.

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Next, in Chapter 7 Karen da Costa interrogates the concept of vulnerability and the labelling of certain groups as vulnerable in disasters. Da Costa commences by examining vulnerability from the perspective of disaster studies, in particular the view that vulnerability is not just about exposure to hazards, but is deeply rooted in social, economic and political processes. Highlighting intersectional and feminist perspectives, and with a particular focus on the labelling of groups such as women as 'vulnerable', the chapter provides an analysis of how international disaster law defines and frames vulnerable populations. Examples include the current wording used in the ILC Draft Articles on the Protection of Persons in the event of Disasters and actions by UN human rights monitoring bodies such as the CEDAW Committee.[13] Based on this analysis, da Costa identifies four key avenues for change: (i) revisions to the definitions and categories of vulnerable groups within international disaster law; (ii) exploring ways in which international law can guide more equitable, inclusive and stigma-free (or less stigmatising) disaster relief efforts; (iii) providing recommendations for policymakers on how to integrate these reframed understandings of vulnerability into future legal instruments; and (iv) paying attention to and increasing advocacy efforts towards the important role of international organisations, non-government organisations and local stakeholders in promoting more equitable international disaster law frameworks. The chapter ends with a call for action, inviting academic, legal and policy communities to critically re-examine the concept of vulnerability and its usage in disaster studies, human rights and disaster law.

In Chapter 8, Gatkuoth Kai presents a practitioner's perspective on disaster risk governance. Due to the increasingly complex risk landscape, which is exacerbated by climate change and driven by development-related factors, the chapter advances the concept of a neo-normal disaster risk paradigm – in other words, a scenario in which disaster risk, characterised by increasing exposure, hazards and vulnerability, continues to rise while coping capacities, particularly in low-income settings, are in decline. Reflecting on COVID-19, Kai argues that the pandemic exposed significant weaknesses in global and local risk governance and highlighted the need for robust disaster risk governance and institutions to respond to emerging risks. As an example of an institutional architecture for risk governance in this fast-changing risk context, Kai examines the 'Roots of African Resilience' (RoAR) framework as a promising model for managing risks in an interconnected system that focuses on local governance as a means of driving transformation towards resilience. Based on this analysis, the chapter argues there is a critical need to deepen the understanding of existing arrangements for disaster risk governance. In particular, Kai presents a research agenda focused on two core areas: suitable institutional arrangements and appropriate legislation, both of which are essential for improving disaster risk reduction and resilience.

While disasters can arise from geophysical events, such as earthquakes and volcanoes, the majority of damage (in terms of human and financial impacts) is caused

[13] UN Committee on the Elimination of Discrimination against Women.

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by hydrometeorological events, such as storms, flooding, wildfires and droughts.[14] Crucially, these are the types of natural hazards that are most likely to be exacerbated by global climate change and thus are at risk of becoming more frequent, severe and unpredictable over the coming years. The next three chapters therefore address the important connections between disaster law and environmental and climate law and policies.

In Chapter 9, Chhaya Bhardwaj explores the intersections of climate change and disasters and argues that it is now possible to delineate a specific field of law known as 'climate disaster law'. The chapter commences by considering the fragmentation and coherence of climate change law and disaster law from the perspective of international advisory opinions and other international decisions on climate change, and from international forums such as the UN Framework Convention on Climate Change[15] (UNFCCC) system. Next, the chapter highlights the potential for fragmentation or coherence between international, regional and national laws, and argues that an important research agenda is to understand how the specific socioeconomic and geographical needs of people are reflected in domestic disaster laws around the world. For example, the effects of slow-onset disasters such as sea-level rise for coastal communities are different from the effects of desertification for nomadic or pastoral communities. Citing examples of the relocation of island-based communities in India and the devastating Bhopal Gas Disaster in the 1980s, Bhardwaj argues that legally the power dynamics are often not in favour of these vulnerable communities, leading to injustice. Consequently, the chapter concludes by arguing that the expanding range of litigation exploring the intersection of climate change and disasters provides opportunities for major research studies that can help benefit law and policy, alongside a more structured understanding of domestic laws on climate adaptation and disaster risk reduction.

