



Introduction

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Peter Billing and Emanuele Sommario

Abstract

This volume surveys contemporary Disaster Risk Management (DRM) through an institutional-legal lens. Drawing on EM-DAT trends, it notes the marked rise in disasters since the twentieth century, the escalating economic losses, and the increased vulnerability driven by climatic, demographic and geopolitical change. The surge in fatalities due to the recent COVID-19 pandemic underscores the need for an all-hazard preparedness approach. Internationally, the UN has shifted from reactive relief to integrated risk governance, anchored in the Sendai Framework (2015–2030) and aligned with the 2030 Agenda and the Paris Agreement. At a regional level, the EU has strengthened the Union Civil Protection Mechanism and is working to improve the speed and effectiveness of its interventions. Normatively, the IFRC's IDRL Guidelines steer domestic facilitation of cross-border aid, and the ILC's Draft Articles on the Protection of Persons in the Event of Disasters furnish a blueprint for a comprehensive treaty on international DRM expected by 2027. This book maps actors and coordination mechanisms and analyses rules on disaster response/recovery and on disaster prevention/preparedness. Conceptually, it adopts UN terminology on hazard, exposure, vulnerability and coping capacity, and explicitly engages the disaster-risk equation linking these variables to explain why hazards become disasters. Finally, it

P. Billing (✉)

Department of Geography, University of Bonn, Bonn, Germany

e-mail: pbilling@uni-bonn.de

E. Sommario

Scuola Superiore Sant'Anna, Pisa, Italy

e-mail: emanuele.sommario@santannapisa.it

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E. Sommario and P. Billing (eds.), *International Legal and Institutional Frameworks for Disaster Risk Management*, Civil Protection, Disaster Management, and Resilience 4, https://doi.org/10.1007/978-3-032-11806-6_1

grounds disaster relief in humanitarian principles and links it with the ‘do no harm’ imperative.

Keywords

Disaster risk management • Sendai framework • Disaster risk equation • International disaster law • Union civil protection mechanism

1.1 Introduction

Virtually every scholarly work on Disaster Risk Management (DRM) begins by highlighting the staggering and increasing number of catastrophic events that have occurred in recent decades, along with their devastating consequences. This volume is no exception, as only by engaging with the empirical data can the magnitude of the problem and the urgency of identifying effective solutions be fully appreciated.

1.1.1 Data and Trends

Even though there are inevitable annual variations, data from the Emergency Events Database (EM-DAT)¹ provide sufficiently robust evidence that globally the number of disasters² has indeed significantly increased since the beginning of the twentieth century. Annual figures of natural disaster impacts have oscillated between 40,000 and 50,000 deaths and between 100 and 600 million affected people on average over the last two decades.³ It is noteworthy that the number of affected people and fatalities caused by natural disasters has decreased over the years, mainly due to progress made in early warning systems, evacuations, improved design of infrastructure and better coordinated disaster response mechanisms. However, figures risk increasing due to new hazards and vulnerabilities caused by climatic, demographic, economic and geopolitical changes. In terms of economic damage, for instance, the decadal average damage caused by natural disasters, measured in percentage of global gross domestic product (GDP), has more than doubled since the 1960s.⁴ In absolute terms, economic damage caused by natural disasters in the

¹ The database is run by the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain, www.emdat.be. See also <https://ourworldindata.org/natural-disasters>. These, like all other online resources referenced in the volume, were last accessed in June 2026.

² The database defines a ‘disaster’ as an event that meets one of the following criteria: 10 or more fatalities; 100 or more affected people; a declaration of state of emergency; or a call for international assistance. For more insights on the definitions and their limitations, see <https://doc.emdat.be/docs/>.

³ Actual figures vary according to source and period selected. UNDRR estimated 42,000 fatalities per year from 2015 to 2022, see <https://www.undrr.org/explainer/unaccounted-costs-of-disasters-2023>.

