Informal Disaster Governance
in Longyearbyen and South Dominica

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DECLARATION

I, Patrizia Isabelle Duda confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

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Signature   Date

ABSTRACT

Scholars and practitioners are increasingly questioning formal disaster governance (FDG) approaches as being too rigid, slow, and command-and-control driven. Too often, local realities and informal influences are sidelined or ignored to the extent that disaster governance can be harmed through endeavours to impose formal and/or political structures. Efforts to include so-called 'bottom-up', local, and/or participatory approaches have not changed the FDG-centred disaster narrative. This study considers the role of informality in disasters, encapsulated here as Informal Disaster Governance (IDG). It theorises IDG and situates it within the long-standing albeit limited literature on the topic, paying particular attention to the literature's failure to properly define informal disaster risk reduction and response (DRR/R) efforts. Empirically, this study explores IDG in two locations—the settlement of Longyearbyen in the Arctic archipelago of Svalbard and the southern region of the Commonwealth of Dominica—where IDG might be expected to be more powerful or obvious, namely in smaller, more isolated communities. Fifty-four semi-structured interviews were conducted, visually aided by an innovative use of the PRISM (Pictorial Representation of Illness and Self Measure) tool, to examine residents' perceptions of disaster risks, and informal sources of disaster-related information and help. The findings suggest that informality plays a significant and complementary role in disasters in both locations and highlight the role of proximity/propinquity, relationships, experience, and power as contributing factors for why people choose informal sources of disaster information and help. Thus, this study conceptualises the drivers and far-reaching implications of IDG but also considers its 'dark sides'. By presenting IDG as a framework and exploring its merits and challenges, this research restores the conceptual importance and balance of IDG vis-à-vis FDG, paving the way for a better understanding of the 'complete' picture of disaster governance.

Keywords

IMPACT STATEMENT

This study generated insights for academia, policymakers, practitioners, and other stakeholders involved in disaster risk reduction and response. For academia, researching informal disaster efforts through the eyes of the very people involved in them, provides novel and vital data to understand when and why people choose informal means of disaster information and help over, or in addition to, formal sources of disaster governance. In disaster science (DS), the idea that informal actors are important to the success of disaster efforts is not new; however, the role, extent, and impact attributed to them and their efforts remains understudied, undervalued and/or tokenised vis-à-vis the perceived *deus ex machina* role of formal disaster governance (FDG). The findings of this research—generated through an innovative visual interviewing method that allows for more dependable results—reveal the key role of what this thesis conceptualises as 'Informal Disaster Governance' (IDG). Importantly, 'everyday' factors of proximity and propinquity, people's own and others' experiences, relationships, and power dynamics, influence why people choose IDG. Thus, contrary to what is widely assumed, FDG 'failures' or the lack of FDG action are not the determining factors in this choice. Ultimately, seeing disaster efforts through the framework of IDG creates new thinking about disaster governance. Rather than being the 'other', alternative', or 'opposite' approach, IDG is and should be seen as complementary to FDG. This academic contribution was solidified and disseminated through conference engagements, academic publications, and popular media. Selected publications (cf. full list in Appendix A) include:

Duda, P. I., Kelman, I., & Glick, N. (2020). Informal disaster governance. *Politics and Governance, 8*(4), 375–385. http://dx.doi.org/10.17645/pag.v8i4.3077

Kelman, I., Sydnes, A. K., Duda, P. I., Nikitina, E., & Webersik, C. (2020). Norway-Russia disaster diplomacy for Svalbard. *Safety Science, 130*, 104896. https://doi.org/10.1016/j.ssci.2020.104896

Duda, P. I. (2019). Informal disaster governance in the Arctic. In D. R. Menezes, & H. N. Nicol (Eds.), *The North American Arctic* (pp. 289–308). UCL Press. https://www.uclpress.co.uk/products/126973?_pos=1&_sid=7b3c55872&_ss=r

This research also applies to policy and practice. FDG, governmental and non-governmental, is critiqued for being too rigid, slow, bureaucratic, or irrelevant to local realities, with the result being an erosion of public trust in formal disaster-related capabilities. The findings of this study can help decision- and policymakers better understand people's disaster-related efforts and the motivations behind them and, thus, engage with

IDG beyond tokenism and to the benefit of all. This study shows a way forward to rethink fundamental and/or national disaster governance models beyond decentralisation efforts to local but still formal authorities. Instead, by recognising and collaborating with IDG actors, governments can effectively engage with and include people and their informal disaster efforts in a way that gives them 'a seat at the table' and allows for more effective and efficient disaster governance overall. The findings and their practical implications have already been discussed with practitioners familiar with this study to inform their strategic planning. Acknowledging the roles of both FDG and IDG and studying their potential for collaboration completes the picture of disaster governance, to the benefit of disaster-affected people.

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Looking back with gratitude and newly found hindsight
How did I surmount the dreaded PhD grind-plight?
How did I survive advanced thesis-induced mind-blight?
Only by white-horsed saviours: here I cite each kind knight.

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Finally, since the idea for the PhD came from my field experience, I would like to acknowledge those **informal actors**—individuals and organisations alike—that are involved in disasters, being either affected by them or helping to counteract and mitigate their impact. My thanks to all those from whom I learned so much.

For my dear grandparents, no longer in this world, but who are still lighting my way...

PREFACE

This thesis on Informal Disaster Governance (IDG) was born of the surprise and confusion that came from observing the unexpected. It was the summer of 2014 in Israel, during the latest Gaza-Israel war, otherwise known as Operation Protective Edge. As a disaster practitioner, I was helping a non-governmental organisation (NGO) that was sending supplies to the border area which was under constant rocket fire. When I first arrived on the scene, I was shocked by the chaos I discovered there. Despite Israel's famed military expertise and disaster management reputation, governmental initiatives to manage the impact of the crisis on civilians and to coordinate relief were few and far between. Even the soldiers returning from the front were largely abandoned to their own devices, without the necessary infrastructure to receive them. However, the border was also a flurry of activity, as countless supplies were sent or brought, local residents were active and engaged, and thousands of people were arriving every day to help and contribute to relief efforts. As a part of one of the handful of organisations there, my role was to try and organise these 'volunteers', sort through the arriving mess of supplies, and create an organised system to address civilian needs. Spending nearly the entire war (six weeks) on the border left me with questions about the role of governments, organisations, and the general public in disasters, and the lack of communication between them. I took an interest in disaster governance and started reading about 'emergent' or 'spontaneous' volunteerism.

A year and half later, I was sent by the Israeli Ministry of Health to investigate the unfolding European refugee crisis on the Greek islands. I arrived on Chios to assess the needs of the hundreds of asylum seekers that had been arriving every day, primarily from Syria, Afghanistan, and Iraq. Here too, the 'formal' institutions that one would expect to be 'managing' the situation, namely the Greek government, UN agencies, and NGOs, were largely absent, or woefully under-resourced. The local authorities were active but struggling to support the sheer number of arrivals, best represented by the understaffed local hospital with its single outdated ambulance which now had to service both the fifty-five-odd thousand people on the island PLUS the arriving asylum seekers, many of whom needed medical care. Once again, this gap was met by a massive influx of international informal 'volunteers' and local concerned citizens. Yet the impressive scale, scope, and professionalism I was witnessing did not match the literature I had found on the topic. In the research, while the 'important' role of such informal efforts was highlighted by many, its associated actions were mostly relegated to a secondary, 'amateur' status, to be managed by formal actors, or at best fill the gap until they arrive and complement their efforts. Instead, I was witnessing highly developed, organised, and increasingly well-resourced efforts to manage a complex crisis with heavy daily logistic requirements.

I presented these observations at the World Association for Disaster and Emergency Medicine (WADEM) conference in Toronto the following year, and heard similar accounts from other practitioners, but continued to find little research that seriously considered the topic. I was puzzled. Was informality as central to disaster risk reduction and response (DRR/R) in general as I had observed in Greece and along the Israel-Gaza border? The anecdotal accounts of practitioners seemed to suggest so. If this was the case, then why was research into the phenomenon so marginal? After an initial phase where I considered the implications of informality within disaster diplomacy, I decided to dedicate my PhD research to the phenomenon of informality within disaster governance, or 'Informal Disaster Governance', and explore its features, causes, and relationship to formal disaster governance. By doing so, I hope to shed light on a vital aspect of disaster governance, and so contribute to both disaster science and practice.

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ABBREVIATIONS

CAQDAS	Computer-Assisted Qualitative Data Analysis Software
CB-DRR/R	Community-Based Disaster Risk Reduction and response
CREAD	Climate Resilient Execution Agency for Dominica
CRRP	Climate Resilience and Recovery Plan (Dominica)
DG	Disaster Governance
DR	Disaster Response
DRC	Disaster Research Center
DRG	Disaster Risk Governance
DRR	Disaster Risk Reduction
DRR/R	Disaster Risk Reduction and Response
DS	Disaster Science
FDG	Formal Disaster Governance
IDG	Informal Disaster Governance
IFRC	International Federation of the Red Cross and red Crescent Societies
IR	International Relations
NSA(s)	Non-State Actor(s)
PRISM	Pictorial Representation of Illness and Self Measure
SD	South Dominica
TA	Thematic Analysis
UK	United Kingdom
UN	United Nations
UNDRR	United Nations Office for Disaster Risk Reduction
UNISDR	United Nations International Strategy for Disaster Reduction
UNDP	United Nations Development Programme
US	United States

CHAPTER 1

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INTRODUCTION

1.1 THE OPEN SECRET OF INFORMAL DISASTER GOVERNANCE

Many of today's disaster institutions were devised to fit the risks and needs of the rising complexities, first of the industrialisation era, and then the civil defence requirements during and after the World Wars (Alexander, 2002; Kirschenbaum, 2004). These formal disaster governance (FDG) mechanisms essentially came in the form of centralised, hierarchical, command-and-control driven approaches. This perspective and modus operandi were reinforced by the Cold War, an era in which DRR/R was primarily seen through the lens of civil defence with the underlying assumption that taking 'control' is the most suitable practise to deal with the 'chaos of disasters' (Dynes, 1994a; Gilbert, 1995; Helsloot & Ruitenberg, 2004; Quarantelli & Dynes, 1977; Wolbers et al., 2016; Wolf & Pfohl, 2014), which also included concerns over Chemical, Biological, Radioactive and Nuclear-related issues (Strömberg, 2019). This militaristic approach pervades many formal disaster operations until this day, notwithstanding the rise of civil protection (Alexander, 2002), and the disaster governance (DG) turn that followed, as is discussed below (Tierney et al., 2006; Wolbers et al., 2016).

Yet, when vulnerabilities and risks become disasters, governmental and other formal institutions mandated with disaster risk reduction and response (DRR/R) show limitations. Scholars critiquing FDG attribute these shortcomings to, amongst others, historical roots, the lack of knowledge, incentives, coordination mechanisms, or flexibility, as well as focusing on infrastructural and technocratic solutions over engaging with existing local resources, including knowledge, wisdom, learning, contextual understanding, incentives, people power, and other requirements that FDG cannot or does not provide (Boin, 2009; Boin, Rhinhard, & Ekengren, 2014; Dynes & Aguirre, 1979; Kirschenbaum, 2004; Lagadec, 1997; Perrow, 2011; Quarantelli et al., 2007; Roasa, 2013; Robin, Chazal, Acuto, & Carrero, 2019; Wachtendorf, 2000). As a specific example, Marchezini (2015) suggests that governmental FDG might sometimes focus on saving individual lives without linking this approach to wider social needs.

Indeed, FDG remains plagued by the flawed narrative that disasters are natural, acute, and unpredictable events, instead of considering the context in which they occur, and how human choices determine our vulnerability to natural hazards (Kelman, 2020). Viewed from this narrow perspective, climate change and

the globalised world's interconnectedness are perceived as the main drivers of disaster risks, leading to the growing speed, frequency and scale with which today's disasters are, ostensibly, occurring. This perception is further reinforced by some disaster scientists' inclination to see disasters as 'complex' phenomena, and the application of complexity science and related fields (e.g. systems science, network science) to DRR/R. This is demonstrated by the resulting new or revived concepts, such as 'cascading disasters' or '(super)-wicked disasters' (Helbing et al., 2015; Levin et al., 2012; Pescaroli & Alexander, 2015). Thus, a view of disasters as 'extreme' 'events' is supported, which, in turn, requires an equally complex response that navigates complicated systems, often across borders and functional boundaries, and masters complex 'network interactions', while taking into account disasters' cascading effects. In short, FDG mechanisms are to be forgiven if they cannot adequately deal with what is ostensibly a world grown too complex for us to understand, and that is threatened by an unbalanced and angry mother nature fighting back.

Regardless of causes, the result is that in the absence of (effective) FDG, successful DRR/R often depends on informal actors and networks (Boersma et al., 2018; Carrero et al., 2018; Chatfield & Reddick, 2017; Elkins et al., 2014; Fritz & Mathewson, 1957; Kreps, 1984:320–322; Ng, 2016; Pant et al., 2008; Parthasarathy, 2015; Roasa, 2013; Rose & Chmutina, 2020; Twigg & Mosel, 2017) and their "urgently needed tools for knowledge and action" (Fawaz, 2017:101). Such DRR/R shifts action away from the government to ordinary people who, often without disaster-related training, devise informal approaches—e.g. by improvising new or repurposing old informal networks (Roasa, 2013)—to supply the much-needed aid normally expected of FDG. Examples of actions are: building barriers against hazards; evacuating residents; providing food, water, medical assistance, and emotional support; and leading local clean-up, rebuilding, and relocation efforts (Barenstein & Trachsel, 2012; Carrero et al., 2018; McFarlane, 2012; Parthasarathy, 2015; Roasa, 2013; Versluis, 2014; Whittaker et al., 2015). Disaster-affected populations are not only the first to respond to disasters—recently termed also 'zero-order responders' (Briones et al., 2018)—but they also often go beyond their perceived responsibilities to make up for institutional shortcomings (Edwards, 2009; Lavell & Maskrey, 2014; Maskrey, 2011; Stallings & Quarantelli, 1985).

Informal human agency, a prevalent theme across many academic disciplines, has been discussed in earlier and recent DS, yet, predominantly from the perspectives of intra- and interorganisational informality (Forrest, 1986; Wachtendorf, 1999, 2000) or as convergence, emergence, and volunteering practices and self-organisation by informal actors (e.g. Barton, 1969; Dynes & Quarantelli, 1968; Fritz & Mathewson, 1957; Shaskolsky, 1967; Stallings & Quarantelli, 1985; Taylor, 1970; Wolensky, 1979). Over time, as informality theoretically became increasingly acceptable with the 'governance turn' in the 1990s, a variety of perspectives and terms related to informal forms of DRR/R developed, even when drawing on much earlier literature. This is attested to by the numerous concepts in DS that directly or indirectly, in a focused manner or in passing, deal with (aspects of) informal DRR/R. In addition to the above, a plethora of other concepts and terms has emerged, many of which connect the 'informal' in DRR/R to terms such as 'governance', 'networks', 'participatory', or 'community' (Table 5, Ch. 2.4.3).

On the basis of the above, institutional actors seem to be well-advised to recognise and integrate the actions of such informal actors to add important resources (including diversity and ideas) to their DRR/R frameworks and create something that constitutes DG more fully. In reality, in an environment which views DRR/R as the responsibility of formal organisations (e.g. governmental and non-governmental disaster management agencies and emergency services), informal DRR/R actors still tend to be ignored, managed, bypassed, or ousted by FDG actors once they are on the scene (Harris et al., 2017; Wolbers et al., 2016).

As UCL informality scholar Alena Ledeneva points out, it is the "banality of informality that causes [it] to be taken for granted by insiders [while remaining] unnoticed by outsiders" (2018b:17). However, "despite their banal nature, marginal significance and under-the-radar scale, informal practices are central to the workings of human societies, their resilience and stability" (Ledeneva et al., 2018b:18). In disasters, informal actors and their positive or negative actions have the power to secure or jeopardise the stability and resilience of personal and community wellbeing (Parthasarathy, 2015; Roasa 2013; Whittaker et al., 2015). Additionally, informal DRR/R activities may encompass long-term development or political and diplomatic agendas that sometimes are opposed to, or bypass, governments (Kelman, 2015; Ng, 2016). Accordingly, since their activities, including by some of the most vulnerable populations, may result in the difference between success and failure of a community's DRR/R (Barenstein & Trachsel, 2012; Parthasarathy, 2015; Roasa, 2013), informal DRR/R actors can become a powerful (counter-)force creating de facto 'new realities' in ways unanticipated and/or undesired by FDG actors (Birkmann & von Teichman, 2010).

Notwithstanding the breadth of references acknowledging the importance of, and bringing important insights to, the complexities of informal DRR/R, knowledge on informality in disasters can remain superficial, lack conceptual discussions, and incompletely address practical considerations. Consequently, informal actors are often seen as little more than 'volunteers'. Where informal DRR/R is seen as a viable alternative, this is often limited to equally functional characteristics such as the ability to respond faster and more flexibly than FDG actors. This raises doubts as to whether scholars dealing with informal DRR/R have truly detached from these traditional dichotomies, especially when their analyses lead to the question of how to improve FDG by 'managing' these efforts, so that they will not hinder formal DRR/R mechanisms—whereas the logical consideration should instead be how to 'capitalise' on informality as an asset, and how FDG could 'serve' capable communities in disasters rather than 'manage' their efforts (Ogie & Pradhan, 2019). Perhaps these accounts offer more insights on how the involvement of informal actors in disasters is, and has been, imagined and managed by FDG rather than considering them as an integral part of DG per se, which is the premise of this thesis.

1.2 THIS THESIS

1.2.1 RATIONALE AND SCOPE OF THE STUDY

There exists a gap in disaster literature's understanding of informality's role in DG, and the apparent role that it plays in practice. This study explores the phenomenon empirically in two locations, Longyearbyen settlement on Svalbard and the southern region of Dominica, and subsequently proposes Informal Disaster Governance (IDG) as a conceptual framework to distinguish, organise, and examine the significance of informality in DG. Given the circumstances, a simple approach would be to ask the question "why does IDG exist"? However, asking this kind of broad question has several drawbacks:

1. It presupposes that IDG exists;
2. It focuses on differences and correlations, rather than process;
3. It falsely considers that a fixed number of factors 'cause' IDG.

Further, asking this sort of 'grand' question is likely to result in a macro-level discussion of issues such as the politics of power, governments and non-governmental organisations, democracy, and funding gaps. However, as a practitioner, my motivation for investigating informality is of a more humble and direct nature: to further the understanding, and ultimately effectiveness, of DG as a whole. Rather than considering formality directly, and through it the limited lens of the formality-informality divide, this study is centred on the overall perceptions of DG of those who are at the centre of disaster efforts—the affected people.

1.2.2 RESEARCH QUESTIONS, AIM, AND OBJECTIVES

To investigate and analyse IDG, this research was conducted in two case study locations: Longyearbyen in the Arctic archipelago of Svalbard, and the southern region of the Caribbean island nation of the Commonwealth of Dominica (subsequently referred to as 'Dominica'). The goal was to explore people's experiences with and perceptions of informal sources of disaster-related information and help, and to understand their IDG-related perspectives within the larger context of DG. As such, the main research aims were to a) build an understanding of the phenomenon of IDG in Longyearbyen and South Dominica (SD) by examining how residents perceive DG, b) examine the factors that contribute to these perceptions, and c) consider the possible implications for DG. The main research questions of this study are:

1) How do residents of Longyearbyen and SD perceive the role of IDG within sources of disaster-related information and help?
2) What factors influence these perceptions?

Additional sub-questions include:

1) How do residents of Longyearbyen and SD perceive IDG/FDG sources?
2) What contributes to interviewee choice of IDG or FDG?
3) What are the implications of IDG's role for DG?

To answer these questions, the research aims were operationalised through a total of 54 semi-structured, open-ended interviews supported by the revised Pictorial Representation of Illness and Self Measure (PRISM) visual tool.

1.2.3   ORIGINALITY AND NEW KNOWLEDGE

Informality is prevalent throughout disaster action and thought. Yet, this wealth of knowledge and ideas has not been converted into a coherent and systematic concept, framework, or theory of informal forms of DG. Without such standing—that is, one of equal footing with FDG—it is doubtful whether DG itself can live up to the promises made vis-à-vis the mere 'disaster management' from which it purposefully departed; that is, the recognition that to be a more effective framework, DG must truly represent all DRR/R stakeholders. Thus far, this has not happened. Research on informal DRR/R is, therefore, imperative and timely.

The theoretical contribution of this thesis lies in stepping back and examining more fully the meanings and implications of informal DRR/R, and subsequently developing an IDG framework for application within DG. The application of the IDG lens to the two case study sites of Longyearbyen and SD, conducted through the collection of 54 semi-structured interviewees, represents the first investigation of informality in disasters in either location. This study is also adding new data to the DS body of knowledge on the understudied archipelago of Svalbard. The data were collected using a unique combination of semi-structured open-ended interviews and the Pictorial Representation of Illness and Self Measure (PRISM) tool, specifically adapted from clinical psychological research for this research. In doing so, this study further offers an original contribution to DS methodology.

Finally, this research aims to provide insights that can be translated into policy and affect practice. Recognising the significance of informality, improving DS's understanding of its role and constituent elements, and creating a framework for collaboration with FDG can lead to a more effective and efficient DG, with positive implications for all.

1.2.4   STRUCTURE

This thesis is divided into seven chapters. This chapter introduced the background and rationale for this thesis as well as its objectives. Chapter 2 reviews the literature and builds a theoretical framework for the study of IDG. To do so, the constituent elements of IDG—disasters, governance, and informality—are

critically reviewed and their gaps are analysed to suggest a baseline for the IDG framework that informs this study. Chapter 3 presents the methodology and its limitations while chapter 4 introduces its case studies of Longyearbyen and SD. Chapter 5 describes this research project's findings, which are then analysed and discussed in chapter 6, where the IDG framework and its implications for FDG are considered. Chapter 7 summarises the conclusions and achievements of this thesis, considers its limitations, and offers avenues for further study.

CHAPTER 2

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INFORMAL DISASTER GOVERNANCE: THEORETICAL FRAMEWORK

2.1 INTRODUCTION: BEYOND PREVAILING FRAMEWORKS

This chapter frames the topic of IDG within DS. While FDG has been institutionalised, informality—though included in some disaster concepts—has neither been properly conceptualised nor integrated into DRR/R. This research project aims to improve DS and practice through conceptualising IDG and its relationship with FDG.

According to Schwandt's advice for conducting literature reviews, "to analyze means to break down a whole into its components or constituent parts. Through assembly of the parts, one comes to understand the integrity of the whole" (2015:57). Thus, this chapter reviews IDG's constituent parts in the following order: disaster(s), governance, and informality. Each term is discussed and defined at the beginning of each section. The discussion of major developments and debates pertaining to disasters and governance in sections 2.2 and 2.3 provides grounding and understanding of the context in which IDG occurs. Section 2.4 analyses informality with an in-depth discussion of the term, its occurrence in DS, a gap analysis, and highlights the need for examining and incorporating IDG into DG.

Though presented in a linear manner, this chapter's topics are not linear. Informality arguably finds considerable space in today's DG paradigms that emphasise a multi-stakeholder approach to DRR/R. It is, thus, presented at the end of the chapter. However, this order of presentation does not imply that informality only accompanied or followed DS's 'governance turn'. Indeed, as section 2.4 argues, informality in DS has been variously discussed since the field's inception. The same principle applies to the other topics in this chapter and should be considered when reading.

2.1.1 SEARCH STRATEGY

Literature reviews can be dispassionate summaries of obtainable data and knowledge on a particular topic—as is exemplified by systematic literature reviews or meta-analyses—or they can "present[] a logically argued case founded on a comprehensive understanding of the current state of knowledge about a topic of study (Machi & Mcevoy, 2016). In accordance with the latter, the purpose of the literature presented in this chapter is: (I) to provide an overview of IDG-relevant research and the research questions related to it; (II) to identify gaps in DS concerning IDG; (III) to establish the need for, and specifics of, the study of the IDG.

Initially, a systematic literature review of IDG in DS was conducted. However, the outcome was significantly imitated as only few direct results were generated (less than thirty publications). Table 1 shows Google Scholar hits per relevant keyword and the relevant results amongst them (hits minus duplicates, non-existent sources, etc.).

Table 1. Google Scholar Results for Direct IDG Keywords.

Keyword	Hits	Relevant Results	Comments
"Informal Disaster Governance"	9	6	3 are own publications
"Informal Disaster Response"	17	16	-
"Informal Disaster Risk Reduction"	3	3	-
"Informality in Disaster Response"	0	0	N/A
"Informality in Disaster Risk Reduction"	0	0	N/A

These results were further limited by the identified studies' relevance. Some publications included the search term coincidentally while none included a systematic study on IDG but rather focused on limited sub-categories (e.g. the use of drones for informal disaster response [Greenwood et al., 2020]).

A less rigid search led to the opposite outcome. A Google Scholar search for informal disaster governance (without quotation marks) resulted in an amount of material (over 20,000 results) that could have not been reasonably handled by one researcher within the scope of a thesis. This body of potentially relevant literature is immense due to the replication of scholarships across a range of different disciplines (e.g. urban studies, climate change adaptation, development studies) and their many sub-topics linked to informality. Further, many of these results were irrelevant, as papers may have contained all three terms without bringing them together in a way that would discuss IDG in any way. However, the review of the first 10 pages of Google Scholar search results nonetheless helped to reveal that informality loosely connects to several distinct topics. In DS, this connection particularly concerns collaborative forms of governing risks and disasters, complexity, and networks. In fields related to DS, topics included informal settlements/urbanisation, informal intra- and inter-organisational communication/networks, informal insurance schemes, informal education, and 'Geographic Information System' (GIS) technology for

DRR/R. Given the artificial boundaries and lack of communication across disciplines, other relevant issues which may have been investigated by other disciplines but did not emerge from this search.

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Against this background, a 'traditional' (also: 'complex' or 'narrative') literature review strategy was chosen to present and interpret relevant literature and to arrive at a comprehensive understanding of the current state of knowledge on IDG in DS and related fields, as it provides the necessary combination of accuracy, critical/reflexive synthesis, and interpretation (Machi & Mcevoy, 2016:77–81; Rudestam & Newton, 2015). Due to their broader nature than systematic or meta-reviews, and the ability to incorporate quantitative and qualitative research, traditional literature reviews are well suited to identify patterns, generalisations, and gaps within a specific body of research (Rozas & Klein, 2010:395). Thus, they are particularly useful to identify worthy research directions (Machi & Mcevoy, 2016:4; Strauss & Corbin, 1990:50–53).

Traditional literature reviews "draw upon the literature selectively and appropriately as needed in the telling of [the] story" (Wolcott, 1990:17, 2009). However, that does not mean that they should be 'unsystematic' (Timmins & McCabe, 2005). Thus, next to the analysis of the limited literature on IDG, concepts related to informality in DRR/R, or IDG, were identified, organised, and compared to identify similarities and differences. Finally, they were refined and structured into key concepts. Procedurally, the following steps were taken:

1. **Defining Search Terms.** A list of relevant key words and insightful outliers was collated. This stage proved to be challenging given the difficulty to define and limit relevant key words. A critical step was to acquire a breadth and depth of knowledge through 'venturing'. This included reading and investigating 'off the beaten path' and tracking unassuming references and hunches. Following this procedure, it was possible to discover that '*social participation* in disasters', 'disaster risk reduction *behaviour*', or '*everyday* networks' can be synonymous with IDG even without the mention of the word 'informal'.

2. **Supplementary Search.** Additional sources were identified by consulting other/open databases, known experts, foreign and grey literature, using 'cited by' snowballing, and individual so-called 'smart' recommendations (Appendix B).

3. **Searching Key Databases.** Searches were conducted across multiple databases to avoid publication bias (e.g. geographic bias, bias against publication of negative results). The used databases were Scopus, Web of Science, and UCL explore. Database searching was limited by restricting search terms to the title and abstract fields. However, the search for "informal disaster governance" and derivatives was extended to the full text to identify potentially missed references.

While the search focused on DS journals, apposite literature from other journals (and, thus, disciplines) was considered.

4. **Literature Selection, Management, and Review:** The literature selection and review follows the approach set out by Machi and McEvoy (2016). Reviewing titles and abstracts scanned the search results for relevance. Attention was paid to peer-reviewed and impactful[1] recent and older studies. Relevant literature was saved, skimming the whole text in the next step to exclude irrelevant literature and to map topics as they arose during this process. These were then expanded and refined during the subsequent in-depth review of the remaining literature, and subject memoranda were created. Relevant references were saved to the reference management software, Sciwheel.

2.1.2 LIMITATIONS OF AHISTORICISM, CULTURAL AND LINGUISTIC BARRIERS, AND ACADEMIC SILOS

DS is a young discipline with Samuel Prince's 1920 dissertation on the 1912 Halifax explosion considered to be the discipline's beginning. However, this narrative ignores centuries of disaster thought, which is often inaccurately and simplistically reduced to perceptions of disasters as 'Acts of God'. Disaster thought and practice in ancient China, Greece, Rome, the late Middle Ages or during the Enlightenment period are illustrative (Massard-Guilbaud et al., 2002; Quarantelli et al., 2007; Stuber, 2003). Three significant and interconnected 'blinders' limit the scholars' vision: Ahistoricism, cultural and linguistic barriers, and academic silos.

First, the ahistorical nature of modern DS is problematic. As discussed in section 2.2 below, disaster definitions and 'best practices' are contested and roughly divide into technocratic and vulnerability-based approaches. The latter is said to have started in the second half of the 20th century. Concerning modern DS, this may be true. However, concerning the study of disasters, it is not. For example, the written accounts of eyewitnesses, clerics, and scholars in response to a series of 14th century disasters triggered a wave of disaster thought that overlaps with the disaster thought of today.

The 'modern' characteristics of these centuries-old perceptions are well illustrated by the coinciding disasters of Europe's (and Asia's) Black Death and the 1348 Friuli earthquake[2] in the mountainous border

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[1] As measured by 'journal impact' and 'number of citations' on Google Scholar, which is considered a leading citation analysis tool as it offers: "comprehensive coverage, indexes all categories of publications and counts citations from non-peer-reviewed works, such as practitioner magazines, government documents, and newspapers" (Dumay, 2014:5; Massaro et al., 2016).

[2] The earthquake hit on January 25th with aftershocks lasting until March 5th; magnitude: estimated M 6.9 (Richter scale), intensity: X; Casualties: estimates range from ~5000 to 10.000 (Hammerl, 1994). The earthquake cascaded into several deadly landslides and coincided with the beginning of Europe's 'Black Death' pandemic.

region between today's Italy, Austria, and Slovenia, and felt as far as Rome. Critical of what he saw, German scholar Conrad of Megenberg (1309–1374) wrote in 1350 that the earthquake and the plague were the result of not only natural but especially historical causes that had developed and penetrated society over time. Accordingly, disasters materialised through the inability of elites to spiritually and politically live together, scientific inquiries that sought to self-represent rather than target truth, and politicians who desired to rule the 'simple-minded' rather than realise morality (von Megenberg, 1972:871–878). Rebutting popular explanations[3] for the occurrence of these disasters, von Megenberg directly links and accuses the unreasonableness of the 'dignitaries' for not preventing catastrophes. As paraphrased by Borst:

> The world does not have to wait for its end, it can meet the challenge, not by vain speech, but by truthfulness and justice. If people change their attitude towards each other, the crisis loses its horror. If nothing changes, the spokesmen are responsible for the disaster. (1981:543)

Von Megenberg was not merely an exception of his time. Publishing anonymously due to his religious status, theologist Franciscus Pragensis, examining the causal chain of the earthquake, came to similar conclusions (Borst, 1981:545–546)—as did many others across the 170-odd written accounts of the same disaster series. The coinciding and compounding manner in which the disasters of the 14th century unfolded—earthquakes, the Black Death, floods, wildfires, locust plagues—confronted people with existential fears over the apparently threatened future of the world and would affect thought and writing for the next 200 years (Hammerl, 1994). Disaster thought of that time did not contest God's dominance over the world—which became the prevalent theme of latter Enlightenment thinkers. Rather, it added a dimension by which previously common 'disaster response' attitudes of "pious stagnation in the valley of tears" in the hope for a better afterlife turned to an active appropriation of this world (Borst, 1981:559, own translation). This shift towards more active disaster prevention may not have occurred through an easily discernible unified front, but the change can be clearly seen in the subsequent mindset shifts across political, societal, scholarly, and literary domains. Historians' review of documented scholarly and other thought of that time, points to perceptions that, to use modern disaster lingo, disasters are not 'natural'; they are products of historic vulnerabilities; they affect elites and common people differently; there are important power differentials; and they require multi-stakeholder approaches and for information to across borders (Borst, 1981; Tuchman, 1987).

Humanity today is facing some similar difficulties to the late 14th century, which can, therefore, be called a distant mirror of our time (Tuchman, 1987). Then, as now, disaster risks assumed an overwhelming quality, evoking perceptions of being unprecedented and unpredictable. What was true for the 'strange'

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[3] Variously assumed to be the result of either (I) Jews having poisoned a well (and thus, the disaster led also to the burning of Jews), (II) a planetary constellation, (III) God's wrath against a corrupt society, or (IV) poisoning of the air through miasmas released during the earthquake.

series of 14th century disasters, holds also true for the risks of much of the 20th and 21st centuries—especially when considering risks of nuclear fallouts and climate. Important research themes for the study of disasters were already anticipated seven centuries ago and it is false to state that today's vulnerability and governance approaches to the study of disasters are novel. Yet, 'old' literature is rarely considered in today's scholarly work that emphasises up-to-date literature over the possible lessons gleaned from extant historical accounts. Consider the following statement by Degasperi et al.:

> The most severe damage was caused by the events of 1511, whereas **no information was found for the effects of the 1348 quake which should have been the strongest felt in the town.** (1991:53; emphasis added)

To be fair, this geophysics paper refers not only to context but specifically also to technical data. Yet, medieval authors only 'reluctantly' provide technocratic data to describe disasters. However, as the above accounts show, they may not be as reluctant to provide valuable data and insights that are in accordance with the 'vulnerability stream' of DS. What we might discover from a historical pathology of disasters, could well show that different relations between times of disaster versus 'normal' life, and between victims and helpers, prevailed in different countries and ages. The conclusions of such a historical investigation neither fit into the vulnerability stream's claim to novelty nor into the technocratic approaches of isolating and containing disasters and responding to them as events or objects separate from the social context in and from which they emerge.

Although it appears that modern DS forgot what it owes to history and its influence, some disaster scholars do make an active effort to bring in a more historical approach. Quarantelli et al. (2007) point to ancient civilisations' disaster mitigation efforts. Dynes (2000) as well as Chmutina and von Meding (2019), go back to the Voltaire-Rousseau exchange to demonstrate the substantial tradition of social vulnerability notions of disasters (Ch. 2.2.2). These attempts to bring in a historical perspective are crucial, and DS would do well to incorporate a deeper historical reading. Such a historical reading would have uncovered the above 14th century and onwards concepts not just as a fringe activity but as a significant phenomenon that calls into question our perception of how disasters and dealing with them were viewed long before Rousseau's letters. Oversights by established disaster scholars portraying, for instance, the enlightenment period as the first social movement which shed the dominance of the Christian/religious perspective on disasters and was "moving towards new ways of knowing" (Gay 1973, in Dynes, 2000:100), might have been corrected, adding more weight to viewing disasters through the social vulnerability lens. But, as Borst (1981) laments, current DS is under the spell of technocratic approaches to disasters which were only intensified with the onset of the nuclear age.

This brings us to the second scholarly limitation presented in this chapter, the language and cultural barriers that often prevent such undertakings. This thesis' author only encountered the 14th century literature by reviewing non-English sources. As Borst reminds us (in German), "The most instructive

example of disinterest was shown by French and English historiography, which simply ignored the earthquake" (1981:558; own translation). While this shortcoming may be unavoidable, language and related 'cultural' barriers also work in the opposite manner. The predominantly western tradition of DS literature may have excluded the consideration of literature key to this thesis, due to the academic power structures which hinder non-Westerners' efforts to publish in journals deemed 'relevant'.

A culture of academic silos further limits research. This is a well-known phenomenon across many fields, including DS. To use the 1348 Friuli earthquake example, the disaster has been studied by various academic disciplines other than DS. Geophysical and historical studies form the bulk of this work, though, as mentioned above, much of it in languages other than English. The lack of crossover between the sciences leads to limitations, inaccuracies, and unnecessary repetition of work that is consistently rediscovered as ostensibly 'novel'. Reaching beyond academic silos would cast doubt on the "'supposed' medieval equation of natural disaster and divine punishment" (Rohr, 2003:127). In fact, the evidence shows that the earthquake itself was experienced as something that "belonged to daily life" (2003:127).

These three academic constraints suggest caution and humility when making claims of novelty or 'gaps' based on reviews of existing literature. While this chapter considers literature from across DS and related disciplines, these constraints limits our 'young' discipline and inevitably also this thesis.

2.1.3   KEY TERMINOLOGY

Before diving fully into the next sections that make up the core of this chapter, some terminologies need to be clarified. The definitions given are subject to ongoing debate and, thus, are often based on the lowest common denominator. Nonetheless, they offer a useful and easy to understand baseline for understanding this thesis' key terms.

Governance Turn: Borrowing from International Relations (IR), the governance turn in DS refers to the 'turn' away from DRR/R as a hierarchical command-and-control disaster management practice to the notion that the involvement of all stakeholders and, thus, governance, is vital to DRR/R.

Hazard: "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. [...] Hazards may be natural, anthropogenic or socionatural in origin [and] single, sequential or combined in their origin and effects." (United Nations Office for Disaster Risk Reduction [UNDRR], 2020).

Institution(s): The term institution can refer to governmental or non-governmental organisations; established customs, practices, norms, laws, and other mechanisms which govern behaviour; or meta-institutions (e.g. family). In the context of this thesis, unless stated otherwise, institution(s) refers to organisations (governmental or non-governmental).

Power: The concept of power is crucial to any understanding of society. Given this thesis' focus on the emergence of and tension between the informal and formal realms of DRR/R, the concept of power is central to understanding IDG and FDG and the relationship(s) between them. This section briefly outlines how power is understood and situated within this research.

Leading thinkers including Giddens, Lukes, Bourdieu, Weber, Arendt or Foucault have developed useful theoretical lenses to understand power[4]. They can be roughly divided into modern positions which view power and reality (or 'truth') as opposites, and postmodern positions which hold that power and reality are mutually constitutive (cf. Haugaard, 2012). This distinction is crucial to the understanding of the IDG-FDG dynamic, whereas DG 'truth' is typically dominated by conceptions and mechanisms conceived and developed by official DG authorities. Especially within the concept of DG (Ch. 2.3) which aims to decentralise top-down power structures while 'empowering' local people to retain ownership over their DRR/R matters, in practice, local actors often have little choice, as it is still FDG actors who decide on the priorities and appropriate action, thus, exposing the asymmetric FDG-IDG power relationship (Chmutina et al., 2016). The 'reality/truth' of DG is so still dominated by FDG ideas, processes, and consensus. Conversely, IDG operates within this 'illusion of truth'[5] which IDG actors may contest both vis-à-vis FDG but also 'internally', exposing intra-IDG power differentials (Ch. 6.3) but also DG 'reality' which may differ from official DG 'truth'—or in Haugaard's conception of power, constituting the difference between what 'is' and what 'ought' to be (2012).

These tensions and the underlying power dynamics materialise at various points of the IDG-FDG nexus and are discussed in-depth—conceptually and empirically—and in-context throughout chapters 2 and 6.

Resilience: "The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner" (UNDRR, 2020).

Vulnerability: "The 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" (UNDRR, 2020).

As this project deals with IDG and FDG, other concepts that require a definition are their constituent elements: Formality/Informality, Disaster, and Governance. There is a fundamental lack of clarity concerning these terms. One problem lies in the variety of terms that are used in an interchangeable manner. Additionally, there is no agreement in DS on definitions of 'disaster' and 'governance'. Some

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[4] For a useful review, see: Haugaard, 2003; 2021.

[5] Cf. Lukes' 'false consciousness' (Lukes, [1974] 2005).

fields, such as education, distinguish further between the formal, non-formal, and informal (Coombs et al., 1973; Eshach, 2007; Melnic & Botez, 2014). Hence, these terms are discussed and defined individually in their respective sections below. Definitions notwithstanding, throughout this thesis, for ease of reading, the words informality, informal, and IDG are used interchangeably to refer to those disaster-related practices, processes, action, and actors that are not mandated by official institutions, laws, and regulations, which includes both the informal and non-formal realms.

2.2 DISASTER RISKS AND DISASTERS

2.2.1 WHAT ARE DISASTERS?

With many disasters, it is difficult to determine the boundaries of where it begins or ends. Intuitively, we recognise events such as the 1931 China floods, the 1986 Chernobyl reactor meltdown, or the 2004 Indian Ocean earthquake, as disasters. Often these events are said to possess one or more common characteristics—e.g. fast-onset, large, visible, deadly, destructive, costly, or 'extreme'—and usually seem to demonstrate natural hazards or human error. From this perspective, disasters are regarded as unique, unprecedented, or unpredictable events—even if similar ones have occurred in the past—and often perceived as synonymous with the phenomena or hazards that trigger them, such as earthquakes, landslides, or tsunamis.

But perceptions of what constitutes a disaster can be elusive and controversial. Financial crises or 'fuzzy' situations, such as failed states/regions, even the "environmental consequences of modernity" (York et al., 2003), might be classified as disasters. When compared to the instances mentioned above, they may account for similar or higher numbers of affected lives, resources, and the lost promise of individual opportunities. Similarly, should terrorist attacks be included (Perrow, 2007)? Slavery? Colonialism? Depending on one's perspective, disasters can be defined as everything from individual calamities to incremental historical developments.

Scholars agree that disasters are easier to recognise than to define (Barkun, 1974:51; Britton, 1986:255; Kreps, 1985; Quarantelli, 1998:236), a challenge DS has struggled with since its formal inception with Prince's study of the 1917 Halifax disaster (1920) and which more recently two volumes on 'What is a Disaster' (Perry & Quarantelli, 2005; Quarantelli, 1998) put to rest. To date, no universally accepted definition of what constitutes a disaster, its characteristics and consequences exists (Shaluf, 2007:24). The alternating references to disaster agents and physical impacts, and their evaluation or social disruption, turn the term 'disaster' into a 'sponge' concept that is yet to be clarified (Quarantelli & Dynes, 1970:328).

Disaster definitions have encompassed different foci depending on time, place, interest, and academic discipline (Kreps, 1989:278; Tierney, 2007:504).[6] This has led to definitions of disasters on the basis of technical characteristics including event magnitude (Foster, 1976), level of physical damage (Foster, 1984), economic loss, number of causalities (Michaelis, 1982, in Britton, 1986:257), speed of onset and the 'surprise' effect (Barton, 1969:53), or spatial dimensions (Lindell, 2013; Wallace, 1956). Fischer proposed a 'disaster scale' analogous to the Richter scale to communicate and compare disasters "based upon the degree of disruption and adjustment a community(s)/society experiences when we consider scale, scope and duration of time" (2003:100). This approach perceives disasters as consequences of natural forces, demonstrating a technocratic tendency to view technological progress as universal solution, including to disasters. Technocratic approaches' resulting key concern is the interest in the geo-physical processes that underlie disasters, highlighting the need to monitor, predict, recognise, and mitigate risks while preparing for, responding to and recovering from disasters through the intervention disaster professionals (Hilhorst, 2003:38).

Rooted in natural and exact sciences, these physical underpinnings have contributed to our overall understanding of disasters. However, this perspective does not incorporate "understanding the key problem of vulnerability, which some scholars regard as a far greater determinant of disaster risk than the existence of hazards themselves" (Alexander, 2006:2). In this approach, disasters' effects on different social groups are not considered while resilience as a factor in preventing future disasters is seen through the technocratic lens of the resilience of systems, technology, or the built environment. Yet, the emphasis on social factors and vulnerability is as old as (contemporary) DS itself. Prince's aforementioned seminal work highlights the social impact of disasters rather than its physical agents (Smith et al., 2009:307). Since then, scholars have further examined this dimension and their work has brought attention to the social embeddedness and social construction of disasters (Quarantelli & Dynes, 1977a; Tierney, 2007:507). The sociologists Barton, Fritz, and Quarantelli pioneered the notion of disasters as social phenomena (e.g. the concept of 'collective stress situations') while the 'social problem orientation', starting in the 1990s, placed disasters in the wider context of public policy, perceptions, and history (Kreps & Drabek, 1996). Amongst these scholars, Fritz' disaster definition remains influential:

> [a]n event, concentrated in time and space, in which a society, or a relatively self-sufficient subdivision of a society, undergoes severe danger and incurs such losses to its members and physical appurtenances that the social structure is disrupted and the fulfilment of all or some of the essential functions of the society is prevented. (Fritz, 1961)

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[6] These multiple foci are not surprising due to the many fields intersecting with the study of disasters. Alexander lists geography, anthropology, sociology, development studies, health sciences, psychology, geophysical sciences, and engineering—some of which have not "made a serious attempt to define disaster before studying it" (Alexander, 2005a:26). Pelling adds feminism, management science, IR, institutional economics, human geography and development studies (2003:9). Information science and complexity science constitute more recent additions.

This definition's popularity notwithstanding, elements such as the insistence on physical losses, the notion that disasters are concentrated in time and space, and the 'disaster-as-events' view are problematic and have been contested especially by proponents of social/anthropological approaches to DS according to which disasters are viewed as 'normal' or 'inevitable' elements of life rather than events (Hewitt, 1983; Mileti, 1999; Perrow, 1984, 1999, 2011). From this point of view, disasters do not have a clear beginning, middle, and end, with distinct onset and consequences. Instead, they are deeply complex and inherently "episodic, foreseeable manifestations of the broader forces that shape societies" (Tierney, 2007:509). They are the logical consequences of social, political, and economic circumstances and vulnerabilities. This view introduces into the disaster realm often ignored so-called 'slow-onset' phenomena—though, applying the vulnerability logic to disasters means that all disasters are slow-onset—such as famines, epidemics, or mass migrations (Kreps & Drabek, 1996:132). Borst (1981) notes that adopting this view means accepting disasters as a permanent experience of society and history, an assessment that is profoundly opposed to modern perspectives which prefer 'quick fixes' to isolate disasters in the present, and eliminate them from the past, as they are not supposed to define the future (1981:532).

The social or vulnerability approach to disasters is further at odds with Fritz' and similar definitions as it emphasises human responsibility as key driver of disaster vulnerability. The subsequent focus on DRR and the more recent conceptions of 'disaster risk creation' (Lewis & Kelman, 2012), 'disaster risk production' (Chmutina & Bosher, 2015), or "disaster by choice" (Kelman, 2020) highlight agents of disasters and the 'chosen' social and physical preconditions that cause them. In line with this perspective, Carr, in his analysis of the sequence-pattern of social change in disasters, states that "In every disaster there is a preliminary period during which the forces which are to cause the ultimate collapse are getting under way" (1932:211). Accordingly, decisions that lead to unsustainable development can produce disasters which must be then explained with reference to those forces (Kousky & Zeckhauser, 2006; Mileti, 1999; Wisner et al., 2004). Tierney argues that this focus is necessary to move beyond the disasters-as-events notion and proceed towards recognising the potential of "decisions and actions of government, elites and their financial supporters, and global industries and financial institutions that make disasters inevitable" (2007:510).

Defining disasters through the social lens has done much to advance disaster thought and induced a paradigm shift, albeit imperfect, from reactive management to an emphasis on vulnerability and the proactive governance of disasters. Nonetheless, much of the discussion has and continues to be confined within separate academic disciplines with little cross-fertilisation, with technocratic approaches still dominating some academic and professional spheres (Cutter, 2002, 2005:40–41; White, 1988). However, Britton states that "the proposition of disaster as a social product should not be regarded as an end-product in the quest for a definitive identification of a disaster. Rather, this approach is illustrative of the continuing maturation and the widening understanding of this field of research" (1986:260). Yet other scholars have discussed whether these attempts are feasible or desirable (Alexander, 2005b; Al-Madhari

& Keller, 1997; Kreps, 1989; Oliver-Smith & Hoffman, 1999). Similarly, Stallings suggests that, while there is sufficient discussion about 'what' qualifies as a disaster, the process of deciding 'who' identifies a disaster should also be examined (1991). Disasters are often declared on political grounds with implications over resource allocation. According to Kirschenbaum, "In the United States, a disaster has occurred when the president says it has" (2004:7–8). Conversely, much of what is declared as disaster, is defined "to fit bureaucratic organizational survival needs [in which] disasters parameters are to a large extent an artificial, bureaucratic 'make-work' definition" and would by many not be considered as a disaster (2004:26–27). Hewitt confirms, stating that disasters "have been radically redefined to suit modern, instrumental agendas" (1995:318).

This study supports the view that disasters are contextual. What constitutes a disaster lies in the eye of the beholder, highlighting the need to 'define' disasters through local eyes. A disaster will acquire different meanings for different people depending on their backgrounds and experiences. Physical, social, and medical scientists will all perceive earthquakes differently and will not necessarily define the same events as disasters. From a national perspective, disasters in Bangladesh "almost invariably will be associated with the word flooding"; conversely, when thinking of disasters in Ethiopia, "famine immediately comes to mind" (Al-Madhari & Keller, 1997:18).

This approach constitutes the basis for this study's research methods. Concerning the Arctic, for instance, limited information is available about disasters in the Arctic, and the few disasters that have occurred and were widely publicised in the media are, thus, defined by outsiders. Moreover, new events and trends constantly challenge our field of study and force us to broaden our definition of disasters. Thus, in line with the above principles, including and especially the subjectivity of disasters, this study:

1. embraces a wide conception of disasters which includes a range of natural- and human-induced 'hazard agents' (Burton & Hewitt, 1974), events, and inherent societal processes;
2. regards disasters as "collective stress situations" (Barton, 1969:38) that are an "expression of the vulnerability of human society" (Britton, 1986:254). These are, in turn, driven by issues of power, class, gender, and other "axes of inequality" (Tierney, 2007:503; cf. Bradshaw & Fordham, 2015; Fordham, 1999; Gaillard et al., 2017) and, therefore, represent "primarily a social phenomenon" (Quarantelli & Dynes, 1977b:24), yet, with strong interdependencies between social and physical systems (Wisner et al., 2004), making disasters an inevitable part of life;
3. takes into account wide-reaching spatial, or longitudinal/inter-generational effects;
4. respects that what constitutes a disaster is often local, contextual, and/or subjective, thus, it is not always visible to everyone and is likely subject to biases (e.g. media bias).

In many ways, the above elements arrived at through the reviewed literature are supported by the definition of the United Nations International Strategy for Disaster Reduction (UNISDR), according to which a disaster is:

> A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts. (2017)

In annotation, the UNISDR further states that:

> The effect of the disaster can be immediate and localised but is often widespread and could last for a long period of time. The effect may test or exceed the capacity of a community or society to cope using its own resources, and therefore may require assistance from external sources, which could include neighbouring jurisdictions, or those at the national or international levels. (2017)

A shorter version is provided by Kelman (2020) who defines disasters "as events that require outside help". For the sake of operability, this last definition will be employed as this study's working definition.

2.2.2   THE 'NATURAL DISASTERS' MISNOMER AND THE 'VULNERABILITY TURN' IN DISASTER SCIENCE

In line with defining disasters and the approach taken by this study, the strongly critiqued, yet continuing, use of the term 'natural disaster(s)' requires some elaboration. This term constitutes a point of tension between disaster scientists who suggest that disasters are not natural, and those who continue to use the term. The point of contention is one of cause and effect. Section 2.1.2 elaborated how a 14th century (and onwards) debate predated this discussion in contemporary DS. A similar debate erupted between Enlightenment thinkers in reaction to the 1755 Lisbon earthquake which served as a focal point for the ideological battleground of opposing Enlightenment philosophers to rationalise disasters and to bring them under human 'control' (Borst, 1981; Dynes, 2000; Stuber, 2003). For Kant, the earthquake was unprecedented and demonstrated that 'man-made' (hereafter: human-made) disasters can be tackled, while 'natural disasters' (i.e. the Lisbon earthquake) are events which humanity had recourse only to bear (Kant, 1976). Voltaire used the Lisbon disaster to undercut theological optimism, such as that of Pope's and Leibnitz's, aiming to 'free' humanity through reason, science, and technology. Most notable is the exchange between Rousseau and Voltaire. Threatened in his own religious beliefs, Rousseau protested Voltaire's pessimistic and naturalistic view, pointing to social causes as the key drivers of disasters:

> [...] nature did not construct twenty thousand houses of six to seven floors, and that, if the inhabitants of this great city would have been dispersed more equally and more lightly housed, the damage would have been much less and perhaps of no account at all. Everything would have fled at the first shock, and they would have been seen the next day twenty leagues away, just as cheerful as if nothing had happened. But you have to stay, get stuck around the hovels, expose yourself to new shakes, because what you leave is better than what you can take. (Rousseau, Letter to Voltaire, 1756 in Rousseau, 2005:147 [own translation from French])

Accordingly, disasters could be prevented and the key to preventing them was in creating a better society (Rousseau, Letter to Volatire, 1756, in Rousseau, 2005:147). The exchange between these and other Enlightenment thinkers did not have a unanimous result, but a clear consequence: it tore apart the connection between God and man, nature and history, which continues to influence thought and rifts in disaster thought today (Borst, 1981:562; Dynes, 2000). For Dynes, Rousseau's view of vulnerability as the root cause of disasters, marks the emergence of a social science perspective on disasters (2000). Conversely, the technocratic consequences of naturalistic interpretations, such as Voltaire's, dominated early DS and still persist (Borst, 1981:563–569; Hewitt, 1983).

On the one hand, the Lisbon earthquake, and the city's subsequent development, became symbols for overcoming nature and history by 'enlightened' state administration, 'modern' thought and planning practices. In fact, in the 19th century, technology and medicine completed the utopia of a perfect life in conquered nature by isolating the ills of humanity and dealing with them one by one in expert fashion, ostensibly rendering them harmless (Borst, 1981). The focus of these scholars was to understand disasters through the lens of factors such as magnitude, frequency, damage, or causalities (Ch. 2.1). To ease the process, disasters were now divided into those triggered by natural hazards and, thus, resulting in so-called 'natural disasters' (e.g. earthquakes, volcanic eruptions, tsunamis, landslides), and those triggered by human action, thus, human-made disasters (e.g. nuclear fallout, war, industrial fires).

In this 'physical agent' or 'hazard' paradigms (Burton et al., 1978; Gilbert, 1995; Hewitt, 1995), otherwise known as the 'dominant paradigm' (Gaillard & Texier, 2008), hazards and their potential for damage are the main reference points. Vulnerability is expressed in physical aspects and their propensity for damage: weaknesses in systems, the strength or flexibility of building materials and practices. As for humans, vulnerability then refers to predominantly "being in the wrong place at the wrong time" (Liverman, 1990). This viewpoint comes down to a simple (or, simplistic) cause and effect paradigm: (I) disasters are caused by natural or human-made hazards resulting from errors and interdependencies and are, therefore, uncertain and complex; (II) people with their naturally imperfect knowledge must cope, as far as disaster creation goes, as passive agents while an unpredictable Mother Nature forms the active agent (Gilbert, 1995; Hewitt, 1995). Seen from this perspective, the logical approach is to invest in disaster response and recovery 'mechanisms' that quantify, sense, model, and measure disaster risks and their impacts, as it creates the best chance for human control (Gaillard & Texier, 2008; Hewitt, 1995; Watts, 1983). Thus, the marriage of state and (large) formal organisations as the only competent actors to 'control' nature, and the natural and exact sciences as guiding lights to understand disasters, and formulate appropriate responses to them, was forged.

On the other hand, the increasing ease of developing and applying technical tools led to a growing recklessness in dealing with disasters that ignores their social, political, and economic root causes (Borst 1981). Yet, the related understanding of disasters as 'natural', 'abnormal', 'unpredictable' 'events' has

been critiqued by many scholars since the field's inception, but increasingly so, since the 1970s as "no more valid than the ancient perception of alien habitats and people as intemperate" (Claus et al., 2015:293). Prince (1920) and Sorokin (1942) pioneered this approach by diverging from technocratic views towards a social conception that proposes that disaster vulnerability goes beyond physical attributes and is the predictable result of human-caused social, political, and/or economic vulnerabilities. Maintaining that the effects of disasters are not the same for all individuals, Sorokin later concluded that the future of mankind and its development are in the hands of mankind itself (1958). Similar conclusions had come from Gilbert White concerning flood disasters (1945) while the 1970s saw a small but significant wave of voices referring to ostensibly 'natural' disasters as a 'myth' (Ball, 1975), suggesting to "[take] out the 'naturalness' out of natural disasters" (O'Keefe et al., 1976), advocating for 'Un-Natural Disasters' (Tiranti, 1977) while highlighting disasters' "roots in in political, social and economic conditions" (Ball, 1979).