In Chapter 10, Marie Aronsson-Storrier explores the duality that nature is central in both the creation and reduction of disaster risk. Although it is recognised that nature plays multifaceted roles as, *inter alia*, the creator of hazards, a natural resource providing funding for disaster risk reduction measures, and a provider of nature-based solutions, Aronsson-Storrier argues that deeper reflections on nature are thus far missing, resulting in unarticulated conflicts between and within international instruments and institutions. The chapter therefore extrapolates the way in which nature, or 'the environment', is regulated and conceptualised in international law for disaster risk reduction – for example, in the Sendai Framework for Disaster Risk Reduction.[16]

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[14] The leading source for statistics on the annual impacts of disasters is the EM-DAT International Disaster Database run by the Centre for Research on the Epidemiology of Disasters at the Université catholique de Louvain, Belgium www.emdat.be/.

[15] United Nations General Assembly (UNGA), *United Nations Framework Convention on Climate Change* (UNFCCC) (adopted 9 May 1992; entered into force 20 January 1994) UN Doc. A/RES/48/189.

[16] United Nations, *Sendai Framework for Disaster Risk Reduction 2015–2030* (adopted 18 March 2015) UN Doc. A/CONF.224/CRP.1.

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Aronsson-Storrier notes that the conflicting roles of nature in instruments concerning disaster risk are symptomatic of the wider international legal system, so it is essential to unpack the underlying assumptions of nature and humans' relationship with it. In particular, Aronsson-Storrier highlights calls for a more in-depth inclusion of Indigenous peoples and other counter-hegemonic voices into international law- and decision-making sites and spaces, as well as the need to acknowledge that the understanding of nature currently underpinning international law is not the only one. The chapter concludes by setting out some areas demanding greater attention by researchers, such as: interrogating the rights of nature in disasters; the inclusion of marginalised voices and perspectives in law- and decision-making processes; understanding resistance to disaster risk creation and the extent to which the law protects those who fight against risk creation activities; and responsibility and accountability for disaster risk creation.

The third of our chapters examining the intersections between climate, nature and disasters is Chapter 11. In this chapter, Stella Ngugi examines the pressing issue of displacement due to climatological disasters or 'climate displacement', particularly within the African context. Writing from her perspective as a disaster law practitioner, Ngugi outlines the need for in-depth research into how legal frameworks can serve to enhance our comprehension and management of such displacements. The chapter commences by noting that climate displacement is not just an environmental issue but a multi-dimensional crisis impacting societies on various fronts, including economic stability, social order and political structures. Ngugi also notes that the role of law extends beyond immediate disaster management to encompass the protection of the rights and dignity of affected communities, including displaced persons, ensuring their access to life-saving assistance, livelihoods, and fostering social inclusion. The chapter also explores the interrelated nature of disaster risk management and climate displacement and flags the need for more research through a displacement lens into law and policy frameworks regulating disaster management and the effectiveness and sustainability of the recovery process. In particular, Ngugi argues that there is a need for continuous research and adaptation of legal frameworks to keep pace with the evolving nature of climate-induced displacement, particularly in the context of planning for recovery. The chapter concludes by stressing the importance of legal frameworks in managing climate displacement and that this demands a critical reassessment of existing governance structures and legal frameworks.

The final two chapters address key technological developments for disaster risk management and for disaster law more broadly – first from the perspective of the risks and opportunities posed by digital technologies and artificial intelligence, and then regarding the role of space-based technologies for remote sensing and early warning systems.

In Chapter 12, Gabrielle Simm examines the biases that can exist within new technologies, especially within artificial intelligence (AI). As Simm notes, proponents of digital technologies in disaster response and risk reduction claim they will do the job better, cheaper and faster, while reducing risks to humans. Therefore, in this chapter,

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Simm interrogates these claims by taking an intersectional gender and race approach to AI in disasters, in particular by examining how AI builds on older technologies, such as radio, telephony and satellite imaging. The chapter highlights that a lack of diversity in the AI workforce contributes to gender and race biases in its outputs, with these biases being replicated and exaggerated through feedback loops. Simm then applies these findings to three examples: a UN health emergency warning project based on radio talk-back data; a project using satellite images and mobile phone data to assess earthquake damage; and the World Food Programme's HungerMap Live used to map food insecurity and predict famine. By applying Crenshaw's intersectional approach[17] to disaster law and technology, Simm identifies a series of key questions: Who develops disaster preparedness plans, who responds, and who is most affected? Who undertakes the low- and high-valued steps in the process of developing AI, and who decides when, how and why AI is used? How are different groups affected? Moreover, Simm sets out a series of issues where further research is required. For example, whether the deployment of AI in low regulatory environments means that it is being tested on the world's most vulnerable people in life and death situations; whether digital humanitarianism necessarily entails new forms of humanitarian action ('post-humanitarianism'); and who benefits and who loses from further automating and digitising disaster response. The chapter concludes by highlighting that other new technologies and new applications of older technologies in disasters are also ripe for investigation through the lens of an intersectional approach.