⁴ Ritchie et al. (2022).

period 1980–2024 was around 7 trillion United States Dollars (USD),⁵ an amount more or less equivalent to the combined annual GDP of the United Kingdom (UK) and France.⁶ If one considers not only natural disasters, but also recent technological and public health disasters, the decade 2015 to 2024 witnessed a dramatic increase in both the number of fatalities and those injured compared to the previous decade: an increase of 249% and 173%, respectively.⁷ This is mainly attributable to the COVID-19 pandemic and the effects of climate change. In Europe, heat waves have become the most lethal disaster.

1.1.2 Actors and Mechanisms

Heightened awareness of the plight of disaster victims has drawn attention to the importance of adequate national and international rules and structures for DRM. International actors have not remained idle and have sought to adapt their roles and functions to better address these challenges. Since the early 2000s, the United Nations (UN) has progressively expanded and refined its disaster response framework, shifting from largely reactive, humanitarian-centred approaches to a broader, integrated disaster risk management system closely linked to development, resilience-building, and climate adaptation. Notable milestones include the adoption of the Sendai Framework for Disaster Risk Reduction (2015–2030), which shifted the focus from managing disasters to managing disaster risk and emphasised the importance of prevention, preparedness, response, and recovery. At the same time, the United Nations Office for Disaster Risk Reduction (UNDRR) emerged as a critical actor in supporting implementation, monitoring, and reporting under Sendai. More recently, disaster response has been increasingly integrated with the 2030 Agenda for Sustainable Development, the Paris Agreement on Climate Change, and the Agenda for Humanity. In addition, the COVID-19 pandemic underscored the need for all-hazard preparedness, blending biological disaster response with traditional disaster management approaches.

Regional DRM systems also witnessed an unprecedented development. Europe strengthened its regional disaster management by enhancing cooperation, coordination, and rapid response capacities. The European Union Civil Protection Mechanism (UCPM) was expanded and reformed to offer better disaster response both within and outside EU borders. Major developments came in 2013, with the adoption of Decision 1313/2013/EU, emphasising risk assessment, disaster preparedness, and mutual assistance, as well as

⁵ Munich Re (2024).

⁶ Statista, The 20 countries with the largest gross domestic product <https://www.statista.com/statistics/268173/countries-with-the-largest-gross-domestic-product-gdp/>.

⁷ Own calculations by the authors using the EM-DAT database, with data extracted on 14 April 2025. The World Health Organization (WHO) estimates the COVID-19 has killed more than seven million people, see WHO COVID-19 dashboard, <https://data.who.int/dashboards/covid19/deaths>.

the creation of the Emergency Response Coordination Centre (ERCC), offering enhanced 24/7 operational support.

1.1.3 Legal Developments at the International Level

The international legal landscape has also changed at an unprecedented rate. A first significant effort to organise international rules on disaster response was led by the International Federation of Red Cross and Red Crescent Societies (IFRC) through its International Disaster Response Laws, Rules and Principles (IDRL) Programme, launched in 2001. The IFRC developed the non-binding Guidelines for the Domestic Facilitation and Regulation of International Disaster Relief and Initial Recovery Assistance (IDRL Guidelines), offering technical advice for States to legally prepare for international disaster assistance. In parallel, a more traditional codification effort was undertaken by the UN International Law Commission (ILC). In 2007, the ILC began its work on the topic ‘Protection of persons in the event of disasters’ and finally produced a set of 18 Draft Articles (DAs), covering the disaster response, recovery, and prevention phases. The text has been identified as the blueprint for a future, comprehensive treaty on disaster risk management, scheduled for adoption by States by the end of 2027. This Treaty will represent a significant contribution to the development and consolidation of international disaster law, harmonising what is currently a disparate landscape.