This concept of vulnerability and its ostensible antonym 'resilience' have had a long history before and throughout DS, resulting in various meanings (Alexander, 2012, 2013; Faas, 2016; Liverman, 1990). Important in the context of this study, is the shift that the social vulnerability perspective brought from perceiving vulnerability as 'physical' 'agents' to 'conditions' (Hewitt, 1995), while emphasising the human responsibility involved. From the 1970s onward, the 'dominant approach' became increasingly critiqued as being too instrumentalist and insufficiently informed by reality "but rather by a social scientific tradition in the West which fragments reality and which promotes a type of functional analysis that is profoundly ahistorical" (Waddell, 1977:75). In parallel, other scholars examined the encroachment of human settlements in hazard zones (White & Haas, 1975), human-made famines (Wisner, 1976), and disaster vulnerability, as the result of introducing alien technologies (Reidinger, 1974), or the effects of poverty, power differentials, and other pre-disaster social conditions on people's ability to deal with disaster hazards (Blaikie et al., 1994; Borst, 1981; Hewitt, 1983; Wisner et al., 2004). Thus, such scholarship—much of it rooted in sociology or disaster work on the ground—began to discuss a new paradigm that rejected the primacy of external disaster agents as the cause of disasters, maintaining that these notions "actually perpetuate and worsen them" (Comfort et al., 1999). Instead, long-standing political, social, and socio-economic vulnerabilities, were understood as disasters' key drivers. Rejecting the dominant "causal relationships involving people and nature" (Hewitt, 1983:276), this research called for "a change in the whole approach to disaster" (Lewis, 1976).

Against the background of human responsibility as the cause of disasters, the vulnerability approach reinforces the notion that most disasters cannot be natural but are products of human choices (Kelman, 2020). As such, disasters "reveal and amplify both the capabilities and the vulnerabilities of the societies in which they occur [with] disaster experiences and recovery trajectories [being] shaped by predisaster conditions" (Tierney, 2020). Thinking back to the 1755 Lisbon earthquake, the disaster only led to such far-reaching consequences because these conditions and vulnerabilities were already in place. From this

vulnerability angle, "human actions, behaviour, decisions, attitudes, and values" create vulnerabilities which, in the face of hazards, may result in disasters (Kelman et al., 2016:S131; Hewitt, 1983; Wisner et al., 2004).

Consequently, the vulnerability paradigm highlights deep-seated power differentials as an important dimension of disasters from their creation to disaster response and recovery. Put differently, some people are more vulnerable than others, which is partially a function of the power to decide. Wisner summarises it aptly when he writes that "people with power in society, and the institutions that wield and channel that power, can reduce or increase the burden of vulnerability or shift it from one group to another through policy decisions" (2020:241). Disasters do not affect all people equally but tend to do so based on vulnerability factors including poverty, gender, age, disabilities, race, class, or ethnicity (Bankoff et al., 2004; Bolin & Kurtz, 2018; Fordham, 1999; Gaillard et al., 2017). These factors are perpetuated by and further maintain (long-standing) unsustainable development practices (Oliver-Smith, 1999). In conclusion, vulnerability and disasters are situational, and the result of human decisions, meaning that "disasters are not natural neither in the sense of being from nature nor in the sense of being normal and acceptable" (Kelman et al., 2016:131) making both the terms of, and distinction between, 'natural' and human-made disasters obsolete. This view and its implications are now firmly embedded in scholarship, policymaking, and practice.

Yet, despite decades of research pointing to its inappropriateness, disasters are still commonly described as 'natural', with scholars continuing to use the terms either out of conviction, habit, or ignorance (Chmutina & von Meding, 2019). Like definitions, words matter as they may "cage and imprison thought and imagination" (Wisner, 2020:240) and, by extension, practice. If disasters are conceived as the results of nature that just 'is' and cannot be questioned, they become 'products' that are 'unavoidable', 'unexpected', or a force majeure. The outcome of this view is a focus on disaster response over disaster creation and reduction. In this image of powerless humans versus an omnipresent, controlling nature, disasters can, at best, be dealt with post-event, through disaster response mechanisms, necessitating the involvement of the state and organisations that have the required (technological) 'capacity' (and authority) to do so. In this perspective, the 'miniscule' human role must be propped up by investments into technologies that can 'match' the power of nature and the disasters it 'throws' at humankind. Current disaster research will miss its goal of preventing future disasters if it does not agree on a broad and multi-faceted concept of disasters that focuses on roots causes over symptoms. To paraphrase O'Keefe et al. (1976), "taking the naturalness out of disasters" is key in this pursuit.

2.2.3 DISASTER RISK REDUCTION VERSUS RESPONSE

How we understand and define disasters has an important impact on how we deal with them (or not). The afore-mentioned attention to the social embeddedness of disasters directs the analytical lens to their

root causes and away from the conception of 'environment as a hazard'. The shift away from viewing disasters as single, sudden-onset, extreme events that require a comparably strong, ad hoc, rapid response by highly trained (often military) staff, together with partly widening disaster perceptions and climate change awareness, has changed the field's mandate in objective and scope. By focusing on the vulnerabilities that 'create' disasters instead of the 'event' itself, the strategy for dealing with disasters shifts from single near-surgical post-event interventions by specialised response teams to an ongoing process, with no clear beginning or end, addressing what is essentially sustainable development.

This process is called 'disaster risk reduction' (DRR). To Drabek, DRR is the "road map of mitigation, response and recovery" (1989, paraphrased in Alexander, 2013:2713). The United Nations Office for Disaster Risk Reduction (UNDRR) defines DRR as the policy objectives of disaster risk management efforts that are "aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development" (2020). Consistent with the vulnerability approach, this definition highlights the need to minimise risks, and places disaster efforts within sustainable development practices. However, previous UNISDR definitions were more direct and useful by highlighting the avoidance and limitation of "adverse impacts of hazards" (2004, vol II:3), while emphasising the "causal factors of disasters" that emanate from exposure and vulnerabilities (2009:10–11). The former recognises that certain events (e.g. volcanic eruptions) may 'become' hazards when met with vulnerability and do not "inevitably have only negative consequences", whereas the latter "focuses on understanding and addressing the 'causal factors'" (Kelman, 2018b:286–287). In contrast to increasingly complex jargon-filled UN definitions and DRR scholarship that can stifle moving knowledge into action, Kelman calls for a return to the basics (Kelman, 2018b:290–291).

Embracing the DRR mindset instead of structural or technocratic disaster approaches has been a welcome move by the latest generation of disaster scientists and many practitioners. Yet, despite examples of DRR successes (Wisner et al., 2004), "few paradigms are panaceas" (Kelman & Gaillard, 2009:133). As Alexander states, more research is required into "inequality, instability and the dark side of the global economy [which] affect disasters [and are] factors of disaster risk creation, not reduction [which] we ignore [...] at our peril" (2016:5). The emphasis is on risk reduction through a focus on its 'creation'. Though not a new idea, recent DRR debates have conceptually catalysed 'Disaster Risk Creation', also encompassed by 'disaster creation' or 'disaster by choice' as a more useful articulation of the vulnerability approach's logical operational consequences (Collins, 1990:66; Handmer, 2003:60; Hoffman & Oliver-Smith, 2020:1; Kelman, 2020; Levine, 1997:4; Lewis & Kelman, 2012; Rumbach, 2016).

In practitioner circles, an obvious challenge is that rhetoric is not necessarily followed by practice; thus, DRR still takes the backseat to disaster response. In the 'field' as in scholarship, "the assumption that engineering approaches always protect and always reduce risk is still prevalent, so that structural or

technocratic approaches are frequently the main, or only, approach selected" (Kelman & Gaillard, 2009:133). Practitioners are also not always informed by the latest scholarship so that this important shift does not enter the design of their programmes. Yet, as Alexander states, DRR is essentially about "transformation rather than preservation of the 'state of the system'" (2013:2707). Conversely, those who try, find themselves navigating the paradox of funders desiring DRR/development language while in practice exhibiting an overwhelming preference for funding more 'visible' disaster response than DRR programmes. Where DRR efforts happen, Boyce challenges their fairness as they generally seem to depend on wealth and power, not on rights to equitable protection (2000). Finally, embedded in sustainable development, DRR involves a wider range of actors across functional scales ('outwards')—e.g. fields of development, humanitarian aid, urban planners; hierarchical scales—decentralisation of disaster efforts 'upwards' to the supranational level and 'downwards' to regional and local levels; and the temporal scale which is the need for intergenerational DRR. Yet, this DG approach to DRR is riddled by challenges from recognising key stakeholders to lack of cooperation and/or power differentials (Ch. 2.3).

In critique of both research and practice, if reducing disaster risks and disasters is about reducing people's vulnerabilities that are necessarily contextual (Mercer et al., 2012), the consideration of the local level, peoples' attitudes and buy-in becomes crucial for success. As O'Keefe et al. put it, "Successful precautionary planning, then in focusing on the population's vulnerability, depends upon the identification of cultural attitudes towards the use of indigenous resources at local and regional levels, and the incorporation into development planning of strategies to mitigate disasters" (1976:567)[7]. In disaster literature, this has been encapsulated by the idea of involving 'other' stakeholders in FDG. These multi-stakeholder or all-stakeholder approaches are called, amongst others, 'participatory' or community-based' approaches. Irrespective of designations and foci, underlying these ideas is the notion of a departure from disaster management, characterised as top-down, hierarchical, command and control, to 'inclusive' DG. This is the topic of the next section 2.3.

2.3 GOVERNANCE

As per the above section, disasters are multi-layered long-term phenomena that require equally multi-layered development-focused approaches to, ideally, prevent their creation and respond to disasters when they manifest. The disaster vulnerability approach dictates—as do rising perceptions of disasters as complex, cascading, or systemic phenomena—that this cannot be achieved in a top-down, command-and-

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[7] In turn, this point and its execution has been critiqued for being driven by top-down and predominantly Western-generated ideas and practices casting significant doubt over actual relevance of participatory DRR on the ground (Gaillard, 2019). This is further discussed in sections 2.3 and 2.4.

control manner. Disasters necessitate the involvement of multiple stakeholders at multiple hierarchical, functional, and temporal levels. In short, a 'governance' approach to disasters.

This chapter reviews the DG concept, its merits, and gaps. Again, we are faced with the need for definitions. Understanding DG requires both an understanding of the term 'governance' and a broader understanding of political, technological, and societal trends. The next section (2.3.1) discusses and defines the term 'governance'. Section 2.3.2 tracks the application and formalisation of governance approaches (thus, 'formal disaster governance' or 'FDG') in DS and practice vis-à-vis disaster 'management' approaches. The final section of this sub-chapter focuses on the limits of FDG. By doing so, this chapter finishes the review of the necessary background to then hone in on the core of this chapter and research project: IDG (section 2.4).

2.3.1 GOVERNANCE

Governance approaches have become increasingly popular since the 1990s, particularly across the spheres of politics, economics, and business management. Also referred to as the 'governance turn'—a move from government/management to governance within much of the 'Western World'—this shift needs to be understood in the context of wider political, economic, technological, and societal developments of the 20th century. These changes were powerfully driven by the dissolution of bipolar world politics, the rise of collaborative schemes such as the EU, globalisation, and the realisation of so-called 'wicked problems'[8], e.g. climate change. Other global challenges include health, crime, rising untenable poverty, and terrorism, which require nations' collaborative and 'networked', efforts[9] (Ferlie et al., 2013; Head & Alford, 2015; Levin et al., 2012; Weber & Khademian, 2008). Concomitantly, communications technologies helped elevate the involvement and expression of people's concerns, ideas, demands, and actions onto the world stage. These developments facilitated the decentralisation of power and responsibilities as a means to both assist nations to collectively respond to the issues they face, and also to elicit participatory internal 'help' from regions, cities, and individual citizens (Rydin & Pennington, 2000). In sum, the above developments led to the subsequent decentralisation of power and responsibilities in three directions: upward, i.e. supranational governing bodies such as the UN or the EU; downward, i.e. regional and local levels of authority; and outward, i.e. Non-State Actors (NSAs) (Jones et al., 2015).

However, the term's meaning is surrounded by ambiguity. Put simply, governance denotes "actions, processes, and systems creating, evolving, and monitoring rules and regulations (e.g. administration,

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[8] For a critical discussion of the concept, see Peters (2017).

[9] Concerning the challenges and limits of collaboration to address wicked problems, especially as they refer to social complexity, see Roberts (2000) and Conklin (2005), chapter 1. For a conceptual critique, see Daviter (2017).

markets, and networks) by which people function within society" whereas government relates to "the bodies that are charged with formalising and enforcing governance" (Kelman, 2015:2). Nonetheless, three elements complicate the use of the term: the complexities of its evolution and its different associations across various realms (mentioned above), fundamental changes of its meaning over time, and difficulties to conceptually differentiate it from the term 'government'. While previously governance referred to the ways of governing in the sense of 'ruling', its post-WWII meaning changed, amongst others, to an "euphemism for repressive national civil administrations when dealing with the civil administrations of dictatorships (to) the transfer of power from states to corporations (and more recently) to a more traditional meaning as one of 'good government'" (Alexander, 2013:2714).

Thus, 'governance' in this normative sense, or 'good governance', functions as an umbrella term for actions or reforms meant to create sustainable and "positive changes in accordance with the principles of: participation, representation, deliberation, accountability, empowerment, predictability, coherence, social justice, and organisation features" (Jones et al., 2015:79). In its purely descriptive sense, governance refers to the sharing of power and collective decision-making by actors across different functional and hierarchical levels concerning particular issues and/or policy domains (Goodwin, 1998; Renn et al., 2011). This view of governance shifts it from a state- or authority-centric focus to one that examines wider mechanisms of 'collective' and/or 'collaborative' governance, involving "the resources, values, intelligence, capacities, and technologies of various multi-stakeholders [including] political and economic institutions, the civil society forces, market and business sectors, military organisations, and people [across] local, national, and global scales and arrangements" (Blanco, 2015:744). Thus, for governance to be at all possible, there must be (the acknowledgement of) what Stringham calls forms of 'private governance' (2015), the will and the possibilities for people's 'active' participation and collaboration across hierarchical, spatial, and functional levels (Intergovernmental Panel on Climate Change [IPCC], 2012; United Nations International Strategy for Disaster Reduction [UNISDR], 2015a). So, while governmental activities are a fundamental part of governance, governance by so-called NSAs is an integral, exceptional or complementary, element.

The emphasis on active participation across hierarchies and domains, thus, governance as sharing of power and responsibility, is also reflected in Rosenau's influential work (Rosenau, 1992b, 1997; Rosenau & Czempiel, 1992). In contrast to state-centric views, Rosenau maintains that governance encompasses "spheres of authority at all levels of human activity—from the household to the demanding public to the international organisation—that amount to systems of rule in which goals are pursued through the exercise of control" (Rosenau, 1997:145). Put differently, the exercise of governance is not only defined by the functional status of its holder but equally by exercising control, thus, "the structures and processes by which societies share power" (Lebel et al., 2006). Accordingly, governance includes "**any actors** who resort to **command mechanisms** to make demands, frame goals, issue directives, and pursue policies" (Rosenau, 1997:145). However, Rosenau himself observes that the use of terms such as 'command' or 'managing'

is misleading as it implies hierarchical structures that can exist but are by no means a precondition for governance—'taking control' of a situation or 'steering' it may be more appropriate terms to "highlight the purposeful nature of governance without presuming the presence of hierarchy" (1997:146). Conversely, taking control also implies the possibility of governance without, or beyond, government, which may or may not be opposed to formal action, and as such, may or may not be tolerated (Ng, 2016; Peters & Pierre, 1998; Rosenau & Czempiel, 1992).

Therefore, the governance perspective raises fundamental practical and philosophical questions about the power and mandates of institutional and non-institutional actors vis-à-vis collective issues and the responsibility over them. Stoker (1998) divides these into the following five propositions, and as usefully summarised and expanded upon in Goodwin (1998:8):

1. governance refers to a complex set of institutions and actors that are drawn from government but also beyond;
2. governance identifies the blurring of boundaries and responsibilities for tackling social and economic issues;
3. governance identifies the power dependence in the relationship between institutions involved in collective action;
4. governance is about autonomous self-governing networks of actors;
5. governance recognises the capacity to get things done which does not rest on the power of government to command or use its authority [...].

Despite of the lack of a universally accepted definition of the term, the above background informs the working definition of this thesis. Governance in the context of this research project must go beyond the mere highlighting of the involvement of multiple stakeholders as has become a common shortcut to define the term. Instead, governance begins and ends with issues surrounding power, with direct effects on who is to be included in this 'pool' of multiple stakeholders and on what terms. Thus, governance here is understood as *the collaborative efforts of stakeholders across hierarchical, functional, geographical, and temporal boundaries, as well as boundaries of vulnerability and exclusion, who are encompassed in a system that puts forward the necessary structures and processes that allow for equitable and just collaboration and power sharing between formal and informal stakeholders concerning issues that matter to them or require action.*

2.3.2 FROM DISASTER MANAGEMENT TO DISASTER GOVERNANCE AND PRACTICE

Consistent with the broader governance turn, the notion of governance has also entered DS and practice, especially following Gray's concept of 'collaborative governance' (1989). Since then, DG has become integral to DRR/R (Tierney, 2012). Borrowing from IR terminology, this development can be described as the 'governance turn' in DS which represents a paradigm shift from (technocratic) disaster

'management' to governance as a more comprehensive approach to DRR/R. This shift is attested to by the proliferation of various, sometimes interchangeable, DG-related terms[10] including: 'participatory governance', 'governance for adaptation', 'disaster risk governance', 'risk governance', 'integrated risk governance', 'environmental governance', or 'multi-level governance in disasters'. Table 2 summarises prominent concepts and their unifying themes which, in line with Newell et al.'s (2012) review of environmental multi-actor governance, can be roughly divided into four broad categories: typologies; origins and proliferation; effectiveness and impact; legitimacy and accountability.

Table 2. Disaster Governance and Selected Other Denominations and Related Concepts.

Term	Selected Studies	Common Themes
Disaster Governance	(Lassa, 2010, 2015, Miller & Douglass, 2016a, 2016b; Tierney, 2012)	Drivers (structural/institutional) Decentralisation Globalisation
Disaster Risk Governance / Governance of Disaster Risk Reduction	(Ahrens & Rudolph, 2006; Bang, 2013; Blackburn, 2014; Castellano, 2011; Gall et al., 2014; Gaston et al., 2012; Jones et al., 2015; Kelman, 2015)	Complexity and uncertainty Collaboration and cooperation Institutional and coordination failures Adaptive capacity Drivers (hazards)
Environmental Governance	(Balsiger & Debarbieux, 2011; Betsill & Bulkeley, 2004; Bulkeley, 2005; Lemos & Agrawal, 2006; Newig & Fritsch, 2009)	Focus on single hazards (e.g. floods, volcanic eruptions, earthquakes) Climate change and environmental disasters/policies
Adaptation Governance / Governance-for-Adaptation	(Aoki, 2016; Bronen & Chapin, 2013; Eakin et al., 2011; Fisher & Surminski, 2012; Tennberg, 2009)	(Transboundary) Risks and disasters Complex issues / 'wicked' problems Actors: Communities / cities / regional governments / supranational institutions / local institutions / NGOs / elites Focus predominantly on Asia / Africa / EU Informal institutions Networks
Risk Governance / Risk-Based Governance	(Carabine & Wilkinson, 2016; Castellano, 2011; Renn, 2008; Renn & Schweizer, 2009; van Asselt & Renn, 2011; Walker et al., 2014)	Tools Cross-scale/ hybrid governance partnerships (e.g. state-market-community) Participation
Climate Governance	(Andonova et al., 2009; Bäckstrand, 2008; Hoffmann, 2011; Jordan et al., 2015; Okereke et al., 2009; Tennberg, 2009)	International governance regimes Efficiency Legitimacy Accountability
Collaborative / Networked Disaster Governance; Co-Governance	(Bae et al., 2016; Howes et al., 2015; Kapucu, 2011; Srikandini et al., 2018; Vachette, 2016, 2017; Wilkinson, 2015)	

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[10] For simplicity, the researcher of this study prefers the term 'disaster governance' due to its broader encompassing nature (Tierney, 2012). In the context of this research, the use of the qualifier 'collaborative' is seen as unnecessary because the concept of DG, as defined here, is by default a collaborative effort and, unless stated otherwise, assumed.

While differences between these concepts are mostly cosmetic, some are fundamental, e.g. the different foci of environmental governance and DG literature. While the former focuses on formal, supranational, or global governance arrangements (and subsequently the more visible issues of accountability and legitimacy), DG literature often highlights 'lower' levels of authority, e.g. local or regional sub- and NSAs. Further, Tierney refers to substantial differences between risk governance and DG, with the latter classified as a subset of the more encompassing concept of risk governance which, next to hazards and disasters, includes the "full range of risks recognized by human societies, including health and medical, safety and security" (2012:343).

However, more important than the differences between them are their relatively similar foci across meta-discussions of DG itself (rationale and evolution), or questions concerning DG actors and tools (modalities). In short, who is 'doing' DG and how. These are discussed in the section below followed by this thesis' working definition of DG.

2.3.1.1 Evolution and Rationale of Disaster Governance

To explain the evolution and rationale of DG, it needs to be explained in terms of: (I) broader global[11] trends including globalisation, political shifts, decentralisation, and climate change; (II) the vulnerability approach to disasters and the recognition of a more complex disaster reality (Chs. 2.1 and 2.2); and, (III) a general ineffectiveness of, and dissatisfaction with, reactive disaster management.

<u>(I) Global Trends: Political, Societal, and Technological Drivers of Disaster Governance</u>

DG has been powerfully driven by globalisation and accompanying decentralisation (Maskrey, 2011; Oldham & Astbury, 2018; Reinsberg & Westerwinter, 2019; Tierney, 2012). The globalisation of disasters is not a new phenomenon considering previous historical accounts provided earlier in this chapter or the 20th century's two world wars. However, full recognition of this phenomenon came about only in the 1990s and can be attributed to at least four interconnected developments:

Globalisation of Disasters

The globalisation of conflict during the first half of the 20th century and the transformation of this development into "regional and national proxy wars by the major power blocks [...was...] instrumental in breeding 'complex emergencies' characterized by political, military, social and economic breakdown" (Alexander, 2006a:4). Adding to these are hazards and crises driven by global phenomena, e.g. climate change or economic interdependencies (Forino et al., 2015; Levin et al., 2009; Levin et al., 2012; Tierney, 2012). In reaction, worldwide awareness and acknowledgement of disasters' complexity increased, including their often global significance, and prompted an increase in international humanitarian

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[11] It is important to remember here that 'global' does not mean 'applies (equally) to all countries/communities'.

responses (Alexander, 2006a:4). Ironically, these conflicts, crises, and humanitarian malpractices, included short-sighted crisis and disaster response that have also led to, or increased, disaster vulnerabilities and, thus, disasters (Macrae, 2002). Taken together, these developments have driven the (perceived) need for increased coordinated international assistance.

Information and Communications Technologies

The growth of information and communications technologies has elevated disasters to the world stage. Provided media coverage, even disasters in remote locations of the world may not go unobserved, prompting international 'participation' from the individual or household level to international humanitarian involvement (Alexander, 2006a:3). On the individual level, digital social connectivity heightens people's sense of disaster participation. This can provoking public pressure on national and international actors to intervene, or prompt individuals themselves to become involved, e.g. as 'digital humanitarians' in remote GIS provision networks, crowdfunding initiatives, or by disseminating written or pictorial information (Laituri & Kodrich, 2008; Leson, 2017; Park & Johnston, 2019, 2018; Schmidt et al., 2017; Sutton et al., 2013; Whittaker et al., 2015). Consequently, tools and tasks traditionally under the sole purview of formal state and organisational DRR/R actors, "have been transformed into a more dynamic, more transparent, and decentralised form with a wide participation" (Kawasaki et al., 2013:201).

International Travel

Operationally, the ease of global travel has facilitated the logistics involved in humanitarian and disaster response, further supporting the globalisation of DRR/R. Especially large governmental and non-governmental organisations—including national armies' disaster response wings, the United Nations (UN), or the Red Cross and Red Crescent Societies—have created substantial logistical mechanisms to enable swift international DRR/R (Alexander, 2006a:3). Simplified international travel also emigrants enables to extend hands-on involvement to their former countries. Similarly, a consequence of today's well-travelled societies is people's heightened feelings of crisis involvement in places to which they have built connections. An example of this has been the refugee crisis of the last decade, prompting personal engagement by emigrants, former travellers, and other individuals through either direct participation, or the exertion of pressure/encouragement on FDG to do so (Guribye & Mydland, 2018; Haaland & Wallevik, 2019; Kitching et al., 2016).

Political Changes and Decentralisation

The state of affairs outlined above is inherently connected to the wider globalisation trends and the fundamental political changes of the past century. Particularly, following the dissolution of the Soviet Union a "period of confusion in IR and growing moral crisis in humanitarian assistance" set in (Alexander, 2006a:4). Subsequent political reforms drove the decentralisation of state authority, elevating the voice and practices of sub-national administrations and NSAs. However, true decentralisation "must not be

confused with deconcentration"—whereas the former constitutes "devolution, i.e. a transfer of decision-making authority from central to local governments" or communities, the latter merely refers to a "transfer of authority within central administrative structures (Ahrens & Rudolph, 2006:215). Specifically with disasters, decentralisation is understood as the "preferred means for bringing government closer to the people, and is tied to an expectation that people and their communities will become more empowered to politically articulate their needs and priorities through public decision-making" (Miller & Douglass, 2016b:1). Further, decentralisation is expected to counteract institutional limitations (Chs. 2.3.2.3, 2.3.3) by offering a quicker and localised—in terms of resources and knowledge—response (Miller & Douglass, 2016b; Tierney, 2012).

(II) Disaster Realities as Drivers of Disaster Governance Approaches

In as much as the above developments signify important changes across much of the world—particularly following the end of the Cold War—DG is equally driven by global challenges that require nations' concerted efforts. These include climate change, global health concerns, crime/terror networks, and (other) disasters. The decentralisation of power and responsibilities can both help nations to collectively respond when one nation's abilities would not suffice, but also to galvanise 'help' internally, requiring public participation within nations, including regions, cities, and citizens (Rydin & Pennington, 2000).

This acknowledgement attests to the important shifts in perceptions of disasters as fundamentally social, contextual phenomena (Chs. 2.1 and 2.2). The shifts in mindsets concerning the more complex nature of disaster realities have driven the perceived and actual need for DG approaches. Prominent ideas in this regard are encompassed by the concepts of: vulnerability as a driver and, thus, the need for DRR and sustainable development; cascading disasters; or wicked and super-wicked problems. Underlying them all is the notion that disasters are complex phenomena that can only be tackled collaboratively and at all levels; hence, governance. Similarly, contemporary disaster concepts—including complexity and network theories, cascading and cross-border disasters, wicked, super-wicked or collective action problems, and 'normal accidents'—embrace that disasters cascade, and, thus, must also be tackled, across various boundaries which comprise one, several, or all of the following dimensions:

- **Functional Boundaries:** Generally, a failure in one part of a system propagating to another (seemingly unconnected) part via complex rather than linear interactions, e.g. a power failure affecting water supply (Boin, 2009; Helbing et al., 2006, 2015, Perrow, 1984, 1999, 2011; Pescaroli & Alexander, 2015);
- **Geographic/International Boundaries:** Vulnerabilities and disasters crossing, physically, socially, and/or digitally, national and natural borders, e.g. a flood of a river that demarcates a border, a

lightning strike on a mountain peak between two countries on a busy day[12] (Boin, 2009; Edwards, 2009; Field & Kelman, 2018; Hamdani, 2014; Hansen & Nissenbaum, 2009; Kapucu, 2011; Wachtendorf, 2000);

- **Temporal Boundaries:** Gradual/delayed phenomena often connected to policymaking, e.g. climate change, accumulation of pesticides over time, unsustainable harvesting methods, (Duit, 2011; Levin et al., 2012);

- **Societal/Hierarchical Boundaries:** e.g. the transmission of vulnerabilities from one part of society or a community to another as, for instance, exemplified by the so-called 'downstream problem' (Wachtendorf, 2009).

Consequently, rather than viewing disasters as events that can be 'managed' by a select few experts in a professional, top-down, command-and-control and manner, scholars and practitioners now converge on the idea that effective DRR/R approaches necessitate the proactive collaborative input and effort by experts across: academic disciplines (e.g. exact sciences, social sciences, and humanities); professional fields (e.g. development, urban planning, construction, emergency services, private sector); policy spheres (from supranational organisations, via national and regional government, to local municipalities and cities); and, 'communities', 'local stakeholders', 'non-traditional actors', or simply 'people'. For example, in terms of vulnerabilities as a disaster root cause, their tackling via sustainable development involves, by its very nature, governance by a multitude of stakeholders rather than top-down management by government or other mandated instances of authority. Similarly, concerning the temporal dimension, if disasters are viewed as processes and not events, then the DG approach must include a long-term—and, necessarily also a multi-stakeholder—view that considers historical lessons and knowledge, intergenerational efforts, and intergenerational consequences. The latter has been particularly emphasised by literature on '(super-) wicked problems' (e.g. disasters, but climate change, and related issues) and related 'sticky' policy approaches or governance solutions that consider path-dependencies to achieve desirable long-term effects (Humphreys et al., 2017; Levin et al., 2009; Levin et al., 2012; Rosenbloom et al., 2019). In short, DRR/R requires input across hierarchical, functional, geographic and temporal boundaries. This has been discussed in greater depth in the preceding sections.

In sum, the conditions and mindsets summarised above partially[13] account for the increasing emphasis on governance and the 'governance turn' in DS and practice. Recognising disasters' transboundary nature means that they then also need to be dealt with in an equally transboundary fashion; thus, 'governance'.

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[12] A recent example is the August 2019 lightning bolt that hit Giewont mountain in the Polish/Slovakian Tatra mountain range, killed five and injured over one hundred people, and required immediate, coordinated cross-border emergency response (Cappucci, 2019).

[13] I.e. also developments across other fields, notably business management, economics, and urban studies, influenced this discourse.

<u>(III) The Limits of Disaster 'Management'</u>

Yet, DS points out to the extraordinary limitations of traditional DRR/R-tasked governmental and other institutional bodies when supposed to engage in such cross-boundary[14] DRR/R—or DG—efforts (Boin, 2009; Boin & Lagadec, 2000; Lagadec, 1997; Perrow, 2007). Accordingly, formal institutions often lack the knowledge, incentives, coordination mechanisms or flexibility to prepare for, prevent, and respond to, disasters, and their often hierarchical 'non-governance' and/or technocratic approaches to DRR/R pose further limitations to deal with disasters efficiently. Much of this critique focuses on functionalist limitations, which are those stemming from these actors' institutional design, including: problems associated with inter- and intra-organisational communication and coordination within/across borders; lack of (local) knowledge resulting in inappropriate DRR/R and subsequent diminishing local buy-in; or inflexibility associated with bureaucratic structures, resulting inefficiencies, and inertia when speed is required (Boersma et al., 2014; Boin, 2009; Boin & Lagadec, 2000; Comfort & Kapucu, 2006; Quarantelli et al., 2007; Uitto & Shaw, 2016). As much of this critique also applies to DG itself, this is further discussed in chapter 2.3.3.

2.3.1.2   Disaster Governance Modalities—Actors, Relationships, Means

As governance potentially includes any actor who chooses to take control over a situation (Ch. 2.3.1), the questions of who these actors typically might be emerges. The decentralisation of disaster authority can both help nations to collectively respond to disasters when one nation's capacity is insufficient, and also to enlist 'help' externally and internally. Consequently, DG agency is said to have shifted upwards to the supra- and international levels[15]; outwards across functional (e.g. private sector) and geographic (e.g. online communities) boundaries; and downwards to the sub-state, regional, and local level in an attempt to deal with humanity's common crises, which cannot be compartmentalised in states or sectors (Brundtland, 1987; Hedrén & Linnér, 2009; Rumbach, 2016; Tierney & Oliver-Smith, 2012).

This research is particularly interested in the latter, the local level. Attempts across the literature to categorise sub-national DRR/R actors range from simple distinctions, between private versus public actors, governmental versus non-governmental, professional versus non-professional, to more elaborate concepts such as the multi-track diplomacy model developed by Diamond and McDonald (1996). This model has nine separate categories, distinguishing between: (I) government, (II)

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[14] The term 'cross-boundary' is here understood as an umbrella term for DRR/R that crosses the range of functional, sectoral, temporal, societal boundaries or geographical borders.

[15] Accordingly, the now globalised issues of climate change adaptation and sustainable development, each of which hold direct consequences for DRR/R, constitute collective action problems. Official statements calling for international cooperation, culminating in the creation of supranational institutions and organisations, are testament to this development.

nongovernment/professional, (III) business, (IV) private citizens, (V) research, training, and education, (VI) activism/advocacy, (VII) religion, (VIII) funding, and (IX) communications/media. As such, distinctions are made between institutional and non-institutional actors. Similarly, disaster scholars confer DG-actor status to: DRR/R-mandated governmental municipal bodies and cities, emergency services, non-governmental and -profit organisations, (urban) planning agencies, educational institutions, public health institutions, religious institutions, or mandated and non-mandated community groups, (online) volunteers, voluntary associations, and private sector actors (McLennan et al., 2016; Miller & Douglass, 2016b; Parthasarathy, 2015, 2016; Rumbach, 2016; Schmidt, 2019; Tierney, 2012). Despite being schematically useful, such ostensibly clear-cut categorisation of are problematic. Particularly in disasters, actors may not act in their usual capacity either when caught in a disaster, where they need to act informally, or because they fulfil different roles, as happens especially in the case of smaller locales.

Clearly, the decentralisation of DG has opened up DRR/R to a range of mandated institutional actors—who provide DRR/R-related efforts—and (traditionally) non-mandated institutional and non-institutional actors—who contribute to disaster-related efforts based on emerging needs and their will to engage. For the latter, two powerful examples are represented by the actions of private sector actors in New York following the 9/11 attacks in 2001, and, more recently, of private European-wide citizens who flocked to the Greek islands of Lesvos and Chios to deliver—privately and later as newly founded organisations—vital services for refugees in the absence of formal politically based help (Guribye & Mydland, 2018; Haaland & Wallevik, 2019; Kitching et al., 2016).

However, a more important point than making "simplistic divisions between either public or private actors, national governments or communities", is the relation between these actors (Fisher & Surminski, 2012:20). When engaging in DG, the numerous actor types and entities, and the myriad of connections between them, create a "complex web of informal networks" and interactions between multiple stakeholders, sectors, and hierarchical levels (Egnell & Haldén, 2009). These, by their nature, respond in a non-linear fashion that is juxtaposed with the expected behaviour of classical state/organisational hierarchies. However, 'how' the various DG actors might interrelate remains understudied (Fisher & Surminski, 2012:14; Lassa, 2015; Silverman et al., 2019).

Recently, network approaches to DG have emerged as one way to explore this issue. While collaborative networks have received considerable attention, e.g. in the fields of complexity science and network theory, the idea to look at networks in disaster studies is relatively new. Thus far, network research into DG has focused on establishing its relevance by offering answers to actors' characteristics (e.g. diversity, betweenness, centrality), the nature of ties (e.g. weak or strong) and overall network patterns (e.g. emergence, duration, and stability/volatility), or forms of DG networks including ad-hoc, repurposed, or digital ones (Carrero et al., 2018; Chatfield & Reddick, 2017; Helbing et al., 2006; Lassa, 2015; Park & Johnston, 2019; Parthasarathy, 2015; Roasa, 2013; Sadri et al., 2018). However, research concerning the

practical nature of these disaster-related efforts, that is, the type of disaster assistance that might 'flow' via these networks, e.g. material, hands-on, financial, legal, and emotional, as well as when, why, and how it might do so, is lacking (Carrero et al., 2018).

Participatory Approaches, Community-Based DRR/R, and Social Networks

With an emphasis on responsibility-, capacity- and input-sharing with local DRR/R stakeholders, community-based DRR/R (CB-DRR/R) and related participatory approaches have assumed prominence as "increasingly important elements of vulnerability reduction and disaster management strategies" (Allen, 2006). The decentralisation of DG has unlocked possibilities for increased community participation. Participatory approaches to DRR/R seek the input of 'people', 'local stakeholders', 'citizens', or 'the public'. Highlighting the local level, scholars maintain that local populations often: understand local risks more intimately; are the first responders when disasters hit and need to cope, recover and live with the consequences; and, have access to both local knowledge and networks (Allen, 2006; Cadag & Gaillard, 2012; Carabine & Wilkinson, 2016; Falleth & Hovik, 2009; Miller & Douglass, 2016b; Stallings & Quarantelli, 1985; Wisner et al., 1977). Consequently, the consultation and involvement of this level constitutes a cornerstone of the DG approach. Drawing on Hilhorst (2003), Warner explains the issue pointedly:

> Therefore, it would seem prudent to consult and involve stakeholders in decision making on the type and modality of protection they should get when the next disaster strikes. Therefore, the international aid community calls for local stakeholder involvement in planning for and response to extreme events both to promote public awareness and preparedness and to improve coordination and communication between the public sector, the aid relief sector (often private or NGO) and local citizens. (2008:567–68)

Considered a fringe approach pre-1990s, CB-DRR/R can be seen as the result of decades of lessons learnt and the subsequent shift from top-down, technocratic disaster management to embracing vulnerability-based DG. More recently, CB-DRR/R has become a central part of DG, emphasised across national policies and supranational guidelines (Shaw, 2012; The Sphere Project, 2011, 2018, UNISDR, 2005, 2015b), and "mainstreamed to the point of orthodoxy" (Maskrey, 2011:46). Operationally, CB-DRR/R or localised DRR/R, is achieved through local participation, feedback, accountability, and ownership (Curato & Calamba, 2020:243), e.g. as manifested through the sharing of knowledge and best practices, community-based micro-loan initiatives, or capacity-building programmes. When done successfully, DRR/R is hoped to become more relevant, equitable, efficient, and accountable (Wilkinson, 2012:155–156). These aims are consistent with contemporary research which posits that deepening CB-DRR/R research, practice and adaptation have the potential to: highlight overlooked local vulnerabilities and knowledge; close science gaps by gathering data through participatory activities (e.g. monitoring); shape policies to make them more relevant to the local realities; and raise the awareness of and empower local stakeholders in order to encourage more risk-averse development before disasters, and faster recovery after they occur (Bartels et al., 2014; Bdeir et al., 2016; Starkey et al., 2017).

Drawing on the above, DG, specifically when community-based, represents democratic ideals of giving citizens a voice in their (political and otherwise) governance, itself another important factor contributing to the rise of DG following the political changes in the late 1980s and 1990s (Callahan, 2007; Innes & Booher, 2004; Michels & De Graaf, 2010). Outside of DS, this has been prominently identified by Arnstein who, critiquing her time's "exacerbated rhetoric and misleading euphemisms" concerning citizen involvement, referred to this as the 'ladder of citizen participation' by which citizen can be either treated as passive recipients of policies and subsequent action, or, through the above modalities, enact 'citizen control' over their own DRR/R needs (1969). Applied to DRR/R, and much along Rosenau's work (1992a; 1992b), participatory approaches are, thus, about reframing DG strategies towards (pro)active modes of action in which power ('control') is shared amongst stakeholders at every stage of the DRR/R process.

The aforementioned disaster network lens proves particularly useful to demonstrate such pro-active behaviour and subsequent potential for stakeholder control/power. Next to transcending functional boundaries, actors and their efforts' also cross national borders. As such, these efforts challenge traditional concepts of territory, both in their own right, and through the attitudes and possibilities they beget. Citizens are increasingly contesting authority because of an "erosion and dispersion of state and governmental power and the progressive weakening of other societal institutions" (Rosenau, 1992a:275), but also because of the rise of the individual's voice in world affairs, not least due to the advancements in communications technologies and subsequent cultural changes mentioned above.[16] Especially important is how the resulting diverse networks may operate "beyond effective control by formal governance structures" (Jones et al., 2015:46). In the words of Rosenau and Czempiel (1992), this represents "governance without government". Elaborating on this succinct expression, instances of DG morphing into de facto foreign policy actions, effectively constitute a form of disaster para-diplomacy (Kelman et al., 2006). By participating in cross-border negotiations about collaboration and coordination of DRR/R, stakeholders engage in parallel, everyday forms of diplomacy (Constantinou, 2016), and transgress into the traditional prerogatives of states and professional experts—politicians and diplomats—but also scientists, lawyers, and others (Lipschutz & Rowe, 2006). This expansion of operational mobility and influence directly challenges and moves beyond a markets-and-states definition of the political realm; alternatively, it can also be regarded as a result of state transformation, rather than its decline (Pierre & Peters, 2005). This changing context, whatever the reason, has led to changes in behaviour and has resulted in some people/communities engaging in their own collaborative governance to respond to issues of concern to them (Carrero et al., 2018; Cavalcanti, 2020; Daly et al., 2017; Ng, 2016; Parthasarathy,

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[16] This idea itself, however, precedes the technological developments of the 1990s and goes back to industrialisation. For instance, see the work by the sociologists Beck and Beck, especially *The Normal Chaos of Love* (1990).

2015). As such, local forms of DG are not only obviously political but subject to their own power relations, as further elaborated on in sections 2.3.3.

2.3.1.3   Arriving at a Working Definition of Disaster Governance

In principle, and as per the wider governance definition above, DG refers to the "structures and processes by which communities share power" (Lebel et al., 2006) for disaster-relevant issues by involving "a multitude of actors and processes that lead to collectively binding decisions (van Asselt & Renn, 2011:431). However, the cacophony of DG approaches has led to ambiguity surrounding the term. For instance, there is a little-discussed confusion between the terms of DG and 'disaster risk governance' (DRG). While often used interchangeably, their delineations concerning DRR and DR activities are blurred. While both can be subsumed under risk governance, it is not clear whether DG or DRG encompasses the other. Tierney, for example, uses in her seminal paper only the term DG and sees it as encompassing DRR/R activities (2012:342–344). Similarly, Ikeda and Nagasaka, are content that DRG 'incorporates' the means of DRR (2011), whereby DRG becomes a subset of DG. However, UNDRR only defines DRG, and as "The system of institutions, mechanisms, policy and legal frameworks and other arrangements to guide, coordinate and oversee disaster risk reduction and related areas of policy", whereas the annotation reads "Good governance needs to be transparent, inclusive, collective and efficient to reduce existing disaster risks and avoid creating new ones" (2020). This definition is clear in that disaster risk governance applies to DRR but less clear as to what the 'related' areas are. Can it be construed as an implication that DG does not apply to disaster response? Or, perhaps this choice is the tokenised result of creating language to visibly encompass these two popular approaches? Another problem is the ambiguity of meaning concerning the term 'inclusive'. Instead, the words referring to who, or what, is to be included—institutions, mechanisms, policy, and legal frameworks—seem to imply a certain formality of these entities. 'Mechanisms' could also mean non-formal mechanisms, but, as with the latter 'other arrangements', their meaning remains vague and no other annotation or explanation is provided.

In accordance with its English meaning, 'governance' in relation to disasters implies all actions encompassing risk reduction and disaster response. Thus, DG here refers to all disaster-related efforts, including DRR and DR. Further, it bases itself on the underlying notions of DG which, despite definitional ambiguities of the term itself, are clear: (I) disasters pose complex problems which (II) require the involvement and buy-in of stakeholders across different hierarchical, functional, geographical, and temporal levels, and, thus, (III) DRR/R requires inclusive ways to deal with disaster risk and disasters, including pre-disaster activities of preparation, planning, and mitigation (together labelled as DRR) and in post-disaster activities, including response, recovery and reconstruction (Jones et al., 2015; Kelman, 2015:1; Tierney, 2012; UNISDR, 2015b:9–13). Thus, against this background, this research project views DG as the *purposeful de facto power- and responsibility-sharing formal and informal actions by*

stakeholders across functional, hierarchical, geographical, and temporal boundaries to mitigate, prepare for, and respond to, disasters.

2.3.3   THEORETICAL AND PRACTICAL LIMITS OF FORMAL DISASTER GOVERNANCE

DRR/R has traditionally been perceived as the responsibility of formal disaster management and, later, as the governance systems consisting of governmental and non-governmental agencies, NGOs, or emergency responders (ambulance, police, and fire department). More recently, the role and involvement of non-traditional actors for disaster-related efforts have been recognised and encouraged for more equitable, just, effective, and efficient DRR/R. Inherent to the DG approach, is the intention to remedy the limitations of technocratic, top-down disaster 'management' systems. This rectification is achieved through a conceptual and operational reorientation towards a wider conception of disasters and their social embeddedness and construction, as per: the vulnerability approach, DRR, decentralisation of responsibilities, inclusion of sub-stake and non-traditional stakeholders, and, with it, better DRR/R (Bankoff et al., 2004; Hewitt, 1983; Wisner et al., 2004). Progress has been made on a terminological level, shifting from management to governance or from a technocratic response-oriented terminology to one of sustainable development aimed at reducing disaster risks and improving best practices of disaster response. However, this progress has yet to be fully reflected across DG research as well as substantiated in practice (Ahrens & Rudolph, 2006; Tierney, 2012).

In fact, disaster scholars today echo Arnstein's critique above (1969), challenging FGD on the basis of historical, functionalist, conceptual, structural, and power-related arguments. With the resulting cacophony of (interrelated) critiques, it can be challenging to understand their full extent. Roughly, these critiques can be divided into: (I) functional and structural limitations of FDG and their historical roots; (II) problems implementing theory into (appropriate) practice especially concerning participatory approaches; and, (III) underlying power dynamics. These critiques are not linear with the segmentation here used to attempt their conceptualisation in a clear manner. In particular, the still often-ignored issue of power threads directly or indirectly through the first two categories.

2.3.1.4   Historical, Functionalist and Structural Critiques

Emphasising historical roots, some scholars point to the outdated design of formal disaster institutions as the source of fundamental challenges and inefficiencies within DRR/R (Kirschenbaum, 2004; Quarantelli et al., 2007). Despite changes and advances in how disasters are tackled, the baseline structures of today's formal disaster-related institutions were devised more than a century ago to fit the risks and needs of the industrialisation era's rising complexities (Kirschenbaum, 2004). The elicited response came in the form of centralised, hierarchical, command-and-control driven approaches. This perspective and modus operandi was reinforced further by the two twentieth century world wars and it continued through to the end of the Cold War, an era in which DRR/R was primarily seen as a question of civil defence with the

underlying assumption that taking 'control' was the most suitable practise to deal with the perceived 'chaos of disasters' (Dynes, 1994a; Gilbert, 1995; Helsloot & Ruitenberg, 2004; Quarantelli & Dynes, 1977b; Wolbers et al., 2016; Wolf & Pfohl, 2014).

Accordingly, part of the problem is still the prevalent command-and-control mentality criticized already 40 years ago by Dynes and Aguirre for the "centralization of authority and the formulation of procedures" in a situation where such a strategy is "inappropriate" (1979:73). Notwithstanding the field's DG emphasis, this militaristic approach still pervades many formal disaster operations (Tierney et al., 2006; Wolbers et al., 2016). This situation is not only due to DRR/R's historical embeddedness in a military perspective, but also is the result of concerns over Chemical, Biological, Radioactive and Nuclear-related disaster issues (Strömberg, 2019). This critique can also be extended to scholarship, since, despite progress and the related shifts over the past decades towards vulnerability and governance approaches to disasters, their insights are often ignored, while instead the dichotomy mindset of "Chaos, Command and Control, versus Continuity, Coordination and Collaboration governance models" still persists (Wolbers et al., 2016:435; cf. Dynes, 1994a).

Additionally, FDG shows a limited ability to deal with disasters that either cascade—especially across borders—or are classified as 'small'[17] and, therefore, of low priority, or escape FDG's radar altogether (Boin, 2009; Dahles & van Hees, 2004; Edwards, 2009; Hamdani, 2014; Quarantelli et al., 2007; Said Aini et al., 2000; Shrestha & Gaillard, 2013; Wachtendorf, 1999, 2000). FDG actors often do not have the required knowledge to take charge of the necessary coordination (Grube & Storr, 2014). Moreover, as disasters spread—particularly across borders—their rapidly changing nature requires flexible and ad hoc responses that are difficult to coordinate, particularly in a top-down manner by institutional players. Many traditional response agencies are not set up to produce swift DG that coordinates between, and across, international, state, sub-state, municipal, neighbourhood- or community-based, and individual stakeholders (Marchezini, 2020).

Another issue resides in the fact that DRR/R activities are often separated by FDG amongst different institutions, each with their own rivalries, territorialism, and mandates, irrespective of overlaps and cooperation. To exemplify this drawback at a governmental level, the responsibility for overseas disaster response, overseas DRR, domestic disaster response, and domestic DRR are highly partitioned in

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[17] Note, these have been variously called small or small-scale disasters. However, as per Kelman's 'AntiLexicon' (2020): "To the people affected, a disaster and its impacts are rarely small. Additionally, small disasters may create vulnerabilities to subsequent events which then become larger due to these vulnerabilities—an important part of the disaster process. Similarly, successfully dealing with some disasters, which are labelled as being 'small', may induce complacency or overconfidence regarding subsequent instances, again demonstrating how vulnerability can be created and perpetuated. Treating all disasters as being important is a significant component of reducing vulnerability and stopping the disaster process".

governments such as the UK and US. The UN system also has different agencies that coordinate humanitarian affairs (Office for the Coordination of Humanitarian Affairs [OCHA]), disaster risk reduction (United Nations Office for Disaster Risk Reduction [UNDRR]), development (United Nations Development Programme [UNDP]), and climate change (United Nations Framework Convention on Climate Change [UNFCCC]). This compartmentalisation is compounded by political pressures stemming from, amongst others, sponsors' expectations. Taken together, the fragmentation and pressures can handicap the institutional learning necessary to move from DG in theory to DG in practice. Specifically, that is to move from so-called 'single-loop learning' in which organisations learn the technicalities of how to achieve intended goals, to reflexive 'double-loop learning' in which assumptions are re-examined and strategies rethought, to 'triple-loop learning' which entails questioning and amending larger institutional or systemic assumptions within which organisations and their values, here FDG, are nested (Goldstein, 2008; Nielsen, 1993). Therefore, "working with or within a [disaster] governance system requires more emphasis on process, problem solving and investment in long-term efforts to build trust and achieve change" (Twigg et al., 2020:5).

Overall, the above arguments constitute common functionalist critiques that formal institutions are rigid, bureaucratic, and, thus, inflexible (Boin et al., 2014; Dynes & Aguirre, 1979; Wachtendorf, 2000). However, some scholars find this assessment too simplistic, referring to the capacity and even the indispensability of command-and-control approaches to adapt to changing circumstances through, for instance, swapping pre-determined roles, or making choices to which parts of the command structure as necessary and useful in any given situation (Bahrami et al., 2020; Bigley & Roberts, 2001; Boersma et al., 2014). Nonetheless, precisely this adaptation of a system without deeper introspection as to its modes and modalities has been characterised by organisational theories as the problem of the 'garbage can model', according to which, problems are fitted into existing solutions and choice opportunities (Cohen et al., 1972; Kirschenbaum, 2004). Yet governance which is entirely anarchist would run into its own problems due to lack of systemisation, regulations, implementation, monitoring, and enforcement. These limitations might, in turn, cause a higher rate of disaster deaths as demonstrated by the 2010 Haiti earthquake (Mika, 2019), and the lack of a tsunami warning system across the Indian Ocean on December 26, 2004, where more deaths occurred in comparison to locations which had a local one (Gaillard et al., 2008).

Nonetheless, for Beck, DRR/R efforts as the sole purview of formal systems, as currently conceived, limit their effectiveness due to inherent organised irresponsibility or what he defines as 'imposed amnesia' and 'denial' of risks. Accordingly, FDG limitations, rather than stemming from 'non-knowing' vis-à-vis possible risks due to their ostensible 'unpredictability' or 'unprecedentedness', lie with FDG systems deciding what does/does not classify as risk or disaster (Beck, 2009:115–128; Kirschenbaum, 2004). According to Beck, FDG systems create the very rules by which certain risks are ignored, tolerated, and normalised, resulting in vulnerabilities that cause disasters. Gaillard (2019) adds that FDG limitations are fundamentally

emerging from its very make-up due to the field's preoccupation with Western epistemologies and disaster orientalism. IR and economic theories add issue complexity, the number of discrete actors (organisations, states, and sub- governmental institutions) and their resulting interorganisational relations, coordination issues and competition, formality-related norms, or homogeneity of these actors and/or their preferences, as further factors that disproportionately influence FDG's institutional design and the subsequent articulation of priorities and practices (cf. Reinsberg & Westerwinter, 2009). Consequently, FDG as currently conceived often fails to investigate, discuss, and address "the deep origins of risk" as per the vulnerability approach to disasters (Bonati, 2019:190). This reality has been taken as a fundamental driver of public-private relationships to more efficiently address DRR/R (Reinsberg & Westerwinter, 2019). Additionally, what emerges from this more structural critique is the need for balancing FDG through a social/community force (in Beck's terminology, an 'ecological democracy') to overall improve DRR/R (Beck, 1992, 1995, 2009; Bonati, 2019).

2.3.1.5 Communities, Participation, Power, and Reflexivity

One of FDG's key propositions is the inclusion of a wider stakeholder base. In this case too, partially stemming from the above limitations, FDG has demonstrated gaps between rhetoric and practice, as recommendations concerning the involvement of local stakeholders are neither fully developed in theory, nor necessarily followed in practice. Put simply, participatory solutions often fail to live up to their own ideals, with an emphasis on vague and aspirational lip service and a lack of concrete and or thought-out action (Curato & Calamba, 2020; Lane & Corbett, 2005). Aly's analysis of the 2016 World Humanitarian Summit demonstrates this aptly: "for all the talk of putting people affected by crises 'at the centre' of humanitarian action, the subject didn't feature much at the summit" (2016). Aly's and others' critique is clear: there has been little or no mention of accountability; no clear way to allow the 'end-users' of aid to have a real influence, such as a common approach to receive feedback from disaster-affected communities; and, no funding "conditional upon projects acting on feedback from affected communities" (2016).

FDG and DG scholarship have been disapproved for their uncritical, predominantly positively connoted, or tokenised use of the term 'community' as a catch-all phrase for those stakeholders who have traditionally not been involved in DRR/R (Cannon, 2008; Talen, 2000). This is less the case at the scale of nations, where the notion of 'imagined communities' is commonly understood (Anderson, 1983). However, in the academic fields of development, sustainability, or DS, the term community seems by default to signify some of the most "appealing features of human social relationships" such as a "sense of familiarity and safety, mutual concern and support, continuous loyalties [...]" (Brint, 2001:1). Disaster scholarship that focuses on 'therapeutic' communities with an emphasis on post-disaster kinship and pro-social behaviour contributes to this perception—though it did not imply this positive connotation as a

default of communities but rather one possible characteristic amongst many possibly 'corrosive' attributes (Barton, 1969; Dynes & Quarantelli, 1976; Fritz, 1961:685; Jenkins, 2013:404–405).

Critical scholarship contradicts these sweeping statements, showing that participatory DG approaches are not the panacea they are believed to be, and sometimes constitute merely a façade behind which organisations gain access and (perceived) legitimacy to act (Callahan, 2007; Cooke & Kothari, 2001; Hickey & Mohan, 2004; Hore et al., 2020; Michels & De Graaf, 2010; Silverman et al., 2019). Inherently, community notions reflect simplistic, apolitical associations, whereas geographical proximity suffices for the identification of a community of stakeholders. To state the obvious, the co-existence in the same geographic location does not guarantee the 'sense of community' that DRR plans often rely upon. "Common ways of life do not necessarily imply common beliefs. Small numbers of people do not necessarily imply common ways of life" (Brint, 2001:3). This has been well illustrated in the literature decades ago (Amick & Kviz, 1975) and since, when some of the most important works done in this field:

> gained dramatic power primarily from their tendency to undermine the image of warm and mutually supportive community relations. An oft-repeated message of the community studies literature is that communities are not very community-like. They are as rife with interest, power, and division as any market, corporation, or city government [...]. (Brint, 2001:5–6)

Nonetheless, many disaster practitioners, scholars, and policymakers are "pushing an idealized notion of locality and community to the forefront of policy" (Cannon, 2008:12) in support of local DG. Resulting sweeping and large-scale participatory DG programmes often disregard nuanced local complexities such as ethical issues, conflict, or gendered power relations, and resulting inequalities within and between geographically delineated 'communities' (Brint, 2001:15–16; Guijt & Shah, 1998). These power structures are often missing in the way DS depicts community. Any 'community' consists of a variety of active individuals and groupings that may exhibit different interests and power relations with potential for both cooperation and conflict. This is not different in disaster contexts (Quarantelli & Dynes, 1976).