The final chapter, Chapter 13, examines the rapid development of space-based remote sensing technology and the proliferation of state and private commercial actors in space exploration. Reflecting the need for a holistic approach to disasters, Anna Marie Brennan and Alex Davis explore the relationship between outer space law and disaster law, and the use of remote sensing technology in the management of potential disasters. The chapter commences by explaining the surge in satellite technology, specifically in the context of remote sensing, and the increasing role played by private corporations in the launch and operation of remote sensing satellites. Due to the technical nature of the topic, the chapter sets out a history of aerial photography and remote sensing technology dating back to 1858. More recently, the UN Principles Relating to Remote Sensing of the Earth from Outer Space[18] were adopted in December 1986 and the International Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural and Technological Disasters[19] was established in 2000 as a voluntary partnership among 17 space agencies to support disaster

[17] Kimberlé Crenshaw, 'Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics' (1989) 1 *University of Chicago Legal Forum* 139–167.

[18] United Nations Resolution (RES) 41/65, *Principles Relating to Remote Sensing of the Earth from Outer Space*, adopted without a vote on 3 December 1986 www.unoosa.org/pdf/gares/ARES_41_65E.pdf.

[19] *Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters*, Rev 3 (adopted 25 April 2000) https://disastercharter.org/text-of-the-charter.

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relief organisations. Despite these initiatives, Brennan and Davis argue that law has so far had extraordinarily little to do with remote sensing. Consequently, the use and regulation of remote sensing technologies in disaster contexts offer "a treasure trove of opportunities" for doctrinal legal research, as well as empirical and socio-legal research – not least regarding the ambiguity surrounding the duties and responsibilities of space companies to collect and pass on data safely and with integrity to aid in relief efforts.

Conclusion: advancing an ambitious agenda for the ongoing development of disaster law

As the chapters of this book all attest, the field of disaster law offers a plethora of challenging research questions that have real-world practical impacts. Researching the legal implications of disasters also addresses some core themes of law more generally, such as: the relationship between national, regional and international legal frameworks; state sovereignty and international cooperation; the connections between different branches of international law; sources of legal rights and obligations (not least for individuals and communities affected by disasters); the differing roles of states, civil society and private corporations; and the need for a holistic and interdisciplinary approach to understanding complex societal and ethical challenges.

Law and politics are inextricably linked at both the national and international levels. So how politicians and states envisage, articulate and take action regarding disaster risk reduction, prevention, preparation, response and recovery has a fundamental impact on the lives of those most at risk from natural and human-made hazards.[20] Consequently, international cooperation and solidarity should form the fundamental basis of our actions to ensure the protection of persons in the event of disasters. Yet the world appears to be at a historical inflection point. Not only do we face a series of horrific armed conflicts – from Ukraine to Gaza and the Democratic Republic of Congo – that are reshaping international relations; how we act in the next few years will determine the global climate for decades, even centuries, to come. In challenging times, working together to build resilience to risk entails a whole-of-society approach – from financing actions undertaken by local authorities and civil society groups to promoting peaceful cooperation and respect for the rule of law in regional and international institutions. Research can play an essential role in helping us understand these dynamics and how the law can support, or possibly hinder, preparations and responses to disasters. The contributors to this book have presented an ambitious agenda for the ongoing development of disaster law, underpinned by respect for the dignity of all those affected by disasters, which provides multiple avenues for academic enquiry and practical application for the coming years.

[20] See, for example: Ilan Kelman, *Disaster Diplomacy: How Disasters Affect Peace and Conflict* (Routledge, 2012); Ben Wisner, Piers Blaikie, Terry Cannon and Ian Davis, *At Risk: Natural Hazards, People's Vulnerability and Disasters* (2nd edn, Routledge, 2004).

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