This volume seeks to provide readers with a comprehensive overview of the issues outlined above. While it does not purport to offer an exhaustive treatment of the subject, it is intended to serve as a reference text for those interested in gaining a deeper understanding of the institutional and legal mechanisms underpinning contemporary DRM efforts at the international level. To this end, the book is structured into two parts, each comprising two chapters. The first part examines the principal institutions and actors involved in DRM activities. In particular, the Chapter 2 will present the traditional and new players in the international humanitarian arena, as well as the most important coordination mechanisms that have been developed in recent years. The Chapter titled 3 will then zoom in on the most advanced example of a regional mechanism aimed at disaster management, namely, the UCPM. It will also provide an insight into the features of the civil protection structures in EU Member States and in other states participating in the UCPM. The second part analyses the legal framework governing DRM activities, roughly dividing them between rules applying to the post-disaster and pre-disaster phases. The Chapter titled 4 will address the norms pertaining to disaster response and recovery activities. After reviewing some key definitions, it will focus on the typical obligations codified in disaster response instruments and then offer a description of the emerging legal framework concerning recovery activities. The Chapter on 5 will do the same with respect to disaster prevention and disaster preparedness measures and highlight the role of disaster risk reduction (DRR) in the broader disaster risk management framework.

1.1.4 The Contemporary Notion of *Disaster* and some Relevant Definitions

Before proceeding, it is necessary to clarify a few preliminary concepts that are relevant to all four chapters of the volume. These include the conceptualisation of the notion of *disaster*, the categorisation of activities aimed at dealing with disasters in various phases that compose the so-called *disaster risk management cycle*, and the humanitarian principles that should inform disaster response efforts.

Starting with how calamities are commonly addressed in academic studies, it is becoming common knowledge that a disaster is not merely the materialisation of a hazardous event, but needs to be conceptualised considering its concrete effects on the affected communities. Indeed, natural or technological hazards may become disasters depending on the exposure and vulnerability of the affected community, as well as its capacity to react. According to this approach, disasters are not isolated incidents but rather events that expose the underlying dysfunctions of the affected society. The position that ‘there is no such thing as a natural disaster’⁸ has therefore become a *Leitmotiv* in disaster studies. This approach has also been expressed through an equation seeking to capture the distinguishing elements of disaster risk⁹:

$$\text{Disaster risk} = \frac{\text{Hazard (H)} \times \text{Exposure (E)} \times \text{Vulnerability (V)}}{\text{Capacity to cope (C)}}$$

While agreeing on shared definitions of the terms employed in the equation is a rather difficult endeavour, for the purposes of the present volume we will adopt those identified by the Open-Ended Intergovernmental Expert Working Group on Indicators and Terminology Relating to Disaster Risk Reduction,¹⁰ which can be considered to reflect the approach adopted by the UN. In its 2016 report, the Working Group defines the term *hazard* as ‘[a] process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation’.¹¹ Hazards may originate from natural, anthropogenic, or socio-natural causes. Natural hazards are primarily linked to natural processes and phenomena, such as earthquakes, floods, and volcanic eruptions. Anthropogenic hazards arise entirely or predominantly from human activities and decisions, and include phenomena

⁸ Hartman and Squires (2006).

⁹ For a thorough explanation of how the equation has emerged and how it is conceptualised, see IPCC (2012, p. 69 and ff).

¹⁰ The Working group was established by the UN General Assembly (UNGA) through its resolution 69/284, 3 June 2015, and was mandated with the development of a set of possible indicators to measure global progress in the implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030, with the support of the UNDRR.

¹¹ UNGA, Report of the Open-Ended Intergovernmental Expert Working Group on Indicators and Terminology Relating to Disaster Risk Reduction, UN Doc. A/71/644, 1 December 2016, p. 18.

such as industrial pollution, nuclear radiation, toxic wastes, dam failures, factory explosions, fires, and chemical spills.¹² Finally, socio-natural hazards have their origin in a combination of natural and human-induced factors, such as environmental degradation and climate change.¹³

Exposure is defined as ‘[t]he situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas’.¹⁴ If a hazardous event occurs in an area where there is no exposure (meaning no people, property, or assets are present) then no risk is generated. However, exposure patterns are dynamic and can evolve over time as a result of factors such as population growth, economic development, and urbanisation, all of which can increase the concentration of people and assets in hazard-prone areas, thereby elevating disaster risk.