Failing to account for the complexities of how communities are understood as stakeholders, the resulting modes of participatory DG may perpetuate, exacerbate existing, or create new power injustices amongst them, sometimes at a 'tyrannical' group level (Cooke & Kothari, 2001; Hickey & Mohan, 2004; Titz et al., 2018). Community-based approaches often establish practices in which "the new universal humanitarian values of empowerment and resilience reproduce old exclusions [making communities] thus also sites of friction where re-politicization can occur" (Pascucci, 2017:332). Not enough is done to ensure that participating local stakeholders are not simply the most vocal or powerful ones at the expense of less vocal and powerful but perhaps the most vulnerable ones. External FDG actors may act on idealised notions of governance and community, effectively including 'everyone' irrespective of stakeholders' power relations or desires to be involved (Cooke & Kothari, 2001; Hickey & Mohan, 2004; Titz et al., 2018). In this way, progress may be stifled, and funds and resources misused that might have been used more effectively elsewhere.

The issue of sharing responsibility demonstrates an important problem associated with FDG's uncritical adoption of participatory approaches. DG has been criticised for not fully taking into account the responsibility that smaller actors are asked to shoulder (Meyer, 2017; Reid, 2018, 2019a). That is, the near-celebratory status of 'community' and especially 'indigenous' resilience, or the capacity and capability of the local (municipal) level, run the risk of ignoring deep vulnerabilities that require action and support from the national level. In practical terms, rather than helping, this emphasis and these sometimes "unreasonable" propositions may burden the 'local level' even more, beyond its actual capabilities and/or during disasters times, when "tremendous human and asset losses" have been incurred, and have further entrenched existing vulnerabilities (Yuka, 2013:100). Similarly, Hewitt warned of the potential to also view disaster-affected people as passive victims rather than focus on national policies and systems, which create these vulnerabilities, or undermine people's capacity 'to avoid or recover from disaster' (1997:167). This position is in line with Bankoff's critique that points at vulnerability approaches' resemblance with other labelling practices, such as the 17th century's 'tropicality' or the 20th century's 'underdevelopment' (2001, 2003).

Thus, next to FDG's problematic (mis)understanding of communities, is the issue of how DG understands itself within this relationship and impresses this perception on others. That is, while advocating the involvement of a wide range of stakeholders, DG approaches do not fully manage to escape established conceptual 'boxes' of technocratic and hierarchical disaster management. The paradigm shift from central control-and-command in DRR/R to decentralised multi-stakeholder governance is still very much 'centred', and the subsequent operational pre-occupation with local stakeholders (defined as local governments) follows logically, while non-governmental actors are treated as 'non-traditional' actors. The latter is a logical contradiction to the essence of CB-DRR/R or participatory approaches. This failure to go beyond established structures can also be found in the constant emphasis to collaborate with NSAs, 'non-traditional actors' or 'emerging actors' and various derivatives. It not only implies a top-down, directed, and thus, still a state-centred initiation or running of such collaborations, perhaps more importantly, it treats actors beyond state and/or established organisations as 'out of norm' 'informal' actors.

To conclude, while the term community cannot be entirely avoided, it must be used with care to account for its possible negative connotations (Brint, 2001; Kelman, 2020). Synthesizing and building on similar community studies, particularly in the field of sociology, Brint suggests defining communities by their relations and interactions within, and between them, to account for factors such as power relations (2001:3). To better understand how communities can be mobilised in DRR/R, more nuanced studies that examine exactly how this can be achieved systematically, while explaining heterogeneity within and amongst community stakeholders, are needed. Such research would elucidate stakeholder interests and perceptions, cultural and historical factors, political, economic and technological constraints, power relations, as well as differences in "vulnerability to disaster impacts [...] associated with demographic

characteristics such as gender, ethnicity and poverty" (Lindell, 2013:799). It would also entail viewing local or 'community' in DG as a process that creates trust, and is based on trust (Kapucu, 2008), which cannot be established without considering power dynamics in DG, as is discussed in chapter 2.4.

2.4 INFORMALITY IN DISASTER GOVERNANCE

Approaches to dealing with disasters have undergone fundamental conceptual changes—particularly from a focus on technocratic disaster management to highlighting DRR as a key part of an encompassing DG approach. DG is in many ways an attempt to improve DRR/R through reconciling formal, centralised expertise, resources, and capacity with input and action from 'below'. Thus, DG implies a multi-actor approach which, by definition, includes various social, 'non-elected', new, ad hoc, public, private sector, and civic actors (van Asselt & Renn, 2011:434). Despite the formalisation of DG principles, FDG has struggled to implement these changes. Where DRR/R is extrapolated to the supranational level, decisions are neither binding nor do they question possibly obstructive FDG hierarchies. Operationally, the execution of participatory DG approaches to involve disaster-affected people are (Wolfenstein, 2018:77, [1957]; cf. Quarantelli, 2001) often minimal and/or (conceptually) flawed, including due to arbitrary inclusion criteria which raise concerns over local power dynamics, effectively resembling Arnstein's level of tokenism (1969) rather than local stakeholders' active participation and say over DRR/R.

Yet, when faced with disaster matters, people may choose to act, regardless of the functioning of such FDG-frameworks. When FDG does not act, fails, is irrelevant, or harmful, DRR/R may fall to local informal stakeholders, that is, people that are not mandated with DRR/R or affiliated with FDG. Decentralisation, information technologies, and globalisation provide the structural opportunities for local actors to exert influence in DG, yet without a formalised relationship to official institutions this possibility remains tenuous (Ansell, 2011; Dorf & Sabel, 1998). As Waddell already critiqued when referring to the 'hazard of (disaster) scientism', FDG "legitimizes the appearance of a new generation of experts operating in a new field of specialization" (1977:76), leaving little space for non-experts in an increasingly professionalised field (Raungratanaamporn et al., 2014). The result is an implicit, yet transparent, ideological basis underlying much of DG literature and practice as to who and what is or is not part of DRR/R efforts and, thus, who 'leads' DG. Lacking specialisation and, thus, FDG's buy-in, non-formal disaster actors' efforts become informal and are marginalised, while FDG's central position remains untouched. Thus, with DG participation predominantly directed at other formal actors, there is doubt over the earnestness of calls to heterogeneity in DG, and its promise to be a more effective approach to DRR/R has yet to be fulfilled.

If the above is correct, FDG as currently conceived and/or practiced does not constitute genuine DG and a new analytical framework that accounts for all DG—formal and informal—is necessary to deal with disasters more effectively. As in the field of IR, with which disaster thought and practice shares similar

trajectories and vocabulary, 'sovereignty', here of both state and organisational FDG systems, must be reconceptualised; a step back for more reflection is necessary. This applies to both operational and conceptual dimensions. Operationally, how can FDG more successfully live up to its implied promise to include non-experts in DRR/R and, thus, in true governance sense, operate from a mindset of service and collaboration with people at risk of or affected by disasters rather than just 'allow' their participation on FDG's terms? By extension, introspection is necessary concerning what true DG implies vis-à-vis FDG's mandate and power as the 'bull in the China shop'. This is the core of this research project, with this sub-chapter closing in on informality in DG to provide a more structured framework for its study. In the following, informality is first defined (2.4.1). The chapter then outlines how informality has been dealt with in DS (2.4.2) before turning to a gap analysis (2.4.3) and the conclusion of this chapter (2.4.4).

2.4.1   THINKING ABOUT INFORMALITY

Defining informality is challenging. Commonly, informality is simply considered the antonym of formality and can be defined as the absence of formality and, thus, as acts that are not formal or official (Oxford University Press, n.d.). This binary view of formality vs. informality extends to value judgments such as good or bad informality; unstructured informality versus structured formality; informality as embodiment of 'us' vs. 'them', or the domain of the poor vs. the rich; valid vs. invalid; elusive vs. in plain sight; vague vs. precise; or legal vs. illegal (Ledeneva et al., 2018b; McFarlane, 2012; Toope, 2008; von Steinsdorff, 2005; Yusuff, 2011). Such conceptions of informality are simplistic and thread the boundary between negative connotations and romanticism (Alfaro d'Alençon et al., 2018; Fadaei, 2018:64). Disciplines in which the concept has made considerable headway defy these simplistic, yet persistent, dichotomies of informality and formality as separate, distinguishable concepts. Indeed, these dichotomies are viewed as inaccurate and misleading, ignoring the complexities of informality, and, thus, constituting an obsolete conceptualisation (Cheng, 2014; Fadaei, 2018:168–170; Ledeneva et al., 2018b; McFarlane, 2012; Misztal, 2000; Parthasarathy, 2015; Ram et al., 2017; Toope, 2008).

Informality is more complex than just being the 'other' or 'alternative' approach that is simply not formalised. Rather than a dichotomy, informality can be viewed as a phenomenon across the informality-formality spectrum that represents "overlapping and intersecting relations between authorised and unauthorised, or between regulated and unregulated activities" (Roy, 2011). These activities can have positive or negative connotations, though the latter are generally more pronounced (Ledeneva et al., 2018a; Ram et al., 2017). Taken negatively, informality itself is seen as the problem, as that which is not regulated; as hidden power structures or other practices that entrench marginalisation, violence, poverty, and other deep-seated social issues. Alternatively, informality can be understood as the liberation from that which is inflexible, stifling, hierarchical, structured and follows set norms and rules of 'doing'. 'Doing things informally' is perceived as a more 'relaxed' way of providing solutions (Ledeneva et al., 2018b). More balanced approaches consider informal practices as useful in the short-term and, thus, positive, but

potentially counterproductive/harmful in the long-term due to the risk of lacking accountability measures or unsustainable dependencies (Cavalcanti, 2020).

Some academic fields have dealt extensively with 'informality'. Development studies and economics have a long tradition of research into the tensions and "constructed opposites of formality and informality" with subsequent foci such as 'informal economies' (Guha-Khasnobis et al., 2006; Hart, 1985; Portes & Sassen-Koob, 1987; Sassen, 1994). The 'informal organisation' as proposed by social organisational theories was a source of controversy in the 1930s, while the 1960s classic Weberian bureaucratic model's focus on formality by default delineates a formal/informal dualism (Preisendörfer, 2016; Tacke, 2015). In political science, informality manifests in the study of corruption, negotiations and diplomacy, political cultures, marginalisation, or poverty (Aliyev, 2015; Gazdar & Mallah, 2013; Grydehøj, 2014; Hendy & Zaki, 2013; Ledeneva et al., 2018a; Nazier & Ramadan, 2015; Pannes, 2015:17). In health sciences, informal care takers are of key interest (Elkins et al., 2014). While in urban studies informal expressions of urbanism are viewed as encompassing slum development on squatted land along city peripheries, which represent a key challenge to "long-standing and contemporary approaches to planning". Informality is also key to the arts, law (cf. Weinrib, 1993; 'theory of justification'), informatics and communications science.

Particularly useful beyond their respective disciplines are conceptualisations of informality proposed by economics and development studies. These form three dominant schools of thought: dualism (modernisation), structuralism, and legalism (neo-liberalism) (Alfaro d'Alençon et al., 2018; Fadaei, 2018).[18] Consistent with the above, dualist approaches view informality as a vestige of traditional, pre-capitalist, often rural, modes of living and working to which modernisation provided a solution through formalisation of what were considered 'developed' modes (Rostow, 1960). Next to the (flawed) binary consideration of informality itself, this approach problematically equated the shift from informality to formality with the development of western values and standards of economic and societal growth (Yusuff, 2011:626). Additionally, informality was seen as 'backward modus operandi' or a 'state of exception', subdued to the formal, leaving little room for positive interpretations of informality as dynamic or resourceful, and, thus, an area of potential innovation and growth (Fadaei, 2018:168–170; Yusuff, 2011:626). Finally, this view saw informality as a stage in a society's development and did little to question its emergence or 'raison d'être', thus, ignoring the possibility of any reciprocal relationship between formality and informality.

In a bid to grapple with the complexities of informality, scholarly thinking shifted from a casual and empirically flawed perception of informality as confined to pre-modern regions—obsolete and vanishing

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[18] Note: Despite consensus referring to three main schools of thought, some authors further sub-divide them into four or more including denominations such as voluntarism, dependency, or neo-liberalist approaches (Chen, 2012; Yusuff, 2011). These largely overlap with the outlined three schools of thought and their differences are either cosmetic or irrelevant in the context of this study.

in light of (economic) development and modernity)—to viewing informality as a congenital feature of either unjust capitalism (cf. Portes & Castells, 1989; 'marginalisation theory',) or motivated by excessive state regulations, interference, and/or bureaucracy (De Soto, 2001). The former constitutes a structuralist approach to informality, the latter a legalist one. Both schools of thought reject dualistic approaches to informality, emphasising instead its interrelationship with formality. In opposition to dualist conceptions, legalists (sometimes: neo-liberalists) provide a more positive reading of informality as ordinary people's revolutionary, sometimes heroic, response to excessive state intervention (Rakowski, 1994a; Yusuff, 2011:627–628). De Soto, a proponent of this view, calls this 'the other path' (1989), implying that informality is an alternative yet rational choice to avoid the cost, time, and effort to deal with the bureaucratic state apparatus. Yet, as Fadaei states, the legalist approach also simplifies informality as these choices are, after all, engendered in the "state's imposition of legal and regulatory frameworks" (2018:169). Consequently, informality is not a state of exception, but is illegitimatised through mechanisms of inclusion and exclusion by sovereign power (Roy, 2005:147–153) and to which, in de Soto's grandiose perspective, extra-legal micro-entrepreneurs stand up as revolutionaries, with the power to not only create wealth through bypassing the state, but surpassing and replacing its formalised mechanisms, especially as manifested in its 'first economy' (De Soto, 1989, 2000). Informality becomes more than choices to opt for avoidance strategies—these choices are political.

Conversely, structuralists view the market not the state as culprit and informality as "the survival strategy of the 'losers' of the capitalistic system" (Fadaei, 2018:170). Thus, informality is seen as a practice by which some, usually the poor, are actively 'informalised' by others, usually the wealthy and/or the capitalist system as a whole (Maloney, 2004). Gupta (2012) for instance, describes the rise of the informal economy in India as a response to the 'red tape' of government bureaucracy which marginalises its poorest. Structuralist approaches to informality, thus, take on a dystopic character while its potentially beneficial aspects, as debates on the emergence and value-generation of informal settlements show, are "overshadowed by the structural deficits that lead to their emergence" (Fadaei, 2018:172). However, Rakowski cautions that viewing informality as a direct consequence of capitalism is a misconception. He notes that the novelty of informality is an illusion and what is today considered informal has largely been the norm prior to formalisation processes (1994b). As Yusuf states, "informality only came into existence as a distinct category [...] after its antithesis [formality] was created [...]" (Yusuff, 2011:629). Thus, actions considered 'normal' for people are labelled 'abnormal' or 'informal' as a by-product of formalisation processes.

Fadaei (2018) considers dualistic approaches to informality 'obsolete', as the aforementioned shifts have helped overcome this dualism. However, many studies still approach informality as the exception, removed from the formal and effectively its opposite (Alfaro d'Alençon et al., 2018). Conversely, as indicated above, legalism and structuralism have also either been challenged or refuted (Chang, 2014; Williams, 2017). More recently, some authors have noticed a trend towards romanticising informality

(Alfaro d'Alençon et al., 2018; Roy, 2005). If informality happens irrespective of markets and states acting justly or unjustly, or acting at all, some scholars prefer a more positive reading of informality as alternative (but as opposed to legalists' conceptions, in this case voluntary) entrepreneurial activities (Chen, 2012; Ram et al., 2017). Their emphasis is on "informality as the capacity for flexibility, adaptation and resilience [and] as a chance to create adaptive environments, abandoning the idea that informality exists for purely survivalist purposes" (Beall et al., 2010:188; paraphrased in Alfaro d'Alençon et al., 2018:61). In line with the aforementioned critique of resilience approaches, this view risks romanticising informal activities due to either their perceived underground, non-conformist, creative, disruptive, or innovative nature. By extension, the role of the state, and other mandated formal organisations, as providers of support is relinquished, as is often pointed out by critics of self-help or resilience concepts (Fadaei, 2018; Kelman, 2018a; Reid, 2019b; Ward, 1982).

The point here is not to elaborate on the weaknesses of each approach but to focus on the picture of informality that emerges from these approaches: the range of types, conditions, motivations, actors, actions, and consequences of informality that exist between 'fully formal' and 'completely informal', defying, in the process, simple, dualistic, and, importantly, acontextual and ahistorical conceptualisations of informality (Alfaro d'Alençon et al., 2018; Devas, 1999:60). Whatever the motivations for informal actions, the "wide range of economic, social and geographical processes [that] come together to nudge some individuals towards 'unorthodox' [informal] practices" (Ram et al., 2017:364; emphasis added) demonstrate that notions of informality vary and depend on a myriad of interrelated factors. Difficulties in measuring informality, due to both its conceptual fluidity and the complexity and character of unregistered and under-reported informal activities, add to the challenge of reaching consensus as to its meaning.

Ledeneva goes a step further, stating that the use of informality as an umbrella term is appropriate since the "variety of social and cultural phenomena [that informality refers to, are] too complex to be grasped in a single definition" (2018b:1). Spearheaded by Ledeneva, UCL's Global Informality Project (GIP) describes this 'umbrella concept' as:

> [...] an umbrella term for a variety of unregulated human activities that go under the radar, stay above or beyond the law, or circumvent the law through loopholes. Informality refers to the world's open secrets, unwritten rules and hidden practices of getting things done. Informal practices are the ways of solving problems used where the formal institutions do not make adequate provisions or allow gaming the system and playing the letter of the rules against their spirit. Informal practices may escape official discourse, but they capture the 'know-how' of what works in the vernacular. (2020)[19]

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[19] A shorter but more ambiguous version of this definition was previously published in (Ledeneva et al., 2018b:1).

This notion of informality captures the wide, sometimes contradictory, character of informal actors and actions. It indicates the goal of developing a framework of understanding informality through decoupling its analysis from chasing a consensus around a single definition. Notably, this conceptualisation implies a focus on informality as 'practices' to 'get things done', often conceived as 'solutions' to 'problems', with, without, in parallel, in spite of, or against formal systems, including legal structures and processes. As Misztal reminds us, such 'getting things done' depends also on informality being understood as non-instrumental (e.g. small talk, gossip, tacit behaviour) but also as instrumental "forms of interaction [in which actors enjoy] relative freedom in interpretation of their roles' requirement" (2000:8). Engagement with informality, thus, reveals a process different from the prevailing view of informality as isolated acts or an actor's perceived status (Alfaro d'Alençon et al., 2018:60). Further, relationships—sometimes collaborative, other times competitive—are a fundamental dimension of informality. This points to the complex underlying power dynamics between interdependent, rather than independent actors, further blurring the ostensible lines between formality and informality (Cheng, 2014). Drawing on case studies in pre-1970 Chile, Mexico, and the (then) Soviet Union, Adler Lomnitz shows that informal activities in the formal sector "are not random or chaotic but are based on informal networks following principles similar to those in shantytown networks: patronage, loyalty, and *conzanza* (trust)" (1988:42; emphasis in original). Thus, informality is not a static condition (Roy, 2010), but rather intentional and unintentional processes, underpinned by power relations, that bridge the informality-formality continuum. Viewing informality as a process, "opens a new door towards conceptualizing it".

Additionally, the UCL GIP definition suggests that informality is 'hidden' and simultaneously in plain sight. That is, informality constitutes 'every-day' practices that are conducted outside of formal structures, contexts, and protocols. Kreibich usefully distinguishes between informality by 'exclusion', by 'fragility', and as 'anarchy' to illustrate its varying forms as and when informality becomes a strategy adopted in reaction to failure, weakness, or the absence of formal control mechanisms (2012). Here, informal practices can refer to people's local, habitual, and/or natural modes of being and action which can either respond to or resist formalisation processes which they may predate (Ledeneva et al., 2018b:1; Simone, 2010). This emphasises the importance of a historical reading of informality (Meagher, 2016) and supports understandings of informality as being not only the domain of the poor and marginalised, but encompassing all people (Alfaro d'Alençon et al., 2018; Fadaei, 2018; McFarlane, 2012; Roy, 2011). The Albanian Kanun offers an example of a traditional legal system that, though not legalised, is accepted in parallel to the country's formal judicial system as Albania's informal 'normative' and/or 'punitive' system (Hille & Gendron, 2020; Mangalakova, 2004). While it may not be legally recognised, the Kanun itself is a strictly formal system with established, written rules, upheld by, and exerting influence even on and within Albanian communities living outside of Albania (Mangalakova, 2004). This dynamic of parallel formal and informal systems holds for various other examples where, for instance, national vs. indigenous systems are involved (e.g. segments of New Zealand's Maori population).

Legitimacy, power, and resources are, therefore, interrelated key aspects of (understanding) informality (Herrle et al., 2014; Herrle & Fokdal, 2011). Legitimacy can refer to the legality or illegality of informality, though, this too is not clear-cut. Different degrees of informality exist, as do levels of acceptance of informality. Some informal actions may be illegal, but viewed as legitimate locally, or be due to decision-makers' ambivalence towards them (Fadaei, 2018:171). Thus, beyond the juridical sphere, legitimacy also refers to social, economic, and political drivers, as illustrated by the Albanian Kanun example. State or formal organisations' ambivalence or tolerance vis-à-vis informal actors and actions must, however, be also viewed in light of the climate it creates. In such an environment, not only is informality indirectly encouraged, but the lack of formal engagement further informalises the actors and actions in question. The emerging power vacuum can be filled by potentially exploitative structures of informality while essential and "active protection and support for informal actors" is absent, allowing stronger actors, formal or informal, to (mis)use these informal structures, actors, and services (Yusuff, 2011:633). In this climate, informal actors can also flip existing formal relations and structures, by, for instance, transgressing existing power structures and going beyond national borders, as concepts of para-diplomacy demonstrate (Kelman et al., 2006).

Such renegotiation of power takes on a larger meaning by virtue of other trends, e.g. globalisation, connectivity (internet), and social networks. As a result, the private and public realms of (political) life increasingly overlap, further blurring any informal-formal boundaries. Modern political and social theories highlight societal changes through empowered individuals and interest groups demanding bottom-up co-action beyond passive co-operation—that is, the active co-defining of issues, co-planning, co-designing, co-implementing, and co-managing. Despite broad consensus that participatory governance frameworks are vital, and that embracing "alternative systems of governance [has] the potential to achieve structural improvements" (Alfaro d'Alençon et al., 2017:61), solutions as to how to incorporate this 'other path' are rarely offered. Watson aptly refers to the latter as the 'clash of rationalities' (2009), implying that the need to change outdated formal mental models and ways of doing are officially acknowledged, while being simultaneously required to maintain and reinforce elite interests. To address this contradiction, Watson suggests acknowledging this clash as a first step and, with deep introspection, to reflect on the system as a whole.

What emerges from the above is that informality is neither the exception nor a fringe phenomenon on the 'other' side of the continuum, rendering dualistic approaches obsolete (Fadaei, 2018). Informality is embedded within the entire continuum of formal and non-formal actors and actions and inundates all spheres of society: economics, politics, business, and DG; from the poor and marginalised to the wealthy and powerful. Böröcz (2000:348–351) calls this the 'sea of informality', in which much of social action takes place, with the potential to shape whole societies', including states' norms and "ways of doing" for generations to come, under even the most "regulated [...] regimes of collective behaviour" (:351–353). As the editors of the 'Global Encyclopaedia of Informality' (Ledeneva et al., 2018a) stress, the term is linked

with understanding social and cultural complexity since informality is tightly intertwined with concepts of 'Us vs. Them', non-conformity, resistance and political opposition. Thus, the term is associated with unlocking from prevalent power structures, or sociability and instrumentality. However, as the above discussion shows, a functionalist view reduced informality to only forms of anti-behaviour, is misconceived.

Overall then, it appears most useful to understand informality as a framework of strategic processes underpinned by perceptions, desires, and power relations and dynamically influenced by relational, contextual, historical, and other factors. Based on these insights, this study proposes an understanding of IDG as '*disaster-related processes which fall outside of strictly formal settings, acted out irrespective of people's socio-economic background, and whose legitimacy, driven by power relations, is continually renegotiated'.* Thus, rather than defining unequivocally who and what is informal, more focus is needed on the nuances of informality, especially as they relate to the perceptions of informal actors; the correlates of informality driven by formal mechanisms; and the 'dark' sides and/or unintended consequences of informality. Some academic fields have already begun to unpack this supposedly enigmatic or ephemeral concept and DS needs to follow suit; particularly within the DG paradigm, as without accounting for informal disaster activities, DG remains incomplete and, thus, is not DG in the true sense of the term.

2.4.2   INFORMALITY IN DISASTERS AND DISASTER SCIENCE

DRR/R has been largely perceived as the responsibility of FDG systems, consisting of governmental and non-governmental agencies, NGOs, or official emergency/first responders (e.g. ambulance, police, fire department), particularly in so-called 'developed' countries (Whittaker et al., 2015). In contrast, some scholars emphasise the informal disaster efforts of people not affiliated with FDG. Highlighting that local actors may choose to step up, particularly in the absence of state and organisational response to the 'complexities' of disasters, 'local', 'citizen', or 'community' actors are key to DRR/R due to their often more intimate understanding of local risks, access to local knowledge and networks (Carr, 1932; Form & Nosow, 1958; Fritz & Williams, 1957; Miller & Douglass, 2016b; O'Keefe et al., 1976; Parthasarathy, 2015; Prince, 1920; Roasa, 2013; Solnit, 2010; Stallings & Quarantelli, 1985; Twigg & Mosel, 2017; Whittaker et al., 2015; Wilkinson, 2012). Naturally, these are the very people involved on the ground or the 'real' first responders, aka. 'zero-order responder' (Briones et al., 2018), when disasters unfold, often offering alternative, innovative solutions while needing to cope, recover and live with disasters' consequences. These efforts may "include public, private, and hybrid actors, acting in their own right and forming novel partnerships and networks" (Newell et al., 2012:380).

Seen in reaction to ineffective FDG or its absence, people may devise informal approaches, improvising new and repurposing former informal networks to provide much-needed aid that is normally within the purview of FDG (Carrero et al., 2018; Parthasarathy, 2015; Roasa, 2013; Whittaker et al., 2015). These

informal DRR/R-efforts shift social agency away from the government to ordinary people who, habitually without disaster-related training, evacuate residents, provide food and water, deliver medical assistance, provide emotional support, build barriers, lead local clean-up missions and engage in rebuilding or relocation efforts (Barenstein & Trachsel, 2012; Carrero et al., 2018; Chien, 2011; McFarlane, 2012; Parthasarathy, 2015; Roasa, 2013; Versluis, 2014; Whittaker et al., 2015). Beyond these immediate tasks, informal disaster efforts may encompass long-term development and/or DRR (Goldstein, 2008). Parthasarathy claims that in these situations the most vulnerable are frequently the most resourceful populations (2015, 2018). They often initiate activities for their own benefit and that of others—whether out of necessity or by turning DRR/R efforts into opportunities—resulting in the difference between success and failure of a community's overall DRR/R efforts (Barenstein & Trachsel, 2012; Roasa, 2013). Form and Nosow view self-help, volunteering and convergence of the activities and relationships that develop in and around disasters, as integral to forming the 'disaster system' (1958:14).

Whilst there is a long tradition of highlighting informal human agency in disasters, informality is often implied and rarely explicitly conceptualised. In particular, (earlier) DS tackled informality in disasters through the concepts of 'self-help', 'mutual aid', 'convergence', 'volunteerism', or 'emergence' (Drabek & McEntire, 2003; Fritz & Mathewson, 1957; Kendra & Wachtendorf, 2003; Lodree & Davis, 2016; Prince, 1920; Schmidt et al., 2017; Skar et al., 2016; Stallings & Quarantelli, 1985; Strandh, 2019; Taylor et al., 1970; Twigg & Mosel, 2017; Whittaker et al., 2015).[20] Rather than concepts, self-help and mutual aid are vital principles of, and umbrella terms for, the latter concepts. The idea underlying self-help and mutual aid is that most people "anticipate handling some types of crisis" (Form & Nosow, 1958:14). This could be alone, with the help of emergency resources from family or friends (thus, contingent on pre-existing relationships and kinship structures), or with the help of their community ('citizen action') when individuals' experience, expertise and/or resources are exceeded (Bunker, 1957; Form & Nosow, 1958:14–15; Fritz & Williams, 1957; Helsloot & Ruitenberg, 2004; Stallings & Quarantelli, 1985; Whittaker et al., 2015; Young, 1954). Examples across disaster literature are abundant. The 1985 Mexico earthquake is well-known to have overwhelmed FDG capabilities due to insufficient formal disaster planning, and emergent, informal actors subsequently dominated the response efforts (Dynes et al., 1990; Quarantelli, 1993). Similarly, examples including the 2015 avalanche in Svalbard, the 2009 L'Aquilla earthquake, the 2010 Haiti earthquake, or the 2010–11 Christchurch earthquakes, have visibly demonstrated how informal efforts can either replace formal ones in their absence, often forming new

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[20] Additionally, sometimes the term 'first responders' is used to convey the above principles based on people responding to a disaster by virtue of proximity and, thus, their ability to respond 'first'. However, the term also refers to official emergency services in disasters. Briones et al. suggests using 'zero-order responders' to refer to affected populations who "are the first to the unfolding events of a disaster, because they live at ground zero" (2018:119), distinguishing them from 'official first responders'.

initiatives or groups, or may be drawn upon by FDG when manpower or specific/local knowledge is needed (Indreiten & Svarstad, 2016a, 2016b; Villemure et al., 2012; Whittaker et al., 2015:362–363).

Roasa (2013) demonstrates how informal actors mobilised new and repurposed former networks in response to Bangkok's 2011 flood when FDG was intentionally absent from some suburban areas, having released water into these (low income) neighbourhoods to save more affluent ones. The 2011 Bangkok flood powerfully demonstrates how non-formal actors are informalised by existing power structures that create and maintain exclusion mechanisms. However, rather than concluding that FDG failures (and the resulting citizen mistrust) create informal disaster actions, Roasa maintains that these actions sprung to life 'instinctively'—irrespective of FDG (2013). Further, rather than these efforts being the exception, "from New York to Bangkok recent events have forced cities to let informal networks react to disasters with relative autonomy" (2013:3); thus, "combating disasters with (formal) hard infrastructures alone ignores half the equation" (:1). Though rarely articulated as such, some of these examples are consistent with the above discussion on informality, in that they demonstrate that IDG does not only happen in reaction to lacking or absent FDG.

Meanwhile, Puerto Ricans engaged in informal disasters efforts in the wake of Hurricane Maria in 2017 and recently Covid-19, following inaction from formal authorities (Soto, 2020). In Israel, where volunteering is a key cultural element, the organisation *Lev Echad* was established to 'absorb' thousands of informal actors who regularly 'flood' disaster scenes, matching them with municipal, organisational, but also individual needs. Parthasarathy (2015) emphasises how marginalised informal actors played a central role during the 2005 Mumbai floods due to their resourcefulness and extensive access to key networks and industries, offering fast low-cost solutions necessary for the city's overall recovery. Not only were these actors the first on scene, but in the absence of FDG efforts, they were vital to recovery efforts in Mumbai's affluent neighbourhoods. Parthasarathy concludes that FDG needs to change to include "more imaginative disaster mitigation and management strategies that recognize the role of informal [actors]" (2015:551).

Earlier disaster scholarship aptly points to the tensions between formal and informal DRR/R efforts. Outlining the evolution of the American Red Cross' disaster efforts, Bunker points to the nexus between people's self-help efforts and institutional mandates which she describes as 'mass care', consisting "primarily in meeting the needs common to all people [including] clothing, shelter, and emergency medical and nursing, services [thus, caring for people] *en masse*, without fine lines of distinction as to their differing needs" (1957:112). Form and Nosow point to formal organisations' lack of understanding of local realities and subsequent "inappropriate" DRR/R, which may disrupt rather than reinforce self-help patterns (1958:19–20). Young shows how in post-disaster shelter situations peoples' overwhelming preference for staying together and family-based assistance were ignored, and disaster-affected families separated, in the name of formal 'women and children first' policies (1954).

Overall, the principle of self-help and its reincarnations highlight active and pro-social disaster behaviour while challenging popular myths of disasters as scenes of passive victims, chaos, and disorganisation. DS dealing with non-organisational, informal disaster efforts distinguishes between (the concepts of) convergence, volunteerism, and emergence. Convergence refers to movement of external people, information, and goods to the disaster area, which can be anxiety-, help-, curiosity-, or gain-motivated (Barton, 1969; Fritz & Mathewson, 1957). Kendra and Wachtendorf add three convergence archetypes: supporters (offering encouragement, expressing gratitude), mourners, and memorialisers (2003). Disaster convergence can be seen as a valuable resource that requires FDG integration (Auf der Heide, 2003) or as a "hindrance to organized relief efforts" (Fritz & Mathewson, 1957:3), e.g. by overloading logistic, communication and transportation infrastructure.

By extension, disaster convergence is related to disaster emergence. In the 1970s, researchers at the Disaster Research Center (DRC) described four typologies of disaster response mechanisms: established disaster organisation, e.g. emergency services (type I); expanding organisations which do not have a DRR/R mandate but have underlying emergency capacities (type II); extending organisations which engage in novel tasks, e.g. private sector providing shelter on premises (type III); and finally, emergent organisations which are new groups, tasks, or initiatives that form during or shortly after a disaster to address (potentially) unmet needs (type IV) (Dynes & Quarantelli, 1968; Dynes, 1970; Dynes & Aguirre 1979). According to Stallings and Quarantelli, emergent groups are characterised by informal structures and flat hierarchies and are likely to engage in tasks such as damage assessment, operations, or coordination (1985). Whittaker et al. note that their activities may pre-date disasters or exceed them (2015), making the use of 'emergence' with the connotation of 'ad hoc' and 'unorganised' problematic, at least in cases of pre-disaster and/or DRR activities which imply a certain anticipation and a priori (strategic) organisation. However, Wilkinson notes that while informal efforts to press FDG to enact DRR are important, pressing for FDG action "to reduce disaster risks [is] a rarity [with actors] particularly in resource-poor municipalities, generally respond to more pressing day-to-day concerns" (Wilkinson, 2012:156). However, Wilkinson shows that local informal efforts may be more successful in small municipalities, presumably, due to closer relationships and interaction between informal and formal actors (2012:165–167). Pre-existing relationships may imply expectations of others, including those in formal organisations, creating "a nexus between the 'ordinary citizen's' performance, [...] [and] by those who are formally constituted to deal with emergencies" (Form & Nosow, 1958:16).

In response, formal organisations may reject, ignore, or incorporate informal actors and efforts into formal DRR/R. The latter—incorporation—is commonly understood as disaster volunteerism. There have been various attempts to unpack disaster volunteerism, pointing to the diverse, contextual nature of actors, activities, and motivations. Shaskolsky (1967) and Wolensky (1979) offer two such categorisations (Table 3 & Table 4). While both authors differentiate between individuals and groups, their foci are different.

Wolensky determines volunteer types based on their motivation and the resulting scope of their actions, whereas Shaskolsky's four categories are defined according to their respective DRR/R mandates.

Table 3. Wolensky's Types of Volunteerism in Disasters and Their Explanations.

Type	Explanation
Public interest emergent volunteerism	Spontaneous action motivated by concern for the public and their wellbeing ('altruistic')
Public interest organisational volunteerism	Organised activities by civil society organisations with a mission to support their community ('communalistic')
Private interest emergent volunteerism	Spontaneous action by individuals and groups to protect their own interests ('egoistic')
Private interest organisational volunteerism	Organised assistance for members of a particular group ('mutualistic')

Table 4. Shaskolsky's Four Types of Volunteerism and Their Explanations.

Type	Explanation
Anticipated individual volunteers	Action by those with a role generally perceived as relevant to the situation (e.g. a medic)
Anticipated organisational volunteers	Organised activities by those with a relevant mandate (e.g. members of volunteer SAR-teams)
Spontaneous individual volunteers	Individuals without a pre-existing DRR/R mandate who spontaneously get involved (e.g. bystanders cleaning debris or distributing supplies)
Spontaneous organisational volunteers	People without a pre-existing DRR/R mandate who join formal groups/organisations (e.g. someone without training that joins SAR efforts)

Similarly highlighting that volunteerism can occur with or without formal affiliation, Whittaker et. al distinguish between formal and informal volunteerism[21], sub-dividing into 'extending volunteerism', 'emergent volunteerism', and 'digital volunteerism'. As noted earlier, extending volunteerism refers to the private sectors' non-DRR/R-mandated activities. This is consistent with studies highlighting organisations without DRR/R-mandates increasingly seeking active involvement beyond financial contributions as part of their corporate social responsibility portfolios to ensure employee satisfaction through engagement in 'value-driven' activities (Chong, 2009; Twigg, 2001).

Yet, cultural underpinnings challenge understandings of volunteerism. Current Western understandings of volunteering as activities 'by choice' sit uneasy with some cultures' realities (Whittaker et al., 2015:360). In Bhutan or amongst New Zealand's Māori population, volunteering activities extend to citizens' intergenerational commitment or social contract—a responsibility by which volunteering become essentially non-optional but culturally expected (Choden, 2003; Robinson & Williams, 2001). Whittaker

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[21] It is unclear why the authors, despite highlighting the autonomous nature of these actors and activities, choose to nonetheless refer to them as 'volunteers'.

et al. (2015) join earlier scholarship (Drabek & McEntire, 2003; Quarantelli, 1984; Stallings & Quarantelli, 1985) aimed at correcting the tendency to view emergent volunteerism as spontaneous activities in response to a disaster. Rather, emergent volunteerism may 'emerge' in the context of DRR or pre-disaster efforts and entail "considerable deliberation, planning and organisation" (2015:362). Accordingly, these activities may be less visible, especially as volunteering efforts may not be recognised as such in some cultures or contexts, and "[do] not lead to ongoing formal organisation" (:363).

Whittaker et al. (2015) do not elaborate on why they believe this to be the case, yet the accounts of other scholars on the long-term sustainability of informal DRR/R offer a possible explanation. Forrest et al. (2018) see informal disaster activities as based on repurposed former or new networks, which again 'submerge' due to apathy or 'active forgetting', partially attributable to a lack of further disaster exposure and partially, as people seek to return to their everyday lives (2018). The combination of intrinsic motivators and disaster exposure may also explain the (ostensible) focus of informal efforts on DR over DRR. Additionally, financial fragility contributes to these efforts' long-term non-viability (Kintisch, 2015). Yet, where informal DRR/R networks have been formed, their 'disappearance' may not be permanent but 'submerge' into low-intensity, more durable networks that can be reconstituted when necessary, translating to similar efforts during the next disaster (Goldstein, 2008:26). Twigg et al., in turn, by focusing on localised strategies in Bangladesh to counter seasonal flooding, points to IDG's potential to translate into everyday routines (2000; cf. Paul & Routray, 2010), simultaneously highlighting the norm-generating potential of IDG as well as the susceptibility to some of the same drawbacks as FDG (Ch. 2.3.3). Yet beyond what is perhaps a natural course for IDG efforts, Goldstein (2008) reminds that ultimately, few persist due to "the vigorous efforts of government agencies [and other powerful FDG actors] to demonstrate their relevance" (2008:26).

Beyond the focus on precises of emergence and submergence of informal DRR/R efforts, other scholars focus on what enables them. Whittaker et al. highlight how advances in information and communication technologies enable new ways of—formal and informal—disaster volunteerism, including information dissemination through social media, or knowledge production through web-based mapping software (e.g. 'Volunteered Geographic Information' or 'VGI') (2015:364; cf. Haworth et al., 2018). Chatfield and Reddick explore how digital 'networked citizen interaction' helps informal actors to 'get out of the backseat' of disaster response by providing, processing and, thus, co-producing disaster information (2017). Digital volunteerism platforms enable 'ordinary' people with relatively basic computer skills, to informally offer disaster-relevant information "through the organized efforts, purposefully crafted, organized with participatory culture, and designed in crowdsourcing modules" (Takazawa, 2014:1121).

Digital volunteerism is predominantly seen as an additional resource to support FDG. However, while digital volunteerism may be requested by established FDG organisations, it can also be provided by emergent informal response groups, which may spontaneously organise through digital channels, e.g.

'Occupy Sandy' (Brugh et al., 2019). Others, e.g. 'Geeks without Bounds'[22], may have been purposefully established as creative communal spaces to enable informal actors to check in with affected populations, map needs, as well as create and provide DRR/R solutions. The resulting peer-to-peer or people-to-people impact can be within as well as outside of FDG structures, should the latter not engage with such efforts. Though these efforts often match or exceed similar formal ones, some disaster professionals are concerned about the reliability and quality of digitally volunteered disaster efforts. Consistent quality cannot be guaranteed and the risk of publishing (un)intentionally false information, is considerable (Haworth et al., 2018). Digital volunteerism may also cover highly visible disasters, while neglecting less visible ones (Whittaker et al., 2015:364).

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While consideration of informality in disasters has its roots in early DS as the aforementioned core concept but also ideas of 'altruistic community' or 'therapeutic community' (Barton, 1969; Fritz, 1961) show, the integration of digital (informal) volunteerism and the recent 'governance turn', indicate that informality in disaster is increasingly recognised. Over time, aspects of informal DRR/R have been explored through various concepts/ideas including: self-organisation; bottom-up/participatory approaches; community-/civil society-based DRR/R; various dimensions of DG; through the idea of 'social capital'; more creative terms, e.g. 'disaster skunkworks'; and even studies of indigenous communities' DRR/R efforts may be proposed to illustrate informality within DRR/R. Complementing these are references to informal disaster-related spheres, such as 'informal' communication tools, education, shelters, economy, business, organisations, meetings, networks, insurance, material and immaterial aid, and so on (Sachs, 2017; Sutton et al., 2013). To demonstrate their breadth, Table 5 provides a non-exhaustive sample of, sometimes synonymously used, terms and concepts from across DS and related disciplines, which (may) suggest aspects of informal DRR/R.

Table 5. List of Selected Terms, Notions, and Concepts of Informality in DRR/R.

Term	Sources
Adaptive disaster governance (DG)	(Aoki, 2016; Bakkour et al., 2015)
Adaptive informal institutions	(Tsai, 2006)
Bottom-up DRR/R	(Gaillard & Mercer, 2013)
Civil society contributions	(Radcliffe, 2016)
Civil society DRR/R	(Forrest et al., 2018; Radcliffe, 2016)
Collaborative DG	(Bodin, 2017; Kaltenbrunner & Renzl, 2019)
Collective DG	(Archer et al., 2019)
Collective disaster assets/finance	(Archer, 2012; Archer et al., 2019)
Community-based DRR/R	(Barton, 1969; Taylor et al., 1970)
Decentralised DG	(Bae et al., 2016; Parthasarathy, 2016; Rumbach, 2016)
Disaster para-diplomacy	(Kelman et al., 2006)
Disaster skunkworks	(Goldstein, 2008)
Emergent networks	(Drabek & McEntire, 2003; Gardner, 2013; Twigg & Mosel, 2017)

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[22] See: www.gwob.org

Grassroot disaster initiatives/response/action	(Boersma et al., 2018; Kitching et al., 2016; Yoneyama, 2017)
Grey space	(Ruszczyk & Price, 2019)
Informal Disaster Education	(Feng et al., 2018; Septiana et al., 2019; Shiwaku & Fernandez, 2011)
Informal disaster networks	(Carrero et al., 2018)
Informal life politics	(Yoneyama, 2017)
Local DG	(Bang, 2013; Ikeda & Nagasaka, 2011)
Multi-level DG	(Maldonado et al. 2010; Miller & Douglass 2016a, 2016b)
Net-centric/networked DG	(Chatfield & Reddick, 2017)
Shadow networks	(Brundiers & Eakin, 2018; Bullock et al., 2012; Hossain & Kuti, 2010; Wutich et al., 2020)
Tole-level organisations	(Ruszczyk 2017; Ruszczyk & Price 2019)
Unaffiliated/unorganised/spontaneous volunteers	(Barsky et al., 2007; Harris et al., 2017; Twigg & Mosel, 2017; Waldman et al., 2017)
Vertical/Horizontal DG	(Bae et al., 2016; Wolf & Pfohl, 2014)

Irrespective of their different starting points or foci, these concepts essentially describe the efforts of people without formal DRR/R-mandates to either prevent disasters or to alleviate suffering during and following disasters. Congruent with many of these concepts is a dissatisfaction with FDG and an aspiration to improve its effectiveness. Non-formal DRR/R is then viewed as a reaction to FDG's limitations (e.g. financial/legal constraints, lack of knowledge of local realities, slow, bureaucratic) and, true to the binary formal/informal tendencies previously described, is often characterised as innovative, unbureaucratic, or agile (Parthasarathy, 2015). A 'real time' understanding of the issues they face and general lack organisational, bureaucratic, legal, and (ironically) technological restrictions are emphasised as informal actors' key advantages (Fernandez et al., 2006; Kendra & Wachtendorf, 2007; Whittaker et al., 2015).

Many of these concepts highlight a bottom-up, local, grassroots, or community-based nature of informal DRR/R with resulting emphasis on flat hierarchies, inclusivity, and participation. Collaborative relationships between multiple stakeholders, sectors, and hierarchical levels create a "complex web of informal networks" and interactions (Egnell & Haldén, 2009) which, as opposed to expected hierarchical FDG behaviour, respond to crises in a non-linear fashion. Consequently, the increasing integration of complexity and network theories into DS highlights networks as key to understanding IDG. Research into FDG networks, including amongst international relief agencies and states, or, private organisations when 'extending' their services to DRR/R, have already received considerable attention (Adler Lomnitz, 1988; Helbing et al., 2006; Kapucu, 2012; Lassa, 2015; Lu, 2017; Pant et al., 2008). The digital dimension of disaster volunteerism links to social network perspectives, which have traditionally focused on the dissemination of disaster information, but now increasingly look into emerging formal and informal online relationships between FDG agencies, private organisations, and individuals (Kim & Hastak, 2018). Despite growing interest in IDG networks, as shown particularly by earlier social network studies and more recent interest in informal online networks for disasters, this line of inquiry remains understudied (Carrero et al., 2018).

In their overview of this literature, Faas and Jones (2017) argue that some of the most promising topics in this regard relate to more technical aspects of social network analysis. For example, examining tie

characteristics such as informal network homophily, diversity, strength, constellation, or the translation of network potential into network activation (Jones & Faas, 2017). Marcum et al. (2017) critique such work for treating disaster networks as independent variables rather than outcomes, though disaster (response) contexts affect the nature and activation of informal disaster networks. Hence, others focus on more qualitative inquiry. Some scholars acknowledge this gap and maintain that a better understanding of networks between informal and formal actors is important, while pointing to the difficulty of studying IDG networks due to their 'tacit' nature (Carrero et al., 2018; Chatfield & Reddick, 2017). Next to raising awareness of the existence of informal networks in disasters (Carrero et al., 2018; Jones & Faas, 2017), a better understanding of them could help overcome hindrances FDG faces in these situations, including coordinating DRR/R across various boundaries and international borders. Ruszczyk and Price (2019) add that informal networks can form re-assurance mechanisms for informal DRR/R actors: people may feel that the only way they can exert influence on FDG authorities to provide the DRR/R means and processes they require is through networked efforts. Informal networks might, thus, be an important tool for disaster-affected people to exert power.

In conclusion, irrespective of the different foci that have developed across DS that deals with informality, there is consensus amongst DS scholars that informal actors in disasters are not only prevalent, but crucial to both FDG success and their own DRR efforts and recovery. Paradoxically, informal actors and action are still rarely incorporated into FDG (Twigg & Mosel, 2017). Thus, while this sub-chapter has provided an overview of these concepts and their foci, the next section (2.4.3) focuses on these concepts' limitations.

2.4.3 INFORMALITY IN DISASTERS AND DISASTER SCIENCE: FUNCTIONALIST VIEWS, PARTICIPATION, AND POWER

This section considers two major gaps as they emerge from the here presented literature review concerning how IDG is dealt with in DS and practice. Some—such as the technocratic outlook or binary views—have already been discussed in-context throughout the sections above. Two remain which require being highlighted and discussed separately here: a critique of a binary and purely functionalist view of IDG, and the prevalent narrative of IDG that is FDG-centred and upheld by dominant power structures.

Decades of DS have produced a plethora of informality-related concepts. While these concepts' sectioning of formal vs. informal actors may serve to organise understanding and approaches to DRR/R, it contrasts heavily with the aftermath and reality of disasters which does not distinguish between formal and informal actors. Yet, much of the contemporary research on informal DRR/R takes such a binary as well as functionalist perspective, highlighting IDG's advantages in efficiency and efficacy over FDG. Informal actors' ability to "operate with less bureaucracy, with willing and available volunteers in many professions from medicine to construction to cooking, and their flexibility are important assets to be utilized during a disaster" (Pant et al., 2008:53). This perspective is a logical departure point and can be

traced to research on informal governance in political science during the 1980s and 1990s, which convincingly argued for integrating more flexibility into institutional settings to enable continuous learning, adaptation, and quick readjustment of processes in the face of perceived growing uncertainty (De Burca et al., 2013).

A significant drawback to this rationale is that it views IDG predominantly with reference to FDG (in)action, neglecting the deeper dimension of both motivating factors as well as conflicting interests and power differentials between, and within, informal and formal DRR/R and, thus, also the relationship(s) between them. As Brugh et al. state, "while much research has been done into the workings of formal [disaster] structures, and some into informal structures, very little has been done into how they overlap or what the costs and benefits of doing so might be" (2019).

Furthermore, the shift to DG and the reviewed concepts emphasis on informal actors' importance notwithstanding, IDG is still perceived as temporary and its actors as volunteers for or participants in FDG, and that are to be 'managed' by FDG. Form and Nosow's early study of communities in disasters is a case in point, an interpretation that is still relevant to contemporary practices, despite the changed rhetoric. Accordingly, "citizens must welcome the authority of [formal agencies]" while formal authorities may "expect the people to cooperate and comply with their authority" (1958:18). Helsloot and Ruitenberg corroborate that this hierarchical attitude prevails today and dub it the "lasting impact on the [DRR/R] world" attributable to "the fact that disaster management was originally based on military organised civil defence organisations" (2004:104). An FDG-centred narrative emerges that dictates the terms of interactions with IDG.

The issue of panic constitutes a simple but powerful example of this dynamic. Chaos and panic have been assumed disasters' key characteristics. In the words of a disaster manager in the 1960s, "[t]he layman will not be able to overcome his/her fear of the unknown. Thus, no support can be expected from him/her in the case of a disaster. The main responsibility must lie with the experts" (Gerling and Lorenz, 1970:79, in Czada, 2001:339). In Czada's words, "this statement has not lost any of its currency" (2001:339). After decades of scholarly work busting the myth of collective panic in disasters and questioning the appropriateness of the term itself (Alexander, 2007; Helsloot & Ruitenberg, 2004; Mawson, 2005; Nogami, 2016; Quarantelli, 1954, 2001; Wolfenstein, 2018 [1957]), formal responders still often act as if to prevent an expected panic. Scholars have highlighted this problem, but clear ways forward are missing, and much of DS and practice remains locked within the binary mindset of ostensible chaos that requires command and control approaches, versus models that emphasise continuity, coordination, and collaboration (Dynes, 1994a; Wolbers et al., 2016:435). This is also evident from media coverage emphasising—as if in expectation of uncontrolled behaviour—how remarkably "quiet and well behaved" disaster-affected people are. This modus operandi of FDG potentially "reinforces the [perceptions of] incapacity and helplessness of the citizenry" (Goldstein, 2008:24). This is further achieved through the

application of legal authority, domineering demonstrations of technocratic 'expertise', use of locally unattainable technology, and/or overwhelming media attention, which, regardless of its effectiveness, undermine previous—potentially important and successful—informal efforts by portraying them as small, inadequate, and amateur.

Sometimes this FDG-centred narrative contributes to erosion of trust and credibility down the line. Whereas initial citizen response is acknowledged and used to kick-start FDG—e.g. through the informal provision of information—it is quickly pushed aside as FDG gets a (perceived) hold on the situation and begins operations (Wolbers et al., 2016). IDG actors are almost exclusively viewed as volunteers (Forrest et al., 2018:423) and their activities as external to FDG. This implies that entering into volunteering agreements with established organisations is ostensibly the only way for seemingly 'illegitimate' informal actors to become part of the 'disaster system' as formalised and now 'legitimate volunteers' (Whittaker et al., 2015:360). Actors that fall outside of the formal system constitute "inconvenient bystanders [and their] spontaneous actions [...] as disruptive to the [formal] command and control structure" (Wolbers et al., 2016:422; cf. Comfort, 2007; Helsloot & Ruitenberg, 2004; Majchrzak et al., 2007) and have been variously described as 'unsolicited', 'liabilities', or 'logistical nightmares' (Sauer et al., 2014)—terms that seem to justify their 'management' by 'qualified' FDG actors (once on scene). While IDG efforts are, in theory, appreciated as important assets that can save lives in disasters, in practice, the volunteerism lens artificially narrows views and excludes "those who act independently of the state or formal organisations" (Whittaker et al., 2015:360). This may leave informal responders feeling unappreciated and alienated, affecting their actions and willingness to collaborate in a disaster, but also shaping their perceptions of FDG and potentially negatively predisposing future willingness to inform, exchange, and collaborate (Takazawa & Williams, 2011:433; Taylor et al., 1970:125-127, :143-144).

Nestled within this critique is the issue of dependencies. The external provision of resources by FDG may create undesirable dependencies, restraining people's DRR/R efforts. The mechanisms by which this happens are manifold: FDG's intimidating demonstrations of ability and power; creating expectations for future provision of disaster assistance (Archer et al., 2019); or predisposing peoples' future responses by implementing technologies and/or policies that create lock-in/path-dependencies. IDG loses autonomy to FDG absolutism in the name of missing expertise, liability, portrayal of being a nuisance/threat to FDG actors, and other limiting factors. This is reinforced by processes of subsuming IDG under the 'isms' of civil engagement (e.g. volunteerism), or what Sorokin described as the 'strings' that can be pulled (1942:138).

Thus, whether people take responsibility for their own DRR/R, is not only a reflection of the arising needs, but simultaneously, a function of their perceptions of possibility, which are, in no small part, designed by existing governance structures, and more to the point, shaped by how, and if, formal institutions choose to interact with 'informality'. At the root of this tension between informal and formal

DG, are, and have to be, concepts related to perceptions (of self and others), identity, agency, and power relations. These are interconnected and can be thought of as a dynamic entanglement of factors that ultimately influence how we do or do not respond to disasters, and whether/how we attempt to reduce the risks of them happening. As Yoneyama states, "[w]hile awareness of these problems is widespread, the problems themselves are so deeply imbedded in our civilisation that trying to find solutions within existing paradigms is almost a contradiction in terms" (2017:99).

2.4.4   INFORMAL DISASTER GOVERNANCE

In reviewing the DS literature relevant to informal actors and their actions in disasters, this chapter has identified and discussed the need for DS and practice to acknowledge, better understand, and include such IDG. While some disaster research has explored informal types of DRR/R, policies are "lagging behind in how they engage with so-called informality, with little acknowledgement of the theoretical debate, and limited understanding of their impacts on the 'informal' practices they aim to address" (Alfaro d'Alençon et al., 2018:59). How can DS theory and practice sufficiently take into account 'other' disaster actors who are neither state nor NGOs and cannot clearly be classified along common dichotomies? Ambiguity remains about whether and how to incorporate and/or interact with actors who transcend traditional state or organisational DRR/R. Contemporary academic debate, particularly DS, have overlooked this area of inquiry. As Brugh et al. state, research on informal DRR/R "is nowhere near as broad or deep in the disaster response sector as research on formal organizations [and] benefits from the combination of these two [modes] will require a deeper understanding of each, as well as of the consequences of doing so" (2019).

I argue that informality in disasters is widespread and goes far beyond its contemporary formulations. I propose the term IDG to indicate this broader role and restore its balance with FDG. The 'informality' in IDG refers to informal actors and actions in DRR/R, broadly understood as individuals or groups (any actors) acting voluntarily, in an impromptu or unplanned manner, or because they feel they must. These actors and actions have not been formally mandated and operate without any formal, systematic, or necessarily structured fashion. The remainder of this thesis investigates IDG empirically and addresses the research aims and questions.