Vulnerability is defined as ‘[t]he conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards’.¹⁵ It is a multifaceted concept, shaped by a range of physical, social, economic, and environmental factors, which encompasses the broader structural and contextual conditions that constrain the capacity of people and communities to withstand, respond to, and recover from hazardous events.¹⁶

Lastly, closely connected to vulnerability is the notion of *coping capacity*, which is defined as ‘the ability of people, organisations and systems, using available skills and resources, to manage adverse conditions, risk or disasters’.¹⁷ It requires sustained awareness, resources, and effective management, both under normal circumstances and during emergencies. Strengthening coping capacities plays a critical role in reducing disaster risk, as it enhances the capacity to absorb, adapt to, and recover from the impacts of hazardous events.

¹² Note that this category does not encompass the occurrence or risk of armed conflict or other forms of social instability or tension, which are governed by international humanitarian law, international human rights law and national legislation, *ibid*.

¹³ Although we fully endorse the shift in terminology from ‘natural disasters’ to ‘natural-hazard-induced disasters’, the former term will occasionally appear in this volume. This is partly because many documents and laws have long classified disasters as ‘natural’ or ‘technological’; those labels cascade into reporting, insurance, emergency declarations, and research trends, so changing them has been slow. In addition, ‘natural disaster’ is a compact, familiar phrase: it compresses a complex causal chain into two words, aiding public understanding.

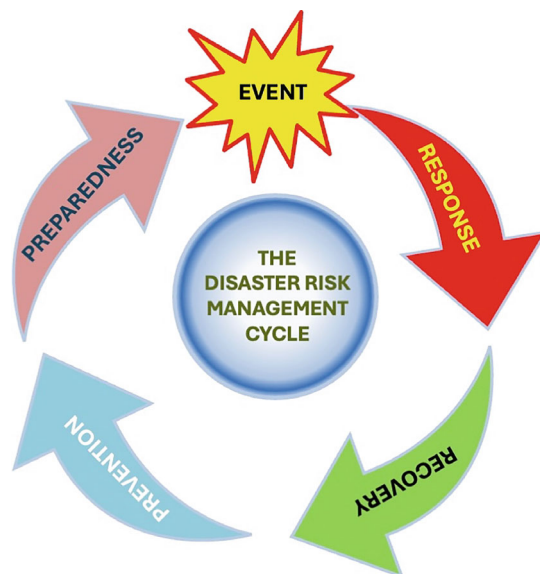
¹⁴ UNGA, Report of the Open-Ended Intergovernmental Expert Working Group, p. 18.

¹⁵ *Ibid.*, p. 24.

¹⁶ Adams et al. (2022, pp. 13–29).

¹⁷ UNGA, Report of the Open-Ended Intergovernmental Expert Working Group, p. 12.

Fig. 1.1 The disaster risk management cycle. *Source* Developed by the authors



1.1.5 The DRM Phases

In making sense of the many activities linked to DRM, one of the most useful organising principles is the disaster cycle paradigm. This model delineates a set of strategies for managing disaster risk and is commonly considered to include four phases: prevention, preparedness, response, and recovery.¹⁸ While more specific definitions are provided in the various chapters, it is worth quickly presenting the meaning attributed to these different terms by the UN Working Group (Fig. 1.1).

The *prevention* phase includes '[a]ctivities and measures to avoid existing and new disaster risks'.¹⁹ Disaster prevention aims at completely avoiding the potential adverse impacts of hazardous events. Where certain disaster risks cannot be eliminated, prevention aims at reducing vulnerability and exposure so that the risk of disaster is minimised. *Preparedness* refers to '[t]he knowledge and capacities developed by governments, response and recovery organisations, communities and individuals to effectively

¹⁸ Note that *prevention* is often associated with, and sometimes replaced by, *mitigation*. The two terms are closely connected, as both refer to measures aimed either at eliminating the risk of disasters (prevention) or at minimising their harmful effects when they cannot be entirely avoided (mitigation). For the sake of simplicity, we will use the term *prevention* to refer to all activities designed to proactively reduce the risk of disasters. Sometimes, these two concepts are grouped together under the broader umbrella of DRR activities. See UN ISDR (2004), p. 17.

¹⁹ Ibid., p. 21. Examples include dams or embankments that eliminate flood risks, land-use regulations that do not permit any settlement in high-risk zones, seismic engineering designs that ensure the survival and function of a critical building in any likely earthquake and immunization against vaccine-preventable diseases.

anticipate, respond to and recover from the impacts of likely, imminent or current disasters'.²⁰ It includes action aimed at building the capacities needed to efficiently manage all types of emergencies and achieve orderly transitions from response to sustained recovery.

The Working Group defines *response* as '[a]ctions taken directly before, during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected'. Disaster response is predominantly focused on immediate and short-term needs and is sometimes referred to as disaster relief.²¹

Finally, *recovery* is said to include activities aimed at 'the restoring or improving of livelihoods and health, as well as economic, physical, social, cultural and environmental assets, systems and activities, of a disaster-affected community or society, aligning with the principles of sustainable development and "build back better", to avoid or reduce future disaster risk'.²² The term includes activities aimed at the reconstruction or restoration of critical infrastructures, services, housing, facilities, and livelihoods required for the full functioning of a community.

We are aware that the conceptual model of the disaster cycle has come under increasing criticism.²³ Scholars and practitioners have pointed out that representing disaster-related activities as circular can be misleading, as it implies a static, repetitive sequence rather than progressive or evolving processes. Moreover, the boundaries between the phases are becoming increasingly blurred, especially in the context of slow-onset events, such as those linked to climate change, which unfold gradually over time and do not fit neatly into distinct temporal phases.²⁴

However, using the disaster cycle as a framework has the advantage of putting the response phase, typically at the forefront, into context and highlights the interconnections between risk management strategies. For instance, failures to prevent disaster risk often amplify the impact of the later disaster, turning an otherwise manageable event into a more serious risk to life or property. Adopting the disaster cycle paradigm is also useful because it simplifies the phases of DRM in a way that is easily relatable in terms of a sequence of events that need to happen after or before a calamity strikes. Yet it should be emphasised that prevention, preparedness, response, and recovery are to be considered as overlapping activities, not separate stages.

²⁰ Ibid. Examples of preparedness activities and include contingency planning, the stockpiling of equipment and supplies, the development of arrangements for coordination, evacuation and public information, and associated training and field exercises.

²¹ Ibid., p. 22. Typical response measures include the activation of counter-disaster systems; search and rescue activities; the provision of emergency food, shelter, medical assistance; evacuation measures; surveying and assessing buildings and other infrastructure in the area affected by the disaster.

²² Ibid., p. 21.

²³ Richardson (2005, pp. 48–50).

²⁴ Staupe-Delgado (2019, p. 629).

1.1.6 The Core Humanitarian Principles

Since the core of disaster management activities still lies in the response phase,²⁵ reference must be made to the basic principles that should inform any type of humanitarian action, including disaster relief. These are the humanitarian principles of *humanity*, *impartiality*, and *neutrality*. Many add as a fourth principle *independence*, which requires humanitarian actors to be autonomous, i.e. not subject to control, subordination, or influence by political, economic, military, or other non-humanitarian objectives. However, some consider that independence is of limited import if applied to national civil protection actors, which are traditionally closely linked to the respective governmental authorities.²⁶ The conformity of the aid offered with humanitarian principles is provided by a plethora of instruments dealing with humanitarian assistance, applicable in armed conflicts and/or in disaster contexts, such as GA Resolution 46/182 and the IFRC's IDRL Guidelines. Although Resolution 46/182 did not elaborate on these principles, the UN Office for the Co-ordination of Humanitarian Affairs (UNOCHA) developed meaningful definitions.²⁷

The principle of *humanity* demands that human suffering must be addressed wherever it is found, with particular attention to the most vulnerable populations such as children, women, and the elderly. The dignity and rights of all victims must be respected and protected. *Impartiality* requires that humanitarian actions must be carried out on the basis of need alone, giving priority to the most urgent cases of distress and making no distinctions based on nationality, race, gender, religious belief, class, or political opinions. According to the principle of *neutrality*, humanitarian actions must be provided without engaging in hostilities or taking sides in controversies of a political, religious, or ideological nature.