CHAPTER 3

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METHODOLOGY

3.1 INTRODUCTION

Chapters 1 and 2 introduced this research project and reviewed the literature relevant to IDG. This chapter marks a shift to research practice, as I lay out the methodological steps taken to empirically explore the phenomenon in the case study locations of Longyearbyen and SD, and I consider the ethical implications and limitations of the chosen research approach, design, and methods.

Presenting a methodology chapter in qualitative research is not a straightforward task (Silverman, 2017:867). The selection of research approach, philosophical assumption, design, and methods in this study was guided by three needs: a) **flexibility** to iteratively explore a phenomenon, and generate (or refine) a theory, following a constructivist/relativist epistemology, b) **simplicity** to clarify a convoluted and complicated concept that has eluded definition, and c) **structure** to systematically create order and ensure the credibility of the study, in line with its ontological 'realist' perspective. The presentation of the topics in this chapter is artificially sequential, whereas in reality they are interrelated, and the research process itself is abductive and characterised by continuous shifts between the various stages (cf. Dubois & Gadde, 2014; van Maanen, et al., 2007:1149). For clarity's sake, they are presented in linear fashion, and in "sufficient detail to enable a naïve reader to replicate [this] study" (Rudestam & Newton, 2015:99).

The chapter continues with a note on my own positionality, and how this identity has informed my perspective as a researcher. The specific research aims and questions that the empirical study of IDG addresses are then (re)stated (3.2). Next, the research approach, design, and methods are presented, together with the underpinning philosophical assumptions and concepts (3.3). The following three sections (3.4–3.6) offer a complete description of the exact steps and procedures taken to conduct this research. Section 3.4 describes the preparatory phase and presents the two case study locations selected. Section 3.5 presents the data collection and handling of 54 semi-structured interviews, and section 3.6 lays out the steps followed in data analysis. Finally, discussions of ethical considerations (3.7) and research limitations associated with the methodology (3.8) conclude this chapter.

Before proceeding, a terminological clarification is necessary. During the preparation of this methodology chapter, diverging and confusing uses and classification of terminology were encountered. Research-

'approach', 'framework', 'design', 'tradition', 'strategy' or 'paradigm' are used inconsistently by different researchers as separate, identical, or interchangeable. As Denzin and Lincoln (2017:61) point out, we are in an "age of ontological, epistemological, and methodological uncertainty". This chapter follows the terminology proposed by Creswell and Creswell, with the key terms 'research approach', 'research design', and 'research method(s)' offering a "successive way from broad constructions of research to the narrow procedures of methods" (2018:25).

3.1.1   A Note on the Researcher's Role

Qualitative research is a process, behind and within which there is a "biographically situated researcher" (Denzin & Lincoln, 2017:16). From the very onset of this research 'journey', I have had an active role in it. My personal empirical observation of informal actions in disasters in two locations sparked my interest in informality within the disaster context, and my experience with governance from other fields fuelled it; and as commonly done in qualitative research (Creswell & Creswell, 2018:156), I have led the entire process from data collection to analysis and interpretation.

Whereas this active role can be perceived as a limitation, it is a fundamental part of my personal philosophical position as a critical realist. The core philosophical stance of critical realism (discussed at length in subsection 3.3.1) explicitly recognises that while there is a reality that exists independent of human perception, it can only be perceived through our own individual subjective lens (Maxwell, 2012:5). This position influenced my choices of the philosophical underpinning for this study, qualitative research as an approach, case study as a design, and semi-structured, open-ended interviewing as a method.

As Glesne and Peshkin argue, "[m]y subjectivity is the basis for the story that I am able to tell [...]. It makes me who I am as a person and as a researcher, [and it is] something to capitalize on rather than to exorcise" (1992:104). My positionality is the result of my identity and experiences. I am a woman of mixed European heritage, influenced by childhood experiences as both a refugee and the only daughter of a single mother. As an adult, I have travelled extensively for work and pleasure. These experiences have shaped both how I perceive others and how they perceive me, depending on interacting beliefs, norms, and cultures.

I share these experiences without presuming to make any causal links or psychological analysis. Instead, I share this information in keeping with the two important duties of researchers outlined by Max Weber (2011:59). First, I hope to provide the reader with transparent insight into my reflexivity, a window through which to judge the credibility of this study, and to ensure its replicability. Second, by explicitly mentioning my own subjectivity, I aim to embody what Reason dubbed 'critical subjectivity', that is, "a quality of awareness in which we do not suppress our primary experience; nor do we allow ourselves to be swept away and overwhelmed by it; rather we raise it to consciousness and use it as part of the inquiry process" (1988:12). In other words, the admittance of individual subjectivity and the unattainable nature of an

objective 'reality' do not absolve researchers from the pursuit of 'objectivity'. On the contrary, as Parker states, putting "subjectivity at the heart of research may actually, paradoxically, bring us closer to objectivity" (1999:85), a view also supported by Weber (2011:59–60).

Thus, while section 3.8 of this chapter addresses the credibility of this research methodology, chapter 7 addresses this study's limitations as a whole. I have endeavoured to cultivate 'critical subjectivity' as an integral and guiding practice during the entire research process, and to offer audit trails as guidance for its replicability and transferability to other cases.

3.2   RESEARCH AIMS AND QUESTIONS

To investigate and analyse IDG, this research was conducted in two case study locations: Longyearbyen in the Arctic archipelago of Svalbard, and the southern region of the Caribbean island nation of the Commonwealth of Dominica (subsequently referred to as 'Dominica'). The goal was to explore people's experiences with and perceptions of informal sources of disaster-related information and help, and to understand their IDG-related perspectives within the larger context of DG. As such, the main research aims were to a) build an understanding of the phenomenon of IDG in Longyearbyen and South Dominica (SD) by examining how residents perceive DG, b) examine the factors that contribute to these perceptions, and c) consider the possible implications for DG. The main research questions of this study are:

1)   How do residents of Longyearbyen and SD perceive the role of IDG within sources of disaster-related information and help?
2)   What factors influence these perceptions?

Additional sub-questions include:

1)   How do residents of Longyearbyen and SD perceive IDG/FDG sources?
2)   What contributes to interviewee choice of IDG or FDG?
3)   What are the implications of IDG's role for DG?

To answer these questions, the research aims were operationalised through a total of 54 semi-structured, open-ended interviews supported by the revised Pictorial Representation of Illness and Self Measure (PRISM) visual tool.

3.3   QUALITATIVE RESEARCH APPROACH

To address the research questions, an in-depth investigation of IDG and its constituent parts was necessary (Ch. 2). In the absence of an appropriate pre-defined theory or conceptual framework, research into informality in DG needed to be empirically based, conducted in its naturally occurring environment, and with a sufficiently flexible approach, design, and method to allow the refinement of existing theories and the formulation of an IDG framework. Consequently, this study adopted a qualitative, abductive, and explorative approach.

According to Rudestam and Newton, "the goal [of qualitative research] is [...] to focus on description, exploration, search for meaning, [and/]or theory building" (2015:41). Thus, a qualitative research approach is well suited to understand phenomena in their context, in particular, vis-à-vis refining or generating theories, as it can reveal underlying relationships between concepts and behaviours (Creswell & Creswell, 2018; Glaser & Strauss, 1967; Denzin & Lincoln, 2017; Patton, 2002; Rudestam & Newton, 2015; Silverman, 2017; Snape & Spencer, 2003). Qualitative research is well-established and widely used in disaster research (Phillips, 2014:1–2). To facilitate the development (or refinement) of a concept such as IDG, this study was inspired by 'systematic combining', a process where "theoretical framework, empirical fieldwork, and case analysis evolve simultaneously" (Dubois & Gadde, 2002:554). This abductive process "likely goes on in most if not all promising research projects, [but] is largely hidden from view" (van Maanen et al., 2007:1149). This 'emergent design' (Creswell & Creswell, 2018:155) or 'researcher-as-bricoleur' status (Denzin & Lincoln, 2017:11–12; Maxwell, 2012:6) is another relevant feature of qualitative research, with data collection and analysis conducted in "such a way that new and unexpected relationships can be discerned and the possibility of identifying unforeseen variables is not excluded" (Stallings, 2003:55).

My exploration of IDG began with an empirical observation, setting the tone of this research as neither exclusively inductive nor deductive, but instead embracing an abductive approach that is considered a cornerstone of discovery (Kuhn, 2012 [1962]; Paavola, 2004; Peirce, 1997) and incorporates elements of both inductive and deductive reasoning, in line with a rejection of the induction-deduction dichotomy in favour of a 'balance' between the two (King & Brooks, 2017:6). According to Phillips, the inductive component makes it "possible to capture, analyze and report on social phenomena surrounding unanticipated events" (2014:3). This feature is important when considering disaster risks and, through them, events that have not (yet) occurred, or are not tangibly considered by the participants in the study. In contrast, even within qualitative research, the testing of a hypothesis and the analysis of data also involve deductive reasoning (Creswell & Creswell, 2018:155).

The above-mentioned features, in line with Creswell and Creswell's (2018) research framework (Figure 1), contributed to my selection of a critical realist 'worldview' for research (3.3.1), case study design (3.3.2),

and interview data collection method (3.3.3), and matched my own stance as a practitioner aware of my own positionality, and interested in the subjective perceptions and experiences of people in their natural settings (Avenier & Thomas, 2015:5).
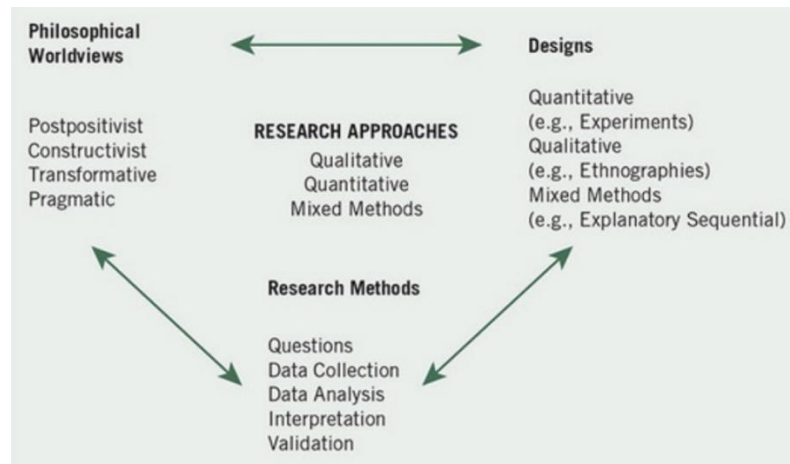
Figure 1. A Framework for Research: The Interconnection of Worldviews, Design, and Research Methods (Creswell & Creswell, 2018:26).

3.3.1 PHILOSOPHICAL ASSUMPTIONS

Critical realism is a form of philosophic realism, most often connected with the work of Roy Bhaskar (1979). It has been widely applied in social sciences under many names, with the 'critical' being replaced by 'experiential', 'constructive', 'subtle', or 'natural' (Maxwell, 2012). Critical realism embraces the realist ontological position that there is an objective reality that exists independently of people's perceptions, theories, concepts, and understanding (King & Brooks, 2017:3; Maxwell, 2012:3; Snape & Spencer, 2003:11). In contrast with traditional forms of realism, critical realism claims that knowledge of this 'objective' reality cannot be attained due to the subjectivity of our own perception (Avenier & Thomas, 2015:5; Maxwell, 2012:4, 2013:43). Thus, critical realists draw on an epistemological 'relativist' or 'constructivist' (and consequently axiologically subjective) perspective (Avenier & Thomas, 2015:5; King & Brooks, 2017:5; Maxwell, 2012:5), and consider that "our *understanding* of this world is inevitably a construction from our own perspective and standpoint" (Maxwell, 2012:5). To use Archer et al.'s illustration, when Galileo showed that the Earth revolves around the sun and not vice versa, reality did not change, but our construction of it did (Archer, 2013:2).

Critical realists investigate "events or outcomes [...], that is the external and visible behaviours of people, systems and things as they occur, or as they have happened" (Easton, 2010:120) to understand "the structures, the generative mechanisms[,] and the contextual conditions responsible" (Avenier & Thomas, 2015:5). This abductive approach is often referred to as 'retroduction' (Easton, 2010:124; Saunders et al., 2019:147). By doing so, one can arrive at "reasoned, though provisional, judgements about what reality is objectively like" (Archer et al., 2004:2). Put simply, while critical realism acknowledges that, from an

epistemological perspective, the 'reality' that we perceive is distorted by our own individual subjectivity, it remains committed to the ontologically realist position that "knowledge is not immune to empirical check and its effectiveness in informing and explaining successful material practice is not mere accident" (Sayer, 1992:5).

Critical realism is, therefore, distinct from more constructivist and relativist positions as it rejects the equal merit of all interpretations, and instead embraces a critical and systematic research approach in the pursuit of a certain amount of generalisability, "albeit [in] a more cautious and nuanced form than in [some] neo-positivist qualitative research" (King & Brooks, 2017:6). Thus, critical realism-inspired research lends itself well to the generation of theories (Maxwell, 2012). It is also suitable for the definition of IDG itself, as this important topic has eluded definition (Ch. 2), and its main distinction as 'informal' is itself an artificial and subjective construct.

This philosophical position is aligned with the aims of, and selected qualitative approach to, this research. The research goal was not to find a definable and predictable objective reality, but to conceptualise an IDG framework for an empirically observed phenomenon whose theoretical gaps were identified through a review of the existing literature (Ch. 2), and then to explore its empirical manifestation and significance in its naturally occurring environment in pursuit of transferability. This, in turn, influenced the selection of the case study research design.

3.3.2 RESEARCH DESIGN

To explore the occurrence and relevance of the IDG framework in its natural setting, case study research was selected as the most suitable design. Generally, case studies involve the investigation of one or more bounded system(s) (Creswell, 2006:73; Rudestam & Newton, 2015:55). However, there is little consensus on a definition for what case studies are, or whether they should even be considered a type of qualitative research (Creswell, 2006:73; Flyvbjerg, 2011:301; Lewis, 2003:52). Flyvbjerg laments the ongoing 'definitional morass' (2011:302), while Schwandt and Gates consider the pursuit of a definition a 'fool's errand' (2017:344). Some of the confusion derives from the use of the terms for different purposes. To clarify, Yin considers the 'foundational trilogy' of the 'case study' as research 'mode', 'method', and 'unit' of analysis (2017:xx). For the purposes of this research, in keeping with Creswell and Creswell's (2018) terminology, case studies are considered as a research 'design', while the units of analysis are also individual 'cases' within the two 'case study locations' of Longyearbyen and SD.

Definitions notwithstanding, the replicability and generalisability of case study findings is debated (Silverman, 2017), particularly in disaster research (Stallings, 2007:63–64). For Rudestam and Newton, without some degree of generalisability, case study research does not meet the standard for (doctoral) research (2016:56), a position echoed by Silverman's statement that "description of a case for description's sake [...] is a weak position" (2017:493), and Stallings stance that "generalization is the goal of all science,

including the social sciences" (2007:63). Though this concern is common to all research (Patton, 2002), it is pronounced in qualitative research, and associated with the use of case studies (Creswell, 2006:74), where the representativeness of sampling procedures cannot be assured, hampering the ability to make inferences about the wider population (Silverman, 2017:495).

This perceived flaw of the case study design is rooted in a misconception of its intended generalisability (Flyvbjerg, 2011:304). While case studies cannot be used as a statistically representative sample of a whole population, they can offer a valid test of a concept that is then generalisable on a theoretical level (Creswell & Creswell, 2018:68; Rudestam & Newton, 2015:56; Silverman, 2017:500; Yin, 2008:15). This position is concurrent with critical realist philosophy that endorses the use of case study design (Ackroyd & Karlsson, 2014), and emphasises "generalizing causal explanations beyond the case at hand while attending carefully to the limits of such generalizations" (Schwandt & Gates, 2017:345). Generalisability is further addressed in subsection 3.8.2.

One of the most crucial aspects of this type of research is the selection of the case study or studies (Flyvbjerg, 2011:304–308). The focus of my study is theory-building rather than a comparison of the two specific locations selected; therefore, I followed Yin's consideration of multiple-case design as simply containing a number of single-cases (2002:46), or what Stake defines as the 'collective case study' (2000:437), a term also adopted by Creswell (2006:74) and Silverman (2017:492). However, whereas Yin (2002) makes a distinction between the rationales for single and multiple cases, this study departs from the linear approach and the positivism that underpins Yin's (2002) 'replication logic' (Dubois & Gadde, 2014; Easton, 2010), as highlighted by his persistent use of closed 'experiments' as analogies for case studies. Instead, by acknowledging the abductive and iterative nature of research, described above (3.3) as 'systematic combining' (Dubois & Gadde, 2002, 2014), this research considered each individual case study location independently, and sequentially. This facilitated the development of the IDG framework by promoting theory building typically associated with single cases, and theory refinement often connected to multiple cases (Avenier & Thomas, 2015:14–15). It also enabled this study to reach the 'multiplicity of perspectives' (Lewis, 2003:52) which is needed to provide 'epistemological closure' (Easton, 2010:124).

The suitability of each location was determined based on their individual value as 'critical cases' (Flyvbjerg, 2011:307; Silverman, 2017:502; Yin, 2008:47–48) for testing whether IDG is significant in disaster contexts. Specifically, considering the early stage of IDG theory development and the exploratory nature of this research, the locations were selected using a 'most likely' strategy, meaning that if IDG is not significant in either location, then it is likely not so in most, if not all, cases (Flyvbjerg, 2011:307).

3.3.3 RESEARCH METHODS

Considering the lack of available data dealing directly and adequately with IDG, particularly in the chosen locations, and the specificity of the information needed to answer the research questions, the generation

of new data was considered more suitable for this study than the use of pre-existing or naturally occurring information (that is, data occurring without the intervention of the researcher) (Lewis, 2003:56–57).

Semi-structured, open-ended, in-depth interviews were selected as the method for this research. Interviews are one of the main data collection methods in qualitative research (Brinkmann, 2017:578–579; Bryman, 2012:469; Legard et al., 2003:138), particularly in case study designs (Yin, 2013:106). It is also the most used method in qualitative disaster research (Phillips, 2014:66). The direct and private nature of interviews helps create conditions of trust with interviewees, ensuring access to the distinct perspectives and lived experiences of participants in their particular context (Byrne, 2004:209; Lewis, 2003:58; Phillips, 2014:65). It also eliminates issues of non-response rates associated with surveying methods. Further, interviewees facilitate a deep understanding of complex topics (Yin, 2013:102)—such as DG—which may include potentially sensitive issues (Lewis, 2003:58). From a practical perspective, interviews are also the easiest and most cost-effective method. They normally take longer then focus groups but require about 26–36% less resources until thematic saturation is reached (Namey, et al., 2016). The coordination of interviews is also easier for both the researcher and interviewees (Lewis, 2003).

Amongst the various types of interviews, semi-structured ones are the most widespread, and are conducive to investigate the meaning of a phenomenon for participants (Brinkmann, 2017:578-579). This format requires that interviewers follow guidelines but are free to ask questions in different orders to make the experience more conversational for the participant, and to use probes to elicit additional information (Bryman, 2012:471). Further, the semi-structured approach ensures that Legard et al.'s four key features of in-depth interviews are followed, namely: 1) the balance between structure and flexibility—further emphasised by the open-ended nature of the interviews (Byrne, 2004:209), 2) the interactivity, 3) the investigation of depth beyond initial answers, and 4) the production of new information, whenever possible (2004:141–142).

Finally, for Alesson and Ashcraft (2012:246), beyond any interviewing technique or best practice, researchers must consider and follow the guidelines of their (research project's) wider philosophical position. The use of semi-structured interviews is in line with the critical realist philosophical assumption underpinning this research, specifically with its relativist/constructivist epistemological stance. Critical realists embrace the active role of the researcher (Brinkmann, 2017: 578–579), and the importance of the subjective perceptions of participants as a means of reaching a "configurational view of causality" (Schwandt & Gates, 2017:345). In the context of this research, this means investigating the mechanisms, conditions, and other elements that contribute to interviewees' perceptions of IDG, and the subsequent choice of IDG or FDG as a source of disaster-related information or help. Further, this approach confronts the prospective limitation raised by the active role of the researcher by mentioning it explicitly and addressing it critically to minimise bias (Ch. 3.8).

To support the interviewing method and to help ensure accurate representation of interviewees' perceptions, consistency across settings and cultures, and Legard's et al.'s emphasis on investigating depth beyond initial answers, a visual aid deriving from clinical psychology called Pictorial Representation of Illness and Self-Measure (PRISM) was added. Developed to assess suffering in patients in routine clinical practice, PRISM is an easily understood and visual method to elicit both qualitative and quantifiable information regarding participants' salient perceptions (Büchi & Sensky, 1999; Peter et al., 2016; Sensky & Büchi, 2016). Following its beginnings in clinical research, PRISM has since been successfully used to structure interviews on different research topics including "patient health outcomes, health and environmental risk appraisal, attitudes to the workplace, and group appraisals of meetings or training sessions" (Sensky & Büchi, 2016:2). The PRISM tool was adapted to the new context of this study with the acquiescence and support of some of its original founders. Following a pilot on Svalbard during the preparatory stage (3.4.4), a final version was developed after conversations with a UCL researcher familiar with the tool and who had an active role in its development. The novel PRISM-assisted interview method used in this thesis represents an original methodological contribution to DS.

3.4 PREPARATORY WORK

3.4.1 Desk Review and Immersion (July 2016 – September 2017)

Empirical observation sparked this research; an extensive literature review of informality in disasters fuelled it (Ch. 2). During these initial stages, I leveraged my professional occupations and network to add a practical and experiential component—attending conferences, informal practitioner discussions, and travelling to the Greek island of Chios for more on-site observation (1.1). I also used my UCL partnerships and networks to further immerse myself in ongoing debates on related/relevant topics.

My empirical observations of borderland status and its associated para-diplomatic activities drew my attention to the possibility of IDG's particular relevance in border areas. I identified the areas of Rovaniemi (Finland) and Kirkenes-Nikel-Murmansk (Norway-Russia) as a potential case study setting for further investigation. Due to the dearth of IDG literature, and my lack of location familiarity, an explorative and immersive field investigation through Finland and Northern Norway (especially along the Swedish and Russian borders) was conducted over a four-week period during 2017. Much of this phase consisted of unplanned, unanticipated encounters. I used convenience sampling—an acceptable sampling methodology for preliminary data collection in qualitative research (Bryman, 2012:201)—and informal interviews, to elicit information from participants and help create an initial understanding of IDG. Seeking active community engagement, I also participated in local cultural life by visiting museums, participating in local conferences and events—during this initial field visit and beyond—and formally and informally connecting with officials and community members.

During my Arctic visit, the widespread observation of IDG and the repeated stakeholder references to it on both sides of the Norwegian/Russian border and in and around Rovaniemi, led me to reconsider the 'exceptional' nature of IDG, and the significance of borderlands as a determining factor for its manifestation. Thus, my prior interest in para-diplomacy and borderlands faded, and IDG emerged as the central research topic. Ultimately, the Kirkenes-Nikel-Murmansk area was not selected as a case study location and the research focus shifted to exploring IDG without a priori limiting it to border areas. Nonetheless, this field trip proved fruitful. Interviewing relevant key community members—such as local newspaper reporters and editors, librarians, individuals working with local emergency services, and public transportation personnel—provided me crucial practical sampling and interviewing training, and helped me refine both the research and interview questions.

3.4.2　CASE STUDY SELECTION

Following this Arctic immersion trip, the case study selection was broadened to investigate the occurrence of IDG in a critical case. Considering the scope of a PhD, the most appropriate case study location would be one hypothetically 'most likely' to feature IDG; this means that if under theoretically IDG-conducive conditions the case did not present itself significantly, then it could be assumed that it is not generally the case (Flyvbjerg, 2011:307). Thus, I sought out known informality settings in numerous societal areas, including health and safety. Small-populated settlements, such as on isolated islands, are frequently touted and complimented for their tight social networks and informal governance (Baldacchino, 2018; Kelman, 2017a). Grydehøj (2014) highlights the Svalbard archipelago as a key example thereof. I decided to leverage my Arctic familiarity, and selected Longyearbyen on Svalbard as a case study (Ch. 4.1).

During the same period, Hurricane Maria tore through the island nation of Dominica, causing extensive damage. As a researcher cum practitioner, I was in contact with several international non-governmental organisations (NGOs) that were physically responding, amongst them IsraAID. During a casual discussion with their leadership, the details of their decision to respond after Maria sparked my interest. The appeals of a long-time Dominican resident and resort owner made its way through informal channels to the organisation, leading to subsequent response and long-term DRR activities funded by said resort owner. This was a clear case of IDG. This occurrence, combined with the island's suitability as a 'most likely' case, and the accessibility potential afforded by my IsraAID familiarity, compelled me to add it as a case study.

A second case study adds a greater 'multiplicity of perspectives' (Lewis, 2003:52) to the research, enhancing the theoretical generalisability of the study's findings (Easton, 2010:120). With a 'sequential single-case' structure, the focus remained on the research's intended goal of simplifying the previously complex and convoluted instances of informality into a conceptual framework of IDG, while drawing on the differences between Svalbard and Dominica's history, culture, politics, socio-economic structures, and

geographic locations. The independent and sequential consideration of each location facilitated the repeated testing and refinement of the IDG framework (Dubois & Gadde, 2002:555; Saunders et al., 2019:153).

3.4.3   PILOT (JANUARY 2018)

Pilot testing offers the opportunity to understand the perspectives of potential interviewees on the topic, practice interviewing techniques, refine the research questions, and finalise interview questions (Bryman, 2012:471–479; Maxwell, 2008:227–228, 2013:66–68; Phillips, 2014:71; Silverman, 2017:541). It also afforded a space to test the revised PRISM tool. Thus, in January 2018 I travelled to the closest and most cost-effective potential case study location: Svalbard.

I spent four days in Longyearbyen to pilot the interview questions, make local contacts, and prepare logistics. I visited a number of key local facilities, including the university, church, government offices, library, social venues like cafes, hotels, and shops, and engaged in spontaneous informal discussions with locals and tourists. Five informal interviews were conducted through purposive sampling. Participants included an academic researching disasters, a journalist, one member of the hospitality industry, and two tour guides. During these pilot interviews, interviewees were informed of my position as a researcher, and of the pilot nature of the interview (no data were collected, no personal information documented, nor any recordings made, to ensure the confidentiality and anonymity of participants). The resulting thoughts, supported by field notes, were discussed with my supervisor and other colleagues (the latter mainly related to the PRISM methodology), resulting in the development of the final questions guide and adapted PRISM tool (described in 3.5.3).

3.5   DATA COLLECTION AND HANDLING

The data necessary to reach 'epistemological closure' (Easton, 2010:124) and answer the research questions were collected during two three-week long fieldtrips to Svalbard (July 2018) and Dominica (October 2018). Data were collected through semi-structured, open-ended, in-depth interviews with individual stakeholders, using PRISM to aid the interviews. The following section outlines the means through which the participants were selected, and the exact steps and procedures taken to gather and record data, and the intention with which it was handled.

3.5.1   SAMPLING

3.5.1.1   Sampling Strategy

Due to the relative novelty of this topic and the limited information available about it with regards to the case study locations, this research relied on a combination of purposive, convenience, and snowball

sampling—recruitment techniques often used in exploratory research (Forman et al., 2008). This approach is concurrent with sampling strategies applied in case study research designs that use interviews as a method (Bryman, 2012:418–424; Silverman, 2017:497, 535–536). These sampling techniques are also compatible with a critical realist worldview that considers the subjectivity of perceptions and critically embraces the active role and reflexivity of the researcher.

Small, purposefully selected samples are widely used in qualitative research, as they may provide a greater depth of information than the random sampling used in quantitative research (Denzin & Lincoln, 2011; Forman et al., 2008). In the context of this explanatory study, convenience sampling[23] provided an effective way to collect preliminary data from relevant stakeholders (Ritchie et al., 2013:81–82), and the flexibility to adapt to unforeseen opportunities as they arose during the fieldwork. Further, snowball sampling is a dynamic type of recruitment method where researchers enrol study participants using referral methods. One individual is recruited, and s/he is then asked to refer other relevant stakeholders. The interviewee may help by encouraging other eligible individuals in their network to participate. This sampling methodology is often used within hard-to-reach populations (e.g. illicit drug users), and its use together with purposive sampling is recommended in DS (Phillips, 2014: 32). In this case, snowball sampling was used as it is an effective way to assess "power relations, social networks, and social capital," which is an important aspect of the project (Noy, 2008:327).

3.5.1.2   Selection Criteria

This research project focuses on a limited number of participants who were selected based on the following criteria:

- Be an adult (≥18 years old)
- Be a resident of one of the case study locations
- Diversity criteria: To obtain a diverse range of interviewees, subjects from both genders and a variety of ages, ethnicities, and socio-economic backgrounds were chosen.
- Accessibility: Both physical factors (distance, ease of access) and potential interviewee willingness to speak contributed to selection of interviewees.

3.5.1.3   Sample Size

In both case study locations, data collection proceeded until no new relevant data were discovered and results were becoming increasingly repetitive, effectively reaching 'relative' theoretical saturation or

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[23] Convenience sampling is also referred to as opportunistic sampling. While these are often used synonymously, other scholars draw clear distinctions between the two. See, for instance, Patton (2015:240–44), for whom the approach described here would constitute an opportunistic sample selection. In contrast, convenience sampling would not involve any defined strategy but rather be based on factors such as ease of access.

'epistemological closure' (Easton, 2010:124). Saturation is an acceptable key determinant of sample size in qualitative studies (Creswell & Creswell, 2018:158; Josselson, & Lieblich, 2003; Mason, 2010; Morse, 2017:809; Schwandt & Gates, 2017:347). It is important to note that true saturation never occurs as each new respondent contributes something unique to the research (Josselson & Lieblich, 2003). Thus, a balance needs to be struck between saturation of findings and quality. More is not necessarily better as too many interviews may be unfeasible to collect and analyse, limiting the depth and subsequent value of each interview. Equally, a relatively small number of excellent, in-depth, repeated interviews may only provide a limited range of perspectives.

Resource limitations (e.g. time, researcher fatigue) was the second factor that determined sample size. Concretely, given an interview length of up to 120 minutes, the amount of data collected in each new interview results in significant workload (e.g. handling, transcribing, coding, and analysing the data). Ultimately, after relative saturation had already been reached, a decision needed to be made regarding whether these factors outweighed the potential benefits of new findings. A balance was struck by adding several interviews after relative saturation had been reached to check against criteria that emerged from previous interviews. In total, 54 interviews were conducted and analysed: 22 from Longyearbyen and 32 from SD.

3.5.2 PREPARING FOR SEMI-STRUCTURED INTERVIEWS

To carry out interviews successfully, the interviewer must be able to: maintain flexibility while steering the interview to obtain answers that will help fulfil the objectives, remain tactful, ask the right questions, and spontaneously re-formulate good questions when interviews take unexpected turns or the respondent is unable to understand the question. While I had interviewing experience, I followed Bryman's "Criteria of a successful interviewer" (2012:475, adapted from Kvale, 1996). I also practiced extensively during both the immersion and pilot trips, as well as with other willing participants (e.g. family and friends). Overall, salient information was elicited through the combination of a structured interview guide supported by the less frontal PRISM tool, as described below, while allowing the participants to provide rich accounts of their experiences (hence the 'semi-structured' label). The observational unit of analysis of this research project is the individual stakeholder and their choices for IDG and/or FDG.

3.5.2.1 Interview Guide

Semi-structured interviews commonly use interview guides that provide a basic structure to ensure consistency across interviews while allowing the participant to add their own direction and information (Brinkmann, 2017:578–579). In exploratory studies, these guides often involve a small number of broad questions intended to elicit expansive answers and give the participant an active and dominant role in the dialogue (Arthur, 2003:110).

To design the interview guide for this study, Bryman's (2012) series of steps were followed (Figure 2).

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│ General  │     │ Specific │     │Interview │     │Formulate │
│ research │ ──▶ │ research │ ──▶ │  topics  │ ──▶ │interview │
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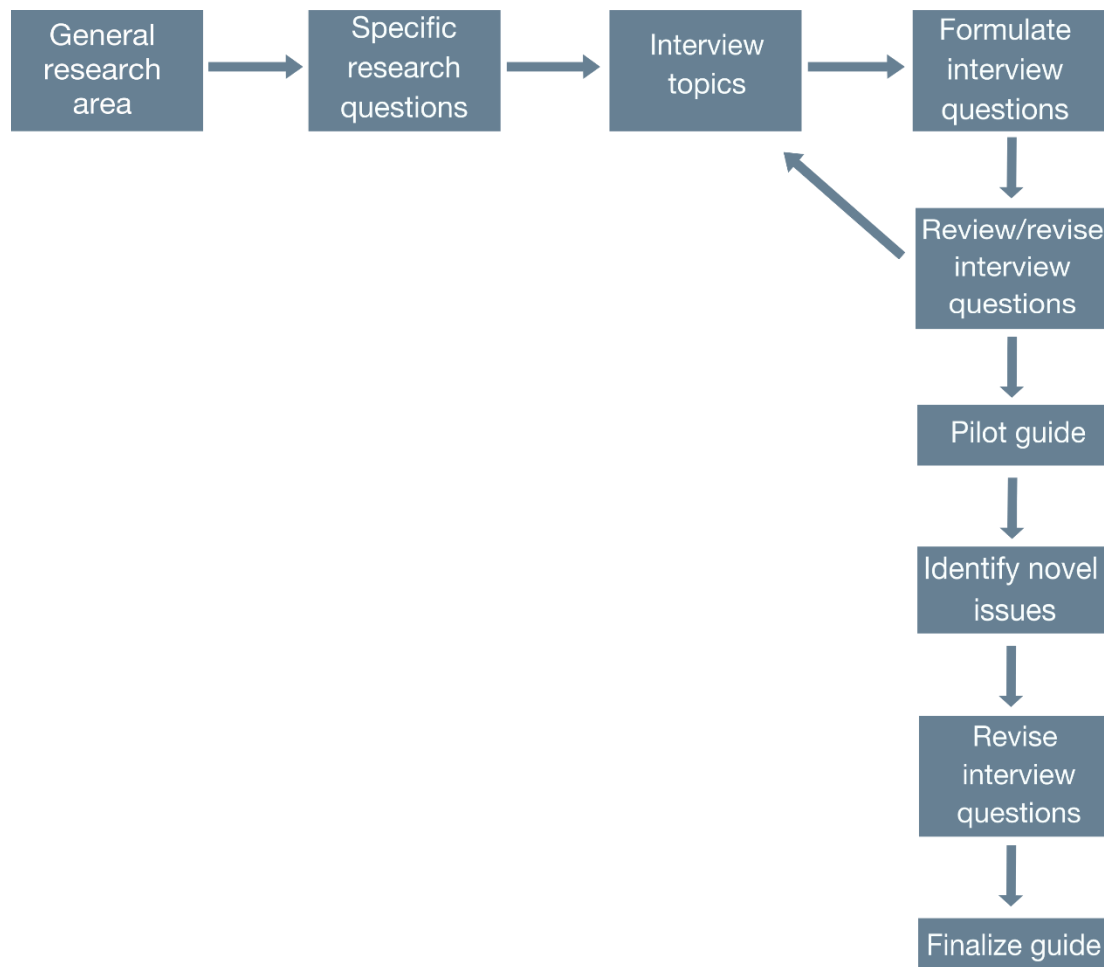
Figure 2. Formulating Questions for an Interview Guide (Reproduced From Bryman, 2012:476).

The aim of the interviews was to determine the significance of IDG for interviewees within disaster-related information and help while avoiding a bias towards discussing IDG or even (in)formality in general. To do so, the interview questions were formulated as an investigation of what interviewees in both locations perceived to be their disaster risks, as well as sources of disaster-related information and help. Additionally, any mention of (in)formality was avoided unless raised by the interviewees themselves. Thus, the interview guide was finalised with the following three broad, open, PRISM-guided, questions:

1) What kinds of disasters or disaster risks do you feel are relevant in your life?
2) How or from whom do you get information about hazards and disasters?
3) What are your sources of disaster-related help?
   a) In the disaster you experienced, from whom did you get help and when? (Pre-disaster mitigation, during, after)
   b) In the event of a disaster, from whom would you get help and when? Who would you approach? (Pre-disaster mitigation, during, after)

The sequence of the questions is significant. Question 1 is an introductory 'icebreaker' question to evoke a consideration of disasters and bring them to the forefront of interviewees' minds. Question 2 adds 'actors' in the form of source of information, and considers not just disasters and disaster response, but also expands interest to preparedness and DRR. Finally, question 3 takes both questions to their logical conclusions, and considers disaster assistance which, depending on interviewees' interpretation, can refer to DRR and DR or both. Not every person in Longyearbyen experienced a disaster directly. Thus, the third question was augmented with an option to inquire into people's perceptions as to who they think they might seek out for help in the case of experiencing a disaster directly. Question 3.b and, thus, the inclusion of people who only indirectly experienced a disaster, added an important dimension to this research by enabling a comparison of perceptions versus reality.

Crucially, as is common for semi-structured interviews, the leading questions above are best understood as guiding 'topics' (Arthur, 2003:109; Byrne, 2004:219–220), and were further expanded with a range of follow-up questions to elicit further information. Table 6 below presents a non-comprehensive list of common questions that were asked in every interview.

Table 6. Leading Questions and Examples of Additional Questions.

Leading questions	Examples of additional questions
What kinds of disasters or disaster risks do you feel are relevant in your life?	- Could you elaborate on why this hazard is of particular concern? - Compared to another (if relevant)?
How or from whom do you get information about hazards and disasters?	- Which sources of disaster information did you find most useful? Why? - What kind of information did they provide you with? - How important were these sources? Compared to others?
A: In the disaster you experienced, from whom did you get help and when? (Pre-disaster mitigation, during, after) B: In the event of a disaster, from whom would you get help and when? Who would you approach? (Pre-disaster mitigation, during, after)	- How did this person/organisation help you? - What is your relationship to this person/organisation? - How important were these sources? Compared to others?

To ensure the validity and reliability of the results, several control questions were introduced throughout the interview (i.e. differently phrased questions at different points that provide a similar answer). For example, if an interviewee considered hurricanes as the disaster risk they are most concerned about, and also referred to earthquakes and floods, a control question would be to ask whether earthquakes and floods are less 'important' than hurricanes.

3.5.2.2 Pictorial Representation of Illness and Self Measure (PRISM)

To complement the interview data collection method, a revised version of the Pictorial Representation of Illness and Self Measure (PRISM) visual tool was used (Chs. 3.3.3 and 3.4.3). Participants were shown a

virtual board via a PowerPoint template on the same laptop, with a fixed yellow disk (ca. 7cm diameter) in the bottom right corner (Figure 3). The board itself constituted the context, i.e. the participant's current life and environment. The yellow disk represented the participant's 'self'. The participant was then asked to place other slightly smaller disks (ca. 5cm diameter) of various colours that represented the object(s) of inquiry (here: disasters in Q1, sources of information in Q2, sources of help in Q3) in relation to the self. The colours themselves carried no meaning and were organised on the side. The more important the object was, the closer it would be placed to the self. Thus, distance-based rank became the main measure derived from this exercise.
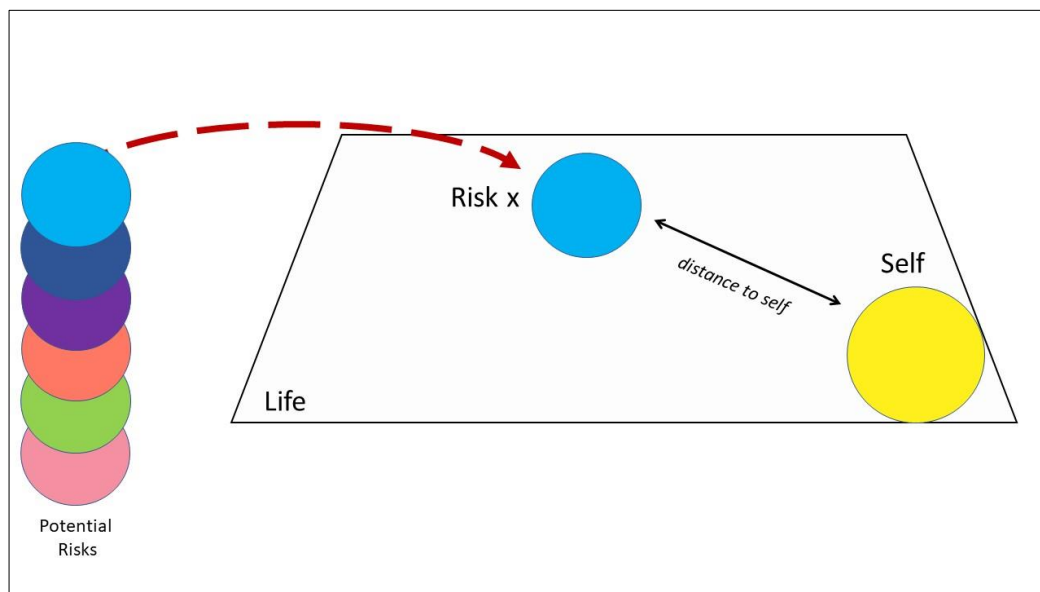
Figure 3. Illustrative Graphic Modelled on Q1-PRISM.

To verify the accuracy of the results, each PRISM exercise was supplemented by qualitative follow-up questions that were asked in relation to the board—i.e. the reason(s) why a disk was placed in a certain place or in relation to others, or why a hazard was missing. As a result of this discussion, participants were able, in an interactive manner, to adjust the PRISM board to reflect their perceptions more accurately. At the end of each interview question, participants were asked to confirm whether they are satisfied that their PRISM board accurately reflects their perceptions or if they would like to change/add disks or comments. Results were recorded as a MS PowerPoint file.

3.5.2.3   Recording and Documenting

Fifty of the 54 interviewees were audio-recorded for later transcription and analysis (with interviewee's informed consent) (detailed notes were taken for the remaining 4). After the initial briefing, a Samsung S8 phone's recording application was turned on, and the phone placed out of direct sight. In addition to signing the consent form (Appendix C), each interviewee was verbally asked for permission to begin the recording and informed when the recording was started and ended.

The interviews were audio-recorded in view of a forthcoming transcription. Transcription has its drawbacks: recording can potentially change the interview dynamics and stress or put off participants (Bryman, 2012:483). Further, transcripts often miss non-verbal gestures and behaviour, and transcribing is time-consuming, quickly resulting in an overwhelming 'pile of paper' (Bryman, 2012:484). However, interview transcription allows for a more thorough and precise examination of what interviewees say. It also reduces notetaking, enabling rapport-building (Bryman, 2012:482; Legard et al., 2003:167–168). Mobile phone technology has also reduced the cost traditionally associated with quality recordings.

Recording and transcription of the interviews was chosen as the list of advantages outweighed the disadvantages. Besides the first limitation of making participants feel uncomfortable while being interviewed, all other limitation issues were resolved with efficient planning, data organisation, and time management. By re-emphasising the details of the information sheet regarding confidentiality and anonymity, and through the use of the least-intrusive technology[24] to record the interview, I tried to make participants comfortable despite the recordings. Engaging in light discussion prior to turning on the device and beginning the interview further helped put people at ease. To minimise the loss of non-verbal observations and serve as back-up in case of malfunction of the recording device, an interview summary form (Appendix D) was filled immediately after each interview. In contrast, it was judged that the minimal additional data gained through the use of additional recording apparatus that focused on other senses (e.g. video camera) would not be worth the complications, cost, and potential discomfort of the interviewees.

3.5.2.4   Interview Procedure

Initial Contact and Scheduling

Whenever possible, initial contact with some potential interviewees was made prior to the start of the field trip itself, facilitated by my previous Svalbard visit, and my own Dominican academic and practitioner networks. On location, prospective interviewees were recruited through snowball sampling as well as at various access points: tourism, cafés, university meetings, church, non-governmental organisations, and other resident encounters.

Communication with all interviewees was conducted in English. The general premise of the interview was shared, and where possible, interviews were scheduled in a neutral setting, most commonly, a quiet hotel lounge, library facilities, a café, as well as outdoors. In some cases, based on the preference or availability of the interviewee, interviews were conducted in the interviewee's home.

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[24] No intimidating large recorder between the researcher and participant that would be both boundary-creating and attention-drawing.

Introduction and Informed Consent

Upon meeting and before starting the interview, utmost care was taken to gain the interviewee's trust and foster rapport. I (re)introduced myself and made sure to allow space for the interviewee to ask potential initial questions and to clarify concerns. The interviewees were briefed on the overall study including:

- What the study's generated data will be used for
- Confidentiality reassurances
- How data will be recorded
- Potential length of the proposed interviews
- Reassurance that the researcher's role is non-judgemental but evaluative

The interviewees were then presented with an information sheet and the consent form (Appendix C); and given the time and space necessary to review them, ask questions, and make an informed decision about the way forward, without any obligations or pressure.

The Interview

If the interviewee decided to continue with the process and signed the informed consent form, then the recording device was turned on, and the interview started. The interviewees were presented sequentially with the three questions and the associated PRISM digital boards according to the procedures outlined in Table 7 below. Although the sequential order of the questions was maintained throughout all the interviews, flexibility was afforded for interviewees to go back to previous questions and review their responses if they wished.

Table 7. Interview/PRISM Guideline.

PRISM Exercise #	Procedure
1 – DISASTER PERCEPTIONS **Question:** What kinds of disasters or disaster risks do you feel are relevant in your life?	1. Open the appropriate MS PowerPoint template. 2. Present a prepared blank PRISM page and explain the setting. 3. Ask the (first) question and get the interviewee to place the reference marker(s) for the hazard(s) identified (e.g. plane/helicopter crash, polar bear attacks, tourism accidents). 4. Repeat the exercise for as many hazards as they name. 5. Ask the interviewee to explain why they placed the markers where they did, and answer any questions about the hazards present on the board. 6. Ask the interviewee if there are other markers that they would like to add. 7. Ask the interviewee if they want to change the positions of any of the markers or add new markers. 8. Save the file.
2 – SOURCES OF DISASTER INFORMATION	9. Move to the next prepared blank PRISM slide and explain that this stage considers how, and from whom, they get information about hazards and disasters.

Question: How or from whom do you get information about hazards and disasters?	10. Repeat procedures 3 through 8 following a line of questioning relevant to Q2.
3 – SOURCES OF DISASTER HELP

Question Scenario A: In the disaster you experienced, from whom did you get help and when? (Pre-disaster mitigation, during, after)

Question Scenario B: In the event of a disaster, from whom would you get help and when? Who would you approach? (Pre-disaster mitigation, during, after) | 11. Move to the next prepared blank PRISM slide, and explain that you are now going to consider how, and from whom, they would expect to get help in the event of a disaster (or have done so in the case of scenario A), before / during / immediately after the disaster and later on.

12. Repeat procedures 3 through 8 following a line of questioning relevant to Q3. |

The length of the interviews was kept flexible. Put differently, as long as interviewees stayed on topic, with or without prompts, they were free to speak without interruption. Rounded to the nearest minute, the shortest interview was seven minutes long, the longest 115, and the average length of interviews was 34 minutes. Beyond the PRISM-related three questions and follow-up questions (section 3.5.3.1), inspiration was drawn from Kvale's (1996) nine types of questions that also feature in Bryman (2012:476–478)—introducing, follow-up, probing, specifying, direct, indirect, structuring, silence, and interpreting questions.

An effort was made to use simple, clear language, but some specific terminology could not be avoided and was explained to the participant. For instance, at times it was necessary to convey what disasters are and what they entail. Conversely, valuable information was gained by not immediately introducing pre-defined conceptions and terminologies and waiting for the participant's interpretations. Definitions were introduced in a way that did not disrupt independent thought but offered guidance to encourage participants to think outside of their own conceptual boundaries. One technique employed was to start the interview without a clear definition of the terms and allow the interviewee to brainstorm and share ideas. Following this, more probing questions exploring the participant's perceptions of the term were asked. Only after was the study's definition introduced to see if it elicited any new thoughts. This technique also offered an opportunity to consider possible gaps between consensus definitions in the literature and the interviewees' perceptions.

One final component of the interview was the collection of demographic data for analytical purposes. Depending on the dynamic of the interview in question, the data were collected either before the recording device was turned on at the start of the interview (but after the consent form had been signed), or at the end after it was shut off.

Wrapping up and Post-Interview

At the closure of the interview, each interviewee was asked one last time to confirm their answers to the PRISM exercises. Next, the recording device was shut off, and the interviewee was thanked for the time, patience, and willingness to express themselves, share their perceptions, and contribute to the research.

In cases where the demographic data had not yet been collected, then the relevant series of questions ensued. To end the interview in a positive and trusting manner, some general conversation followed for a few minutes. This practice ensures the interviewee is respected as a human being and not just a source of data (Creswell & Creswell, 2018:89), and promotes their willingness to contribute to research again in the future (Phillips, 2014:42).

During the interview, no notes were taken to ensure full focus and participation in the interview and maintain a flowing conversation and non-judgemental dynamic. Once back in a private setting, an interview summary with the main ideas discussed and any notes on visual elements (e.g. body language, surroundings, tension, etc.) was completed. These forms make up part of the study logbook and provide backup in case the recording device malfunctioned.

3.5.3   DATA HANDLING

In accordance with UCL's Research Data Policy, a data management plan was created (Appendix E). The digital recordings and PRISM PowerPoints, as well as the signed consent forms were kept private and for 'my eyes only'. Anonymised electronic versions were kept on a secure hard drive and were backed up on a secure online cloud server. The physical signed consent forms were kept in a secure location. All data were then transcribed. The resulting anonymous transcriptions, and associated PRISM PowerPoints were then analysed.

3.6   DATA ANALYSIS

The analysis of data is a "continuous interplay between concepts and data" (van Maanen et al., 2007:1149). Accordingly, in keeping with this study's abductive approach, the data collected through the interviews were analysed through both an inductive approach where codes 'emerged' from the data, and the use of deductive a priori themes (Ch. 3.6.2.3). To develop and organise codes, and subsequently identify patterns and underlying themes, a computer-assisted qualitative data analysis software (CAQDAS) was used. The software MAXQDA was selected for its user-friendliness, clear presentation, and coding features. To ensure data protection, a single license was purchased for exclusive and protected use on one password-protected laptop. The PRISM diagrams associated with the interviews, and the interview summary forms, were considered as sources of corroborative and complementary information. The analysis of the data was guided template analysis, a form of thematic analysis that is described next (3.6.1).

3.6.1   THEMATIC ANALYSIS: TEMPLATE ANALYSIS

Braun and Clark's seminal paper describes thematic analysis (TA) as a "poorly demarcated and rarely acknowledged, yet widely used qualitative analytic method" (2006:1). Put simply, TA is the organisation

of information that emerges from data into themes, and then the examination of the relationships between them (King & Brooks, 2017:4-6). The relative simplicity and flexibility of this approach has led to TA's current status as the most used form of qualitative data analysis (Bryman, 2012:478; King & Brooks, 2017:6). The flexible structure and suitability of TA to case study designs and interview methods were particularly compatible with the purposes of this explorative study (Creswell, 2006:75; Rudestam & Newton, 2015:55).

The flexible and diverse application of TA has also contributed to confusion and a lack of consistent application (Braun & Clarke, 2019:589–590; Bryman, 2012:478). This has resulted in the development of a range of analysis methods within TA, amongst them Braun and Clark's approach, which is now termed "reflexive TA" (2019:590). King and Brooks (2017:5-7) group these forms of TA into three broad categories based on a) whether they have a prescriptive methodology, b) where they stand on the inductive/deductive spectrum, and c) their approach to coding systems. This grouping by characteristics was helpful to identify a suitable approach for this study.

For the first category, the pursuit of flexibility and simplicity excluded a methodology like grounded theory (already at the 'research design' stage) that would set specific and rigid guidelines with implications beyond the analysis itself (King, 2004:257). Concerning the second category, given the abductive nature of this research, a form of TA that would encompass both inductive and deductive elements was necessary. Finally, in line with a critical realist approach, and to address the lack of structure often associated with TA (Bryman, 2012:478), this research opted for a coding system with a flexible procedure, that would be deep enough to cope with the richness of IDG but also systematic enough to ensure its replicability and the generalisability of its resulting conceptual framework (addressed in 3.8.2). Template analysis was selected as a form of TA that meets these criteria (Brooks & King, 2014:203; King & Brooks, 2017:5-7), while the final themes were inspired by reflexive TA's emphasis on going beyond simple data summaries (Clarke & Braun, 2018:108–109).

Template analysis is a balanced form of TA, usually attributed to Crabtree and Miller (1999), and popularised by Nigel King (2004) (Waring & Wainwright, 2008:86). It falls in the 'codebook' category that Braun and Clark consider as a middle path between the rigid structure and technique-heavy 'reliability TA' and their own aptly named 'reflexive TA' (2019:594). As such, template analysis offers structure, hierarchical coding, and the generation of themes during, and sometimes prior to, coding, which is evocative of a deductive approach. Simultaneously, it is flexible and non-prescriptive, allowing for many levels of coding, parallel coding, emergent and post-analysis theme designation, and no set rules regarding the types or levels of coding (Brooks et al., 2015:203). This seemingly contradictive flexibility and structure is reminiscent of the ontological and epistemological contrasts inherent in critical realism, a philosophical position for which template analysis is well-suited (King & Brooks, 2017:18-19). Template analysis is commonly used with data collected from interviews (Brooks & King, 2014:4; King & Brooks,

2017:7), it is not limited to any particular research design, and is applied widely, across academic and non-academic disciplines (e.g. health and social care, education, business and management)(King & Brooks, 2017:10–11). Finally, template analysis is compatible with CAQDAS software like the one used in this study (:31–32).

3.6.2   DATA ANALYSIS PROCEDURE

This project broadly uses King and Brooks' (2017) proposed six-step procedure (Figure 4).
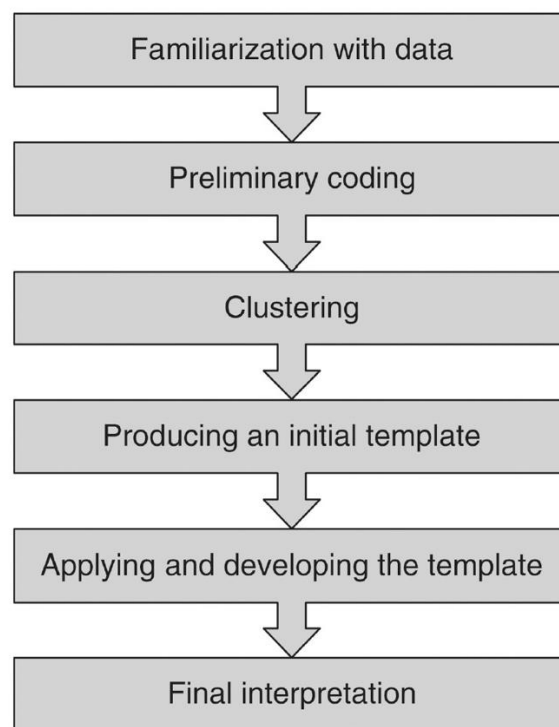
Figure 4. Typical Steps in Template Analysis (King & Brooks, 2017:28).

As King and Brooks note, in practice, the process is not linear. Steps may repeat and involve going back and forth between them (2017:28). Nonetheless, this process offers a systematic format for presenting this study's procedure. The following sub-sections consider each of these steps, although for the purposes of this thesis, several of the stages were merged and a first 'transcribing' phase was added.

3.6.2.1   Transcribing

There are many variations of transcription techniques, ranging from the extremes of naturalism in which every utterance and sound is transcribed and denaturalised approaches that remove idiosyncratic elements of speech (Oliver et al., 2005:1273–1274). The decision regarding which to use depends on the nature of the research question "and the extent to which language and representation are central to the analytic techniques employed" (Kelly, 2010:312; Oliver et al., 2005). As this research focuses on the

informational content and not on the intricacies of spoken language, interviews were transcribed in the 'intelligent verbatim' style, which allowed for ease of readability while maintaining the intended message and structure (Yildiz, 2016). This method was regarded as the best suited for this study as it removed the transcripts' nonverbal sounds (e.g. 'coughing) and filler words (e.g. 'um') that would distract from the focus of the analysis. Additionally, where relevant, the interview summary forms (filled out after each interview) offered insights into the body language, emotional conditions, and external environment of the interview.

3.6.2.2   Familiarisation

After the data transcription, the first step in the analysis of the data was to gain an overview of the information available (Brooks & King, 2014:5; King & Brooks, 2017:28–29; Ritchie et al., 2003:221). This process of familiarisation was facilitated by the data transcription. However, considering the time elapsed between the transcription of the first interview and the data analysis, all the transcripts were first read through while listening to the accompanying audio recordings, taking notes of first impressions. Each transcript was then read carefully, line by line, together with the associated summary form.

3.6.2.3   Preliminary Coding and A Priori Themes

Coding in this study refers to the labelling of sections of data (words, phrases, sentences and/or paragraphs) according to a specific 'code' (King, 2004:257). These codes are used to identify common 'themes' and 'sub-themes' that have distinct information relevant to the research questions. However, in template analysis, codes can also simply be used to index or organise categories of information (King & Brooks, 2017:30), as illustrated by Bushell et al. (2020:42).

The stage at which codes and themes are determined (or generated) is a key differentiating characteristic of the different forms of TA identified by Braun and Clark (2019:594). Template analysis is a flexible approach that offers the possibility to develop a coding structure at several stages throughout the analysis of data (Waring & Wainwright, 2008:86). It is possible but not obligatory to use a set of a priori codes from the very beginning of the process. Ultimately, this decision reflects the philosophical position of the research (King & Brooks, 2017:30; Waring & Wainwright, 2008:86). As a critical realist, I acknowledge the subjective interest that I have in informality, preventing me (and anyone) from coding data completely 'objectively'. This research asked research questions that focused on a specific theory and conceptual framework: IDG. Thus, a priori themes (Appendix F) that concerned IDG were developed, largely along the lines of the interview questions and aims, an approach endorsed by King (2004) and Waring and Wainwright (2008). Simultaneously, this explicit and transparent awareness of subjectivity emphasises reflexivity to minimise bias and go beyond that subjectivity, or what Reason referred to as 'critical subjectivity' (1988:12). To this end, a balance must be struck between too few a priori themes that do not meaningfully contribute to guiding the analysis, and too many that 'box in' the researcher and do not leave

enough room for the data to present new themes and directions (King, 2004:259). Thus, to ensure iterative emergence of themes and further minimise the risk of bias, the number of these themes was limited to six. Finally, the use of a priori themes is also concurrent with the exploration of a phenomenon, and/or particular elements thereof (King & Brooks, 2017:30). With these pre-defined codes in mind, an initial read of all the interviews from one location (Longyearbyen) was conducted, and sections of text were labelled based on several criteria, including whether they are:

- Repeated in several places
- Surprising
- Explicitly stated as important by the interviewee
- In some way indicative of, or related to, concepts, theories, findings, etc. in other publications
- Related to the a priori themes

3.6.2.4   Grouping Into an Initial Template

The initial template development after coding either a subset or the whole data is a characteristic of template analysis (Brooks & King, 2014:7). Doing this step earlier in the coding process helps focus the coding and potentially saves time, but it can also lead to considerable bias and the exclusion of data that fall outside the template in question (King & Brooks, 2017:35). In this study, I preferred to develop the template late and possibly 'waste' time, rather than determine themes early and narrow my perspective, increasing the potential for bias. Further, the use of only three main interview questions, and the assistance of the revised PRISM tool helped keep the interview focused and the data easily indexed using the a priori themes, resulting in clean, relevant, and rich data, further reducing the disadvantage associated with the late creation of an initial template. Thus, the initial template (Appendix G) was determined after completing a preliminary coding of all the interviews from the first location (Svalbard). All initial codes, including those organised under the a priori themes, were reviewed and their relevance to the research questions at hand was evaluated. Some codes were merged or combined as themes or sub-themes, others separated or dropped. Relevant codes were then grouped into categories (themes) of various types (processes, perceptions, etc.), and according to a multi-level hierarchy to enable order and depth of meaning.

3.6.2.5   Evolution to the Final Template

With the initial template completed, the next stage was its application to the interview transcripts from SD. Template analysis does not prescribe whether separate datasets require distinct templates (King & Brooks, 2017:10). In this case, the goal was to test the theoretical generalisability of the IDG conceptual framework. Thus, the same initial template was applied across both locations: first to the 'uncoded' SD interviews, and then again to the Longyearbyen interviews that had undergone 'preliminary' coding. As the process ensued, a certain iterative rhythm of coding a few transcripts and then re-assessing the template

developed. At each point, some themes became more pronounced, new ones emerged, while others merged, resulting in an 'evolving template'. Once a consistent template had been reached, following King's "rule of thumb" (2004:263), it was re-applied to the datasets twice and then validated as a 'final' template (Appendix H). However, it must be noted that the 'finality' label applies more to its status within this research rather than the exhaustion of analytic possibilities, since these could be infinite (Brooks et al., 2015:204; King, 2004:263).

3.6.2.6 Interpretation

The last stage of the analysis entails the examination and interpretation of the emerging themes and codes. For this stage, the study drew on Braun and Clarke's notion of themes as going beyond "descriptive summaries" (Clarke & Braun, 2018:108) to reveal key underlying and uniting concepts observed, highlighting the active role of the researcher as critically subjective. Chapter 5 presents the themes, and chapter 6 their interpretation in the context of the wider IDG framework and this study's research questions.

3.7 ETHICS

The collection and use of any data from human subjects involves ethical considerations, which refers to asking questions of what is good or right when conducting the research—the principle of doing good while avoiding harm. This is particularly relevant in qualitative research, which relies on the collection of mostly unstructured data in naturalistic settings and often requires closeness and long-term relationships between the researcher and research participants (Hammersley & Traianou, 2012).

At its core, this research project is concerned with human relations in adverse life situations. Specifically, in the case of past disasters, it could be traumatic for interviewees to relive disasters when interviewed. Conversely, interviews could also have positive effects, providing the ability to talk about past disasters and grievances, as well as promoting wellbeing. An additional factor in all research is the notion of 'power', be it within the research itself, the dynamic of researcher and interviewee (Creswell & Creswell, 2018:90), or as a general force present in every individual perception, interaction, relationship, and phenomenon. As mentioned at the start of this chapter, I am the 'product' of my heritage, culture, and experiences. This influences my actions, perceptions, interests, and values, as well as the way in which others perceive and interact with me. During the research process, I endeavoured to maintain awareness of these dynamics of power and be sensitive to their direct and indirect implications and bias. Accordingly, ethical considerations were, and continue to be, of utmost importance to protect both the study participants and the researcher from potential harm and/or liability. Ethical considerations are based on the 'Ethical Issues in Qualitative, Quantitative, and Mixed Methods Research' table in Creswell and Creswell (2018:88-90) and are presented in Table 8.

Table 8. Ethical Issues Checklist and Steps Taken.

Research Stage	Ethical Issues	How these Issues was Addressed in the Context of this Research Project
Planning stage / preparatory work	- Seek relevant university-level ethics approval - Gain local permission from site and participants - Select a site without any vested interest in the outcome of the study - Select a research problem that will benefit participants	Approval was sought from UCL IRDR's Research Ethics Committee and received on July 19 2018. UCL's Ethics Standards were read, accepted, and followed. Communication was established with the respective relevant government institutions on Svalbard and Dominica prior to the trips. I have no connections or vested interests in either of the study locations, nor in the general outcome of the study. The ultimate aim of the research is to improve DG in both locations (and beyond) through an exploration of IDG.
Data collection	- Disclose purpose of the study to avoid deceiving participants - Do not pressure participants into signing consent forms - Respect local norms - Be sensitive to needs of the vulnerable populations (e.g. disaster-affected individuals). - Respect the site, and disrupt as little as possible - Ensure all participants receive equal treatment - Be aware of potential power imbalances and avoid potential exploitation of participants - Avoid collecting harmful information	Participants were informed of the purposes of the study during the initial contact and provided with an information sheet (Appendix C) that included the specifics of how the data would be used. Interviewees were informed of their right to refuse consent as well as withdraw it at any stage during or after the interviewee, and no insistence or influence was exerted in cases of hesitation. The local context, including history, culture, norms, and values were explored during the preparation for the trips (Ch. 4), and local organisations contacted prior to arrival. To the best of my knowledge, no vulnerable populations were interviewed. The interviewees were conducted in a polite and respectful manner, endeavouring to build trust. Before starting, the length of the interview, and nature of the questions were presented to minimise disruption. The interview guide and semi-structured nature of the interview ensured a consistent approach and equal treatment. The use of interview summary forms offered an additional reflective space to check this. Interviewing techniques were researched and practiced, ensuring no disclosure of sensitive information, personal opinions, or bias of interviewee answers. There were no deviations from the interview guide, and whenever sensitive topics arose, probing questions were stopped to prevent harm.
Analysing data	- Avoid siding with participants ('going native') - Avoid disclosing only positive results - Respect the privacy and anonymity of participants	The diversity in interviewees offered a range of opinions and perspectives that are equally considered. This is reinforced by the use of an impartial CAQDAS software to code and group data. Inconsistent findings are considered and explicitly referred to. The interviews have been anonymised through the use of aliases and personal information has been generalised to avoid identification.
Reporting, sharing, and storing data	- Avoid falsifying authorship, evidence, data, findings, and conclusions - Do not plagiarise - Avoid disclosing information that would harm participants - Communicate in clear, straightforward, appropriate language - Share data with others - Keep raw data and other materials (e.g. details of procedures, instruments) - Do not duplicate or piecemeal publications - Provide complete proof of compliance with ethical issues and lack of conflict of interest, if requested - State who owns the data from a study	The findings and data are represented accurately and honestly. Raw data and a detailed audit trail were kept. APA 7th referencing guidelines were consulted and followed. Relevant quotes and stories about interviewees were generalised and pseudonymised to prevent identification. Clear and simple language was used throughout the thesis, and jargon avoided as much as possible. Once the study is completed and approved, all interviewees and contributors will be provided a link to access it. Anonymised data from this study will be maintained on a secure cloud for five years following submission. The data are owned by the researcher.

3.8 CREDIBILITY AND LIMITATIONS

This study's limitations and potential avenues for further research are discussed in chapter 7. Methodological limitations, where appropriate, were discussed in the preceding sections of this chapter. This section discusses efforts to ensure the credibility and generalisability of this research project's findings.

Attempts to translate quality criteria from quantitative research to the qualitative sphere often focus on notions of validity and reliability. For example, Yin (2013) suggests isolating four aspects for judging research quality: construct validity, internal validity, external validity and reliability. Similarly, Denzin and Lincoln (1998) propose the assessment of research methods based on their internal validity, external validity, reliability and objectivity.

Validity is defined by whether the employed research design accurately measures the intended study's topic and questions (Creswell & Creswell, 2018:169–171). *Reliability* refers to whether findings are consistent when measured multiple times (2018:169–171). For a measure or methodology to be valid or effective, it must also be reliable. However, reliability does not always assume validity (Maxwell, 2017:118). For example, if an archer is shooting arrows at a target, consistently hitting the same point outside the target, they are reliable, but not 'valid'. In qualitative research, similar findings may emerge out of an interview, but it is important to be sure that those findings are actually associated with the study's research question(s) (Zimmerman et al., 2006:260–77). As Maxwell argues, the "lack of reliability is [therefore] seen mainly as a possible *threat to* validity" (2017:118, emphasis in original). This section will, therefore, focus on validity criteria for research quality.

Generally, for a critical realist, reaching objective reality is unattainable. Thus, there is no independent 'reference point' against which to validate a conclusion or a theory, nor the methods used to reach it. Instead, validity refers to the quality of the researcher's interpretation at every stage of the process (King & Brooks, 2017:20, quoting Maxwell, 2012), affecting the overall credibility of the study's "reasoned, though provisional, judgements about what reality is objectively like" (Archer et al., 2004:2). Thus, the pursuit of validity in qualitative research does not focus on the methods, but instead considers the broader perspective of a study's researcher and their conclusions using a "particular method in a particular context for a particular purpose" (Maxwell, 2017:120). An essential part of this approach is the researcher's commitment to critically evaluate their own subjective interpretation at every stage and document the process to support the interpretation of data and associated claims made by the study. The credibility and replicability, and, therefore, generalisability of the research depends on this 'methodological awareness' (Seale, 1999; Silverman, 2017:702–703). As such, some of the major threats to the validity of this study include:

- **Inaccurate data collection**
- **Misinterpretation** of the 'meaning' of data collected
- **Data drifting**—results are poorly rooted in the original data
- **Anecdotalism**—only considering extracts that support a proposed hypothesis, often at the expense of what the data are actually showing, and other plausible explanations

To address these threats, strategies based on the validity (and reliability) checklists proposed by Maxwell (2008:243–245), Morse (2017:808–809), and Creswell and Creswell (2018:169–171) were applied. In addition, the note on positionality at the beginning of this chapter (3.1.1) offered insights into my own experiences and how they contribute to my subjectivity. Finally, a discussion of generalisability concludes this section and chapter.

3.8.1   ENSURING VALIDITY (AND RELIABILITY)

3.8.1.1   Gathering Rich, Accurate, Unbiased Data

Descriptive validity (Maxwell, 2017:125) relates to the portion of the data collection that deals with the accuracy of the researcher's observations. There are several threats to validity inherent in using interviews as a research method. These include 'social desirability bias'—the participant feeling the need to respond in a certain way because of perceived judgement; 'interviewer effect'—the background and experience of the interviewer subconsciously eliciting certain data; and the interview 'setting'. Each of these elements has the potential to alter results; thereby, reducing their validity (Zimmerman et al., 2006:260–77). To reduce the risk of social desirability bias, the anonymous nature of the interview was emphasised, and it was explained that there are no right or wrong answers. Further, I endeavoured to refrain from showing any form of judgement, whether verbal or non-verbal, and instead adopted a stance of positive curiosity throughout the interview. The visual PRISM tool offers a non-verbal and indirect means of expression that reduces the focus on the interviewer-interviewee dynamic and, thus, may lessen the interviewee's desire to please. Finally, an interview protocol and guide were used to minimise the interviewer effect, while the setting itself was interviewee-determined, to ensure maximum comfort.

The use of a recording device to 'independently' document the interviews further limited the possibility of data loss or distortion due to a selective or flawed memory, or any other form of bias. While the data from interviews extend beyond sound to the other senses, the use of interview summary forms filled out immediately after the interview to document relevant body language, the inter-personal dynamic, and other conditions (e.g. other people entering), minimised important data loss. The recordings were then transcribed and double-checked to ensure their accurate representation of the conversations. During the familiarisation

process of the data analysis, the transcripts were read again while listening to the audio files, which provided another level of verification.

3.8.1.2   Quasi-Statistics

Ensuring descriptive validity also refers to "numerically descriptive aspects of accounts" (Maxwell, 2017:125), also referred to as 'quasi-statistics' (Becker, 1970, as cited in Maxwell, 2008:245). Where possible, vague descriptors such as 'many', 'some', or 'few' were avoided to ensure the statements in this thesis are as precise as possible and substantiated by tabulation (Silverman, 2017:726). For example, statements regarding the number of interviewees that identified a particular risk as important are supported by a count of relevant PRISM diagrams that was confirmed by the participants themselves and corroborated by the interview transcripts.

3.8.1.3   Triangulation

The next dimension of interpretation involves the subjective understanding of the meaning associated with the observations, a process associated with the data analysis and interpretation stages. During this phase there is the risk of misinterpretation of the data informing a claim or conclusion. To illustrate with a fictious example, an interviewee may cry when asked a specific question about a disaster, prompting the researcher to consider the situation to have been 'painful' or 'difficult'. However, the reality may be that the interviewee was crying because their survival was miraculous; or, perhaps something else happened during the questioning that was entirely unrelated. To address this threat, and ensure validity and reliability, triangulation of data was applied both within and across the interviews. Questions were asked in different ways (e.g. control questions) to ensure the findings accurately represent interviewees' positions, and the use of the PRISM tool corroborated answers to the main questions through text and a visual component, an approach that could arguably also be considered a triangulation of methods. Similarly, triangulation of data was used by applying the same interview guide and protocol to different stakeholders in different settings to consider validity and reliability of data (Creswell & Creswell, 2018:170; Silverman, 2017:708).

3.8.1.4   Thick Descriptions

Another strategy to minimise the threat of misinterpretation is to provide 'thick descriptions' (Creswell & Creswell, 2018:170; Geertz, 1993; King & Brooks, 2017:42; Lewis & Ritchie, 2003:268) of each interpreted theme, broadly defined as offering sufficient details about the interpretation to enable the readers to reach their own conclusions regarding the associated meaning. Thus, chapters 5 and 6 offer direct quotes and excerpts to support findings and claims made based upon them.

3.8.1.5   Deviant Cases

In the data analysis, special attention was given to cases that do not support the analysis, a process known as 'analytic induction' (Silverman, 2017:993). A qualitative researcher must consider the entirety of data, including 'exceptions' (2017:717). In such instances, the reasons for the 'anomaly' were sought, and subsequently presented in the findings. Sharing the findings completely is another tool to transparently communicate the context from which the study's claims and conclusions emerged, enabling the readers to reach their own interpretation of the evidence presented.

3.8.1.6   Constant Comparison

Template analysis, by using a priori themes and various and evolving iterations of templates, requires a continuous reassessment of the relevance of the emerging themes against the data. This is in line with the systematic combining approach that guided this study (Dubois & Gadde, 2002, 2014). The use of multiple cases across two locations also enabled both the triangulation of data and the continued testing of conclusions against new cases.

3.8.1.7   Audit Trails

The documentation of every step of this research process provides the reader with the tools needed to determine the credibility of the presented findings (Maxwell, 2017:120; Silverman, 2017:672; White et al., 2003:320). Template analysis lends itself particularly well to this approach (King, 2004:268), and multiple iterations of the 'template' used are shared as Appendices (F, G).

3.8.2   GENERALISABILITY

The validity of a study impacts the replicability of its process and, therefore, the credibility and generalisability of its findings. As described in section 3.3.2, the debate surrounding the generalisability of case studies, and qualitative research at large, is rooted in a misunderstanding of the intended generalisability, or what Yin refers to as the "domain to which a study's findings can be generalized" (2002:34). In quantitative research, generalisability is defined as the ability to test a hypothesis on a selection of data, and then make inferences on the population of which it is a statistically representative sample (:32). In comparison, qualitative research rarely focuses on representativeness in sampling, negating the ability to statistically generalise the conclusions of a study to a larger population (Maxwell, 2017:135). Instead, qualitative research uses empirical evidence to develop theories that explain observed phenomena and these theories can then be tested in other populations, a process Yin describes as 'analytical generalization' (2002:32–33). Guba and Lincoln argue that the 'transferability' of a theory from one case to another is dependent on the researcher's ability to transparently

share as many details about the process as possible, a feature consistent with this study's critical realist approach to validity (1989:241). By doing so, the researcher "shifts the responsibility for making generalizations from the researcher to the reader or potential user of the findings" (Maxwell, 2017:189).

From the beginning of this chapter, the subjective nature of this (and all) research has been explicitly highlighted. Taking this perspective has facilitated a critically subjective approach that is crucial to "explain and understand social phenomena" (Sayer, 1992:5). By engaging in self-reflection, and using audit trails to document it, I hope to provide the reader with a transparent theoretical template applicable to other cases and contribute to the evolution of the IDG framework, and DG at large.

CHAPTER 4

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CASE STUDIES

This chapter introduces this research project's two case studies: the Svalbard archipelago in the Arctic and the Caribbean state of the Commonwealth of Dominica (hereafter: Dominica). The reasons for choosing these case studies have been outlined in chapter three. The chapter provides a background section covering the geography, climate, history, demography, politics, and economy for each case study (4.1.1, 4.2.1), followed by a discussion of each case study's disaster risks (4.1.2, 4.2.2) and the FDG mechanisms put in place to address them (4.1.3, 4.2.3).

4.1 SVALBARD

Svalbard constitutes the first case study of this research project. The archipelago contains two main settlements of which the Norwegian-settled, largely English-speaking Longyearbyen, accounts for ca. 80% of its population. Longyearbyen was chosen for the IDG research of this thesis because of its physical accessibility. Since significant inter-relations exist concerning disaster-related activities between Longyearbyen and the Russian Barentsburg, the background section examines this second main settlement where relevant.

4.1.1 BACKGROUND

4.1.1.1 Geography

The Svalbard archipelago is often highlighted for its exceptionalism, beginning with its location, halfway between the Norwegian mainland (900km) and the North Pole (1,050 km) (Figure 5). It ranges from the 74° to 81°N latitude and the 10° to 35°E longitude, consisting of nine islands and many small islets with a coastline of 3,587 km (Central Intelligence Agency [CIA], 2020b). Spitsbergen is the largest island, making up more than half of the 62,000–65,000 km²[25] total area (CIA, 2020b; Zonn et al., 2017).

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[25] Number varies depending on source.
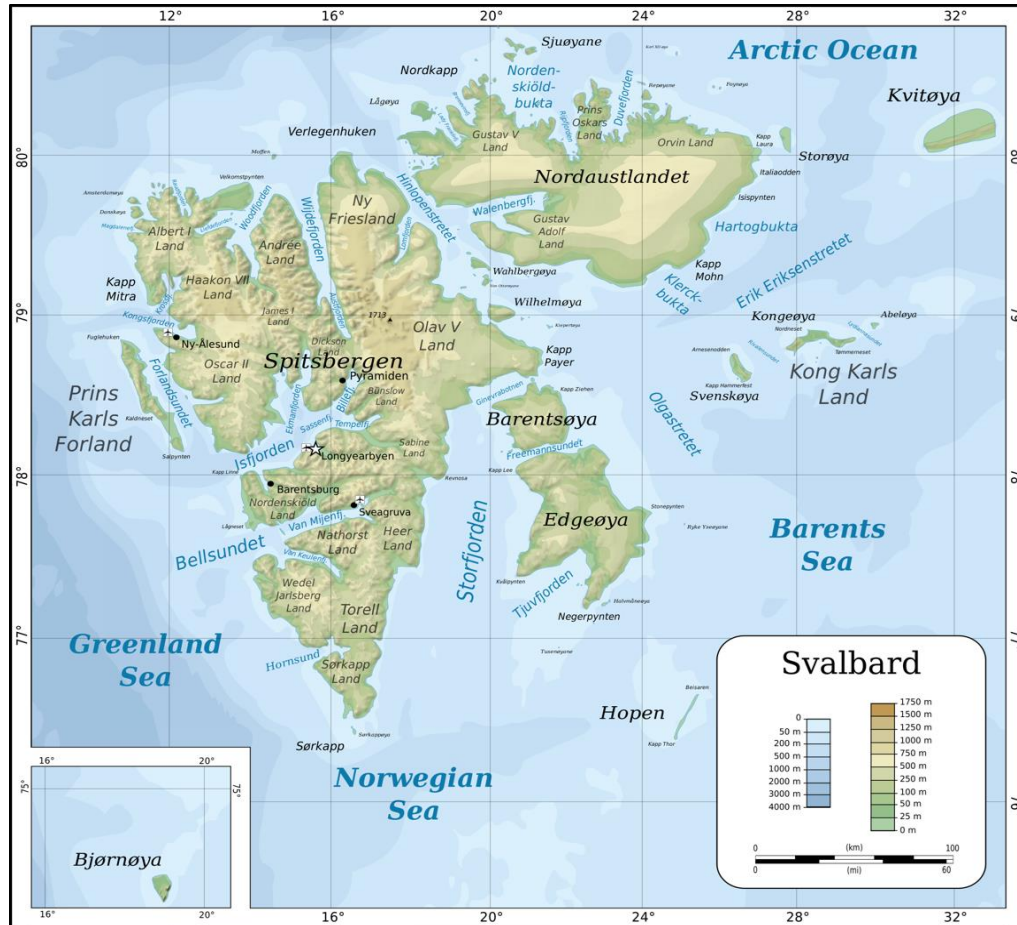
Figure 5. Map of Svalbard (Räisänen, 2008).

Svalbard's distance to the mainland or other populated islands may evoke perceptions of isolation. However, while Svalbard is only accessible by water (cruise ships in ice-free summer months) or air (subject to challenging climatic conditions), there are still regular scheduled flights to and from Tromsø (ca. 1.40h) and Oslo (ca. 3h) in Norway. In the end, Svalbard, is no more isolated than other places which do not necessarily evoke perceptions of isolation, e.g. Israel or New Zealand.

Due to Svalbard's topographic characteristics and demanding Arctic weather conditions, only small parts of the archipelago are easily accessible. Characterised by rugged mountain terrain[26], fjords, glacier valleys, permanent snow fields, '*nunataks*[27]', plateaus, and limited vegetation, approximately 60% of Svalbard is covered in ice and snow, with 30% being barren ground, leaving 10% for vegetation, and no forest or agricultural land (Adakudlu et al., 2019; CIA, 2020b). Cold water and air masses from polar regions and

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[26] The highest point on Svalbard is Newtontoppen, altitude 1,713 m.

[27] Exposed (without snow or ice) ridges, mountains, or peaks within an ice field or glacier.

warm water currents and air masses from the Atlantic Ocean result in a temperature gradient ranging from 15°C to -40°C. With yearly precipitation spanning 190–480mm, the archipelago can be bio-climatically divided into polar deserts and tundra (Førland et al., 2011; Jónsdóttir, 2005). Proximity to the North Pole leads to extreme changes of light conditions on Svalbard. Longyearbyen experiences midnight sun from April to August and polar night from October to February.

With temperatures in the Arctic rising faster than in any other part of the world, climate change constitutes a severe threat for Svalbard (Norwegian Ministry of Climate and Environment, 2013; Post et al., 2019). Besides affecting flora and fauna across the archipelago, the melting of Svalbard's permafrost layer—connected, in turn, to deeper active layers—destabilises the ground (Adakudlu et al., 2019; Norwegian Ministry of Climate and Environment, 2013), threatening Svalbard's infrastructure—buildings, streets, airport, or cultural heritage sites.

4.1.1.2   History

Svalbard has a long and multi-national history[28]. While Icelandic records seem to confirm its discovery around 1194 by Norsemen, others maintain that Russian Pomors fished and hunted on/around Svalbard during the 16th century or earlier (Albrethsen & Arlov, 1988; Arlov, 1994; Harland, 1997; Hultgreen, 2002; Mathisen, 1954:7–8). In either case, it is contested whether the land discovered was actually Svalbard or islands closer to the Norwegian mainland, Greenland (Kalaallit Nunaat), and/or Novaya Zemlya (Hultgreen, 2002; Mathisen, 1954:7–8). Near-parallel English explorations of the region notwithstanding, the archipelago's 'official' discovery is attributed to Dutch explorers in 1596 to which it owes its original name of 'Spitsbergen' (Arlov, 1994; Harland, 1997; Mathisen, 1954). Having discovered Spitsbergen as a lucrative whaling ground, whaling rights' quarrels between the Dutch and the English led to the division of its coast (Mathisen, 1954:9–13). Fuelling the tensions were the Norwegian Crown's sovereignty claims to the 'Northern Sea', increasing Russian Spitsbergen hunting activities between 1730 and 1830, Norwegian summer hunting expeditions throughout the 19th century, and Sweden's 19th century plans to colonise Spitsbergen (Mathisen 1954:14–30).

After the decline of walrus hunting and whaling throughout the 19th century, Svalbard remained a focal point for adventurers and scientists and increasingly, for mining activities. It was used as a starting point for expeditions to the North Pole. With industrialisation and the pursuit of natural resources, the first permanent settlements were established in 1872 (Arlov, 1994:52). Concurrently, tensions between Svalbard's different parties persisted. The previous Russian reluctance to make claims to Spitzbergen changed in 1871 when it

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[28] For a detailed account of Svalbard's history, see esp. Mathisen 1954.

initiated diplomatic measures to block Sweden making Spitsbergen a colony for the Swedish-Norwegian Union (Mathisen, 1954:20–30). The 1920 Svalbard Treaty that came into effect in 1925 (as part of the Versailles negotiations) officially 'resolved' the tensions. The treaty established Norwegian sovereignty over the archipelago. Norway's sovereignty is "full and absolute" (Svalbard Treaty, 1920, Article 1), but also qualified, and thus, limited. Most military activities are forbidden (Article 9), and while the treaty designates issues of environmental conservation (Article 2) and taxation (Article 8) to Norway, its non-discrimination provisions grant all other signatory states (currently 46) "equal liberty of access and entry" to, and "enjoyment" of, Svalbard and its territorial waters for specified activities (Articles 2, 3 and 7).

4.1.1.3 Population

Large portions of the archipelago are uninhabited. Its population of 2,939 residents (Statistics Norway, 2020a, as of April 2020) is exclusively located on the island of Spitsbergen— predominately concentrated across the two settlements of Norwegian Longyearbyen and Russian Barentsburg. Attracted by opportunities in tourism and research, the Longyearbyen population of 2,428 inhabitants[29] (Statistics Norway, 2020a), is growing and thriving (Kaltenborn & Hindrum, 1996; Nilsen, 2019; Viken, 2011:344). Foreign nationals constitute a major source of population increase, growing from 14% in 2009 to 32% in 2018 of the total population (Høydahl, 2018). While Norwegian law applies, no visa is needed for internationals to live on the archipelago as long as they are financially self-supporting (Sysselmannen Svalbard, n.d).

Figure 6 shows the age composition of the local and foreign population in Longyearbyen and Ny-Ålesund. The strongest represented age group is between the ages of 20–44 years, making up about 50% of the overall population. The under-20 and the 65-and-older populations are under-represented. Offering only essential health services, more demanding care must be obtained on the mainland (Norwegians) or in a person's home country (foreigners) (ibid.:49). Additionally, with no burial possibility due to permafrost conditions[30], Svalbard is not a 'cradle-to-death' community (Norwegian Ministry of Justice and Public Security, 2016:30, 49–50). In fact, Svalbard is a 'revolving door society', with a yearly population turnover of ca. 20% (Grydehøj et al., 2012; Statistics Norway, 2016). Figure 6 reveals the large number of non-nationals in Longyearbyen and Ny-Ålesund, highlighting the settlements' multi-cultural nature. Job opportunities and the non-requirement of a residence permit may explain the large number of foreigners (Norwegian Ministry of Justice and Public Security, 2016:52), especially considering that they make up about 50% of the age 20–34 population.

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[29] Including roughly 35 part-time inhabitants of the Norwegian research settlement of Ny-Ålesund, 113 km northwest of Longyearbyen.

[30] Svalbard's permafrost does not allow for safe burial grounds as corpses do not decompose.
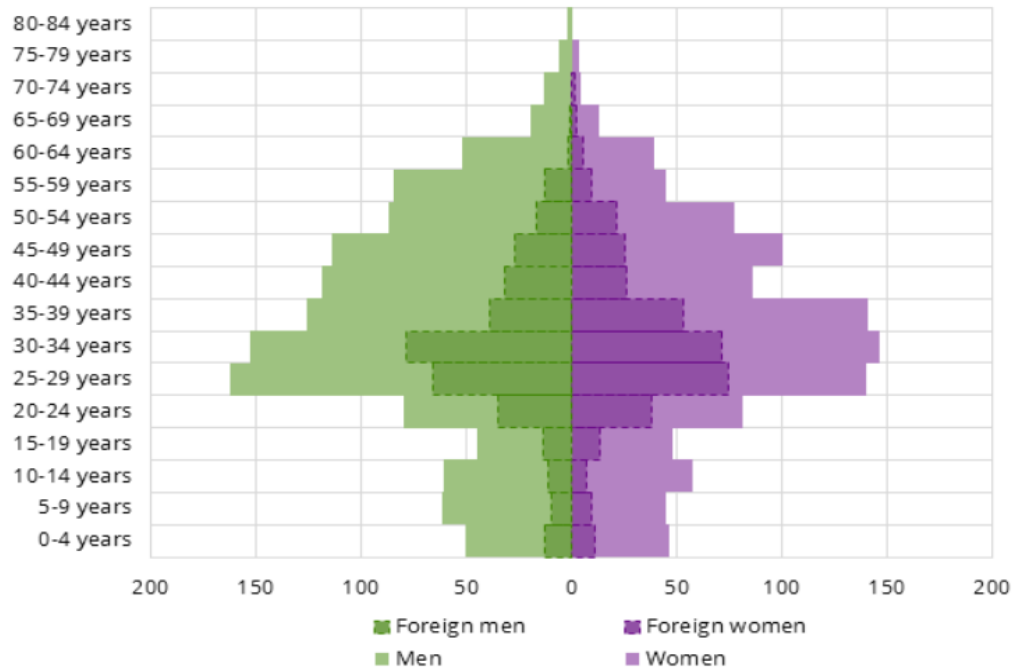
Figure 6. Longyearbyen and Ny-Ålesund Population by Age (adapted from Statistics Norway, 2018).

Table 9. Latest Available Data on Longyearbyen Population by Nationality (Statistics Norway, 2016).

Country	2009	2010	2011	2012	2013	2014	2015*	2016**
Norway	1652	1604	1637	1643	1569	1557	1513	1472
Thailand	93	92	103	103	112	111	116	116
Sweden	65	72	91	94	107	125	123	141
Denmark	32	27	31	37	30	41	43	40
Germany	26	23	23	25	25	30	38	39
Russia	30	35	39	42	42	47	47	50
Ukraine	8	9	10	13	16	23	26	21
Philippines	10	12	16	18	20	27	37	40
Other, Europe	51	57	64	80	87	117	133	144
Other, outside Europe	27	32	54	52	48	54	68	67
Total	1994	1963	2068	2107	2056	2132	2144	2130

* as of 1 December 2015
** as of 1 April 2016
Source: Svalbard Tax Office

The second main settlement, Russian Barentsburg, is an active mining settlement, despite the decline in mining activities in past decades. Its population consists of 500 mainly Russian and Ukrainian inhabitants. Pyramiden, a former mining settlement that closed in the 1990s, has recently started to be revived (Kinossian, 2020). Emulating Longyearbyen, Russia's Svalbard settlements are being promoted as 'exotic' tourist

destinations (Galaburda, 2016; Gerlach & Kinossian, 2016; Kinossian, 2020). Aside from the main settlements in Spitsbergen, research and weather stations across the archipelago make a negligible contribution to Svalbard's population. Although Svalbard's few settlements are designated as either Russian or Norwegian, no legal borders exist and populations are free to travel between them, leading to significant links between the settlements.

4.1.1.4   Politics

Understood as *terra nullius*—no man's land—until the early 20th century (Campopiano, 2019), following the Svalbard Treaty, the archipelago became part of the Kingdom of Norway and has been governed under Norwegian law since 1925. Locally, it is administered by the 'Governor's Office' (Norwegian: *Sysselmannen*), Svalbard's highest governmental representative, who is appointed by the King of Norway (Norwegian Ministry of Justice and Public Security, 2016:24–31). The Governor's Office consists of environmental, police, and administrative departments, as well as a staff section (Sysselmannen Svalbard, 2018). Besides holding the position of a district governor, the Governor of Svalbard is the chief of police, notary public, judge in the courts of first instance, and carries responsibility for all affairs of the entire archipelago—including environmental protection as well as emergency and disaster preparedness. Similar to municipalities on Norway's mainland, Svalbard's democratically elected community council (Norwegian: *Lokalstyre*) is responsible for issues related to education, cultural activities, and town planning—the latter covers disaster risk-related considerations (Sysselmannen Svalbard, n.d.).

Despite Norwegian governance, Svalbard challenges traditional conceptions of sovereignty. This is evident in terms of resource extraction which is granted to all members of the Svalbard Treaty. Besides Norway, Russia exercises these rights to mine coal in Barentsburg. Thus far, no major conflict has occurred between the two countries. However, tensions exist over maritime limits in the Barents Sea, Russia's fishing rights, and environmental protection issues (Churchill & Ulfstein, 2010; Filipek & Hruzdou, 2011; Pedersen, 2008a, 2008b; Zimmerman, 2018; Østhagen, 2018). A long list of research and popular accounts discuss, contest, or defend the legitimacy of virtually all of the Svalbard Treaty's provisions, e.g. sovereignty, resource extraction, environmental protection, and issues concerning governance and military regulations (Åtland & Pedersen, 2008; Carlson et al., 2013; Kaltenborn et al., 2020; Mathisen, 1954; Pedersen, 2008a, 2008b; Ulfstein, 1995).

Norway's recent introduction of stringent environmental protection regulations to safeguard swathes of Svalbard's land has angered some Russians who believe that such moves are designed to thwart their business, and ultimately, to remove their presence from the region (Closson, 2018; Hønneland, 2016; Staalesen, 2020). In turn, Russian opposition to these measures quickly evokes others' concern over Russia's motives (Grydehøj, 2014; Pedersen, 2008a). A recent example is the February 2020 statement by Russian Minister of

Foreign Affairs Sergey Lavrov (Ministry of Foreign Affairs of the Russian Federation, 2020) concerning the Norwegian expanded environmental regulations and the restrictions imposed on the use of Russian helicopters which are important for mining, transportation, and, ultimately, tourism. Referring to Russia's "long-term plans for strengthening, diversification and modernisation" of Svalbard settlements, Lavrov notes that Norway's "artificial expansion of nature protection zones to limit economic activity in the archipelago" stands in violation of the Svalbard Treaty and unjustly limits Russia's "equal free access". With 2020 marking the treaty's 100th anniversary, Lavrov's challenge to Norway's interpretation of the accord seems to come at a strategic moment, especially at a time when Russia is heavily investing in its Arctic infrastructure (Novoselov et al., 2017; Radushinsky et al., 2017; Serova, 2019). Nonetheless, different perceptions of Russian motivations converge on a shared acknowledgement that despite historical disputes and sustained conflict potential, Norwegian-Russian relations on Svalbard have been peaceful (Åtland & Pedersen, 2008; Grydehøj, 2014; Wither, 2018).

4.1.1.5   Economic Development

Activities on Svalbard initially started for economic reasons, focusing on whaling, walrus hunting (ivory), and trapping. Geopolitical reasons aside, starting with the late 19th century, Norway maintained its presence on Svalbard for coal mining activities. Russian mining started in 1912 and accelerated when the Soviet company 'State Trust Arktikugol' (literally: Arctic coal; hereafter: Arktikugol) acquired the Dutch settlement of Rijpsburg in 1932, renaming it Barentsburg. By the end of the 1980s, Store Norske Spitsbergen Kulkompani AS ('Store Norske') had become the largest employer on Svalbard (Norwegian Ministry of Justice and Public Security, 2020). Effectively, this made Norway and Russia the only countries conducting mining activities on the archipelago (Avango et al., 2011) and sparked strategic jockeying for legal status. From the 1930's, mining activities were increasingly motivated by geopolitical considerations rather than economic profits[31], making Svalbard's settlements into proxies of influence for their respective countries (2011:36). To diversify its economy, Longyearbyen has moved from a mining economy to an economy of 'three pillars': coal mining, tourism, plus research and education (Norwegian Ministry of Justice and Public Security, 2016:83–101). Particularly, since the 1990s, Longyearbyen has developed into a diverse community with tourist accommodations and services, restaurants, cafés, and 'The University Centre in Svalbard' (UNIS), the world's northernmost university.

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[31] I.e. for heating, railways, steam energy, and coke production in Norway's case and, for Russia, to fuel its industrial centres, Arkhangelsk and Murmansk, with coal.

Table 10. Industry Statistics of Svalbard by Main Industries in Person-Years and Turnover (in Norwegian Krone Where 1 NOK = 0.092 EUR at the Time of Writing) (Statistics Norway, 2020b).

Svalbard. Industry statistics, by main industry (SIC2007)				
	Man-years		Turnover (NOK 1 000)	
	2019	Percentage change from last year	2019	Percentage change from last year
Svalbard total	1 618.1	-2.6	3 645 405	4.4
Mining and quarrying	96.5	-32.3	152 495	-5.3
Manufacturing; Electricity, gas, steam and air conditioning supply; Water supply; sewerage, waste management and remediation activities	60.3	4.0	249 159	21.7
Construction	221.2	21.3	648 449	10.3
Wholesale and retail trade: repair of motor vehicles and motorcycles	120.2	7.2	393 721	9.5
Transportation and storage	117.1	23.5	457 411	53.6
Accommodation and food service activities	240.4	-12.2	371 263	-9.4
Information and communication	65.8	8.0	677 751	10.2
Real estate activities	6.3	-43.2	92 494	1.5
Professional, scientific and technical activities	70.1	4.5	51 184	23.1
Administrative and support service activities	174.2	-3.8	336 052	-1.7
Public administration and defence	101.2	-15.7	30 511	-84.5
Education	166.3	0.7	64 251	3.5
Human health and social work activities	64.8	7.3	14 158	7.3
Arts, entertainment and recreation	103.1	-16.3	101 129	-4.0
Other service activities	10.7	20.2	5 377	3.1

Table 10 shows the activity across Svalbard's main industries for the year 2019. Amongst the strongest industries (in person-years) are services related to food and accommodation, construction, and administrative and support service activities. These industries support all the aforementioned three pillars and are inherently linked to the overall increase and diversification of Svalbard's activities. Additionally, the strongest revenue results from information and telecommunication indicate employment opportunities in the technological sector. Its transition from mining and subsequent increase of various economic activities, coupled with environmental changes, challenge the archipelago's capacity to accommodate this growth, driving the need for local bottom-up engagement to "support Svalbard's institutional response strategies and [enable] local adaptive capacity" (Olsen et al., 2020:305).

The main economic activity in Barentsburg remains coal mining. As Russia's mining company, Arktikugol is responsible for vital activities such as maintaining technical and social infrastructure, it semi-governs Barentsburg. However, following the successful Norwegian example, Arktikugol has recently begun to rebrand Barentsburg and Pyramiden from a mining settlement to an 'isolated, exotic post-Soviet' tourist destination (Gerlach & Kinossian, 2016). To this end, buildings were modernised between the years 2013 and 2014, and its tourism infrastructure and services were expanded.

4.1.2 DISASTERS IN SVALBARD

4.1.2.1 Disasters in the Arctic

While the Arctic is affected by climate change (Archer et al., 2016; Têtu et al., 2018:141), the notion of disasters in the Arctic evokes surprise. Disasters—often incorrectly regarded as large-scale, sudden-onset, highly visible events (Ch. 2.2.2), with high casualty rates and/or obliterated infrastructure—appear at odds with an Arctic perceived as pristine, sparsely populated landscapes. The resulting lack of media coverage on Arctic disasters reinforces this view. Climate change and its ripple effects on places outside the Arctic, as well as environmental victimisation of Arctic communities, remain at the core of perceptions about Arctic disasters (Banerjee, 2013; Haalboom & Natcher, 2012). While actual DRR/R needs and efforts of affected Arctic communities stay under-reported and ignored, the Arctic is increasingly "at the mercy of decisions made elsewhere, often without the slightest consideration for the top of the world" (Anderson, 2009:9).

In reality, disaster risks and disasters in the Arctic, climate change-dependent and -independent, are abundant. The euphemistic 'changes' that outsiders describe about the Arctic often represent concrete catastrophes for Arctic populations (Reid, 2019b). While Arctic communities have always faced disasters including earthquakes, tsunamis, wildfires, landslides, avalanches, permafrost melt, floods, epidemics, and extreme weather events, some are now occurring at an unprecedented pace (Young, 2011:187). Disaster risks across the extractive, shipping, aviation, or tourism industries, have become more common (Pincus, 2015) due to increased human activity in the Arctic (including tourism-related), exacerbated by a lack of the necessary or sustainable infrastructure and management practices (Hagen et al., 2012).

Scarcity or lack of access to subsidence resources, together with climatic and environmental change-related food security issues, and unsustainable economic development, though less often considered as disasters[32], pose challenges that "raise profound questions about the future of Arctic societies" (Young, 2011:187), and are either expected or, in some places, have already begun to displace communities across the Arctic (Ferris, 2013; Hamilton et al., 2016; Stephen, 2018). Moreover, these risks are inherently connected to adverse effects on public and animal health with potentially catastrophic effects across the entire region (Brinkman et al., 2016; Fossheim et al., 2015). Notably, given the high suicide rates across the Arctic (Artic Mental Health Working Group, 2018; Schreiber, 2018; Young et al., 2015), the health-related disaster focus must also address the mental health consequences of adaptation to climate change, modernisation, and other everyday factors (Bourque & Willox, 2014; Fritze et al., 2008; Hayes et al., 2018; Watts et al., 2018).

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[32] Mistakenly so; cf. Ch. 2.1.

With DS's recent focus on complexity and systems sciences, the challenges of governing Arctic disasters have led some scholars to call them 'wicked problems' due to their interconnectedness, lack of clear delineations, constant change, and actors' competing interests (Johannes, 2014; Kämpf & Sharman, 2011; Mileski et al., 2018; Pincus, 2015). As a result, DG in this region is ambiguous. The issue of Arctic climate change demonstrates this aptly. Highlighted by many for its adverse effects on Arctic ecosystems and societies, for others climate change is synonymous with economic opportunities and development of industry, infrastructure and, by extension, society (Young 2011; Keil 2014; Loe and Kelman 2016). Environmental changes, together with technological and economic advances, facilitate the increased human activity and accessibility that fuel optimism over the future viability of Arctic global trade and the growth of its industries. In summary, the notion of Arctic disasters as wicked problems spotlights the stakeholders' conflicting interests of protecting the Arctic and decreasing disaster vulnerability versus capitalising on the potential for economic gains, thereby creating better lives for Arctic communities. Thus, it has important implications for Arctic DRR/R.

The Arctic hosts hazards and vulnerabilities that can lead to disasters while its specific characteristics can make DRR/R particularly challenging. The need for cooperation amongst various stakeholders at different levels and the pooling of diverse resources complicates the situation, as some disasters cut across national borders, affecting large parts of the region (Sydnes et al., 2017:109). Examples include health-related risks and hazards, including most recently, Covid-19; the destructive consequences of World War II on Arctic infrastructure and communities; the radioactive fallout from the Chernobyl disaster; the effects of sulphur dioxide from Soviet nickel smelters; the Exxon Valdez oil spill; or the sinking of the Soviet nuclear submarine Komsomolets (Rowe, 2018:46). Such disasters not only highlight the well-known fragility of Arctic ecosystems (Dunbar, 1973), but also the need for cross-border DRR/R-related collaboration and coordination.

Existing collaborative mechanisms show that Arctic communities have recognised this issue. Examples are the Arctic Council's disaster-related agreements[33]; the Norwegian-Russian Oil Spill Response regime; the 2015-initiated Arctic Coast Guard; the Barents Regional Cooperation flood-related partnership for knowledge exchange between North American and Russian communities (Bodony, 2016); and para-diplomacy on environmental and related issues between cross-border Arctic settlements and also non-Arctic actors

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[33] With its six working groups tasked with different aspects of SAR cooperation, environmental protection and sustainable development, the Arctic Council creates webs of dialogue and cooperation, while embedding DRR/R (in the form of SAR) into various international/regional systems, potentially influencing regional stability (Exner-Pirot, 2013). Success was illustrated through the achievements of the 2011 first-ever binding "Arctic Search and Rescue Agreement" and the 2013 "Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic". Especially the former can be considered a major multi-lateral step for Arctic DRR/R, deriving progress from establishing norms of cooperation and joint SAR strategy in the region (Sydnes et al., 2017).

(Joenniemi, 2014; Ackrén, 2014; Eliasson, 2015; Heininen, 2017; Joenniemi & Sergunin, 2013; Kireeva, 2017). Yet, these efforts have been critiqued on two grounds. First, many of the Arctic Council's agreements are non-binding. Secondly, though pan-Arctic disaster-related initiatives demonstrate a strong focus on SAR-activities, they form only a small part of the needed DRR/R efforts. These critiques are intimately linked to disaster researchers' calls to go beyond the establishment of operational and technological capabilities and ensure a focus on DRR. As per chapter 2, the field of disaster research has long-identified vulnerabilities as causing disasters rather than hazards or environmental conditions (Hewitt, 1983; Wisner et al., 2004). Vulnerabilities within Arctic communities are rarely admitted and redressed within DRR/R, because the preference continues to be highlighting hazards and hazard influencers. This phenomenon is demonstrated by the plethora of literature dealing with the hazard influencer of climate change on Arctic peoples, covering all eight regional countries[34], compared to the dearth of material on the vulnerabilities of communities to earthquakes, tsunamis, and epidemics.

Finally, scholarly disaster research has been faulted particularly for its focus on marginalised and/or indigenous communities while heralding their resilience—their ability to cope with hazards and disasters, and the traumas incurred (Kelman, 2018; Reid, 2018, 2019a). Ironically, this (flawed) focus reveals this discourse as one between racist undertones, neoliberal colonialism and policy interests (Reid, 2019b), and one that sometimes treats Arctic 'communities' as homogenous groups without considering differential vulnerabilities within and across them. With vulnerabilities being overlooked and resilience overestimated, Arctic populations often find themselves left to their own devices, forced to deal with disaster risks and disasters without external help.

4.1.2.2 Disasters in Longyearbyen, Svalbard

Disasters and disaster risks on Svalbard are common. These include numerous vehicle crashes (aircrafts, boats, snowmobiles), health-related incidents and epidemics, polar bear attacks, power outages, oil spills, and fears over nuclear leaks from nuclear-powered icebreakers/submarines (Aars et al., 2005; Gjertz & Persen, 1987; Harland, 1997; Kelman et al., 2020; Ytterstad & Dahlberg, 2005). The major risks for inhabited areas, located mostly in coastal lowlands and near mountains, are avalanches (Figure 7), landslides, floods, storm surge, and coastal erosion (Adakudlu et al., 2019; Indreiten & Svarstad, 2016a; Jaedicke et al., 2016; Jonsson et al., 2019; Tengesdal & Kruke, 2018). Avalanches are of great and recent concern following a fatal dry-snow avalanche that hit Longyearbyen December 19, 2015, dropping down ca. 90m to kill two people, injure 10,

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[34] Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden and the United States.

trap 25, and destroy 11 houses, as well as numerous vehicles (Figure 8) (Issler et al., 2016; Jaedicke et al., 2016).

Figure 7. Avalanches Released May 14, 2012 Between Longyearbyen and Nybyen (Eckerstorfer, 2013).

Figure 8. Overview of the Destroyed Houses From the Release Area of the 2015 Avalanche. Rectangles Indicate the Original Location of the Four Houses in the Upper Row (Issler et al., 2016:3).

In addition, earthquakes, tsunamis, climate change-related risks—including changing weather patterns, sea-level rise, melting ice and permafrost—and species' health and migration patterns are growing concerns (Adakudlu et al., 2019; Førland et al., 2011; Fuglei et al., 2008; Jónsdóttir, 2005; Macdonald et al., 2011; Mitchell et al., 1990). Moreover, increased maritime traffic, and scientific, economic, and touristic activities add new potential disaster risks, or exacerbate existing ones for Svalbard's inhabitants, visitors, and regional ecosystem. (Forbes et al., 2001; Hagen et al., 2012; Kaltenborn, 1996; Kaltenborn & Hindrum, 1996; Madsen

et al., 2009; Marchenko, 2015; Viken & Jørgensen, 1998). Tourist activities, in particular, add risks and stresses on locals with sometimes several thousand day-visitors arriving on Svalbard, far outnumbering the local population (Figure 9).

Figure 9. MSC Preziosa With 5000+ Passengers at Longyearbyen's Port in August 2017 (Jarle Rossland/Port of Longyearbyen).

With this cacophony of risks, Svalbard's history reveals many examples of these risks becoming actual disasters as Table 11 below demonstrates.

Table 11. Selected Incidents and Disasters Affecting Svalbard.

Year(s)	Event	Location	Fatalities/ Injuries/ Damage	Sources
Since 1906[35]	Mining-related disasters	Longyearbyen, Pyramiden, Barentsburg	Dozens of fatalities. Major incident: 1997 mining explosion, with 23 fatalities, (most serious mining accident on Norwegian soil)	(Miljøverndepartementet, 1999)
1941–1946	World War II	Svalbard	Population evacuated; infrastructure destroyed	(Harland, 1997)
1953	Slush avalanche[36]	Vannledings-dalen	2 fatalities, several destroyed houses	(Indreiten & Svarstad, 2016b)
1978	Soviet Tupolev airplane crash	Hopen Island	7 fatalities	(ASIL, 1984; Devlin, 1979)
1989	Shipwreck Maksim Gorkiy	North-west of Spitsbergen	The ship hit an ice flow; ca. 700 crew/passengers abandoned the ship and were rescued	(Andreassen et al., 2018)
1991	Russian helicopter crash	Svalbard	2 fatalities	(Accident Investigation Board Norway [AIBN], 1991)
1996	Vnukovo Airlines Flight 2801 crash	Operfjellet	141 fatalities	(Olaisen et al., 1997)
2008	Mw 6.1 earthquake[37]	140 km SE of Longyearbyen, felt in Barentsburg	No fatalities or major damage; but psychologically engrained in Svalbard's collective psyche	(United States Geological Survey [USGS], 2008)
2008	Russian Mi-8 helicopter crash	Barentsburg	3 fatalities; 6 injuries	(AIBN, 2013)
2008	Fire in the mine	Barentsburg	2 fatalities; extensive damage to the mine.	(Norum, 2016)
2011	Polar bear attack	von Postbreen Glacier	1 fatality; 4 injured;	(BBC News, 2011)
2015	Slab avalanche (in settlement)	Longyearbyen	2 fatalities; 10 injured; 25 trapped; 11 houses and numerous vehicles destroyed	(Indreiten & Svarstad, 2016a)
2016	Seed vault flooding	Longyearbyen	No damage to the seeds, but the incident cast doubt over the vault's supposed fail-safe protection.	(Carrington, 2017)
2017	Russian Mi-8 helicopter crash	2–3 km off the coast of Barentsburg	8 fatalities	(AIBN, 2018)
2017	Slab avalanche	Longyearbyen	No fatalities; 2 apartment buildings destroyed	(Gunnarsdóttir et al., 2018)
2018	Aurora Explorer ship crash	Barentsburg harbour	No fatalities; 48 injuries	(AIBN, 2019)

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[35] The American Arctic Coal Company began commercial mining activities on Svalbard in 1906. However, explorative mining activities go back to 1869 (Svalbard Museum, 2020).

[36] Two more slush avalanches occurred in the same location in 1989 and 2012, with the latter causing considerable damage to the settlement's infrastructure (Indreiten & Svarstad, 2016b:1157).

[37] Other smaller earthquakes felt by residents occurred in 2009, 2010, 2014, 2016 (shortly after a deadly avalanche had hit Longyearbyen), and 2017.

2018	Shipwreck Northguider trawler	Hinlopen Strait, Svalbard	The ship grounded in Svalbard's remote north; 14 crew rescued; no fatalities	(Andreassen et al., 2020)
2020	Coronavirus pandemic	Svalbard	At the time of writing, no positive cases confirmed in Svalbard. However, the effects on residents' daily lives and on Svalbard's economy, especially tourism-related, are severe.	(Sysselmannen Svalbard, 2020)
2020	Avalanche (outside of settlement)	Fridtjofbreen	2 fatalities	(Klesty, 2020)
2020	Flooding	Wider Longyearbyen area	Mine 7 flooded by heat wave and glacial melt, halting operations for weeks	(Sabbatini, 2020c)
2020	Bear attack	Wider Longyearbyen area	1 fatality	(BBC News, 2020)

Disasters on and around Svalbard may quickly become relevant for Longyearbyen. Given the proximity and similarities between Svalbard's settlements and the personal relationships amongst their people, disasters play an important role in residents' risk perceptions irrespective of where they occur. Scientific, commercial, and tourism activities across the archipelago, including in and around Barentsburg, Pyramiden, and Ny-Ålesund, may necessitate the intervention of Longyearbyen's emergency services (and population) due to necessity, proximity, capabilities, perceptions, or political agendas. The same applies to private and commercial excursions on land and sea across the archipelago, as well as commercial or cruise ships in Svalbard's vicinity. This was demonstrated by the 2018 helicopter crash off Barentsburg's coast which required Longyearbyen's assistance in the SAR-mission (Staalesen, 2017). Private and tourism-related snowmobile or other accidents between Svalbard's settlements often require assistance by Longyearbyen's emergency services, tourist guides, or residents. Recently, a Covid-19 outbreak on a Hurtigruten cruise ship (Figure 10) after it returned from Svalbard but did not dock there, sparked larger concerns over public health across Svalbard (Sabbatini, 2020c).

Figure 10. Hurtigruten Cruise Ship With Covid-19 Cases (Photo: Oscar Farrera/Hurtigruten).