While the principles of humanity and impartiality clearly apply across all disaster contexts, neutrality might, at first glance, appear to be a context-specific principle, inherently linked to situations of conflict. Nevertheless, in the context of disaster response, neutrality should be interpreted as requiring that 'those responding to disasters should abstain from any act which might be interpreted as interference with the interests of the State'.²⁸ In other words, neutrality obliges assisting actors to refrain from taking sides in controversies of a political, racial, religious, or ideological nature.

²⁵ Indeed, we will occasionally use the expression *disaster management* in lieu of *disaster risk management* when the discussion focuses on *response* to natural or technological hazards. However, we recognize that disaster risk management is the umbrella term covering the entire, risk-focused cycle. In this volume, *disaster management* refers to the operational subset that addresses the event and its consequences.

²⁶ Perchinig et al. (2017, p. 18). However, when UCPM assets contribute to humanitarian assistance efforts promoted by the EU, the principle of independence applies to them too, see Decision 1313/2013/EU, Article 26.3.

²⁷ Guiding Principles for Public-Private Collaboration for Humanitarian Action, prepared by the World Economic Forum and UNOCHA, December 2007.

²⁸ International Law Commission, Third report on the protection of persons in the event of disasters, UN Doc A/CN.4/629, 31 March 2010, para. 29.

Of course, humanitarian principles are not uncontested.²⁹ However, adherence to their spirit is fundamental for securing and sustaining access to affected populations, whether in the context of natural disasters, armed conflicts, or complex emergencies. Although often regarded as abstract or aspirational ideals, humanitarian principles constitute a practical and indispensable framework for fostering trust, legitimacy, and acceptance among all stakeholders. Even more importantly, they are recognised as key operational tools by virtually all humanitarian actors.³⁰

Lastly, reference should be made to another core tenet of contemporary humanitarian action, the so-called ‘do no harm’ principle.³¹ Adherence to this principle requires that when humanitarian actors intervene to help people affected by crises (including disasters) they must be careful not to worsen existing problems or create new harms through their actions.

Key Sentences

- **The Intensifying Disaster Risk Landscape**—Despite improvements in preparedness and response, disasters are becoming more complex and costly due to climate change, urbanisation, and emerging vulnerabilities, resulting in growing economic and societal impacts.
- **Disasters as Products of Structural Vulnerability**—Disasters arise from the interaction between hazards, exposure, vulnerability, and coping capacity, revealing underlying social and institutional weaknesses rather than constituting purely natural events.
- **Shift from Reactive Response to Risk Management**—Contemporary disaster governance prioritises prevention, preparedness, recovery, and resilience, embedding disaster risk management within broader sustainable development and climate adaptation frameworks.

²⁹ See, e.g. Slim (1997, p. 342). The principles have also been challenged by the introduction of new frameworks advocating for an increased integration and coordination between humanitarian assistance, development assistance, and peace (the s.c. ‘triple nexus’); see Brown et al. (2024).

³⁰ The European Union, for instance, put them at the core EU of their flagship document on humanitarian aid, see European Consensus on Humanitarian Aid, Joint Statement by the Council and the Representatives of the Governments of the Member States meeting within the Council, the European Parliament and the European Commission, 2008/C 25/01, 30 January 2008, paras 10–14.

³¹ The principle was developed by influential American scholar and practitioner Mary B. Anderson in the early 1990s, see Anderson (1999). Since then, it has transformed in a tool that underpins many operational frameworks. See, for instance, Sphere Association. The Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response, fourth edition, Geneva, Switzerland, 2018.

- **The Progressive Consolidation of International and Regional Frameworks**—International and regional actors have progressively institutionalised disaster governance through coordinated mechanisms and emerging legal frameworks, enhancing collective preparedness and response capacity.
- **The Central Role of Humanitarian and ‘Do No Harm’ Principles**—Humanitarian principles remain essential operational tools, ensuring access, legitimacy, and effectiveness of assistance, while the ‘do no harm’ principle mitigates the risk of exacerbating existing vulnerabilities.

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