Svalbard's healthcare facilities and services are limited, with Longyearbyen's small hospital and Barentsburg's clinic being the main options (Grydehøj, 2020; Norwegian Ministry of Justice and Public Security, 2016). A large influx of ill patients and cases with major complications would overload Svalbard's healthcare services, especially in cases like Covid-19, where a high number of infectious people require isolation, ventilators, and intensive care (Bennett, 2020). With cruise ships reaching the islands on a near-monthly basis, awareness of this situation in Svalbard is high. The 2020 spread of the coronavirus on cruise ships around the world, and the fact that passengers often disembark the ship before an outbreak is identified, demonstrates the catastrophic consequences which could impact Svalbard's health systems. However, other epidemics were considered long before the 2020 Covid-19 outbreak. Examples are: tapeworms, rabies, and the re-emergence of a (potentially mutated) H1N1 virus which killed miners on Svalbard during the 1918 Spanish flu pandemic and which remained in corpses' tissues that failed to decompose in Svalbard's permafrost (Bennett, 2020; Davis et al., 2000; Fuglei et al., 2008; Macdonald et al., 2011). Current DRR/R discussions emphasise the spectre of a cruise ship outbreak, for which norovirus is notable (Klein, 2010; Sabbatini, 2020c). Additionally, health risks in Svalbard's other communities, especially in Barentsburg, may quickly become a concern for Longyearbyen and/or Norwegian authorities on the mainland. Dozens of miners have died in Barentsburg's mines whose small and limited clinic constrains healthcare for workers involved in mining disasters, as does

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their lack of health insurance, possibly requiring assistance by Longyearbyen's emergency services and health care facilities if Barentsburg's facilities become overwhelmed. A similar scenario is conceivable in the case of an epidemic.

4.1.3 DRR/R ON AND FOR SVALBARD

Svalbard's remoteness, limited infrastructure, dynamic and potentially harsh climatic and light conditions accentuate the need for preparedness, cooperation, and fast and efficient DR. Considering that sub-zero temperatures can significantly impede the arrival of outside help or the evacuation of people from Svalbard to the mainland, disasters on Svalbard require a particularly swift response. The archipelago's non-traditional political make-up and geopolitical considerations, as well as the profusion of tourist, commercial, and local activities in its small settlements and in remote areas across Svalbard, further challenge any DRR/R efforts. More distant disasters like the sinking of the 'Kursk' in Barents Sea waters illustrate that Svalbard must consider the potential for similar, nearer events (Kelman et al., 2020:3). Finally, communication failures, limited transportation between the settlements[38], and the limited capacity of hospitals to treat major injuries and perform surgeries, necessitate an over-reliance on (undependable) aeromedical evacuation to the Norwegian mainland. External points of assistance, e.g. emergency resources from mainland Norway, Russia, or even Greenland, may be too far away to be of direct use. With help from even the nearest point of assistance unfeasible for days, the need for local cooperation and pooling of resources is vital.

Thus, DRR/R on, and for, Svalbard relies heavily on cooperation and collaboration from the local to the international levels. To exemplify, SAR-efforts related to international tourists or workers in the Arctic are, by default, matters of international coordination between organisations and governments. Generally, SAR has become a cross-border effort as currently no Arctic player possesses the capabilities to respond to emergencies alone (Ikonen, 2017). Environmental disasters such as oil spills or disturbances to interconnected sectors and systems of transportation, infrastructure, water, or tourism easily span different jurisdictions and must be governed collectively (Ansell et al., 2010; Ford et al., 2014; Perrow, 2011; Pescaroli & Alexander, 2015; Pescaroli & Kelman, 2017). The same principle applies to large-scale or remote disasters, or the protection of the Arctic ecosystem considering growing human activity.

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[38] No roads connect Svalbard's settlements. They are accessible by aircraft (only helicopters in Barentsburg's case), snow-scooters in winter (when avalanche conditions do not prevent it), and by boat in summer (provided the Fjords are sufficiently ice-free). While walking is theoretically possible, the large distances effectively preclude it, apart from specific expeditions.

Svalbard recognises both the need for local and cooperative DRR/R and has developed an FDG system by which Svalbard's governor and, thus, Norway, is responsible for DRR/R across the archipelago. A well-laid out chain-of-command connects it: 'downward' to other settlements, including those of other nations (Russia); 'outward' and/or 'upward' to Tromsø on mainland northern Norway; and eventually to Oslo, when necessary (Kelman et al., 2020). Svalbard prioritises environmental protection as well as SAR drills in cooperation with other relevant professional and national actors, including Russia. As per the Svalbard Treaty, environmental legislation falls under Norway's jurisdiction and its Svalbard environmental management regimes have been described as strong and comprehensive, while critiqued as too "static, rigid, and cumbersome" to effectively deal with the fast-paced changes Svalbard and the region experience (Kaltenborn et al., 2020:26). Despite tensions with Russia over Norway's environmental regimes for Svalbard, Norway-Russia disaster-related cooperation on Svalbard-relevant matters such as SAR and oil spill response has existed for decades (e.g. Sydnes & Sydnes, 2013). Examples are the 1995 Norwegian-Russian SAR regime (Sydnes et al., 2017) and the 1994 oil spill bilateral regime (Sydnes and Sydnes, 2019). Such agreements are enacted through joint training and exercises, involving regional and international emergency management agencies, rescue centres, and coast guards. Meanwhile, cooperative DRR is indicated for Norway and other involved actors signing the Polar Code[39] for shipping (International Maritime Organization [IMO], 2017) which seeks to ensure safe and productive sea routes despite the region's social and environmental changes (Hildebrand et al., 2018).

Svalbard's DRR/R also relies on its population which has become increasingly involved in disaster-related efforts, especially across science, tourism, and pollution management. To improve DRR/R-activities, Longyearbyen's University Centre in Svalbard (UNIS), with support from Norway's Ministry of Foreign Affairs, established in 2016 the internationally staffed Arctic Safety Centre for teaching, research, and the application of safety measures around the Arctic. In Svalbard's international (but Norwegian government-operated) research station, Ny-Ålesund, scientists also collaborate on disaster-related research. In terms of hazards relevant to tourism, Svalbard's tour operators are actively mitigating risks concerning polar bears, avalanches, and rockslides, as well as weather and ice conditions. Operators communicate amongst themselves both informally (e.g. through local Facebook groups and specialised WhatsApp groups) and through meetings facilitated by the Governor of Svalbard to discuss DRR/R-relevant issues. Tour operators assist each other when needed, irrespective of nationality, yet information exchange and coordination is more frequent amongst the longer-established Norwegian-run tour operators, due to their vast experience of Svalbard and existing connections. This is problematic given the previously mentioned staff (and population) turnover on Svalbard.

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[39] *International Code for Ships Operating in Polar Waters*, generally referred to as 'the Polar Code'.

These DRR/R efforts also extend to pollution-related crises and/or disasters (Aitsi-Selmi et al., 2015), whereas assistance efforts have been driven by a diverse team developing 'Project Isfjorden' (cf. Svalbard Environmental Protection Fund, 2020; and; Svalbard Turn, n.d.), now in its third year, which has collected and removed several tons of plastic waste from Svalbard's shores. 'Voluntourism' initiatives by some ship tourism operators, such as the project 'Clean Up Svalbard' (Association of Arctic Expedition Cruise Operators [AECO], 2014), combine tours with cleaning up trash around Svalbard. Cooperation, joint training, and exchange to prevent and deal with pollution from research stations around Svalbard also occurs (Tummon & Schneider, 2019). According to Arctic scholar Timo Koivurova and his colleagues, these kinds of efforts make DRR/R across the Arctic particularly noteworthy. The inherent "*flexibility* of modes of work and structure, and a certain degree of *informality* of cooperation" facilitates important learning processes, leading to more innovative and effective solutions (Koivurova et al., 2015:311).

Yet, despite Svalbard's wide-ranging DRR/R-activities, major drawbacks exist that limit Svalbard's FDG system. Though long-standing SAR activities and cooperation have been extensively highlighted in Arctic literature and practice, "[c]urrently there is no one organization of voluntary cooperation that exists to address the problem of mishaps in the Arctic" (Milesky et al., 2018), limiting the ability of such initiatives to be efficient and fully effective. Thus, cooperation for DRR/R is emphasised but, irrespective of the rather peaceful relations between Svalbard's actors—notwithstanding significant conflict potential— Svalbard's FDG mechanisms are not fashioned in a vacuum. Nationally, Svalbard's overreliance on national response structures, which must be able to react adequately and rapidly and have political support, further burdens an already precarious situation. This is further amplified by the Arctic's growing international political and non-political interdependencies.

Striking a balance between DRR/R needs, and geopolitical and strategic thought and ambitions, is inherent in Svalbard's policies (Kaltenborn et al., 2020), including those relating to DRR/R. The fact that the official responsibility for DRR/R on Svalbard lies with Norwegian authorities may be problematic when a disaster requires—or benefits from—the involvement of Barentsburg, even if it occurs outside of the settlement, e.g. for the many tourist and scientific expeditions outside and between Svalbard's settlements. Such an expedition would call for Barentsburg's involvement due to factors such as proximity, technical capabilities, linguistic expertise, availability of rescue forces, or informal relationships prompting people's help. Nonetheless, logic and necessity do not prevent other players' DRR/R actions to be interpreted as political, further burdening the complexities of reducing risks and responding to disasters on Svalbard.

The 2017 helicopter crash (Table 11) off Barentsburg's coast is a case in point when confusion over SAR chain of command on the disaster led Russian and Norwegian authorities to publicly express their

disagreement on the matter (Staalesen, 2017). Logistically, ensuring emergency access of Russian SAR vessels to Svalbard territorial waters is not straightforward, as it would require permission from Norway, which would be done according to the existing bilateral and Arctic Council SAR agreements (Sydnes et al., 2017). Time could be lost in doing so, without some form of pre-approval, which Norway is unlikely to grant given its preference to retaining control of Svalbard's SAR activities. Instead, dialogue has been moving towards cooperative responses and joint SAR actions. For example, Arktikugol's SAR team consists of 17 contracted professionals permanently based in Barentsburg who have previously trained in emergency actions jointly with Norwegian emergency services (Shepelev, 2015). Norway could consider more use of Arktikugol's SAR team along with existing resources and technical capacity in Barentsburg (Chernakova, 2019).

Finally, while DRR/R efforts for Svalbard focus on emergency preparedness and SAR, relying on SAR mechanisms without accepting their limitations could generate a false sense of security. SAR is only a subset of DRR/R: Reducing disaster risks must also be addressed. Due to Svalbard's current ongoing transformation, risks are developing and changing with no SAR regime able to anticipate all necessary response protocols. For example, during the 2015 avalanche, the SAR-teams, which had, thus far, focused on avalanche risks in the field, were caught unprepared for rescue efforts in built-up environments where collapsed buildings pose additional risks for rescuing avalanche victims (Indreiten & Svarstad, 2016a; Norwegian Ministry of Justice and Public Security, 2016; Sabbatini, 2018). More DRR-related decisions and efforts are necessary that consider e.g. "hazard zoning in a changing climate, design of mitigative measures, removal of exposed houses and extensive costs" (Hestnes et al., 2016). Additionally, some question whether the success of Svalbard's participation in the Arctic's bi- and multi-national SAR exercises will translate into the ability to handle "joint SAR operations in a sharp situation" due to the uncertainties and complexities involved with, for instance, the availability of SAR resources or complications related to transnational DRR/R (Sydnes et al. 2017:129).

4.1.4   CASE STUDY SITES (LONGYEARBYEN)

The data collection for this project was conducted in Longyearbyen (Figure 11). With 2,428 people, Longyearbyen accounts for over 70% of Svalbard's population (Statistics Norway, 2020a). It is the administrative centre, including, most pertinently, the oversight of DRR/R matters by the Governor's Office and local council. Longyearbyen has been the scene of previous disasters, notably two recent avalanches in 2015 and 2017 (Table 11). With a diverse and considerable population to interview using English as a common language, Longyearbyen was considered the optimal location for research.

Figure 11. Topographic Map of Longyearbyen (Adapted From Norwegian Polar Institute, n.d.).

4.2 DOMINICA

4.2.1 BACKGROUND

4.2.1.1 Geography

Dominica is a small mountainous island of volcanic formation located in the Lesser Antilles of the Caribbean Sea, with Guadeloupe to its north and Martinique to its south. It is the largest and northernmost of the Windward Islands. The island covers a total area of about 750 km², stretching ca. 47 km in length from north to south and 26 km from west to east at its widest point (Government of the Commonwealth Secretariat, 2020). Much of the island's interior is difficult to access due to its topography. The island's highest peak, Mount Diablotin, at 1,447 metres, is part of a chain of rainforest-covered volcanic peaks, separated from another mountain range on the southern side (Figure 12).
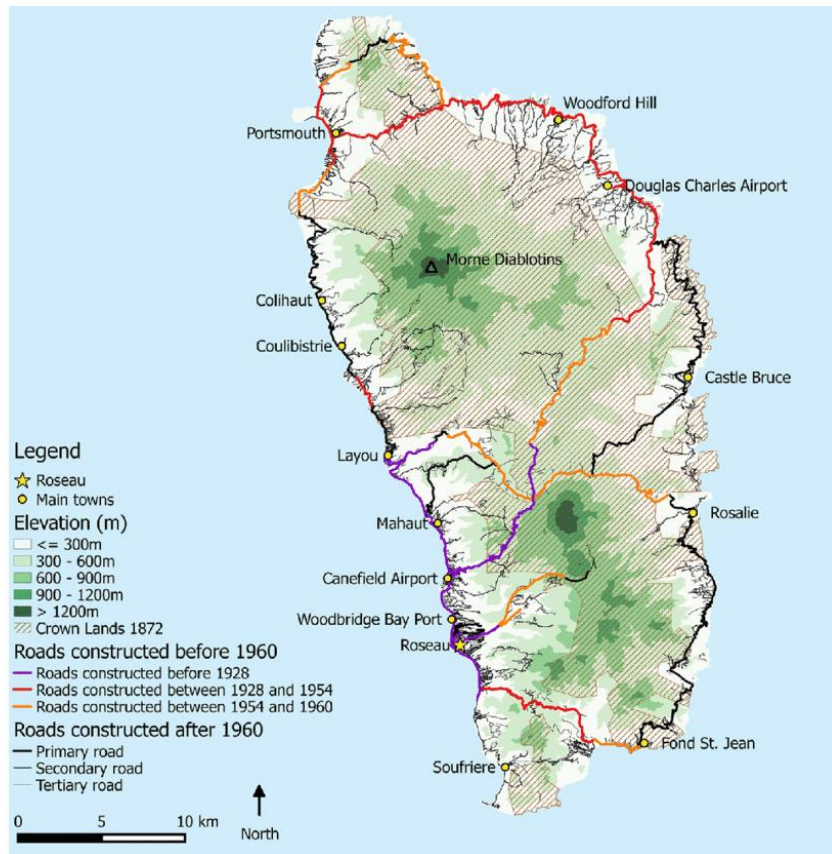
Figure 12. Topographic Map of Dominica (Barclay et. al, 2019).

The mountain ranges serve as the source of 365 non-navigable rivers. Dominica's topography and high rate of precipitation results in unstable slopes and strong orographic variations (Barclay et al., 2019). The mountain ranges are host to active volcanoes which manifest in the many hot springs and sulphur lakes across the island, and in the latest 1997 eruption, following 117 years of inactivity (Smith et al., 2013:5).

Two calderas, the 'Trois Piton' and the 'Wotten Waven', occupy large tracts within Dominica's central graben (Figure 13). Both calderas are inhabited and popular with travellers and tourists. These hollow structures were formed by a series of volcanic eruptions in the late Pleistocene and Holocene.

Figure 13. The Boiling Lake: A Flooded Fumarole in the Trois Pitons (Dominica News Online, 2016).

The capital of Dominica, Roseau, is located on the south-western side of the island and is set along the coast, as are most other settlements and, by default, the majority of the population (Figure 14).

Figure 14. Dominican Coast Devastated Following Hurricane Maria (CNN, 2017).

4.2.1.2   Climate

Dominica's maritime tropical climate produces consistently humid and warm conditions, with an average temperature between 24–26°C (Figure 15). The rainy season, from June to October, brings heavy rainfall, of which tropical cyclones/hurricanes contribute 250–400 mm (World Bank Group, 2020). By contrast, the dry season, from January to May, accounts for less than 200 mm precipitation.
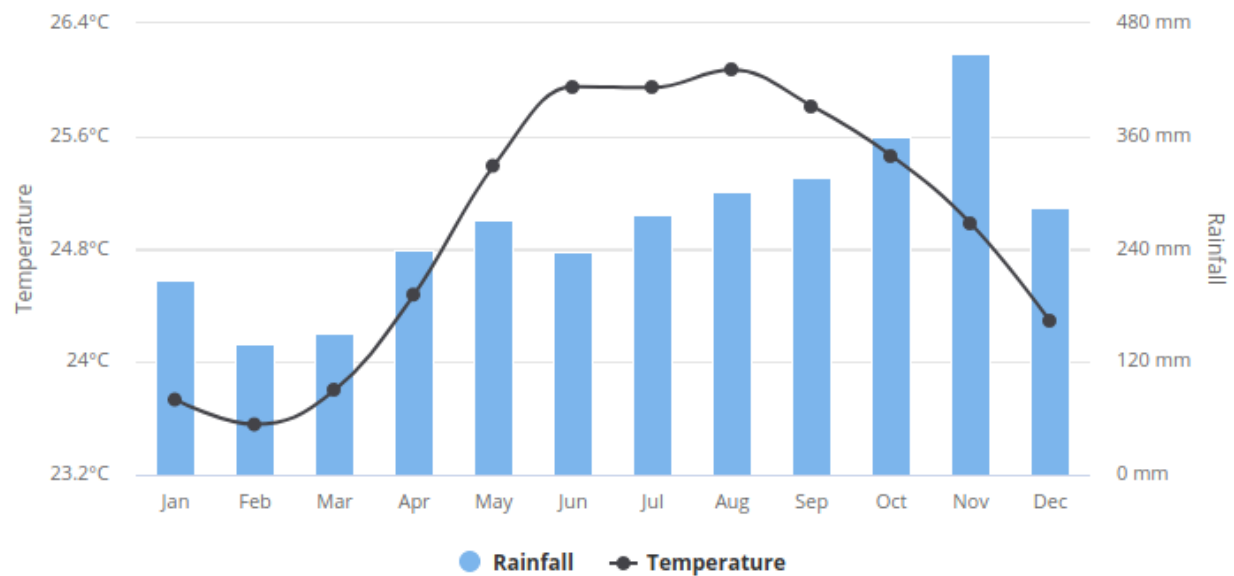
Figure 15. Average Monthly Temperature and Precipitation of Dominica, 1901–2016 (World Bank Group, 2020).

The formation of Dominica's hurricanes is strongly correlated to the El Niño-Southern Oscillation (ENSO) cycle (Pielke & Landsea, 1999), a recurring warming (El Niño) and cooling cycle (La Niña) of the Pacific Ocean's surface water temperatures, with more frequent hurricane activity linked to the colder periods on the island (World Bank Group, 2020). The island's climate is inhomogeneous, its topography shapes the microclimate in different parts, leading to a variety of forests and distinctive species combinations (Burke & Lovell, 2000:3).

4.2.1.3   History

Since the first contact with Europeans and until its independence, Dominica had a colonial history as a strategic point for various powers. Its discovery by the Europeans dates back to Columbus who passed the island in 1493 (Commonwealth Secretariat, 2020). Its indigenous inhabitants at the time, the Kalinago, predominantly lived in small settlements on fertile land sheltered from natural hazards (Burke & Lovell, 2000). After its discovery, the Kalinago resisted Spanish attempts to enslave the local population and no Spanish settlements were built on the island (Beckles, 1992). Due to its central location, Dominica also

became the preferred port for transatlantic travellers in search of food, tobacco, water, and wood (Burke & Lovell, 2000:2). By 1635, France had claimed Dominica as its own until 1686, when it was once again declared neutral territory (Burke, 1998:226). For the remainder of the 17th and 18th century Dominica was considered shared territory between Great Britain, France, and Spain, during which time colonial powers shipped slaves from Africa to Dominica. By 1759, Great Britain had conquered Dominica and, according to the 1763 Paris peace treaty, Dominica was officially ceded to Great Britain (Burke, 1998:248). Under the British, Dominica was integrated into various colonies during the 19th and 20th century. As part of the West Indies Associated States, Dominica officially assumed control of internal self-government, while still ceding foreign relations and defence responsibilities to the UK. Dominica officially gained independence as a democratic republic in 1978 and became part of the Commonwealth (Commonwealth Secretariat, 2020).

4.2.1.4   Population

With a population of 74,243 inhabitants (CIA, 2020a), Dominica is one of the least populated Caribbean countries. In contrast to Svalbard, Dominica has a sizeable young population with ca. 50% aged below 40 (Figure 16).
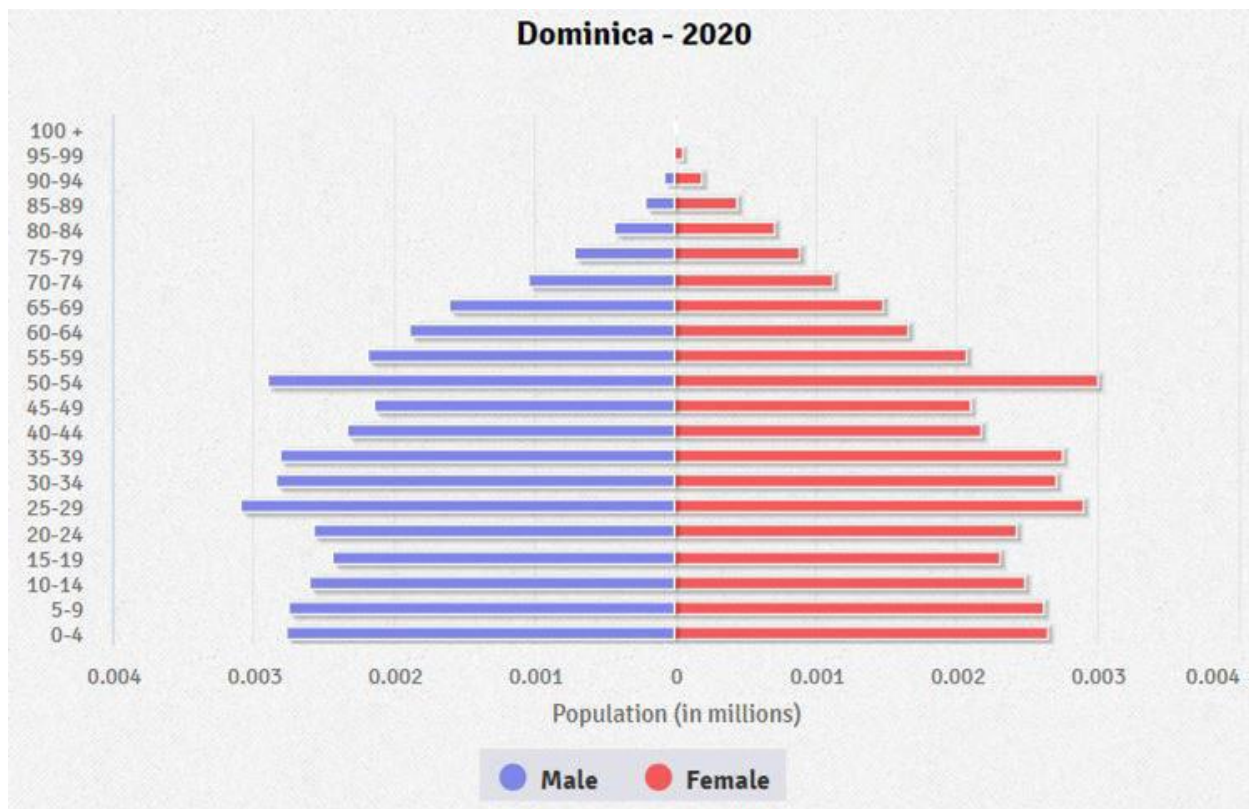
Figure 16. Population Pyramid for Dominica With Gender and Age Distribution (CIA, 2020a).

The nation's slow population growth of only about 0.2%, is attributable to the seasonality of hazards and increased emigration that has resulted in a brain drain (Barclay et al., 2019; Mishra, 2007; United Nations [UN], 2019). The largest segment of the population lives in mostly urban settings along the coast, with 15,000 inhabitants (20%) located in Dominica's capital, Roseau. According to the 2001 census, Dominicans are of mainly African descent (86.6%), while 8.9% are considered of 'mixed' descent (Government of the Commonwealth of Dominica, 2005). The majority are Christian, with the remainder composed of Rastafarians, Hindus, and Muslims, and non-religious—representing 17.4% of the population (Government of the Commonwealth of Dominica, 2005). Dominica's official language is English, although Antillean Creole is also widely spoken (Carrington, 1999).

4.2.1.5 Politics

Dominica is a parliamentary democracy with a non-executive presidency (Commonwealth Secretariat, 2020). Since gaining independence, Dominica has had equal election rights across genders and several women have served as high-ranking officials, including a former Prime Minister, Mary Eugenia Charles (Phillips, 2002). Dominica's House of Assembly is made up of 32 members, of which 21 are elected representatives and nine are senators that are appointed by the President following the advice of the Prime Minister (five) and the opposition leader (four). Currently the country has two main political parties. Dominica's current Prime Minister, Roosevelt Skerrit, and his Dominica Labour Party (DLP) won a landslide victory over the opposing United Workers Party (UWP) in the last elections on December 6th, 2019. First elected in 2004, this represented the fifth consecutive election victory for Skerrit. Dominica ranks 48th out of the 180 countries evaluated on the corruption perception index (CPI), with 55/100 points (Transparency International, 2020), a score that ranks them as faring better than most South American countries and comparable to scores of Eastern European countries, such as the Czech Republic.

4.2.1.6 Economic Development

Dominica is categorised as a 'less-developed' country with its primary income resulting from raw materials, primary goods and tourism (Hubbell, 2008). According to the Heritage Foundation's 2020 Index of Economic Freedom, characterising the freedom of people to control their labour and property, Dominica ranks 97th globally, and 20th out of 32 countries in the Americas region (Miller et al., 2020). Regulations on the financial sector, influence on the allocation of credit, and the lack of financial instruments are the main negative impacts on the score. In 2019, Dominica's GDP per capita amounted to approximately USD 8,300 (The World Bank, 2020). Around 16% of the GDP is derived from the agricultural sector and 15% from the

industrial sector. Seventy percent is derived from services[40] dominated by tourism and tourism-related activities, contributing to about 50% of the annual GDP (Kambon et al., 2019:40).

Due to Dominica's susceptibility to hurricane damage, since the 1980s it has reduced its reliance on the agricultural sector in an attempt to develop an ecotourism industry (Figure 17), as well as an offshore financial sector (Benson et al., 2001; Mohan, 2017; Vlcek, 2007; O. H. Williams et al., 2005). As with other Caribbean countries, Dominica also instituted a Citizenship by Investment Scheme in 1993, by which development finance is procured through the sale of citizenship and national passports (Government of the Commonwealth of Dominica, n.d.). This program has reportedly raised USD 500 Million (Williams & Hosein, 2019).
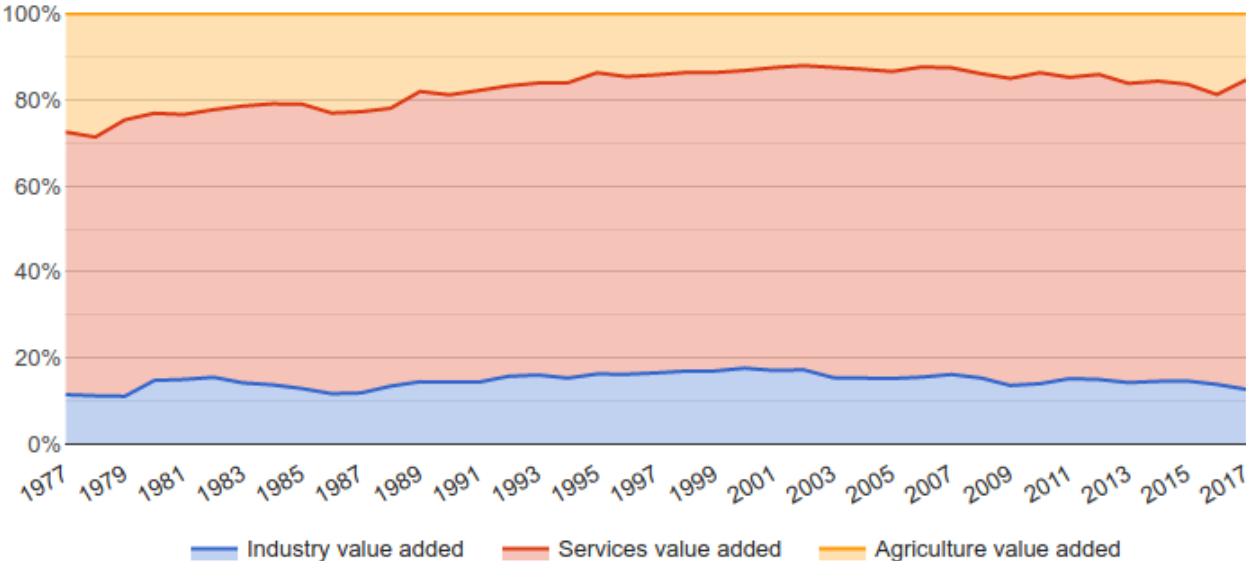
Figure 17. Dominica's GDP According to Economic Sector (The Global Economy, 2020).

Overall, Dominica's economy is vulnerable to disaster due to its overwhelming reliance on the agricultural and tourism-oriented services sectors. Infrastructural damage and destruction resulting from hurricanes, landslides, or floods (Ch. 4.2.2) place further stress on Dominica's already precarious financial situation (Miller et al., 2020:202–203). For instance, widespread damage inflicted by Hurricanes Erika and Maria amounted to about 96% and 226%, respectively, of Dominica's GDP, resulting in a significant economic burden (IMF, 2018).

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[40] In comparison, the division of the EU's GDP is, in the same order, 1.6%, 25.1%, and 70.9%.

4.2.2   DISASTERS IN DOMINICA

Dominica is highly hazard-prone, particularly concerning tropical storms and hurricanes. The region's unique geological and topological features, together with historically embedded disaster vulnerabilities, heighten such risks (ACAPS, 2018; Barclay et al., 2019; Benson & Clay, 2004:4; Wilkinson, 2018). Main hazards include (flash) floods, land- and mudslides, earthquakes and earthquake swarms, volcanic activity (including from surrounding islands), tsunamis, storm surges, coastal erosion, tropical storms, and hurricanes (Benson et al., 2001). Several of these events have destroyed Dominica's roads or impeded road building, making its already precarious mountainous roads an additional significant hazard (Momsen & Niddrie, 2018). Historically, Dominica has been affected by several diseases including smallpox, measles, and typhus which were introduced during colonial rule. Additionally, crop diseases such as coffee blight, root tip, or red rust have significantly impacted its environment and agricultural sector and, thus, Dominica's social and economic wellbeing, through factors such as food security, work opportunities, and declining exports.

In this regard, fears are growing over climate change and associated sea level rise, drought, severe storms and the concurrent impacts on social, health, and economic wellbeing (Dominica Ministry of Health, 2010; Environmental Coordinating Unit (ECU), 2012; Schnitter et al., 2018; Woodward & Samet, 2018). Despite Dominica being a mountainous island, most of its communities are currently located along the coast with their livelihoods also connected to this area. Health-wise, the island has already experienced climate-related disease outbreaks including chikungunya, dengue fever, zika, malaria, and leptospirosis, while concern over climate change-exacerbated food- and waterborne diseases are growing (Schnitter et al., 2018). Dominica's major economic drivers, agriculture and eco-tourism, are inherently tied to its natural environment (Global Facility for Disaster Risk Reduction [GFDRR], 2020). Gradual climate change and shocks contribute to its disaster vulnerabilities, notably food production systems (Schnitter et al., 2018; Verret et al., 2016). Benson et al. (2001) observe that Dominica's eco-tourism sector is dependent on its external perception as a 'natural' lush environment, a perception that is increasingly being challenged by a mounting number of natural hazards, resulting from, or exacerbated by, accelerated climate change.

The predominant hazards associated with Dominica are tropical storms and hurricanes. As with much of the Caribbean, Dominica is located in the storm active Atlantic hurricane belt, making it susceptible to excessive rainfall and strong winds, which have been particularly destructive (GFDRR, 2020). The IMF estimates the probability of a hurricane hitting the island to be above 10% in any given year (2016). Thus, tropical storms, hurricanes and their secondary events such as landslides or floods, are considered the most significant hazards. A number of destructive hurricanes have caused significant cumulative negative social and economic impacts (ACAPS, 2018; Benson & Clay, 2004; IMF, 2016). Hurricane Maria in 2017 was the latest of a series

of significant Dominica hurricanes, including Hurricane David (1979) and Tropical Storm Erika (2015). Other significant tropical storms and hurricanes are listed and briefly described in Table 12 below. Apart from major infrastructural damage and widespread disruption to livelihoods, the aftermath of frequent seasonal hurricanes causes stymied economic growth and widespread internal displacement. As noted earlier, the concentration of much of Dominica's population along the exposed coast is also a great source of vulnerability. Heron (2018) has noted the increased emigration rate following Hurricane David and Hurricane Maria resulting from the displacement wrought by the storm. Heron highlights that displacement here is not solely about the physical dislocation resulting from such events, but also the social displacement of being cut-off from supportive kin networks.

Compared to hurricanes and related events, Dominica's volcanic hazards are perceived as a lesser risk and receive less attention (Eboh, 2018). However, the island is potentially subject to significant volcanic hazards. Dominica's nine potentially active and relatively young volcanoes (ca. 126,000 years old) combined with its 'shallow seismicity' (Ruiz et al., 2013) and active geothermal areas, "suggests an active magma reservoir, and the possibility of disaster" (Frey, 2015)—especially since the population, urban centres, and crucial infrastructure are located in the south, in the direct vicinity to most of the island's volcanos (Benson & Clay, 2004:9). The bulk of national strategic documents and policies are predominantly focused on DRR concerning climate change and hurricanes, presumably reflecting donors' focus on 'visible' disasters. This negligence in addressing vulnerabilities to volcanic hazards is a serious shortcoming in Dominica's DRR policies.

Additionally, Dominica experiences various environmental and conservation issues that make it more prone to disasters. Environmental or land degradation, such as deforestation, increases risks of landslides (Benson & Clay, 2004:16) and is stated to be an "extreme concern" in terms of Dominica's economic diversity, much of which is based on its status as 'Nature Island of the Caribbean' (The Commonwealth of Dominica, 2004, sec. 4). In contrast with other more accessible Caribbean islands, habitat loss has not been much of an issue, nonetheless, agricultural activities have excessively affected some habitat types. For instance, since the 1940s Dominica's more accessible littoral woodlands, tropical lowland rainforests, montane rainforests, and transitional forests have been significantly reduced through extensive clearing for single-crop agriculture (particularly bananas), and subsequent habitat degradation (e.g. erosion) (Malhotra et al., 2007:185). Dominica's wildlife is likewise endangered by human disturbance (e.g. susceptibility of marine turtles to tourism development), accidental or intentional killing (e.g. through pollution, pest control, or food consumption), introduced species, disease, and natural hazards (e.g. hurricanes, or volcanic eruptions) (2007:185–189). It has been widely noted that international relief efforts for Hurricane Maria in 2017, inadvertently facilitated the introduction of two invasive alien species (IAS) to the island, resulting in an

additional threat to biodiversity (van den Burg et al., 2020). The latter highlights the repercussions of reliance on international DRR responses that are less tailored to, and familiar with, local Dominican contexts.

At the time of conducting this research one year later in 2018, affected villages on Dominica's east side were still left without electricity and/or proper road access. Others, especially the small village of Petite Savanne, had been abandoned by its 800+ population due to the continued risk of landslides but also the lack of governmental intention to rebuild the infrastructure. Additionally, the village did not receive any help for days until after the storm. Consequently, rescue and burial efforts were entirely conducted by residents; some even crossed the island on foot to seek help and supplies in Roseau. This experience also tallies with other accounts of the implementation of 'Build Back Better' policies. *Build back better for whom?* The concentration of eco-tourism and tourist-oriented businesses along the cost seems to suggest, as with other such contexts, that there might be opportunities for land grabs of lucrative land under the guise of a plan to reduce housing in 'vulnerable' areas.

Table 12. Selected Disasters in Dominica.[41]

Year(s)	Event	Location	Fatalities/ Injuries/ Damage	Sources
1806	Hurricane / Tropical storm	All island	Unknown strength; 131 fatalities, mostly from flooding in Roseau.	van Westen, 2006
1880 & 1997	Volcanic eruptions	St. Patrick parish	No reported fatalities/injuries; Risk remains high.	(ACAPS, 2018; Nicholls, 1880; Wilkinson et al., 2016),
1979	Hurricane David	All island	Category 4 or 5; 56 fatalities, 180 injured; 95% of buildings damaged; 75% of the population homeless, leading to a temporary 'exodus' of 25% of the population.[42]	(Benson et al., 2001; Emergency Events Database [EM-DAT], 2020; Rasmussen, 2004:7)
1979	Hurricane Frederic	All island	No reported fatalities/injuries; Hit ca. 1 month after hurricane David, closing the airport and hampering disaster relief efforts. Combined with Hurricane David for the most severe damage reported for an island's forests.	(EM-DAT, 2020) (Haney et al., 1991)

[41] All numbers provided in this table are from official Government of the Commonwealth of Dominica websites and reports. Nonetheless, they must be taken with caution. While these are in line with official accounts, actual numbers are likely higher due to many unaccounted for missing or injured people.

[42] Secondary disasters included landslides, coastal erosion, loss of transportation infrastructure; loss of power grid which also halted the water system; significant damage to agriculture; significant loss of housing infrastructure. Dominica's banana export industry was initially entirely destroyed leading to significant long-term direct and indirect economic effects (e.g. policies and disaster aid focused on recovering Dominica's banana industry rather than diversifying it or addressing fundamental disaster vulnerabilities) (Mohan, 2017).

1980	Hurricane Allen	All island	No reported fatalities/injuries; Exacerbated the effects of Hurricanes David and Frederic, compromising crop and forest re-growth; Further decline in agricultural production and resulting economic stagnation.	(Benson et al., 2001; EM-DAT, 2020)
1986	Landslide	St. David parish	1 fatality, 1 injured; Damage to several buildings (inc. a clinic) and roads; Trees and vegetable plantations swept away.	(De Graff et al., 1989)
1989	Hurricane Hugo	All island	Category 4; 1 fatality; No. of people affected: ca. 710.	(EM-DAT, 2020)
1995	Hurricanes Iris, Marilyn and Luis	All island	Three hurricanes hit in quick succession (Luis as a Category 1); 1 fatality; Extensive physical damage, reducing projected economic growth from 4.5% to 2% for that year.	(EM-DAT, 2020) (Van Westen, 2006)
1998	Airplane crash	All island	11 fatalities; Crash took place while attempting to land in Dominica during poor weather conditions.	(EM-DAT, 2020)
1999	Hurricane Lenny	All island	Category 4; No reported fatalities/injuries; 50 houses destroyed; 715 people affected; Damage was worse than Hurricane Luis in 1995.	(EM-DAT, 2020) (International Federation of the Red Cross and Red Crescent Societies [IFRC], 1999)
2004	Earthquake	St. Andrew, St. John, St. Joseph, and St. Peter parishes	Magnitude 6.3; Termed the "Les Saintes" earthquake; No reported fatalities/injuries; 20+ houses damaged, power outages.	(EM-DAT, 2020) (van Westen, 2006)
2007	Hurricane Dean	All island	Category 2; 2 fatalities 725 houses/13,283 persons affected; Damage equivalent to 58% of GDP.	(EM-DAT, 2020) (United Nations Development Programme [UNDP] Barbadoes and the Organisation of Eastern Caribbean States [OCECS], 2007)
2007	Earthquake	All island	Magnitude 7.4; Termed the "2007 Martinique earthquake"; No reported fatalities/injuries; It resulted in widespread power outages across the island.	
2011	Tropical Storm Ophelia	St. Paul and St. Joseph parishes	Dominica affected by outer bands only; More than 80mm of rain in six hours, causing severe floods and affecting much of central Dominica. No reported fatalities/injuries; At least 395 people affected.	(EM-DAT, 2020) (IFRC, 2011)

2013	Flash flooding & landslides	All island	Severe rains and high winds resulting from a low-level trough system; 2 fatalities; Caused floods and landslides affecting hundreds of people particularly in Dominica's south.	(Caribbean Disaster Emergency Management Agency [CDEMA], 2013) (van Westen, 2006)
2015	Tropical Storm Erika	All island	11 fatalities (and 22 missing persons); 15,900 people affected (23% of the Population); Damage equivalent to 90% of GDP.	(EM-DAT, 2020) (ACAPS, 2017)
2017	Hurricane Maria	All island	Category 5; 31 fatalities (and 37 missing persons); 65,000 people affected (80% of the population); 90% of buildings damaged or destroyed; Damage equivalent to 224% of GDP.	(EM-DAT, 2020) (ACAPS, 2018)

As with nearly all disasters, disaster risk in Dominica is driven by social, political, economic, physical, and cultural vulnerabilities. In pragmatic terms, Dominica "exemplifies the experience" of many small island nation states (SIDS) or "small open island economies" which face some "special disadvantages associated with their size, insularity and remoteness" according to which disasters may threaten their very economic viability (Benson & Clay, 2004:4; Briguglio, 1995; Pelling & Uitto, 2001; Thompson, 2019b). Rasmussen underlines that Caribbean islands with their extensive coast lines owe much of their disaster vulnerability to their location in a hurricane-prone region (Rasmussen, 2004:5). Pelling and Uitto add that small islands such as Dominica are "most at risk from 'knock-out' by a single event" (2001:60). This risk adds to overall financial insecurity, due to the long-term effects on external risk perception and resulting difficulties in obtaining foreign investment (without unfavourable terms, e.g. risk transfer) that is often crucial for small and/or developing tourism-dependent economies (Benson & Clay, 2003; Weaver, 1991).

However, as per chapter 2, many scholars emphasize that rather than being a direct result from physical factors, Dominica's vulnerabilities are largely due to unsustainable development resulting from political and economic instability (Barclay et al., 2019; Benson et al., 2001; Heron, 2018; Phillips, 2002; Thompson, 2019a, 2019b; Weaver, 1991). According to Barclay et al., by the time Dominica became independent in 1978, "actions and processes rooted in colonial and postcolonial history", such as the poor education and health infrastructure typical of former colonies used for extractive resources, had already put the nation on a "development trajectory of high exposure and economic vulnerability that was difficult to alter" and allowed for continued risk accumulation (Barclay et al., 2019:150). In fact, sources refer to the devastating effects of hazards on Dominica's historically single or dominant crop industry including sugar, bananas, or lime, and the impact, in turn, on its economic welfare. Overall, these consistently describe, to paraphrase Nelson (2010), a 'cycle of glory and suffering' that is directly connected to vulnerability, disasters, and disaster recovery (Barclay et al., 2019; Benson & Clay, 2004; Nelson, 2010). A range of scholars identified that political

instability in Dominica results from the constriction of the agricultural sector to a dominant or single crop, which is a direct consequence of British rule. This trend has been reinforced by the introduction of structural adjustment programs, the resultant limiting of investment in social welfare, leading to limited opportunities for livelihood diversification and an over-dependency on agriculture and tourism (Annett, 2000; Aurore, 2013; Bellot, 2009; Benson et al., 2001). Today, while agriculture remains Dominica's most important sector regarding both employment and GDP contribution, its strategy to diversify its economy (and reduce the resultant vulnerability) with a growing focus on tourism, and to a lesser extent, an offshore financial sector, has seen some success (Momsen & Niddrie, 2018).

The vulnerability approach to disasters, poverty, gender, as well as ethnic and political marginalisation, is especially problematic with regards to Dominica's disaster susceptibility (Thompson, 2019b). Wall-Bassett et al. point to the correlation between the indigenous Kalinago population and poverty, subsequent food insecurity, and heightened disaster vulnerability (2012). This refers to issues surrounding poor people's limited means and methods of constructing resilient housing, as well as the housing location, and access to often gendered or otherwise politicised disaster aid. Dominica shows how poverty in disasters constitutes a 'double bind' that leads to coping mechanisms that "simultaneously allow management of disaster while prohibiting effective DRR to build a stronger resilient community" (Ferdinand et al., 2012:91). Put simply, existing or 'indigenous' coping mechanisms may be negative and "resist better DRR" (2012:91). As for housing recovery in Dominica, poor people may have no option but to build-in the same vulnerabilities into the reconstruction efforts which led to the disaster in the first place and poverty is maintained constituting the main vulnerability. As Barclay et al. summarise, "disease, natural hazards, and other economic stresses reduced employment opportunities, promoting a drift toward marginal settlement on Crown Land [owned by the State] and on the edges of larger towns; and deficiencies in governance meant that insufficient action was taken to counteract these pressures" (2019:150).

Additionally, hazards affecting Dominica have demonstrated the precarious state of its key infrastructure. As indicated in the table above, nearly all hurricanes over the past decades led to severe damage or the destruction of a majority of housing and public utilities including water, electricity, transportation infrastructure, health services, and schools. It is beyond the scope of this study to offer detailed analysis of often highly technical issues relating to infrastructure design and construction criteria. However, the consistent recurrence of such damage suggests a lack of investment in disaster resilient key infrastructure and building codes appropriate for Caribbean circumstances. Despite Dominica's investment in infrastructure modernisation in the 1950s through to 1978, "hazard mitigation was not sufficiently seriously considered under the pressures to provide infrastructure quickly at low initial investment cost" (Benson et al., 2001:36), partially due to the hurricanes and other hazards that hit the island during that time. Furthermore,

"infrastructure has been located in especially vulnerable sites where there are no protective physical features" (2001:36).

In summary, unlike this research project's Arctic case study, Dominica's disasters' direct and indirect long-term negative impacts, especially when taken cumulatively over the past decades, have been enormous. The nation's extreme disaster vulnerabilities, together with the range of hazards the island is exposed to, have increasingly resulted in disasters. These disasters are characterised by severe damage and loss across Dominica, affecting its productive sectors—agriculture, forestry, fisheries, commerce/microbusinesses, tourism; its social sectors—education, health, housing, culture, population distribution; migration; its infrastructure sectors—roads and transport, ports and airports, water and sanitation, electricity, and telecommunications (Government of the Commonwealth of Dominica, 2017); and its environment at large. A lack of mitigation measures and an absence of significant investment in sustainable development, have resulted in a cycle of deepening vulnerabilities and instability, perpetuating further disasters.

4.2.3   DRR/R IN DOMINICA

Confronted with a range of risks and hazards, Dominica's government has taken significant steps to strengthen its DRR/R measures. Operationally, Dominica's formal DRR/R mechanism follows a decentralised logic and, together with dedicated governmental committees, includes internal, local stakeholders, as well as external regional and international stakeholders. Internally, DRR/R is scattered across different agencies, departments, executive committees and advisory councils, task forces, and district and community emergency management committees. At the central governmental level, the National Emergency Planning Organization (NEPO) is responsible for planning and organising DRR/R measures and reports to Dominica's prime minister. Dominica's Office of Disaster Management (ODM), under the Ministry for National Security and Home Affairs, serves as a secretariat for the overall structure and coordinates the different levels, engaging them through the National Emergency Operations Centre (NEOC) (Organization of American States [OAS], n.d.; Thompson, 2019a). Dominica collaborates with a range of local and international DRR/R partners, notably the regional Caribbean Disaster Emergency Management Agency (CDEMA) which plays a vital role in outlining regionally relevant DRR/R programmes (Kirton, 2013; Thompson, 2019a). Other key partners include the African, Caribbean & Pacific Group of States (ACP), Caribbean Development Bank (CDB), Eastern Caribbean Central Bank (ECCB), European Union, United Nations, World Bank, the International Monetary Fund (IMF), and various international aid agencies.

Dominica's DRR/R policy and legislature are primarily governed by the 1987 Emergency Powers (Disaster) Act (Ch. 15:03) and are further guided by the 2006 revised National Disaster Plan (GFDRR, 2020). Other important guiding documents and legislatives directing Dominica's efforts include: the Agricultural Small

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Tenancies Ordinance (1991, Ch. 58.70), the Forest Act (1991, amending the 1976 Act), the Fire and Ambulance Services Act (1991, Ch. 42:60), National Climate Change Adaptation Policy (2002), the Physical Planning Act (2002), the National Parks and Protected Areas Act (2003), and the National Hurricane Management Plan, the Disaster Preparedness Plan for the Agriculture Sector (2006).

Dominica has placed greater emphasis on directing resources to DRR, evidenced by the language used across government websites, documents, and public statements and, most notably, through becoming a signatory to the Hyogo Framework for Action (2005–2015) and later the Sendai Framework for Disaster Risk Reduction 2015–2030. In line with the Hyogo Framework's third priority—'to use knowledge, innovation and education to create a culture of safety and resilience at all levels' (Priority #3, UNISDR, 2005:18)—a strategy that has been emphasised by Dominica to achieve DRR through pursuing "formal, non-formal and informal educational means" (Knight, 2015:191). This implies investing in school curricula that include DRR. For instance, following Hurricane Maria, Dominica's Ministry of Education collaborated closely with the international disaster response organisation, 'IsraAID,' to build a comprehensive DRR school curriculum which, amongst others, provides training and brings emergency responders into Dominica's schools to teach children about DRR and preparedness.

Similarly, Dominica's DRR/R efforts are generally connected to climate change and related themes. Relevant examples are Dominica's 1993 ratification[43] of the 'UN Framework Convention on Climate Change' (UNFCCC) and the adoption of a subsequent comprehensive climate adaptation project (Caribbean Planning for Adaptation to Global Climate Change [CPACC]) from 1998 to 2001. Further examples include, the 2000–2006 Emergency Recovery and Disaster Risk Management program that was implemented with the support of the World Bank to minimise disaster-related damage and economic disruption, the Low-Carbon Climate-Resilient Strategy (2012–2020), or its membership in the multi-country risk-pooling 'Caribbean Catastrophe Risk Insurance Facility' (CCRIF). Dominica is also a member of the regional initiative 'Caribbean Planning for Adaption to Global Climate Change' (http://www.cpacc.org/), which seeks to support the region in coping with the "adverse effects of global climate change, particularly sea-level rise, in coastal and marine areas, by means of vulnerability assessment, adaptation planning and capacity-building linked to adaptation planning" (CPACC, 2020). Overall, Dominica's priorities centre around four pillars: (I) 'build back better' following Hurricane Maria in 2017 with the objective to become the world's 'first climate-resilient country'; (II) strengthen fiscal resilience to disasters; (III) increase infrastructure resilience; and (IV) strengthen institutional capacity for better disaster response (GFDRR 2020).

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[43] As one of four countries in the region which were the Grenadines, Saint Lucia, and Saint Vincent.

These priorities are partially addressed by technological means, particularly to fix gaps in early warning systems revealed by past disasters. For instance, Hurricane David was ignored until the last minute, with no warnings issued (Honychurch, 1995). While during Tropical Storm Erika (2015), "it is extraordinary that the island was expecting rain showers which would bring an end to a long period of drought but was not under a storm watch" (Wahlström, cited in UNDRR, 2015). Consequently, Dominica's authorities invested in seismic early warning systems (Ruiz et al., 2013), and, with GFDRR support following Hurricane Maria, Dominica produced flood and hazard maps, a handbook outlining "hazard and risk analyses for physical and infrastructure planning", participated in technical risk assessment activities to support the development of disaster mitigation measures, and developed a risk-based transport Infrastructure Asset Management System (GFDRR, 2020).

Many of the nation's initiatives also appear to be guided by DRR approaches. As noted earlier, events unfolding post-Hurricane Maria have demonstrated how underlying issues related to sustainable development intertwine with hazards, resulting in disasters. Thus, ideas around resilience, climate change, and 'building back better' have become tropes for DRR and are increasingly put forward in Dominica's national recovery strategy, potentially signifying a rethinking of existing development paradigms in line with contemporary disaster literature as outlined in chapter 2 (Rhiney, 2020:1). Dominica has become known for its campaign to become the 'world's first climate resilient nation' along with its mantra of 'building back better', both lauded by international dignitaries.[44] For this purpose, Dominica established the inter-ministerial 'Climate Resilient Execution Agency for Dominica' (CREAD) in 2017. CREAD's stated objective is "to lead and coordinate strategic initiatives across all sectors with the goal of leading the climate resiliency mission in Dominica" (CREAD, 2020). Spearheading Dominica's Climate Resilience and Recovery Plan (CRRP), CREAD defines the targets Dominica needs to meet to become the world's first climate resilient nation, oversees nine capital projects on behalf of the Dominican government and international donors, and aims to ensure continuity beyond their four-year mandate, by fostering social, financial, and institutional resilience. However, Dominica's remarkable initiatives have been critiqued for their limitations, especially the gap between verbal/on-paper commitments to DRR/R and the rate of actual follow-through. According to Thompson's recent analysis, "the length of time legislation remains in draft highlights a lack of commitment to disaster risk reduction" (2019a:147). This is echoed by Ferdinand et al. (2012) and Heron (2018) who point to the

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[44] E.g. Prince Charles (2017) (http://dominicanewsonline.com/news/homepage/news/general/prince-charles-hails-resilience-of-hurricane-battered-dominicans/), former US President Clinton (2018) (http://dominicanewsonline.com/news/homepage/news/general/president-clinton-says-dominica-can-lead-way-in-producing-clean-energy/), or UN chief António Guterres (2018) (http://www.un.org/sustainabledevelopment/blog/2017/10/un-chief-lauds-dominicas-vision-to-become-first-climate-resilient-nation-after-recent-devastation/).

mismatch between Dominica's ambitious rhetoric versus the lack of concrete plans and implementation strategies. Tongue-in-cheek, Benson and Clay noted, "saying so does not make it so" (2004:21). Similarly, Knight highlights the problem concerning Dominica's aforementioned integration of a DRR component as part of the school curriculum. While political commitment and, often externally funded programmes developing these curricula exist, in reality, DRR education demonstrates weak institutional implementation (Knight, 2015).

In line with common issues concerning DRR language and implementation strategies, Heron (2018) finds that Dominica's references to DRR terminology, such as 'resilience' or 'building back better', are perceived in binary terms as "something a community possesses or lacks rather than a process", and dictated in top-down manner (2018:125). The focus on static characteristics instead of sustainable development is clearly at odds with the fundamentals of DRR. More concerningly, these tendencies suggest technocratic depoliticised "fixes to complex questions (e.g. the rehousing of displaced people) and [present] universalist expert notions of what 'better' or 'resilient' might mean" (:125). Heron's suggestion, that a more pragmatic approach to DRR would begin with an ethnographically rich analysis "from the ground-up—that is, starting with a ground level framing of how people are actively adapting to post-hurricane life by using the resources and networks within their grasp" (:125), sits well in the context of this research project.

The preparations for this research, as well as field work communication with officials across multiple ministries, seem to confirm the above, as several of Dominica's key DRR/R organisations did not possess any, or otherwise only superficial, vague, or outdated official policy documentation. Further, much of the island's efforts rely on a patchy system of responders and a volunteer roster which is alleged to be unreliable or dwindling (Ferdinand et al., 2012:89–90). This is particularly visible in the context of internal displacement. While those rendered homeless by hurricanes receive attention in the aftermath, their displacement is "barely identified and rarely recognized" (Verdeja, 2017:3). These 'temporary refugees', who were initially relocated by the government under the guise of DRR, are often forgotten once the immediate post-disaster interest drops. In fact, people relocated after Tropical Storm Erika, were still living in improvised tin, carton, canvas, or wood shacks by the time Hurricane Maria hit. During the fieldwork of this research, these 'temporary' internally displaced people had 'rebuilt' their shacks, often in high risk areas, while waiting for government assistance.

Dominica's national resilience plans post-Hurricane Maria, and its general focus on economic growth and development, are not necessarily conducive to reducing disaster vulnerability. As illustrated in chapter 2, people and groups are differentially vulnerable to disaster risks. The research carried out here, as well as other scholarly reviews of Dominica's DRR/R strategies, highlight that this may not be fully acknowledged or

considered (Heron, 2018; Thompson, 2019a). For instance, a review of Dominica's poverty strategy documents, which were co-developed with the IMF after the mid-2000s, show a collection of rather ambiguous statements and vague objectives with little or no mention of gender-, ethnic-, migrant-, age-, or disability-related issues. Conversely, the Dominican government's 145 pages long post-Hurricane Maria assessment report dedicates five pages to the nation's "significant strides" on gender issues, while outlining the considerable steps that remain to reach gender equality. (Government of the Commonwealth of Dominica, 2017:125–129). Overall, vulnerable groups receive little to no recognition, casting further doubt on the effectiveness of Dominica's DRR efforts. Regarding the aftermath of Hurricane Maria, Rhiney (2020) emphasises the link between disasters and pre-existing social problems, such as inequality, underdevelopment, and instability. Thompson (2019b) highlights that the tendency of disaster recovery practices to replicate existing problems, while also contributing to the introduction of disaster-related legislation, did not exist prior to Hurricane Maria. The lack of focus on DRR as a process aimed at reducing vulnerabilities and sustainable development is aptly demonstrated by Dominica's Prime Minister Roosevelt Skerrit's 2017 speech at the 'International Day for Disaster Reduction 2017'. Commenting on Dominica's DRR/R measures and climate 'action', he states:

> In Dominica, we aim to become the world's first climate-resilient nation. We cannot do this alone. We need international cooperation We are among those countries which contribute least to climate change but over the last two years we have suffered the consequences of two devastating storms which have left us struggling to stay on the path of sustainable development. More funding must be made available to vulnerable countries so that they can effectively mitigate the risks associated with such events. Climate change is a hard reality for all of us here in the Caribbean. On International Day for Disaster Reduction we ask that the world does not turn its back on this problem but starts to address it in a meaningful way through reducing greenhouse gas emissions and investing in climate action and disaster risk reduction for small island developing states where unique ways of life are in danger of extinction. (Skerrit, 2017)

This statement is problematic, in its own right, and essentially gives credence to the scholars and practitioners' critique cited earlier. Rather than demonstrating a fundamental understanding of DRR and a genuine commitment towards it, Skerrit's statement is strategic in its use of DRR-friendly terminology, while casting blame on external factors, seemingly geared at accessing international funding. It may be true that Dominica's suffering the 'consequences' of climate change despite 'minimal' contributions to the phenomenon is 'unfair'. However, a crucial element of a DRR strategy is to shift the narrative from one of helplessness to one of individual, community, and national resilience. Through attributing blame and underlining the need for external support, Skerrit's statement fails to take into consideration Dominica's responsibility to reduce risks by sustainably addressing the nation's vulnerabilities.

As this researcher's practical experience confirms, any such DRR/R strategies need to be considered vis-à-vis important donors' DRR/R-related ideas and plans. Often, such plans focus more on reconstruction efforts

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that are in line with their economic and political agendas, rather than sustainable development that is focused on tangible vulnerability reduction and, thus, DRR. Dominica's increasing dependence on China as a donor of medical, material, and financial aid post-Hurricane Maria is a case in point (Eboh, 2018). This donor-recipient relationship between China and Dominica has extended to a USD 14 million donation by the People's Republic of China (PRC) towards aiding post-disaster restoration—aid that is particularly welcomed by Dominica (and other recipient countries) due to China's lack of oversight regarding how these funds are used (Ochieng'-Springer & Springer, 2020:68). However, Chinese aid to the Caribbean comes with a price as it is thought to be inherently tied to its geopolitical strategy vis-à-vis the Americas, including establishing diplomatic, trade, and military relations, gaining access to resources, and creating opportunities for small Chinese enterprises to operate in the Caribbean, like China's insistence for development and reconstruction projects to be carried out by Chinese contractors (2020:69–71).

Figure 18. Chinese Medical Ship During the Project Fieldwork in 2018.

In sum, despite Dominica's considerable DRR/R plans, the mismatch between words, genuine understanding, and action raises questions over the efficiency (and intentions) of Dominica's FDG-efforts and, thus, the island's current recovery tasks, including its preparedness for future hazards, such as increasing climate-related impacts (Rhiney, 2020). Consequently, Ferdinand et al. (2012) highlight the importance of, and reliance on, 'community' DRR/R action in Dominica (and the region at large). Specifically, they highlight that government strategies to respond to the hurricane consequences were not actualised, despite extensive planning. They note that informants emphasised the lack of communication and engagement between NGOs, donors, government agencies, other organisations, and the local community. Similarly, Verdeja, referring to experiences in other Caribbean locations, notes that empowering local authorities can have far-reaching results due to their 'on-the-ground' experience as well as ability to "implement and operationalize [central DRR/R] measures on a tangible scale" (2017:15). Community and local knowledge represent key factors in

the realisation of DRR. In particular, during and after a disaster, already marginalised groups are left to their own devices, relying on social networks and the solidarity of others to cope with the fallout (Heron, 2018). Informal DRR/R mechanisms including kinship and community engagements are deployed as strategies for coping with the longer-term impacts of hazards by providing financial and social security during times of uncertainty and, in the absence of external support.

4.2.4   CASE STUDY SITES DOMINICA

Given the larger number of communities in Dominica compared to Svalbard, data collection was conducted in communities across the four of Dominica's 10 parishes, including its most populated, Saint George, which comprises 30% of the population[45] , and contains the capital city Roseau. The selection of these parishes from the island's southern region was based on three main criteria: population density, disaster exposure/vulnerability, and accessibility during a single field trip, given the budget limitation of a self-funded PhD. The communities in question are below (Table 13). Given that the field trip took place just over a year after the country was severely affected by Hurricane Maria, the information on the change in Quality of Life Index in Figure 19 provides insight into the context in which the research took place.

Table 13. Description of Case Study Locations for South Dominica.

Parish	Parish Population[46]			Main Interview Sites	Observed Characteristics
	Male	Female	Total		
Saint George	10,504	10,737	21,241	Roseau, Fond Cole, Shawford	More affluent locations, expat/international populations, key tourist spots
Saint Mark	913	921	1,834	Scott's Head	Relatively isolated, high poverty, informal links to other islands; popular for 'alternative' tourism
Saint Patrick	3,907	3,715	7,622	Grand Bay, Delices, La Plaine,	Higher poverty than the national average[47]
Saint David	3,248	2,795	6,043	Riviere Ciriques, Morne Jaune	Higher poverty than the national average[48]

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[45] Data from Dominica's most recent census (Government of the Commonwealth of Dominica, 2011).

[46] Data from Dominica's most recent census (Government of the Commonwealth of Dominica, 2011).

[47] Cf. *Post-Disaster Needs Assessment Hurricane Maria* report (Government of the Commonwealth of Dominica, 2017).

[48] Cf. *Post-Disaster Needs Assessment Hurricane Maria* report (Government of the Commonwealth of Dominica, 2017).

Source: Estimates based on Government data

■ Pre-Disaster ■ Post-Disaster
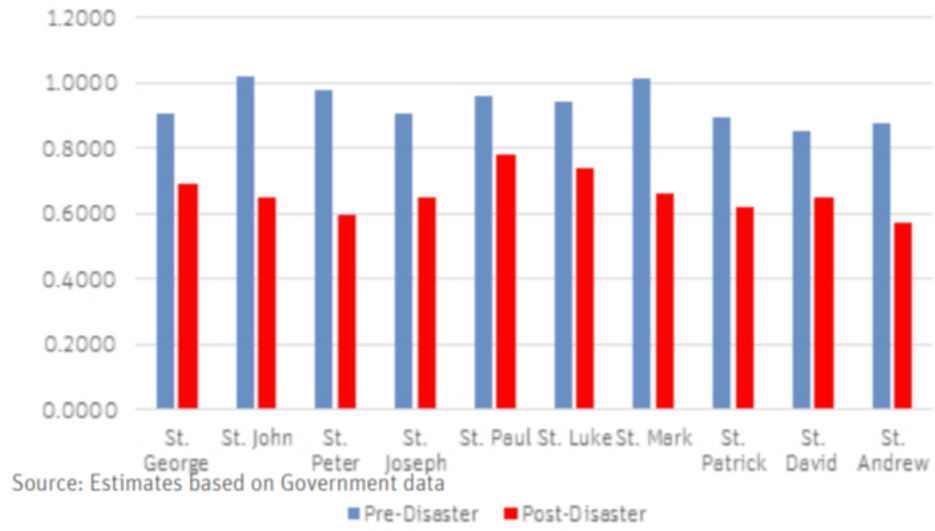
Figure 19. Change in the Quality of Life Index Following Hurricane Maria (Government of the Commonwealth of Dominica, 2017:31).

CHAPTER 5

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FINDINGS

5.1 INTRODUCTION

This chapter presents the findings from the analysis of individual semi-structured interviews conducted in Longyearbyen settlement in the archipelago of Svalbard and the southern region of the island nation of Dominica. The aim was to investigate how residents perceive DG. To maintain the sequential single-case study approach of the project, section 5.2 presents the findings from the first case study of Longyearbyen, Svalbard, while those from SD are provided in section 5.3. A similar structure adapted from the final coding template (Appendix H) is adopted for each section to ensure clarity and consistency. Thus, each section begins with a general information overview pertaining to the sample. The findings from the answers to the three main interview questions are then presented, along with their significance for the (artificial) formal/informal divide, along with a consideration of the factors contributing to interviewee perceptions.

The Pictorial Representation of Illness and Self Measure (PRISM) tool offers an added dimension to the data. By placing a risk (Q1), or source of disaster-related information (Q2), and help (Q3) on the diagram, and choosing to keep it there until the end of the question being considered, interviewees confirmed their answer's relevance. The distance from 'self' facilitated a consideration of the relative importance attributed to the different factors (illustrative Figure 20).
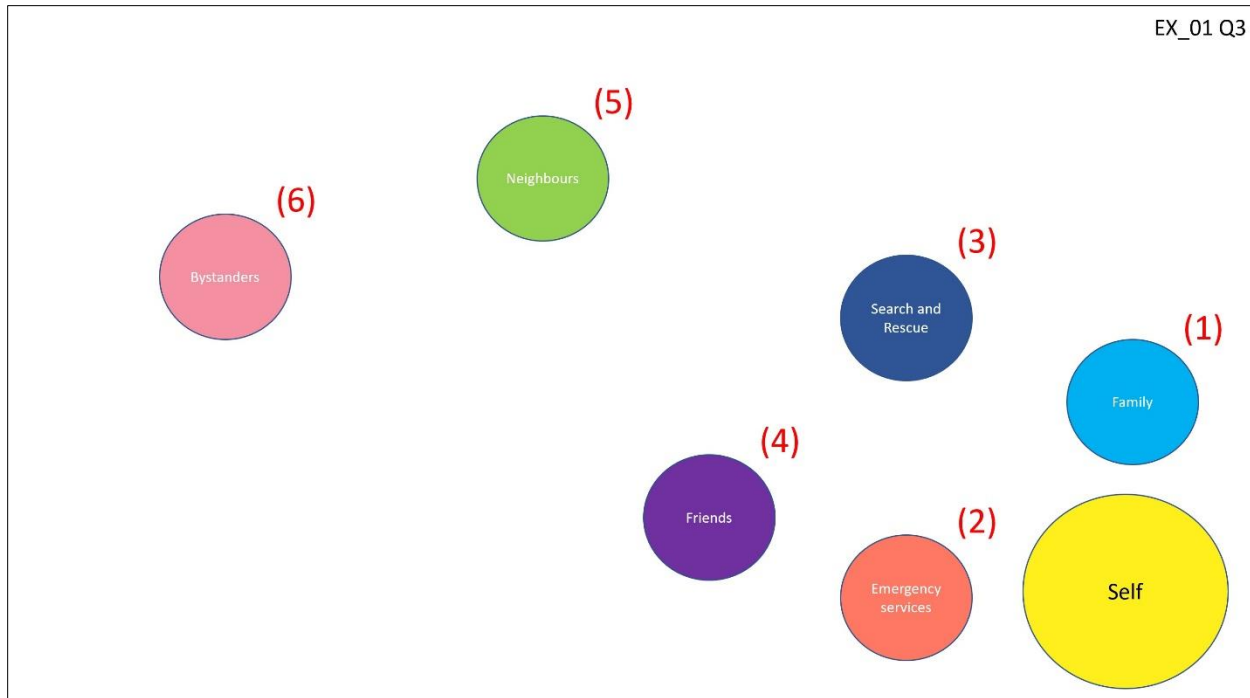
Figure 20. Illustration of a Completed PRISM Q3-Diagram (Ranking Based on Measured Distance Added for Explanatory Purposes).

Thus, while this study is driven by a qualitative approach, some descriptive statistics are used in this chapter, particularly the data collected through the **PRISM** diagrams. When presenting the average ('mean'), the median is also offered as a way to ensure transparency (Loehnert, 2010). Numbers are rounded to one decimal point and percentages are rounded to the nearest integer for ease of reading. Consequently, they may not add up to 100%.

Data were collected from 54 semi-structured individual interviews, conducted on location during the second half of 2018, 22 on Longyearbyen, and 32 on SD. Fifty of the 54 interviewees were recorded, with three interviewees (in SD) expressing discomfort with recordings in general, and one (in Svalbard) citing previous negative research experiences. In these cases, detailed notes, including significant quotes, were recorded instead. All interviewees agreed to fill out **PRISM** diagrams for each question. Table 14 and Table 20 show the list of interviewees in each location, with anonymised personal information. Overall, the average age was 45.5 (median=44.0). The youngest interviewee was 23, and the oldest 76. The gender balance was slightly tilted, with 28 males (52%) and 26 females (48%). Seventy-eight percent of respondents (dual-nationality holders included) were citizens from each location (Norwegian in Longyearbyen, Dominican in SD).

5.2 CASE STUDY 1: LONGYEARBYEN

5.2.1 DEMOGRAPHIC DATA

A July 2018 field trip to Longyearbyen yielded 22 interviews. Relative data saturation was reached after 17 interviews, and was supported by the final five. All interviewees filled out PRISM diagrams for each of the three interview questions, and all but one interviewee agreed to be recorded, in which case notes were taken instead. Interview summary forms were filled out after each encounter. Table 14 shows the anonymised list of interviewees. Due to Longyearbyen's relatively small population, the interviewee job sectors were generalised to avoid identification. The interviewee-age ranged from 23 to 64. The average was 40.8 (median=40.0). The gender distribution was exactly split (50%) between males and females (11 each). The majority of interviewees (64%) were Norwegian, two (9%) were Swedish, and the remaining six (27%) hailed from different countries. Sixty-eight percent of interviewees were 'not married' at the time of the interview, 18% were, and 14% labelled themselves as having a "life partner'. Twenty interviewees (91%) were full-time residents, and the two part-timers had each spent cumulatively at least 12 months in Longyearbyen. The longest-standing resident had spent 42 years in the settlement, and its most recent addition—two months. Six (27%) full-time residents were there for over 10 years, while seven (32%) had spent twelve months or less, showing a breadth of perspectives. Residents' accommodations were divided between three general areas in Longyearbyen: seaside (14%), centre (27%), and by the mountains (59%).

The main interviewee-occupations were tourism, gastronomy (18% each), and the emergency services (14%). Two (9%) were in the hospitality industry, two (9%) were students (including one who was working part-time in the tourism industry). The remaining seven worked in education, sales, construction, mining, security, logistics, and general office work at the local government, while one interviewee was unemployed. From a formal education perspective, apart from one interviewee that declined to answer, all but one of the remaining 21 interviewees had at least completed 12 years of formal education, with 16 (73%) pursuing some form of higher education.

When asked to consider whether they had experienced a disaster, six interviewees (27%) answered 'yes', six (27%) answered 'no', and 10 (45%) replied 'indirectly'. Five interviewees qualified 'indirectly' as referring to general crises (e.g. war, avalanche) that had not directly impacted them, three referred to 'second-hand' experiences through family members, and two declined to provide further information.

Table 14. Longyearbyen Interviewee List.

#	Age	Gender	Nationality	Married	Children	Location	Length of stay	Occupation	Disaster experience
L01	64	Female	Norway	Life Partner	Yes	Mountains	14 months, part-time	Education	Indirectly
L02	49	Female	Norway	No	No	Mountains	20 years	Tourism	Indirectly
L03	27	Female	Norway	No	No	Centre	5 months	Tourism/student	Yes
L04	23	Female	Norway	No	No	Centre	15 years	Unemployed	Indirectly
L05	42	Female	Norway	Life partner	Yes	Seaside	2.5 years	Hospitality	Indirectly
L06	33	Male	USA	No	No	Mountains	4 years	Tourism	No
L07	62	Female	Norway	Yes	Yes	Mountains	42 years	Sales	Yes
L08	63	Male	Norway	No	Yes	Mountains	2.5 months	Security	Yes
L09	50	Female	Sweden	Yes	Yes	Centre	6 months	Gastronomy	No
L10	41	Female	Philippines	No	Yes	Mountains	3 years	Hospitality	Yes
L11	26	Male	Norway	No	No	Centre	7 years	Mining	Yes
L12	39	Male	Norway	No	No	Mountains	10 years, on/off since 1994	Logistics	Indirectly
L13	47	Female	Germany	Life partner	Yes	Mountains	15 years	Student	Indirectly
L14	35	Male	Norway	No	No	Centre	3 years	Emergency services	No
L15	33	Male	Russia	No	No	Seaside	13 months	Tourism	No
L16	34	Male	Bosnia & Herzegovina	No	No	Mountains	2 months	Gastronomy	Indirectly
L17	45	Female	Sweden	No	No	Mountains	2 months	Gastronomy	Yes
L18	37	Female	Norway	No	No	Mountains	16 years	Gov office	Indirectly
L19	30	Male	United Kingdom	No	No	Mountains	2 years	Gastronomy	No
L20	44	Male	Norway	Yes	Yes	Mountains	1 year (part-time)	Construction	Indirectly
L21	42	Male	Norway	Yes	No	Seaside	1 year	Emergency services	Indirectly
L22	32	Male	Norway	No	No	Centre	1 year	Emergency services	No

The following subsection presents interviewee answers to the three main interview questions posed. For each question, both the data from the respective PRISM diagrams and the coded interview transcripts are considered, offering interview responses on disaster risks (Q1), sources of information (Q2), and sources of help (Q3), a consideration of perceptions of formality/informality, as well as insights into factors contributing to perceptions thereof.

5.2.2   QUESTION 1: DISASTER RISK AWARENESS

Intended as a conversation starter, question one set the tone and context of the interview by asking each interviewee to consider disaster risks within their environment. No definition of 'disaster' or 'risk' was offered to give interviewees maximum freedom of expression. Overall, the results suggest that Longyearbyen residents are aware of disaster risks. Interviewees mentioned a total of 123 risks with, on average, 5.6 risks (median=6.0) per interviewee PRISM diagrams for this question. The least risks mentioned were three, while the most were 10, suggesting a range of views (Figure 21).
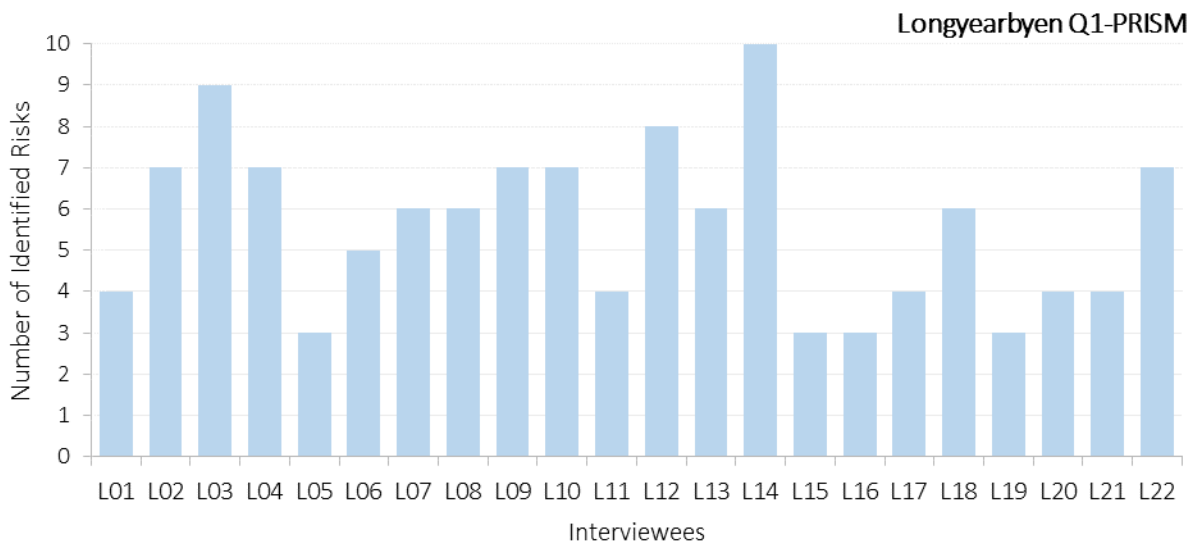
Figure 21. Longyearbyen Q1-PRISM: Disaster Risks Identified by Each Interviewee.

Men mentioned, on average, 5.2 (median=4.0) risks, while women mentioned 6.0 (median=6.0). Length of stay did not present obvious differences, with those who were island-based for a year or less (including part-time residents) and those present for more than one, but less than 10 years, both averaging five risks (5.3 and 5.0 respectively, both medians=4.0). In contrast, long-term residents (10 years and above) averaged 6.7 risks (median=6.5). Age did not affect the results, nor did nationality, or job sector. Interviewees living by the sea mentioned less risks (average=3.3, median=3.0) than those with accommodations by the mountains (average=5.3, median=6.0) or in the centre (average=7.3, median=7).

5.2.2.1 Disaster Risks Ranked

Table 15 ranks the different risks by number of mentions. The avalanche and polar bear threats top the list of risks and were consistently considered the most important. As presented in the beginning of this chapter, thanks to the use of the PRISM diagram, it is also possible to consider the relative importance of the sources mentioned by analysing their distance to 'self' in the diagram (Figure 20).

Table 15. Longyearbyen Q1-PRISM: Disaster Risks Ranked by the Number of Interviewees Who Mentioned Them.

# Risk	Number of interviewees	%
1 Avalanches	21	95%
=1 Polar bears	21	95%
3 Extreme weather	12	55%
4 Landslides	10	45%
=4 Snowmobile accidents	10	45%
6 Earthquakes	5	23%
6 Permafrost melting	5	23%
=6 Access to healthcare	5	23%
9 Climate change	4	18%
=9 Snow blindness	4	18%
11 Boat accidents	3	14%
12 Vehicle accidents	2	9%
=12 Fires	2	9%
=12 Rabies	2	9%
=12 Crevasses	2	9%
=12 Icy conditions	2	9%
17 Reindeer	1	5%
=17 Floods	1	5%
=17 Unsafe buildings	1	5%
=17 Rockfalls	1	5%
=17 Slush slides	1	5%
=17 Sports accidents	1	5%
=17 Terror attacks	1	5%
=17 Tourists	1	5%
=17 Trekking accidents	1	5%
=17 Bird attacks	1	5%
=17 Disease outbreaks	1	5%
=17 Crossing water	1	5%
=17 Mining accidents	1	5%

Figure 22 presents the frequency of risks mentioned by interviewees according to their respective top-three (A) and top-one (B) level of importance. Seven interviewees (32%) considered avalanches to be their 'most significant' risk (Figure 22 [B]) while 17 (77%) interviewees placed avalanches within their three most

important risks (Figure 22 [A]). Overall, avalanches were considered risks by all but interviewee 15, who lives by the sea and spends most of his time on boats. Similarly, polar bears elicited 21 interviewee mentions (95%), 16 of whom (73% of total) placed them amongst their three top risks. L06 was the only one to omit polar bears from his risk list, despite being a tourism-industry guide, where this risk would seem to be significant for him. Svalbard's high-Arctic weather conditions round up the three most-mentioned risks, with 12 mentions (59%).

(A)
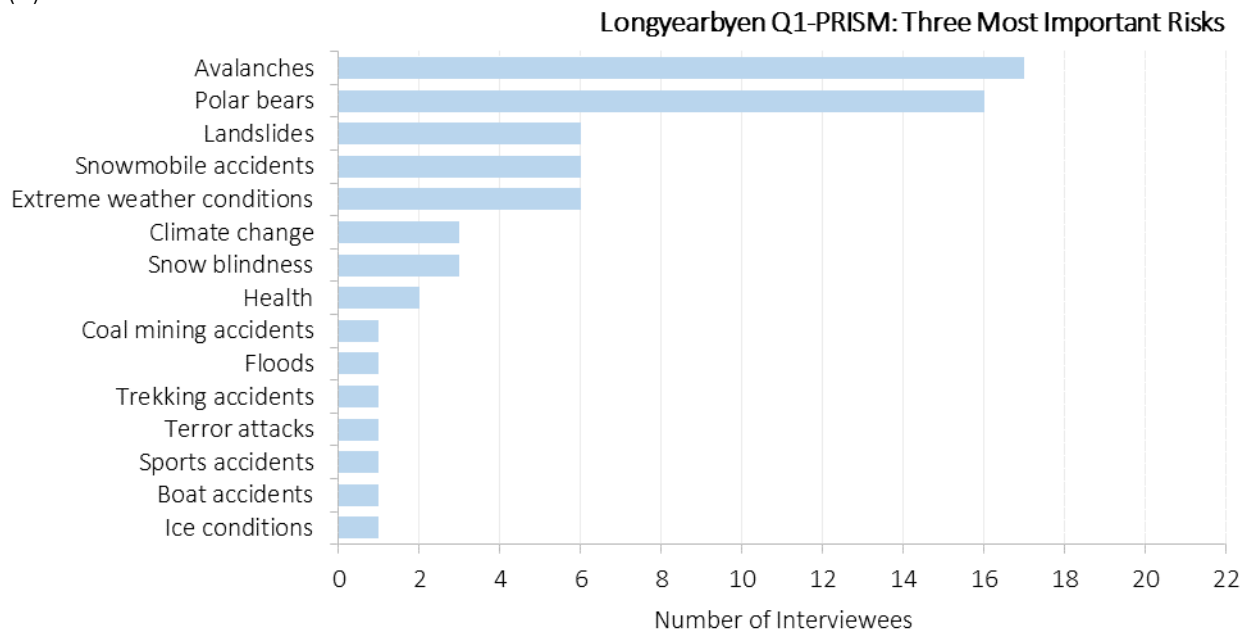
(B)
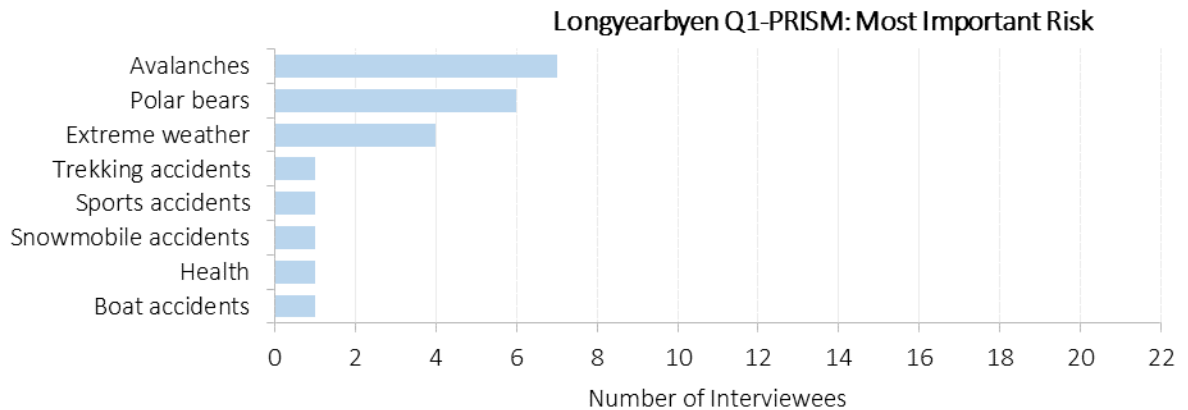
Figure 22. Longyearbyen Q1-PRISM: Disaster Risks Ranked by the Number of Interviewees Who Mentioned Them in Their Three 'Closest' (A)(above) and as Their 'Closest' (B)(bottom).

The hazards associated with climate change and melting permafrost were viewed as threats, as well as exacerbating other risks such as floods, avalanches, landslides, extreme weather, polar bears, and vehicle accidents due to unsafe snow. They were respectively mentioned by four (18%) and five (23%) interviewees

in their Q1-PRISM diagrams, with a combined nine mentions across six interviewees (27%). Finally, L07 included 'tourists' in her PRISM diagram for Q1 due to the negative impact they have on her life and comfort, rather than their contribution to disaster risks.

5.2.2.2   Contributing Factors

Interviewees' knowledge or awareness of perceived disaster risks was informed by the following factors:

<u>Experience (of Self and Others)</u>

To explain the risks they identified, all 22 interviewees (100%) recounted their own life experiences, those of people they know, or even the community at large. Seventeen interviewees (77%) shared experiences of events that they directly witnessed, such as L03 and L04, who felt earthquake tremors in 2012 and 2010 respectively, L06 who suffered temporary snow blindness, L12 who crashed a snowmobile, and L11 whose home was narrowly missed by the 2017 avalanche. Seven interviewees (32%), including two who did not share personal experiences, shared accounts of people they know, such as L08 whose "good friend" experienced snow blindness, L14 who refers to a colleague that dislocated a shoulder driving a snowmobile, or L10 whose daughter slipped and fell while walking in poor and icy weather conditions. Eleven interviewees (50%), including the remaining three, referred to experiences that affected the community at large. L03 referred to reading in the newspaper about a guide that died after going through the ice with a snowmobile, while L05 referred to someone (unknown to her personally) that died in an avalanche while driving a snowmobile. As she put it, "that was really scary because it can happen whenever and whatever and that's one of the main roads we're using". During the beginning or end of the 'demographic data' gathering segment of the interview, 10 interviewees (45%) answered 'indirectly' to a seemingly straightforward 'yes-or-no' type question about whether they had experienced a disaster themselves. This answer confirmed the importance of the experience of others.

The source of experience notwithstanding, references to the deadly avalanche of 2015 by 15 interviewees (68%) may have contributed to avalanches' ranking as one of the most significant risks. L06 shared that the avalanches prompted him to check whether his accommodation is in a risk area, something he had not thought of before. Similarly, seven of the 12 interviewees (58%) who consider climate change either a risk, or a factor increasing vulnerability to other risks, professed having witnessed it happening. For example, L04 shared that "I've seen it over the past fifteen years I've been here, the change in the environment", and L13 stated that "the climate has been very different the last years".

In comparison, interviewees offered contrasting perspectives on how lack of experience influences perception of disaster risks. Three-quarters of interviewees that referred to lack of experience, equated it with a reduced perception of risk. L04 explained that "I've only experienced a flood here once and that was the mid-winter and it didn't really do anything. So, [it's] not really [important to me]", a position shared by L13 and L15, the first of whom said that "in general I don't tend to worry too much about things until they happen". Conversely, for L03, "because I'm not experienced, that's why I'm worried about [polar bears]". These divergent findings suggest that experience can increase or reduce the perceived significance of risks. The severity of the experienced incident may also play a part. L19 reflected that "if some people were killed in the landslide maybe it [his ranking of avalanches as more significant than landslides] will be reversed". The fact that polar bears were considered the joint-most important one (together with avalanches)—despite only eight interviewees (36%) recounting experiences, of which only L07's resulted in a physical altercation 51 years prior—suggests other factors contribute to risk perception.

<u>Exposure</u>

The frequency with which a risk features in residents' daily lives may contribute to their perceptions of its significance. The 'presence' of the risk manifests itself in different ways. For some, awareness of past events and their accommodation location (e.g. near the mountains) provides a constant reminder of the avalanche threat, while also underlining the proximity of the threat (discussed below). Notably, the seven interviewees who considered avalanches their most important risk, identified as living near the mountain where there were two serious avalanches in 2015 and 2017. L04 shared that "living in a house where there has been an avalanche, it's definitely something that affects me". L6 and L19 referred to the presence of avalanche barriers on the mountain, the latter calling them a "a very visual representation of obviously the danger involved". L18 supported this finding, sharing that "the fact that [the road] is closed [because of landslides], you do remember why it's closed and then you think about it".

Residents' activity choices can also contribute to their vulnerability. L04 and L06 linked the significance of avalanches and polar bears to their frequent hiking, and five interviewees (23%) referred to threats that are either specific to, or particularly significant, when boating. Conversely, L10 disregarded certain risks because she is "not an outdoor people", and L18 did not consider boating risks as significant because she is rarely on a boat.

A risk's 'presence' can also be defined by the amount and frequency of associated communication, potentially explaining the high awareness level of the polar bear risk amongst interviewed residents. Similarly, eight of

the interviewees (36%) that mentioned polar bears in their Q1-PRISM diagrams, downplayed the threat involved during the interview. L19 confirmed this finding, explaining that:

> [The odds of seeing a polar bear are] very small. It's in your mind because it's well—I'd say advertised is the wrong word, but very well-represented. Whenever something happens it's all over the news. [...] people talk about it in town, especially [be]cause a lot of the guests that come here, they come here to see a bear.

L05 offered another explanation for why polar bear-associated communication is so high. According to him, if a polar bear is sighted, one must contact the government and alert people, something that L09 did when he saw one. The frequency of polar bear appearances was itself a matter of diverging opinions. For five interviewees (23%), seeing polar bears is infrequent, particularly in town, with L19 going so far as to say that "I've never had any knowledge or information of the bear being here, like in the centre, as I would call it. On this side of the bay". Conversely, another five interviewees (23%) reported having seen polar bears in town, including within the same timeframe. L20 even shared pictures he took of a mother bear and her cubs with his phone. Diverging views also extended to the type of impact a risk's 'presence' has on its significance. While L19 considered that the increased amount of discussion surrounding avalanches "puts it at the forefront of your mind", a position supported by L06; L05 called vehicle crashes 'normal', downplaying their significance as a result of their frequency. L09 was of a similar opinion regarding melting permafrost, calling it "important [..], but it happens all the time. So, perhaps not so near me [on the PRISM diagram]". L20 reflected that "a lot of people, when they have lived here long enough, they get kind of numb [to the polar bear warnings if they haven't seen one]", a reminder of the famous fable 'The Boy Who Cried Wolf'.

Knowledge and Control

The fear associated with the inability to predict or control a risk contributes to its significance. This may offer insights into the significance attributed to the polar bear threat, regardless of its 'presence' or the 'experience' of interviewees. Indeed, six interviewees (27%) refer to the inability to predict a polar bear appearance, with L05 explicitly stating that her polar bear fear is rooted in only being able to control the situation once the bear has been spotted. Similarly, the weather's volatile nature is specifically mentioned by 11 of the 12 interviewees that saw the Arctic weather conditions as a threat, contributing to its position as the third most important disaster risk. Thus, for 17 interviewees (77%), being able to take the right measures to 'control' the risks, otherwise known as 'preparedness', contributes to minimising the significance of a risk. As L14 shared, "if you do what you have learned, and you do it correct[ly], it's minimal danger". This is exemplified by using rifles and flare guns when hiking, or trip wires and dogs when camping, to mininimise the polar bear risk, as shared by eight interviewees (36%). It can also refer to the measures needed to deal with Arctic conditions, as

L12 learnt from driving back from a cabin without proper footwear, emphasising the role of experience in learning. Preparedness also extends to government measures; a topic drawing 15 interviewee mentions. The trust interviewees placed in the various institutions, influenced its significance for them (Chs. 5.2.3, 5.2.4).

<u>Attitude</u>

Nine interviewees (41%) referred to the role of an individual's personal attitude in risk perception. According to L01 and L17, living on Svalbard is a choice that entails a special understanding and acceptance of risks, while L10 and L15 drew on the perspective gained from other locations. L15 emphasised the effect of the mind on perception at the onset of his interview, sharing that "[m]ost of my worries, they relate to my inner situation, my thoughts, so it's nothing. It has nothing to do with something outside [..], all my worry about what's happening to me, it's in my thoughts". L14 considered the attitude of individuals during a trip as contributing to the risk level of others in the group.

5.2.3 QUESTION 2: SOURCES OF INFORMATION

Interview question two sought to identify interviewees' disaster-related information sources. Once again, to reduce bias, interviewees were given no further explanation, resulting in a focus on different aspects, including general knowledge and weather updates about upcoming hazards. In their Q2-PRISM diagrams, interviewees mentioned 138 sources of information, with an average of 6.3 (median=6.0), and ranging between three and 10 answers per interviewee. Answers varied slightly based on gender, with men averaging 5.5 sources of information (median=6.0), as compared to 7.0 (median=7.0) for women. A cursory consideration of the data by age did not yield differences, nor did length of stay, nationality, or job sector.

5.2.3.1 Sources of Information Ranked

Table 16 shows a ranking of the different disaster information sources based on the number of mentions. In this case, grouping was challenging, as interviewees used varying levels of categorisation. For instance, L01 differentiated between husband and children, while others, like L05, referred simply to 'family'. For the purposes of the study, this distinction was not considered significant, so both were grouped under 'family', unless the grouping was rejected by the interviewee. For example, L19 referred to girlfriend as distinct from 'friends' and 'family'. Similarly, L09 identified friends, neighbours, and colleagues as acquaintances, categories to which others referred separately. In these cases, the categories were left separate to avoid mischaracterisation.

Table 16. Longyearbyen Q2-PRISM: Disaster-Related Information Sources Ranked by the Number of Interviewees Who Mentioned Them.

#	Source of Information	Number of Interviewees	%
1	Friends	17	77%
2	Social media	15	68%
3	Governor's Office (*Sysselmannen*)	13	59%
=4	Own experience	12	55%
=4	Town talk	12	55%
=4	Work-related	12	55%
7	Local newspaper	8	36%
=8	Family	7	32%
=8	Weather forecasts	7	32%
10	Disaster/safety courses	6	27%
11	Internet searches	5	23%
12	Books	4	18%
12	News (via radio/TV)	4	18%
14	Acquaintances	2	9%
15	*Icepeople* (news site)	1	5%
15	Church	1	5%
15	Emergency organisations	1	5%
15	Flatmates	1	5%
15	Girlfriend	1	5%
15	Hospital	1	5%
15	Local government (*Lokalstyre*)	1	5%
15	Norwegian Polar Institute	1	5%
15	Police	1	5%
15	Profession-related blog	1	5%
15	Primary education	1	5%
15	Tourist info center	1	5%
15	TV documentaries	1	5%
15	Guides	1	5%

Some interviewees mentioned the people and/or institutions providing the information (e.g. friends, family, Governor's Office), while others focused on the medium through which the information is received (e.g. TV, radio, internet, social media). Follow-up questions were asked to clarify answers and identify the concrete source of the information, with limited success. For example, 'TV' was significant for both L8 and L17, with the first referring to the official news report, while the latter meant broadcasts of Arctic documentaries as an information source. Conversely, follow-up questions could not narrow down the range of sources consulted through books, the internet, and social media (93% of such mentions referred to Facebook).

Interviewees included sources that had contributed to their general knowledge: school (L08), family (seven interviewees/32%), disaster-related and/or safety courses (six interviewees/27%), and updates on upcoming hazards provided by the weather forecast (seven interviewees/32%), the news via radio, television (four interviewees/18%), the local newspaper, *Svalbardposten* (eight mentions/36%), and the Governor's Office (13 mentions/59%). Thus, interviewees referred to both formal sources (e.g. the Governor's Office or the police) and informal ones (e.g. friends and town talk). Highlighting the need for a diversity of sources, three interviewees (14%) explicitly referred to the importance of gathering information from as many sources as possible, as L04 shared, "when you live in a town, you should rely on all the sources that are available to you in town when something happens".

The three most important sources of disaster-related information for Longyearbyen interviewees were (in order) friends (17 interviewees/77%), social media (15 interviewees/68%), and the Governor's Office (13 interviewees/59%). References by 12 interviewees (55%) to their 'own experience', general conversations in town (referred to as 'town talk'), and work-related sources (e.g. colleagues and employers), round off the five (or in this case six, due to equal mentions) most important sources of information. Notably, L09's reference to friends and neighbours as 'acquaintances' could be included in the 'friends' category, further increasing the significance of friends to 18 interviewees (82%), after adjusting for overlap. Similarly, L16's reference to 'flatmates' and L19's to his 'girlfriend', could also be considered 'friends'. However, separate mentions of 'friends' by each of these interviewees clearly demarcate an intentional distinction.

Narrowing the focus to the 'top-three' most important sources (Figure 23 [A]) shifts the perspective, with 'own experience' rising to second most important with 10 mentions (45%), and family to joint-third with six votes (27%), alongside social media and town talk.

(A)

(B)
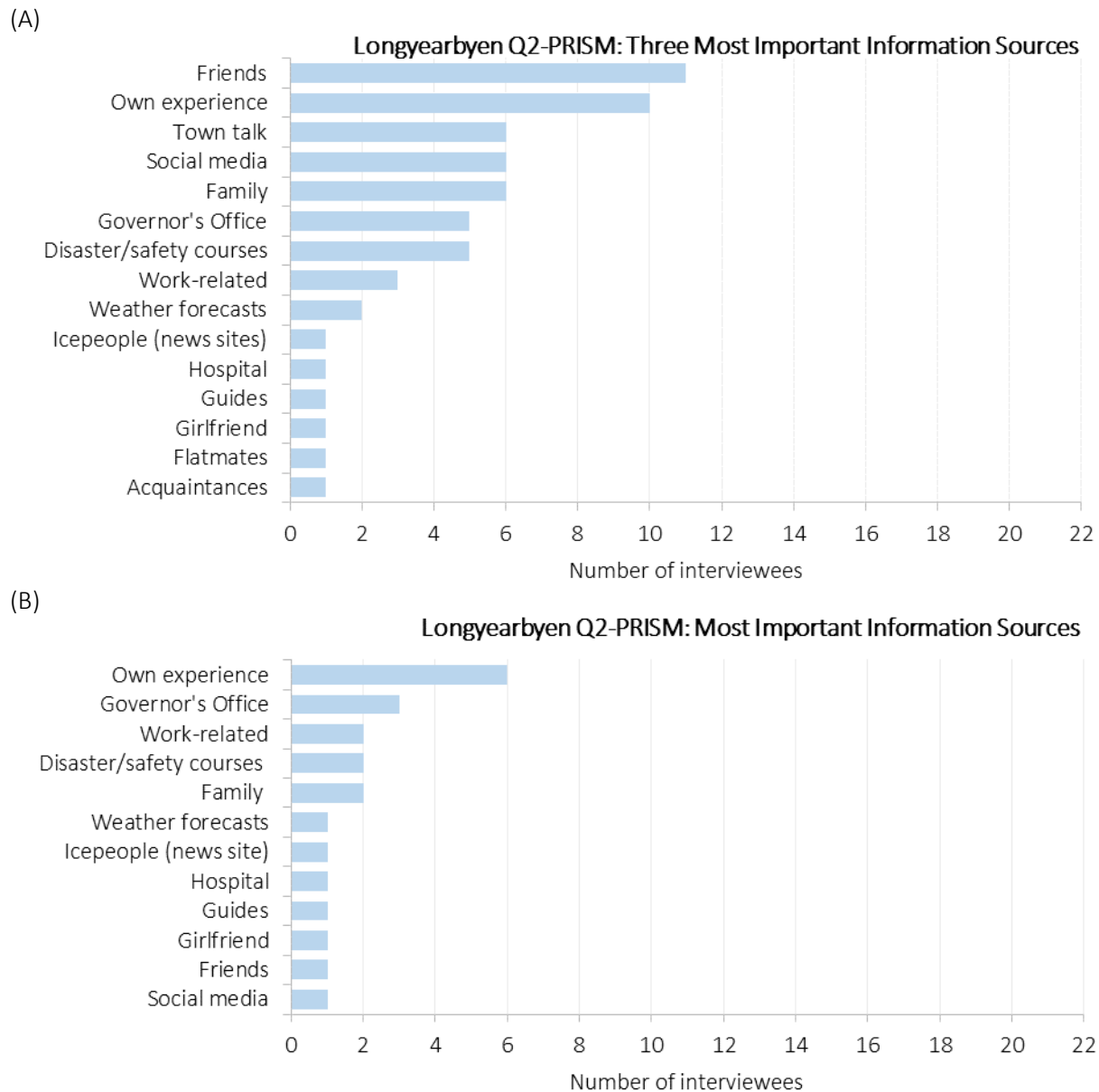
Figure 23. Longyearbyen Q2-PRISM: Sources of Disaster-related Information Ranked by the Number of Interviewees Who Mentioned Them in Their Three 'Closest' (A) (Above), and Their 'Closest' (B) (Bottom).

The perceived importance of experience is further emphasised by its ranking as the single most important source of information (Figure 23 [B]) by the highest number of interviewees—six mentions (27%), double the amount of the second source, the Governor's Office—three (14%). In contrast, 'friends' and 'social media' were only considered the most significant source of disaster-related information by one interviewee each. Twelve interviewees (55%) mentioned conversations with people in town without a specific source (such as 'friends', 'family', 'neighbours', etc.). These were binned under 'town talk'. Twelve others (55%) mentioned

work as a significant source of disaster-related information, specifically colleagues (eight mentions), experts accessible through work, but not directly considered colleagues (two mentions), and the DG chain of command itself, for two interviewees working at the local government office (*Lokalstyre*).

Social media is a source of information for 68% of interviewees, with 93% referring specifically to Facebook, especially to the community group *Ros & Info Longyearbyen*, in which residents and government institutions, like the Governor's Office, are active. For 59% of interviewees, the latter, often called by its Norwegian name *Sysselmannen* (governor), was viewed as a significant source of information (and for three, the most significant—Figure 23 [B]). References were also made to its website, Facebook page, information centre, in-person briefings, and publications. L08, who did not include the Governor's Office in his PRISM for Q2, did acknowledge that the information he receives by reading the local *Svalbardposten* newspaper ultimately comes from the Governor's Office. L13, L14, and L21 similarly referred to the Facebook group *Ros & Info Longyearbyen* while emphasising, amongst others, the Governor's Office's engagement on the platform. These additional references raise the number of interviewees who mentioned the Governor's Office to 17 (77%), surpassing Facebook whose significance is intensified by the Governor's Office's contribution on the platform—and vice versa.

5.2.3.2   Formality and Informality in Information

To avoid bias, the characterisation of sources as (in)formal was purposefully avoided during questioning, and none of the interviewees voluntarily identified sources along those lines, confirming the artificial nature of the distinction. Labelling notwithstanding, the sources named can be considered from the perspective of formality and informality in DG. For the purposes of this study, formal sources are defined as those with an officially mandated role in Longyearbyen's dissemination of disaster-related information. In cases where interviewees referred to a platform for accessing information (e.g. Facebook, books), a clear label could not be allocated. For transparency, such sources are presented as 'mixed' (Table 17).

Table 17. Longyearbyen Q2-PRISM: Disaster-Related Information Sources by Designation.

# Formal Sources:	# Informal Sources:	# Mixed Sources:
1 Disaster/safety courses	1 Acquaintances	1 Books
2 Emergency organisations	2 Church	2 Internet searches
3 Governor's Office	3 Family	3 Social media
4 Hospital	4 Flatmates	
5 Local government	5 Friends	
6 Local newspaper	6 Girlfriend	
7 News (via radio/TV)	7 Guides	
8 Norwegian Polar Institute	8 *Icepeople* (news site)	
9 Police	9 Own experience	
10 Primary education	10 Town talk	
11 Tourist info center	11 TV documentaries	
12 Weather forecasts	12 Work-related	
13 Profession-related blog		

Some of the sources are easily identifiable. The Governor's Office, emergency organisations, the local government, the hospital, and the police clearly fall within the 'formal' designation, as each of these sources has a mandated role within DG. These sources gathered a combined 17 mentions by 14 interviewees (64%). By extending the formal spectrum to include news items that feature in traditional media (newspapers, TV, radio), the weather forecast, the Norwegian Polar Institute, formal education, the tourism information centre, and safety/disaster preparedness courses, 28 mentions are added, raising the number of interviewees who referred to formal sources to 19 (86%). Conversely, the 'informal' sources—family, friends, 'own experience', town talk, girlfriend, acquaintances, and flatmates—total 52 mentions across all 22 interviewees (100%). The one-man English language online newspaper *Icepeople* is considered as an informal source due to its similarity to a personal blog, and lack of formalised status, as opposed to institutionalised newspapers such as the local *Svalbardposten*. Similarly, references to a tourism-related blog, general TV documentaries, the local church, or friendly conversations with tourist guides are considered 'informal', adding five mentions.

Determining the 'label' of the remaining sources is more complicated. Social media, the second most important source, could be considered an 'informal' source; however, eight interviewees (36%) specifically highlight the Governor's Office and police's use of Facebook to disseminate information as a reason for its significance as a 'source', emphasising social media's role as a platform for information sharing rather than as a source, in and of itself. The same applies to books and internet searches, with both offering access to a range of information from both formal and informal sources. The exception is L04 who qualifies her reference to the internet as meaning formal sources, and it is, therefore, counted as such. Overall, the confusion regarding

the informal/formal label highlights the artificial nature of this binary distinction (Ch. 2.4). It also raises questions regarding to what extent citizens can be expected to actively seek out formal disaster-related information, and on which platforms. Lastly, while the 12 mentions of work-related sources could be understood as informal, two of these references were made by interviewees who are employed by institutions with a formal disaster-related mandate. Consequently, these two mentions are added to the formal tally, while the remaining ten are considered as informal.

In total, 35% (48/138) of sources mentioned by 19 interviewees (86%) were formal, compared to 49% (67 references) for informal sources by 22 interviewees (100%), with the remaining 17% (23 mentions) by 18 interviewees (82%), classified as 'mixed' (Figure 24). On average, interviewees mentioned 2.2 formal sources (median=2.0) and 3.1 informal sources (median=3.0), with 1.1 sources undefined (median=1.0). Fifteen interviewees (68%) mentioned more informal sources than formal sources, six (27%) preferred formal ones, with only one interviewee (L21) mentioning an equal amount of formal and informal sources.
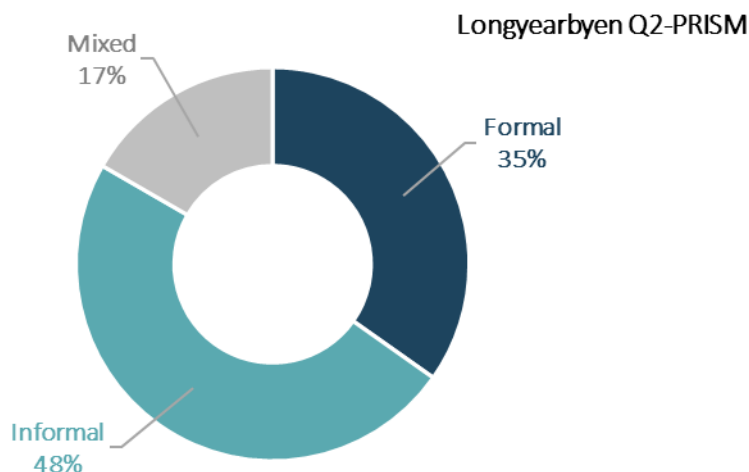
Figure 24. Longyearbyen Q2-PRISM: Disaster-Related Information Sources by Designation (in Percentage of Total Mentions).

All 22 interviewees mentioned informal sources for disaster-related information. Three interviewees (14%) did not mention any formal ones. Two of them (S06, S16) were internationals who did not speak Norwegian. L06 relied on the informal 'one-man' *Icepeople* online English-language news website, sharing how "without him [*Icepeople* editor] then much of the information that is out there would be unknown to me", including the crucial knowledge that the interviewee's house is in an avalanche-prone area. This could suggest a certain marginalisation of foreigners by formal sources based on language, although conversely, the three interviewees that chose the Governor's Office as their most important source of information were all foreigners as well.

Limiting the data to the three closest sources derived from the PRISM diagram (Figure 25), emphasises the significance of informal sources, with 42 of the 66 mentions (64%) referring to informal sources, 17 to formal sources (26%), with the remaining 7 (11%) undefined.
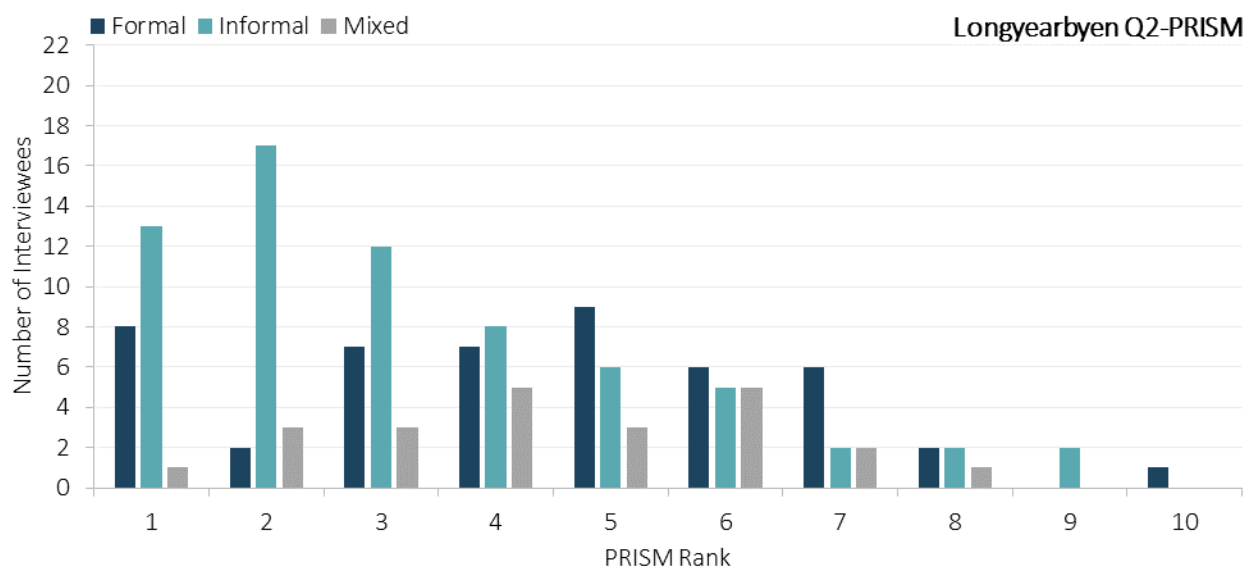
Figure 25. Longyearbyen Q2-PRISM: Sources of Disaster-Related Information Sources Mentioned by Designation, and According to the Number of Interviewees and Rank.

All 22 interviewees (100%) mentioned informal sources within their three most significant sources, while the number that did not refer to formal ones rose to seven (32%). Fourteen interviewees (64%) mentioned more informal sources than formal ones, with only three (14%) showing a preference for formal sources. Comparing each interviewee's 'most important' source supports this trend, with 13 interviewees (59%) opting for informal sources, eight (36%) for formal ones, and one 'mixed'. Overall, while the 'mixed' category prevents drawing a neat informal-formal comparison, the results suggest that both formal and informal sources of disaster-related information are significant, with a slight preference for informal ones.

5.2.3.3   Contributing Factors

By asking interviewees to explain their choices of disaster-related sources, and then analysing the interviews, a series of contributing factors emerged that together formed the 'themes' of the final coding template (Appendix H) which are presented below.

<u>Multiplicity of Perspectives</u>

Four interviewees (18%) referred directly to the importance of accessing a wide range of information sources. As L15 shared, "I like counting on different sources in different ways. I don't like counting on just one thing".

For 15 interviewees (68%), social media and Facebook, specifically, provide a platform to access a network of information sources, warranting its inclusion in the Q2-PRISM diagram. L03 and L12 even mentioned the platform when referring to other sources, highlighting the significance of Facebook for a combined 77% of interviewees. L02 explains the importance of Facebook through its ease of access, stating that "today we carry our phones around wherever we go [...] once we hear about anything we would check if anybody make any updates". The emphasis on accessibility also provides insight into the significance of general 'town talk' with neighbours, passers-by, and others throughout the town, a source mentioned by 12 interviewees (55%). However, five of these 12 interviewees (42%) did not consider such information completely reliable, adding a 'quality' dimension to the sources of information discussion, and confirming L15's reliance on multiple sources as a means of verification. The perceived reliability of information was informed by experience, mandate, and relationships.

<u>Experience</u>

When ranking the significance of their sources of information, 17 interviewees (77%) highlighted the importance of experience. This included interviewees' own experience (12 interviewees/55%), which was chosen by six of these interviewees (or 27% of the total) as the single 'closest' source (Figure 23 [B]). As L08 shared, "personal experience is the best experience you got, and what you learn most from". Notably, all six interviewees (27%) who chose 'own experience' as their most important source were Norwegian, and all the 12 interviewees (55%) who referred to experience as a source of information at all, were either from a country with an Arctic climate (e.g. Norway, Russia, or Sweden) or had been on the island for an extended period (e.g. L13 who is German but has spent 15 years in Svalbard). This suggests an advantageous access to this significant informal source of disaster-related information when compared to foreigners, though this was not confirmed by 'length of stay', with many long-time residents omitting 'experience' as a source of information.

The importance of experience extends beyond that of the individual. For L09, her daughter's previous experience on Svalbard was important, particularly when she was new to the archipelago. These findings reinforce the suggested significance of direct and indirect experience that emerged from the Q1-answers, and highlights the role of relationships, discussed below. Experience can be considered as largely an 'informal' form of information gathering, in contrast with the structured knowledge acquired through traditional media, weather forecasts, or safety and disaster-related courses. Thus, the emphasis given to experience may offer insights into the significance attributed to informal sources.

<u>Relationships</u>

References to friends, family, work colleagues, acquaintances, flatmates, and girlfriend by a combined 20 interviewees (91%), encompassing almost one-third of all mentions (29%), suggest that relationships are important in providing access to trusted information. As L14 explained, compared to other informal sources, such as town talk, "friends you can rely more on because you know them", while L03 highlighted that you "get advice and discuss things with your friends". L03 added that while the official sources are perhaps "more correct, relevant in a way", friends are "just more available. I talk to them every day". For L18, trust in her parents is the reason why she considers their stories as the most influential in informing her disaster-related knowledge.

Offering a slightly different perspective, L02 reinforced the importance of a multiplicity of perspectives by stressing how relationships provide access to a larger network, explaining that "some [friends] know these people, and some [friends] know that people and you hear rumours, listen to what is happening". Exemplifying this, L19 listed Facebook as a source despite not having an account himself, explaining that "even if I don't directly have Facebook, people who do will mention it [if something happens] [..] I'm always aware of what's on there".

Finally, four interviewees (18%) referred specifically to the expertise of their friends. L19 referred to a friend who is a guide, while L06 overcame the restricted access to the Red Cross safety information highlighted above through his friends who are members. Thus, expertise is defined not just through their knowledge and experience, but also through another contributing factor, their mandated 'official' role.

<u>Mandate</u>

In their Q2-PRISM diagram, 13 interviewees (59%) mentioned the Governor's Office—the official government institution responsible for disaster-related matters on the island. As L02 explained, "[t]he Governor, they won't inform anything until they know for sure. So, what you have from the Governor, that you can trust, you know that's official", an opinion echoed by L03's statement that "information from the Governor's Office are more correct". The perceived reliability of official sources may contribute to the significance attributed to 'formal' sources, including disaster and safety courses offered by mandated institutions, such as the local Red Cross chapter and The University Centre in Svalbard (UNIS). L13 referred to the UNIS course as "one of a kind" and "really good". L03 agreed, explaining that "you learn a quite a lot" during UNIS courses. L06 similarly expressed an interest in joining the Red Cross to gain access to "advanced safety trainings". In doing so, he alluded to another factor that may contribute to the perceived reliability of mandated institutions: the alleged privileged access to information from which such entities benefit. As the

same interviewee explained, being a member of the Red Cross also entailed access to safety information that "otherwise [is] sometimes not published".

Negative experiences with officially mandated institutions adversely affect the overall perceived reliability of formal sources. Four interviewees (18%) expressed dissatisfaction with the government's preparedness and information sharing, based on their own experiences during the devastating avalanches of 2015 and 2017. L06 explained, before the avalanches occurred, he did not know the extent of the risk, and that government institutions 'weren't talking about it' despite knowing better, while L04 explained that "when the avalanche happened, people started to lose trust in the local government because why should we believe anything you say if you allowed us to live in a danger zone?". Even after the avalanches, and despite additional measures taken, L11 does not trust the government's understanding of the risk involved, explaining that:

> [After the first avalanche] they [the government] have evacuated me sometimes before in better weather, and this day [when the second avalanche happened] was really bad, this morning [when it struck], but they didn't evacuate, and it happened.

L12 confirmed this account, sharing that before "the last avalanche [in 2017], *Sysselmannen* [the Governor] go on Facebook said it's safe to go home, two hours later, avalanche. And almost killed people". Amongst these four interviewees, only L04 considered the Governor's Office as a source of ongoing information in his Q2-PRISM diagram, and in fifth place (out of 10 sources mentioned). The lack of trust in official information concerning the risk of avalanches may have contributed to the omittance of any official sources of information by three interviewees residing near the mountains mentioned above.

5.2.4   QUESTION 3: SOURCES OF HELP

The final question offered a tangible consideration of disaster-related activities by investigating which sources interviewees relied on for assistance in the event of a disaster. All 22 interviewees (100%) participated and provided answers covering a range of crisis situations, including short-term life-saving rescues (e.g. rescue from a bear attack) and long-term assistance (e.g. funding reconstruction following an avalanche). All interviewee interpretations of 'assistance' were included, whether they were physical (e.g. shelter, food, supplies), financial, or emotional. Whenever relevant, interviewees shared from their personal experiences of crisis, and referred to the scenarios arising from the risks discussed earlier in the interview during Q1, as well as the sources mentioned in Q2, suggesting that the sequential nature of the order in which the three questions were asked affected results.

Interviewees mentioned just 97 sources of help in their **Q3-PRISM** diagrams, compared to 123 disaster risks and 138 information sources for **Q1** and **Q2** respectively. Interviewees mentioned two to nine sources; the average was 4.4 (median=4.0). Segregating by gender produced the most significant variation, with men averaging 3.6 sources of help (median=4.0), compared to 5.2 (median=5.0) for women. Separating the data by age did not yield statistically significant differences, nor did interviewees' length of stay in Longyearbyen, nationality, or job sector.

5.2.4.1 Sources of Help Ranked

Table 18 shows the distribution of sources of help according to interviewees' **Q3-PRISM** diagrams.

Table 18. Longyearbyen Q3-PRISM: Disaster-Related Help Sources Ranked by the Number of Interviewees Who Mentioned Them.

#	Source of Help	Number of Interviewees	%
1	Friends	16*	73%
2	Governor's Office (*Sysselmannen*)	11	50%
3	Family	10*	45%
4	Emergency services	9	41%
5	Bystanders	6	27%
=6	Neighbours	5	23%
=6	Red Cross	5	23%
=6	Work-related	5	23%
=9	Church	4	18%
=9	Hospital	4	18%
11	Self	3	14%
12	*Store Norske*	2	9%
12	Fire department	2	9%
12	Insurance	2	9%
15	Flatmates	1	5%
15	Flatmates and neighbours	1	5%
15	Local government (*Lokalstyre*)	1	5%
15	Central government	1	5%
15	Government	1	5%
15	Guide (*when in a group*)	1	5%
15	Partner	1	5%
15	Townspeople	1	5%
15	Trauma centre	1	5%

Multiple references by the same interviewees adjusted for overlap.

As with Q2, minimal grouping was conducted to ensure transparency and reduce bias. For example, L06 referred to 'partner' separately from 'friends', and 'family', and, therefore, it was not included in either category. A similar distinction remains between the various levels of government.

Friend was the most-mentioned source, with 16 interviewees referring variations thereof, including 'close friends' (L10) and 'best friend' (L9). By adding L02's reference to friends in her source 'bystanders', and L18 and L19's to multiple categories of friends, the significance of friends is emphasised. Notably, L18 segregated between childhood friends from Longyearbyen who are now abroad, local friends currently in Longyearbyen, and friends abroad with no connection to the island. Similarly, L01 and L14 both qualified their choice of friends as a source of help based on their proximity, a reoccurring theme that is addressed below. Mandate emerged as another such factor, with L06 and L19 referring to their friends' expertise.

The Governor's Office was the second most-mentioned source (11 interviewees/50%). Seven out of the nine interviewees that referred to 'emergency services' did not mention the Governor's Office, suggesting a possible inclusion of the latter in the wider category, which would make 'emergency services' the single most-mentioned source, with references made by 18 interviewees (82%). The distinctions between the various layers of government, including single references to 'local government', 'central government' and 'government' respectively, are further addressed below. In third place was 'family' members (10 interviewees/45%). As with the label 'friends', additional multiple references by the same interviewee (L09) to husband and children separately, and L02's inclusion of 'family' in 'bystanders' reinforced its importance for interviewees.

Focusing on the top-three most significant sources (Figure 26 [A]) maintained the rankings, with the same sources sharing the five first spots. Work-related sources and 'self' were added as joint-fifth with 'bystanders'.

(A)
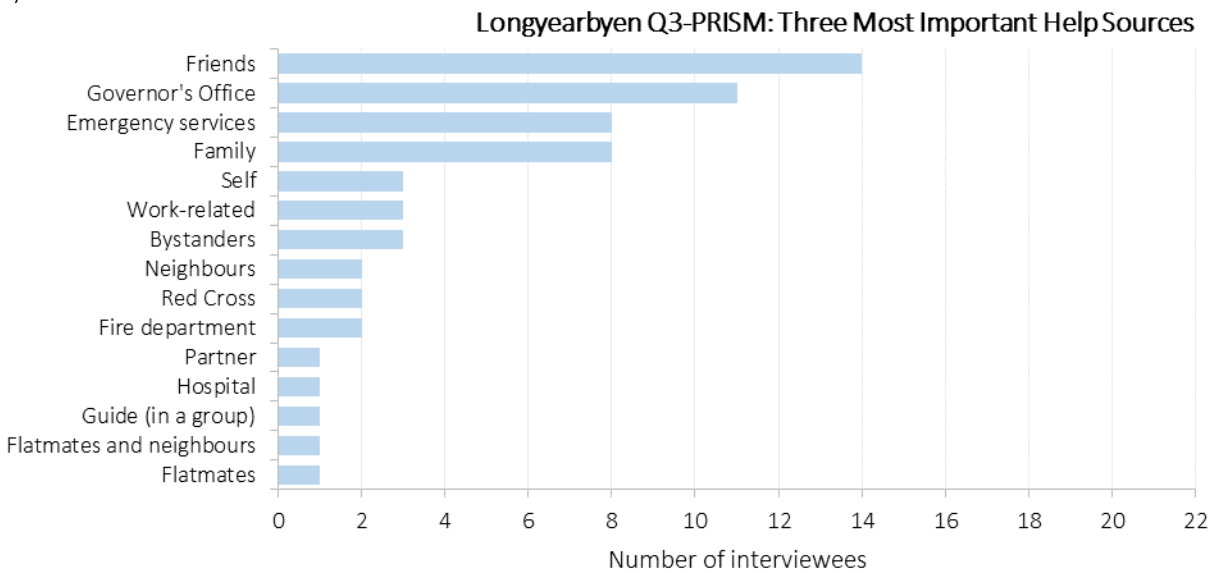
(B)
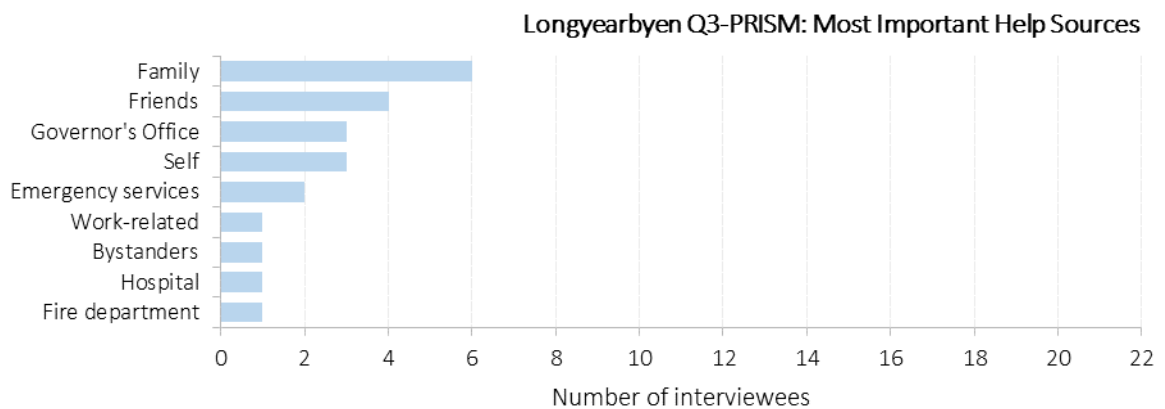
Figure 26. Longyearbyen Q3-PRISM: Disaster-Related Help Sources Ranked by the Number of Interviewees Who Mentioned Them in Their Three 'Closest' (A) (Above), and Their 'Closest' (B) (Bottom).

Narrowing down further to a single source reveals that in the event of a crisis, family was considered the single most important source of help by the most interviewees, with six votes (27%) (Figure 26 [B]). Self was considered an important first line of support as well, sharing the third spot with the 'Governor's Office' (three mentions each/14%). Here too, one of the two references to the "emergency services" was by an interviewee who did not mention the Governor's Office at a later stage, potentially raising its significance to joint-second with 'friends'.

5.2.4.2 Formality and Informality in Assistance

Determining the formal or informal mandate of the sources of disaster-related help was relatively straight-forward (Table 19).

Table 19. Sources of Disaster-Related Help By Designation.

# Formal Sources:	# Informal Sources:
1 Central government	1 Bystanders
2 Emergency services	2 Church
3 Fire department	3 Family
4 Government	4 Flatmates
5 Governor's Office (*Sysselmannen*)	5 Flatmates and neighbours
6 Guide (when in a group)	6 Friends
7 Hospital	7 Neighbours
8 Insurance	8 Partner
9 Local government (*Lokalstyre*)	9 Self
10 Red Cross	10 Townspeople
11 *Store Norske*	11 Work-related*
12 Trauma centre	
13 Work-related*	

The work-related category includes both formal and informal sources

The sources emergency services, hospital, fire department, local trauma centre, and variations on government can be unmistakably categorised as 'formal' due to their mandate, accounting for mentions by 20 interviewees (91%). Additionally, disaster response is recognised as a mandate of the local Red Cross chapter. Likewise, during an expedition, a guide fulfils a formal role and is responsible for the safety of the group and the handling of emerging crisis situations. Insurance companies are also expected to deliver long-term assistance for their clients, while in the context of Longyearbyen, many of the employers and homeowners in the settlement are government-owned companies such as the referenced *Store Norske.* Finally, similarly to Q2, as a government employee, L18's reference to her employer as a source is considered formal. None of the friends, family, bystanders, neighbours, self, flatmates, partners, and townspeople mentioned, and which account for a combined 48 mentions by 21 interviewees (95%), had a formal DG-related role. The remaining eight informal mentions are split equally between the remaining work-related sources (three mentions of colleagues and one supervisor), and the church, which although it is a formal institution, does not have a disaster-specific role.

Together, formal sources amount to 41/97 mentions (42%), by 21/22 interviewees (95%) (Figure 27), with an average of 1.9 (median=1.5). The remaining 56 references (58%) were of informal sources, with an average of 2.6 sources mentioned (median=2.0). All but two interviewees (90%) referred to both formal and informal sources—L08 relied exclusively on two formal sources, and L16 on three informal ones. Overall, the results suggest a slight preference for informal sources, with 12 interviewees (55%) referring to more informal than formal sources.
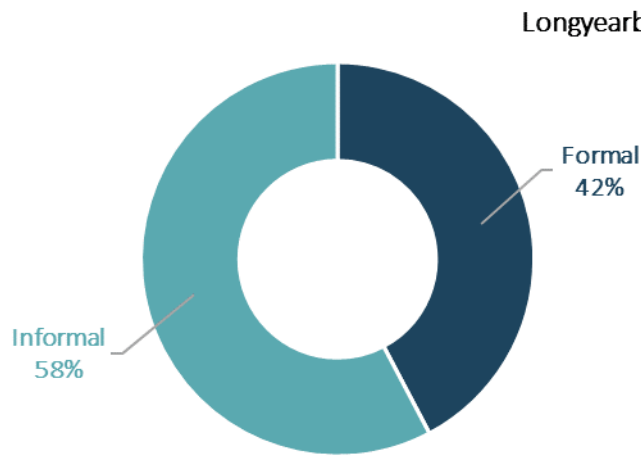
Figure 27. Longyearbyen Q3-PRISM: Percentage of Disaster-related Help Sources by Designation (in Percentage of Total Mentions).

Interviewee ranking of sources by relative significance (Figure 28) emphasise the preference for informal sources. Narrowing down to the top-three yields 59% informal mentions, and an average of 1.8 (median=2.0), compared to 38% for formal sources, with an average of 1.1 (median=1.0). Fifteen interviewees (68%) mentioned more informal than formal sources in their top-three, with four interviewees (now 18%) omitting formal sources entirely.
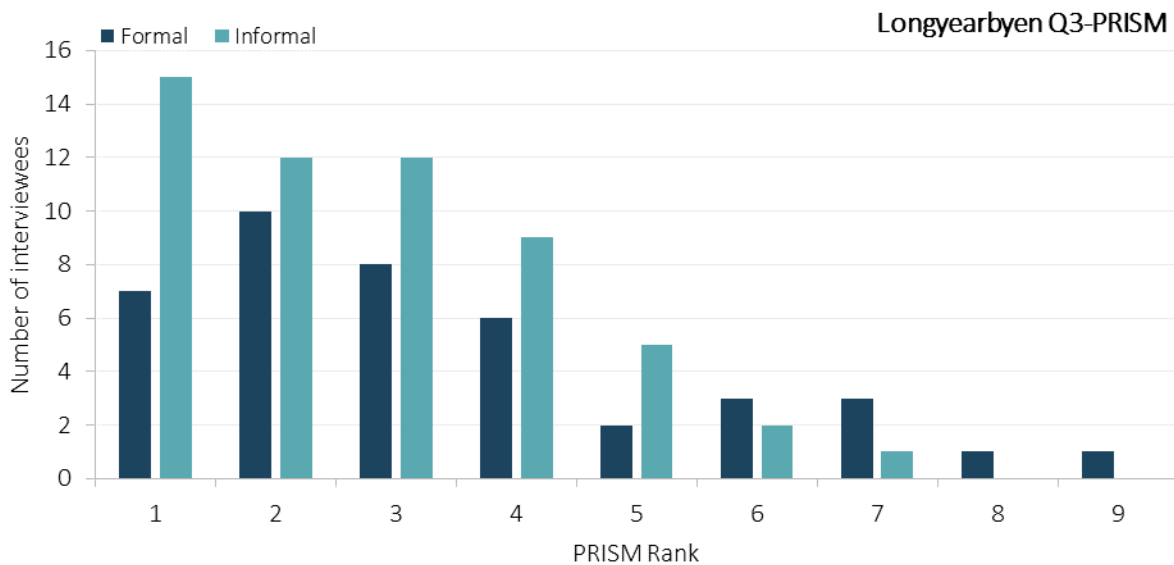

Figure 28. Longyearbyen Q3-PRISM: Disaster-Related Help Sources Mentioned by Designation, and According to the Number of Interviewees and Rank.

The preference for informality is maintained across the single most important source, with 15 interviewees (68%) selecting informal sources as their most significant.

5.2.4.3   Contributing Factors

<u>Experience</u>

When explaining their reasons for selecting a source of help, 16 interviewees (73%) referred to their own previous experiences with these sources. This is consistent with the findings from Q1 and Q2. For L04, trust in the formal emergency services, which she ranked as the two most important sources, was informed by an experience she had when she broke her leg out at a cabin and the Governor's Office immediately deployed a helicopter to rescue her. As she explains, "I felt I got help much faster than I would anywhere else, which I really appreciated when I was in a lot of pain". Similarly, L20 witnessed the organising skills of the Governor's Office following the deadly avalanches, while L19 experienced the speed of the emergency services following a false alarm incident when someone tested a flare gun on a hill. "The *Sysselmannen* [Governor's Office] was there in 15 minutes with a helicopter. They managed to mobilise and get there. They take these things very seriously". Positive experiences also inform interviewees' trust in informal sources. For example, L05 leveraged her personal network to call in a crane outside of work hours to assist after an accident, and resident mobilisation after deadly avalanches was witnessed by L12 and L18. As with L04, such stories are confirmed by interviewee selection of formal or informal sources as their most significant.

The impact of experiences is not limited to crises alone, but also extends to witnessing associated activities. L15's trust in the Governor's Office is influenced by their frequent training exercises, while L17 participated in such training herself. Day-to-day events also build trust. L16 trusts his work colleagues and supervisor, based on their kindness and generosity, while for L15 "I see that they [residents] don't close their cars or they just leave their bicycles. I mean that they just like see that situation is quite safe". Conversely, single negative experiences can impact interviewees' selection of a source (or lack thereof). Three out of the four interviewees that raised doubt over the government's handling of the avalanches (referred to in 5.2.3) did not mention formal sources as their most important source, though still showing a preference for formal sources overall. L04, despite being coincidentally the fourth interviewee with negative experiences related to the avalanche, identified the emergency services and the Governor's Office as her most significant sources. She justifies this choice by distinguishing that the Governor's Office and emergency services are tasked with disaster response, while her criticism is restricted to the *Lokalstyre* (local government) that was meant to inform disaster risks and failed to do so adequately before the deadly avalanches. Such a distinction in roles may also explain the diversity of formal sources identified by interviewees.

<u>Proximity</u>

When identifying sources of help, 16 interviewees (73%) considered their physical proximity. L03 explained that when on an expedition outside the settlement, the guide is the most important, while "if [out with a] group of friends without a guide, then the friends are more important than the guide". Proximity begins with 'oneself', a point expressed by six interviewees (27%), three of which consider 'self' as the most important resource. For five interviewees (23%), the importance of proximity rules out their family not in Longyearbyen. L19 explains that "if I got stuck out on the field and there was a bear 200 metre from me, I wouldn't be calling my family back home", concluding that "the person that can help you the quickest I think is the most important in a disaster". This finding suggests that those embedded in a location have access to a wider network of support, though segregating the interviewees by length of stay did not confirm this. One exception is in the case of emotional assistance, which was mentioned by 10 interviewees (45%), and can be delivered remotely. Conversely, three interviewees (14%) considered the members of a group as a potential disaster risk. L22 explains that based on the people in it, "if the group doesn't have enough knowledge or equipment that's a risk".

References to physical proximity may contribute to the selection of informal sources such as bystanders, neighbours, and work colleagues as sources by a combined 12 interviewees (55%). As L05 explains, "if something [happens] then and there I would ask first the first person I saw that I needed help then and now, and [if] you were passing by I would ask you". L12 states that "if disaster happen and you are in the middle, then I hope friends and family will help if they not have been taken too in the disaster", qualifying the significance of proximity by pointing out how in a crisis, those closest may also be in need and, therefore, unable to help.

<u>Trust, Propinquity, and Vested Interests</u>

When explaining their answers to Q3, eight interviewees (36%) refer to their trust in Longyearbyen residents to assist them in times of crisis. L02 shares that "in Longyearbyen you know everybody would help out if anything happens", while L12 experienced first-hand that with "the first avalanche, there was so many people coming with the shovel and helping here to dig and I think it was 100–200 people coming". When pressed, the same interviewee shared that they did so "because it was a situation. They know they need to help". This finding is further supported by eight interviewees (36%), including six of the same interviewees, sharing stories of assistance that they offered or expressing a will to help others. Three interviewees (14%) directly referred to this phenomenon as a "culture" of assistance. As L14 shares, "when you're out, you always stop and ask if they're okay [...] because [when] you know that you [will] need help the day something happen[s] to you, then

you always offer help to others". L04 explains that "when things happen in a small place like this, you feel like you're involved in it in a way, because it's so close to heart [...], you know that there's maybe 70% risk that you're going to know someone in this incident". L02 concurs, "[it's] [b]ecause we could all be struck by these, it could happen to all of us, and normally we would perhaps know people involved. It could be some of our friends, some from our family", suggesting a link between the size of a community, propinquity—understood as physical and psychological similarities—and assistance, as well as highlighting the importance of relationships.

Relationships

Family and friends were mentioned as sources by a combined 17 interviewees (77%), including as the single most important source by 10 (45%), suggesting that relationships are an important factor when selecting sources of disaster-related assistance. As L01 shared, "family you can trust because they are emotionally invested, they are interested in helping". L06 added that especially for financial assistance, "it's always easy to approach family [...] they know me. The support is coming from someone you've had a long-time interaction with". L10 trusts that "if I really need somebody, they're [her close friends] there", while for L15, "I trust them [my work colleagues] a lot, so I'm just sure they will help me. If something happens then they can come to me". L11 shares that "I know that my friends will be— in many situations, they will be there before the emergency services". L05 highlights how the absence of a personal relationship precludes her contacting the emergency services directly, preferring instead to rely on informal sources such as her husband or family abroad, a position confirmed by L01.

The strength of relationships is what leads L18 to identify three different types of friends in her **PRISM** diagram for Q3, including two groups that are abroad, contrasting the significance of proximity and relationship. L18 also underlines the contribution of experience within relationships by differentiating between friends abroad who have Longyearbyen experience, and those who have none (the former ranking higher). Finally, three interviewees (14%) consider informal relationships with people in official institutions, explaining how they are more likely to contact formal actors if they have a relationship with individuals within them. Specifically, L19 explains how in case of need, he can ask guides for help, "but the fact that this person, with the expertise, [...] they're also a friend, it's much more useful in that situation. I also believe that because he was a friend, he'd got more of a vested interest in my safety".

The Power of Mandate

When explaining their choice of formal sources of disaster-related assistance, 14 interviewees (64%) refer to the power associated with their official mandate, namely the capacity and authority necessary to respond. As

L02 explains, "as a private person, you need help if big accidents or things are happening, you can't run this on your own", expanding further that "we're just normal people [...] we can't handle accidents or disasters [...]—No, it has to be from the Governor's Office". L03 concurs, sharing that "[a]s a private person, you don't know how to act when you're—if you're not there". Five interviewees (23%) attribute this power to the authority that the Governor's Office, Red Cross, and other formal sources have to organise and mobilise a response, while others refer to their exclusive access to resources. Six interviewees (27%) specifically cite the Governor's Office's helicopter as a reason to call them, while L08 and L12 refer to the Governor's Office and Red Cross as being the only entities to have the dogs necessary for rescue following an avalanche. As L08 shares:

> If you're in a difficult situation, an emergency situation, who would you call? You would always call those who are best and able to help you, and in this place it's the Governor's Office. Why would I call a friend saying, telling he or she that I'm trapped in an avalanche or anything if I can reach the proper authorities immediately and they can get first-hand information from me of where I am, what help I need, things like that. So, they're always firmly the appropriate emergency response unit. I wouldn't care about anything else.

Formal sources are also identified with the mandate associated with the specialisation required for different contexts. Upon hearing the question, eight interviewees (36%) raised the question of context. As L08 shared:

> [Listing sources of help] is extremely circumstantial, because if you're at sea you would call the rescue station which is somewhere in Norway and then they will alert the local, any local rescue stations. If you're caught in an avalanche, well, up there you don't have any phone coverage if you don't carry a satellite phone, which is fairly expensive, and you don't normally have. So then, I would call any rescue station if I had a satellite phone. Without satellite phone, you're stuck, and you have your signal flares, for example, and just hope that someone would get you rescued or helped.

L13 further shares that "for burns, of course first I'll call the fire department" while "if I'm injured, of course I will call the hospital and then they take me in". L02 explains that "there have been avalanches where we couldn't do the job ourselves [...]", with "search and rescue equipment [coming] from the mainland". The specialised and context-dependent nature of formal disaster-related assistance may account for some of the variations on "government" offered by interviewees, including the Governor's Office, emergency services, hospital, fire department, trauma centre, local government, central government, and the general 'government'. Amongst the eight interviewees (36%) who referred to context, formal sources dominated, combining for 17 mentions (61%) against 11 (39%) for informal sources, statistics at odds with the general trend observed. This diversity of sources may have led to the misrepresentation of the significance of the 'governmental services' in the rankings. Conversely, in the absence of 'weight' given to each mention, the consideration of many different scenarios may have contributed to the over-representation of formal sources overall.

Stigma Against Asking for Help

The choice of a source of help is influenced by the stereotype of Longyearbyen (and Svalbard) residents as resilient people who can take care of themselves. As L22 shares, "if you're able to take care of yourself, you're able to take care of others or the people around you. If you rely too much on others, this is not the type of environment you should stay or live in, definitely". L18 agrees, stating that "I would try not to ask for the help", and L09 admits that "I don't ask for help here. It's very difficult". Eight interviewees (36%) stated that depending on the severity of the situation, they would first try to contact an informal source such as a friend, before relying on a formal one. This included all four interviewees that are members of 'formal' DG entities, confirming the existence of a 'stigma' associated with requesting assistance. Three interviewees referred to what is locally known as the "Super Puma Club" for those who could not help themselves and needed to call in the Governor's Office's AS332 Super Puma helicopter. L22 explained that "no one wants the *Sysselmannen* [Governor's Office] to pick you up. That's not good. That's embarrassing". L21 concurred, adding: "imagine that story and how that affects people. They don't want to look stupid, they don't want to join the Super Puma Club". The assumption is that if you call in the 'Super Puma' then "you have [not] done your homework" (L14). This finding suggests that the label of shame or embarrassment is a factor that may prevent people from requesting assistance from formal sources, instead turning to informal ones in order to avoid being included in the "Super Puma Club".

For L19, this image of the resilient Svalbardian is limited to Norwegians. "Regardless of the amount of time that you stay, I think that if you are Norwegian or Scandinavian, you're seen as a local a little bit more, [than] say for example, a Filipino person who has been [on Svalbard] for ten years". As a result, when requesting assistance, Norwegians are "less blamed personally in the situation that they're in", whereas "if you're non-Scandinavian, non-Norwegian, especially if you're a guest as well, [...] people would be talking about the idiot that went out without having planned everything sufficiently" (L19). L10 refers to the vulnerability of being a foreigner, explaining how living with just travel insurance is an obstacle to proper health care. She also shares the story of a Thai national who slipped and fractured her hand, with the end result being "the worst thing, that she go home with a debt from home to come here and then she was been sent home with a broken arm". Finally, L06 explained how the language barrier is an impediment to him seeking emotional support with the church staff because it is "awkward".

5.2.5   CASE STUDY SUMMARY

The findings from Longyearbyen suggest that interviewees rely on both formal and informal sources of disaster-related information and help, with an observed preference for informal sources. In their answers to Q2 and Q3, interviewees emphasised the importance of both types of sources, offering different and complementary benefits. Personal experience, and that of others, are underlying contributing factors across disaster-related risks, and sources of both information and help. Relationships and the mandate of formal sources influence interviewee selections of disaster-related sources of information (Q2) and help (Q3), while proximity, propinquity, and a stigma against asking for help, all contributed to interviewees' answers as well. Finally, findings suggest nationality may influence sources of information and help, with three out of eight non-Norwegian interviewees (38%) expressing challenges resulting from their 'foreign' status.

5.3 CASE STUDY 2: SOUTH DOMINICA

5.3.1   DEMOGRAPHIC DATA

An October 2018 field trip to Dominica yielded 32 interviews. Three interviewees opted for no recordings; in those cases, notes were taken, and complemented with the standard interview summary form for each interview. Relative saturation was reached after 27 interviews and was supported by five additional interviews. Table 20 shows the anonymised list of interviewees. In contrast with Longyearbyen, SD's relatively larger population allowed for only sensitive and easily identifiable occupations to be generalised to avoid possible identification. This extended to cases where interviewees criticised the government or shared sensitive action, public knowledge of which could endanger their safety. The average age of interviewees was 49.0 (median=48.5), with the youngest being 23 and the oldest 76. The gender balance was 53% male versus 47% female. Eighty-one percent of interviewees were Dominican nationals, three more had dual Dominican-foreign nationalities (9%), and the remaining three were from the neighbouring Caribbean islands of St. Kitts, St. Lucia, and Antigua. Most of the single-nationality Dominican nationals (25 out of 26) were born and raised on the island, while five of them had also lived overseas. SD28 was born abroad and has been coming back and forth for 20 years, now living permanently on the island. Of the remaining six dual-nationals and foreigners, time spent on the island ranged from four years (SD16) to 30 years (SD11). Interviewees were employed in a range of sectors, with four (13%) working in formal institutions with a disaster-related role. Finally, all 32 interviewees (100%) had experienced a disaster first-hand, with Hurricane Maria in 2017 playing a central role across all interviews.

Table 20. South Dominica Interviewee List.

Interviewee	Age	Gender	Nationality	Married	Children	Location	Length of stay	Occupation	Disaster experience
SD01	60	Male	Dominica	No	Yes	Scotts Head	Born and raised	Fishing	Yes
SD02	47	Male	Dominica	No	Yes	Scotts Head	Born and raised	Environmental protection, tourism	Yes
SD03	36	Male	Dominica	No	No	Scotts Head	Born and raised	Fishing, environmental protection	Yes
SD04	49	Female	St. Lucia	No	Yes	Scotts Head	14 years	Restaurant	Yes
SD05	58	Female	Dominica	Yes	Yes	Scotts Head	Born and raised	Fish vending	Yes
SD06	47	Male	Dominica	No	No	Scotts Head	Born and raised	Restaurant owner, village council, DRR committee	Yes
SD07	44	Male	Dominica	No	No	Scotts Head	Born and raised	Electrician, fishing	Yes
SD08	61	Female	Antigua	Yes	Yes	Shawford	10 years (part-time)	Housewife	Yes
SD09	61	Female	Dominica	No	Yes	Delices	Born and raised	Farming	Yes
SD10	50	Male	Dominica	No	Yes	Delices	Born and raised	Planting, farming, keeping animals	Yes
SD11	62	Female	St. Kitts	Widowed	Yes	Shawford	30 years	Massage therapist	Yes
SD12	27	Female	Dominica	Yes	No	Riviere Cyrique	Born and raised	Security officer	Yes
SD13	76	Male	Dominica	Yes	Yes	La Plaine	Born and raised, now part-time	Stock taker for motor company	Yes
SD14	74	Female	Dominica	No	Yes	Grand Bay	Born and raised	Housekeeper	Yes
SD15	60	Male	Dominica	No	Yes	Grand Bay	Born and raised, lived overseas	Musician, artist, vehicle operator (trucks)	Yes
SD16	49	Female	England	No	Yes	Grand Bay	4 years	Bar owner, makes natural products	Yes
SD17	60	Male	Dominica	Yes	Yes	Grand Bay	Born and raised	Shop owner	Yes
SD18	31	Female	Dominica	No	No	Grand Bay	Born and raised, lived overseas for studies	Works in parents' shop	Yes
SD19	40	Female	Dominica	No	No	Grand Bay	Born and raised	Car wash	Yes
SD20	36	Male	Dominica	No	Yes	Grand Bay	Born and raised	Construction	Yes
SD21	31	Male	Dominica	No	No	Grand Bay	Born and raised	Construction worker	Yes
SD22	48	Male	Dominica	No	Yes	Delices	Born and raised	Carpenter, farmer	Yes
SD23	54	Female	Dominica	Yes	Yes	Delices	Born and raised	Housewife	Yes
SD24	73	Male	Dominica	Yes	Yes	Delices	Born and raised	Farmer, carpenter, mason	Yes
SD25	36	Male	Dominica	No	Yes	Delices	Born and raised, lived overseas	Carpenter, joiner	Yes

SD26	47	Male	Dominica	Yes	Yes	Fond Cole	Born and raised	Government leading position	Yes
SD27	35	Male	Dominica	No	Yes	Morne Jaune	Born and raised	NGO assistant prog. director	Yes
SD28	37	Male	Dominica	No	No	Roseau area	20 years (on and off)	Procurement manager	Yes
SD29	67	Female	Dominica	Yes	Yes	Roseau area	Born and raised, lived overseas	Former director of a major NGO	Yes
SD30	23	Female	Canada / Dominica	No	No	Shawford	12 years	Car rental agent	Yes
SD31	55	Female	Israel / Dominica	No	Yes	Shawford	16 years	Resort owner / manager	Yes
SD32	34	Female	Dominica	No	No	Delices	Born and raised	Caregiver	Yes

5.3.2 QUESTION 1: DISASTER RISK AWARENESS

Interviewees offered answers to this question without additional prompts or clarifications. Four interviewees (13%) expressed a wish to put the risks they fear the most as far away from them as possible, as opposed to close to them. In the words of SD14, risks should be "far away from me [...] because I'm scared [...] I don't want it closer to me; I want it far from me", while SD15 and SD24 expressed a wish to put hurricanes far away to reduce their impact. The instructions were clarified, and the PRISM exercise continued as planned, but this offered a new perspective for this methodological innovation. Interviewees mentioned a total of 101 risks in their PRISM diagrams for Q1, with the most per person being six, the least—one, and the average 3.16 (median=3.0) (Figure 29). Segregating data by age, gender, nationality, marital status, children, location, length of stay or occupation did not significantly affect results.
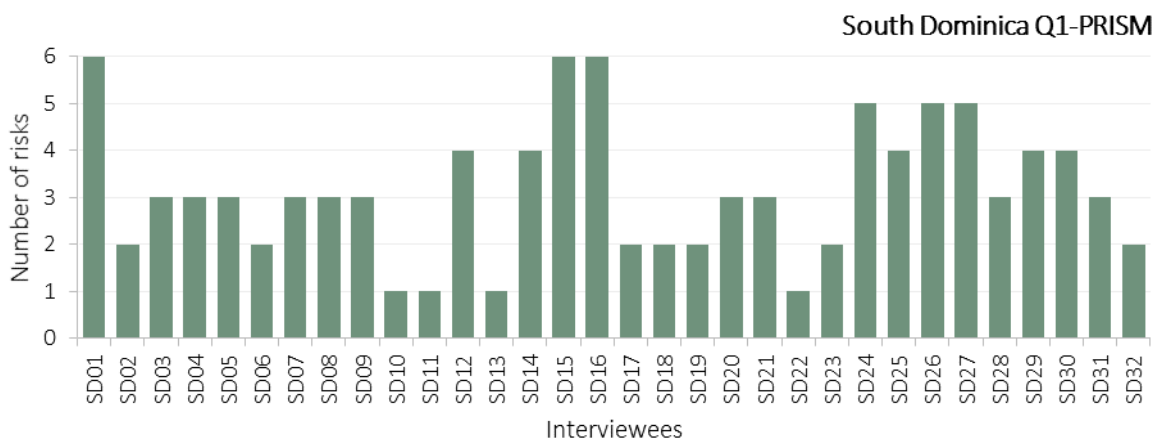
Figure 29. South Dominica Q1-PRISM: Disaster Risks Identified by Each Interviewee.

5.3.2.1 Disaster Risks Ranked

Table 21 ranks disaster risks by the number of interviewees who mentioned them. All but one interviewee (97%) identified hurricanes, making it the highest-ranked risk. SD10, the sole person not to put hurricanes in his Q1-PRISM diagram, did refer to them and other risks during the interview, yet did not include them in his list because he is "not afraid of disasters", including instead 'accidents while in nature' as his only risk. Earthquakes are the second most frequently mentioned risk (20 mentions/63%), with volcanoes and storms sharing the third spot (12 interviewees/38%). Notably, for six interviewees (19%), the 'storms' category contained references not only to tropical storms, but also to heavy rains and associated cascading disasters, such as floods and landslides. Landslides completed the five most frequently mentioned (eight mentions/25%).

Table 21. South Dominica Q1-PRISM: Disaster Risks Ranked by the Number of Interviewees Who Mentioned Them.

#	Risk	# of interviewees	%
1	Hurricanes	31	97%
2	Earthquakes	20	63%
=3	Volcanoes	12	38%
=3	Storms/heavy rain/flash floods	12	38%
5	Landslides	8	25%
6	Tsunamis	4	13%
7	Flooding	3	9%
=8	Health issues	2	6%
=8	Hurricane aftermath	2	6%
10	Poor road conditions	1	3%
10	Being homeless	1	3%
10	Diseases	1	3%
10	Droughts and resulting famine	1	3%
10	Losing husband/family	1	3%
10	Wildfires	1	3%
10	Accidents in nature	1	3%

The significance of hurricanes was maintained across the ranking by importance ('closeness' to 'self' in the PRISM diagram) with 28 interviewees (88%) featuring them in their top-three most significant risks (Figure 30 [A]), twice the number of the next risk (earthquakes with 14 mentions/44%). The order of the ranking by significance remained the same. Focusing further on perceived risk significance, 21 of 32 interviewees (66%) chose hurricanes as their single most important risk (Figure 30 [B]), suggesting a relative consensus on their importance, potentially influenced by the devastation caused by Hurricane Maria one year before. Amongst the 11, one did not choose hurricanes as their biggest concern; there was less consistency in answers regarding the significance of other risks. The remaining 11 interviewees identified seven risks between them, with volcanoes second (three mentions/9%), and both earthquakes and the fear of deteriorating physical health two mentions (6%) each.

Beyond the highest-ranked risks, references by two interviewees (6%) to the aftermath of hurricanes, and by one (3%) to famines resulting from drought, further emphasise interviewee awareness of the interconnected nature of risks and cascading disasters. Mentions by four interviewees (13%) of deteriorating physical 'health', 'being homeless', 'accident in nature', and the potential loss of a husband or family member are all representative of fears rather than disaster risks, perhaps highlighting the anxiety, fear, and trauma that is associated with disasters, particularly amongst a group of interviewees who all experienced at least one disaster.

(A)

(B)
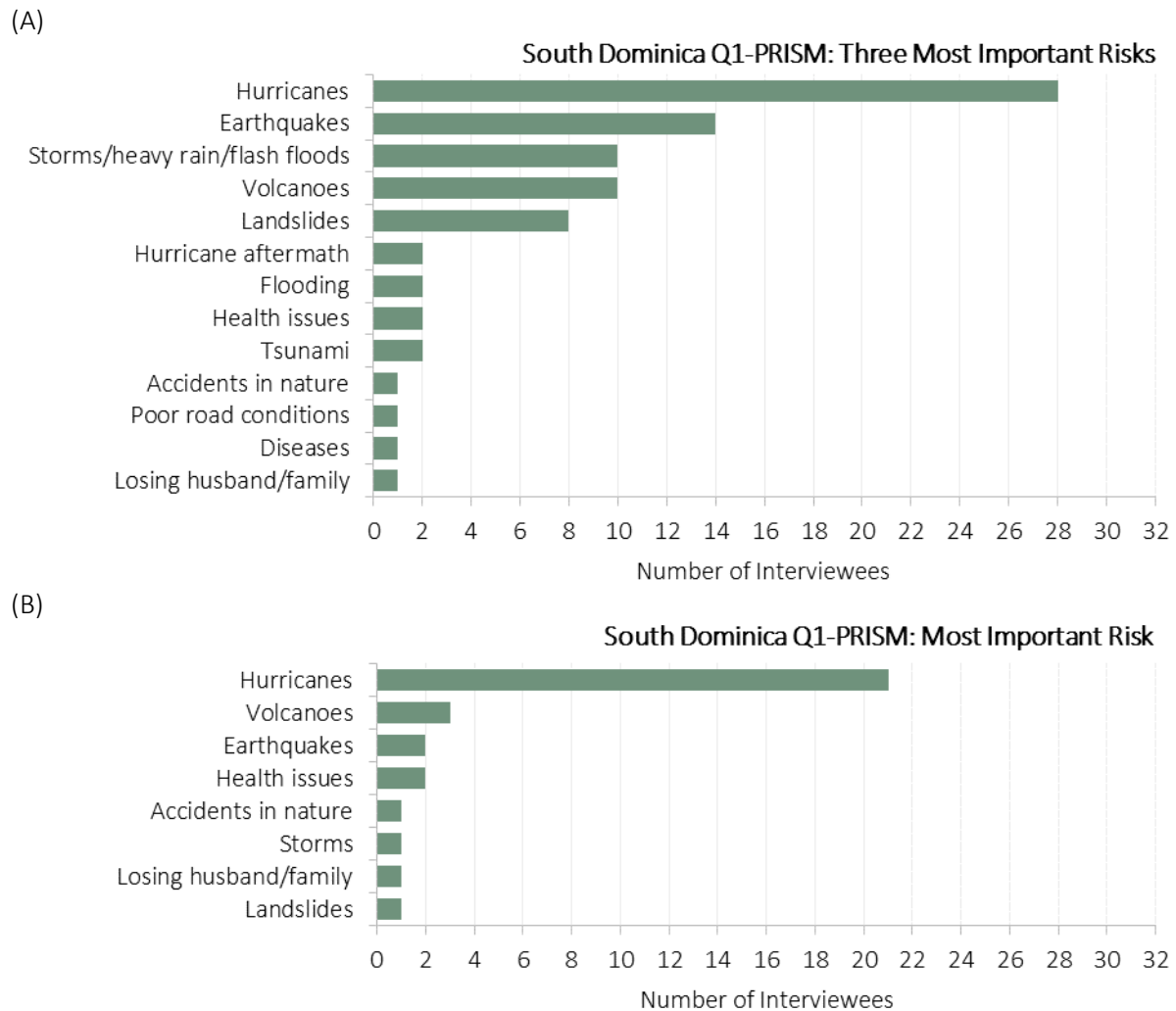
Figure 30. South Dominica Q1-PRISM: Disaster Risks Ranked by the Number of Interviewees Who Mentioned Them in Their Three 'Closest' (A) (Above), and as Their 'Closest' (B) (Bottom).

5.3.2.2 Contributing Factors

To explain their answers interviewees referred to:

<u>Experience</u>

With wreckage from Hurricane Maria a year prior to these interviews still visible throughout Dominica, it is no surprise that all 32 interviewees (100%) referred to, and shared their experiences of, the category five hurricane and its aftermath. For 12 interviewees (38%), recollections of past hurricanes also extended to Tropical Storm Erika in 2015, accounting for many of the references to storms, heavy rains, floods, and landslides. Five interviewees (16%) even mentioned their 1979 Hurricane David experiences, emphasising the impact on risk perception of formative disaster experiences, even after 39 years. The nature of this influence varied amongst interviewees. While the rankings of Q1-PRISM diagrams would suggest that major hurricane experiences add to their perceived significance as a risk, for five (16%) interviewees, the opposite was the case. SD03 is not concerned about hurricanes because "we pass[ed] Maria". Similarly, SD10 explained that "Because I'm tell you I'm an old man, I know what is hurricane.

I don't fear hurricane, I don't fear no". The same is true for earthquakes. Interviewees like SD27 placed earthquakes as their least significant risk (5/5), sharing that "I've experienced earthquakes here in Dominica and it's not so serious". Six interviewees (19%) mentioned earthquakes in their interviews but omitted them from their Q1-PRISM diagram, citing experience to explain their perceived lack of importance. SD12 shared that "I felt earthquake, but it was nothing" while SD13 stated that "we had a bit of tremor but I have not experienced no bad damage from the tremor". Experience can also be misleading, as SD20 testified, sharing that "we experienced it [hurricanes] so much but we never experienced it in a category this way, the way it [Hurricane Maria] came the last time".

Conversely, a lack of experience led to both either an increased or reduced significance of risks. SD12 expressed that "I [have] never seen any volcano erupt so I'm not worried about that", while SD27 said that "I kind of worry about the tsunami, which I have never seen here, or I have not heard anything like this in the Caribbean". SD15 considered both aspects, sharing that "because we have not have one [for] generation[s], so we do not see the dangers, so we're not fearful. But probably if one would happen tomorrow, of course it would change".

Exposure and Frequency

The manifestation of a disaster risk in interviewees' lives is not limited to direct experience. When explaining risk significance, the frequency with which Dominica faces the tropical storm and hurricane threat during its 'hurricane season'—its 'exposure' to hazards— was referred to by 12 interviewees (38%). Like experience, the 'presence' of a risk can contribute to either its perceived significance, or its lack thereof. Three interviewees (9%) considered the still-damaged state of their home as a painful reminder of the destruction a hurricane like Maria can inflict, whereas five interviewees (16%) considered hurricanes to be less threatening by virtue of their frequency, a factor linked to both experience and its status as a 'known' event. SD03 shared that "I am accustomed to hurricane already and it don't be a risk for me", while SD01 explained that "I don't worry much about hurricane because you know I expect hurricane every year", qualifying them as "normal".

Similarly, references to 'small' earthquakes or 'tremors' by 20 interviewees (63%) may arguably be classified as 'experience', yet they are also a reminder of the potential for a much larger and destructive earthquake (as well as volcano). Thus, regular shaking may contribute to the high level of significance attributed to earthquakes, while other hazards such as tropical storms, landslides, or even bad roads are lower-ranked, despite causing more damage. For SD09, frequency is also why earthquakes are less significant than hurricanes, because in comparison "it's not often we get that [earthquakes], a little something, every two years". A further manifestation of a risk's presence is its physical proximity, embodied in SD25's ranking of volcanic eruption as his biggest fear because the volcano is "just up the road there [points], so it's very close".

Sixteen interviewees (50%) referred to risks in an interconnected, even interchangeable manner, underlining their inter-relationship, and the 'cascading' potential of disasters. Nine interviewees (28%) mentioned the relationship between tropical storms, heavy rains, and flooding and landslides, while two (6%) connected earthquakes to volcanic eruptions. SD12 even voiced his personal belief that earthquakes and hurricanes are connected. The crisis aftermath and its potentially disastrous consequences—effectively, the vulnerability it creates—was itself identified as a disaster risk by two interviewees (6%), with seven (22%) referring to the added island vulnerability since Hurricane Maria.

Attitude

Perceptions of disaster risks and their significance influenced four interviewees' (13%) attitudes towards life. When asked why she did not consider any disaster to be significant, SD31 explained that it's a matter of "mind", stating that "whatever happens to us in life, how we grade it, how much we let it influence us, disturb us, affect us, put us down" affects our wellbeing, and "as long as I'm alive and not injured, I know that I can move on and do something else, if it's here, if it's anywhere else, and I'm not going to let it affect me". SD10, the sole interviewee to not identify hurricanes as a risk, shared that "I do fear about hurricane [but] I know hurricane have to come [...]. We have to face it".

5.3.3   QUESTION 2: SOURCES OF INFORMATION

The question-two format was consistent with the technique used in Longyearbyen, fostering an open dialogue, without definitions or interviewer input, to reduce bias. Interviewees did not require further question clarifications before offering their answers. A total of 104 answers were shared for Q2, compared to 101 for Q1, with the same minimum number—one, and maximum—six, and a comparable average of 3.25 (median=3.0) (Q1: average=3.16, median=3.0). Segregating the data according to the demographic categories did not significantly affect the results.

5.3.3.1   Sources of Information Ranked

The ranking of interviewees' information sources for the Q2-PRISM diagram are presented in Table 22. Concurrent with the Longyearbyen experience, grouping answers to Q2 proved to be more complex than Q1, resulting in 10 more categories for a similar number of answers, with only one information source being mentioned by more than 50% of interviewees, and only three by more than 25%.

Table 22. South Dominica Q2-PRISM: Disaster-Related Information Sources Ranked by the Number of Interviewees Who Mentioned Them.
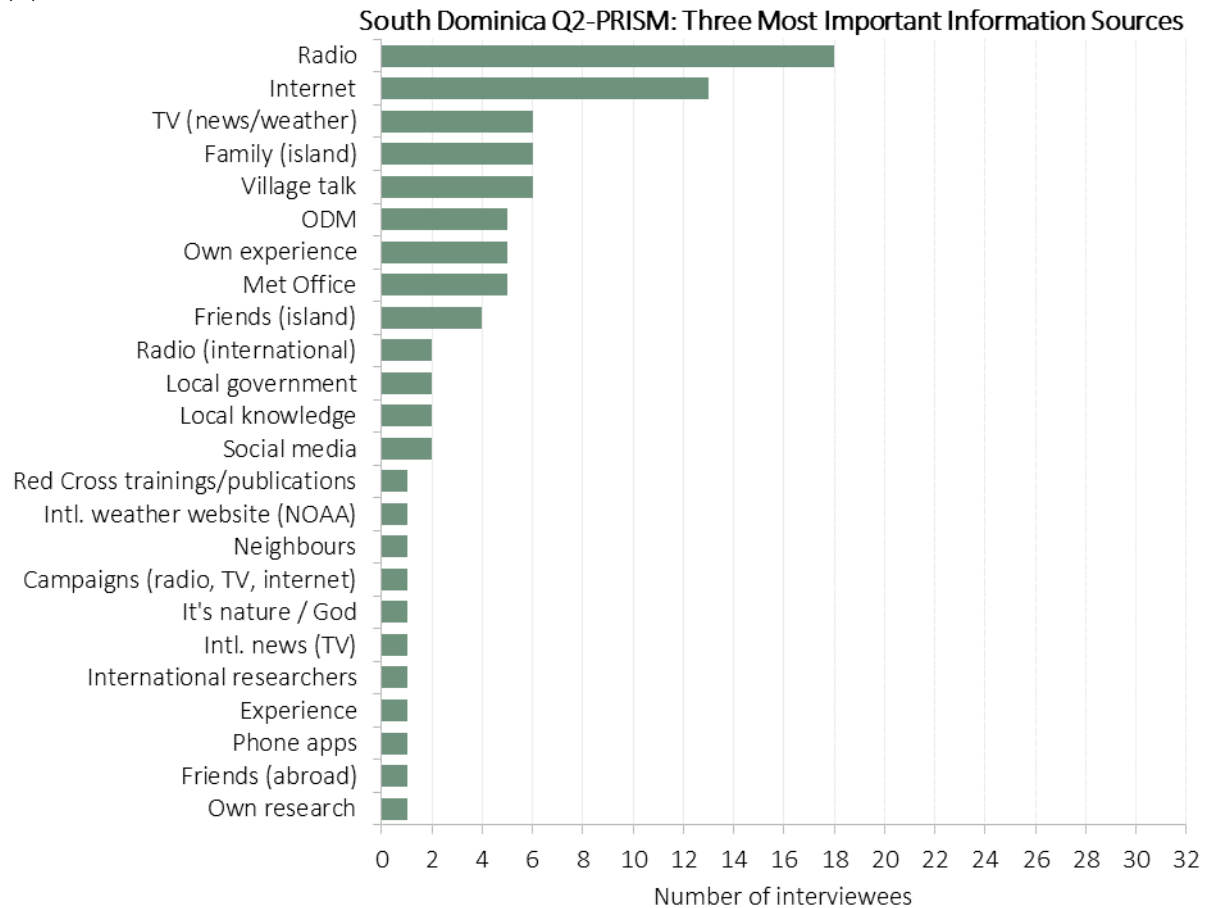
#	Source of Information	# of interviewees	%
1	Radio	20	63%
2	Internet	14	44%
3	Village talk	9	28%
4	Family (island)	7	22%
=4	TV (news/weather)	7	22%
6	Met Office	6	19%
7	Office for Disaster Management (ODM)	5	16%
=7	Own experience	5	16%
9	Local government	4	13%
=9	Friends (island)	4	13%
11	Local knowledge	3	9%
12	International news (TV)	2	6%
=12	Social media	2	6%
=12	Experience	2	6%
15	Own research	1	3%
=15	Friends (abroad)	1	3%
=15	Neighbours	1	3%
=15	Family (overseas)	1	3%
=15	Phone apps	1	3%
=15	International researchers	1	3%
=15	It's nature / God	1	3%
=15	Intl./natl. campaigns (radio, TV, internet)	1	3%
=15	International weather website (NOAA)	1	3%
=15	Red Cross trainings / publications	1	3%
=15	Primary education	1	3%

Interviewees differentiated between the geographic location of some of their sources (e.g. island friends and overseas friends, Dominica-based radio or from the neighbouring French islands), or referred to the information-provider actors or institutions (e.g. government, friends) and the information-reception medium (e.g. radio, TV, internet). Follow-up questions clarified the actual source of information. Whenever not specified otherwise, the source refers to Dominica-based providers (e.g. 'radio' refers to local radio shows). The remaining sources—grouped under 'internet', 'social media' and 'apps'—were considered exceptions. As they provided interviewees with a vast range of sources, additional questioning could not identify any dominant sources amongst them. Finally, the mentions of 'local council', 'local council disaster representative', 'parliamentary representative' were all combined under the general 'local government' label, leaving separate specific references to various central government agencies, such as the Met Office and the Office for Disaster Management. The most-mentioned source of disaster-information was the radio, Dominica-based services and those by the neighbouring French islands, combining for a total of 23 interviewee mentions/72%, followed by a general access to the internet with 14 interviewee mentions/44%. SD28 referred to 'national/international campaigns via radio, TV, and the internet' which

could be included in the 'internet' category. Unspecified references to discussions with other residents were binned as 'community talk', rounding off the three-highest ranked sources with nine references/28%. Information conveyed by island-dwelling family members, and television news and weather reports, completed the five most important sources of information, with seven references/22% each.

A focus on the perceived significance of sources, determined by their 'closeness' to 'self' in the PRISM diagram, maintained a similar ranking, including from a narrowed top-three perspective (Figure 31 [A]). For the single-most important source of information (Figure 31 [B]), radio remained the highest-ranked, although mentions by less than 25% of interviewees, with a total of 10 different categories cited, suggests little consensus. Family was considered significant, rising to second position with five mentions/16%, while personal experience and the Office for Disaster Management (ODM) moved up above TV and the Met Office to joint-fourth (three mentions/9% each).

(A)

South Dominica Q2-PRISM: Three Most Important Information Sources

(B)

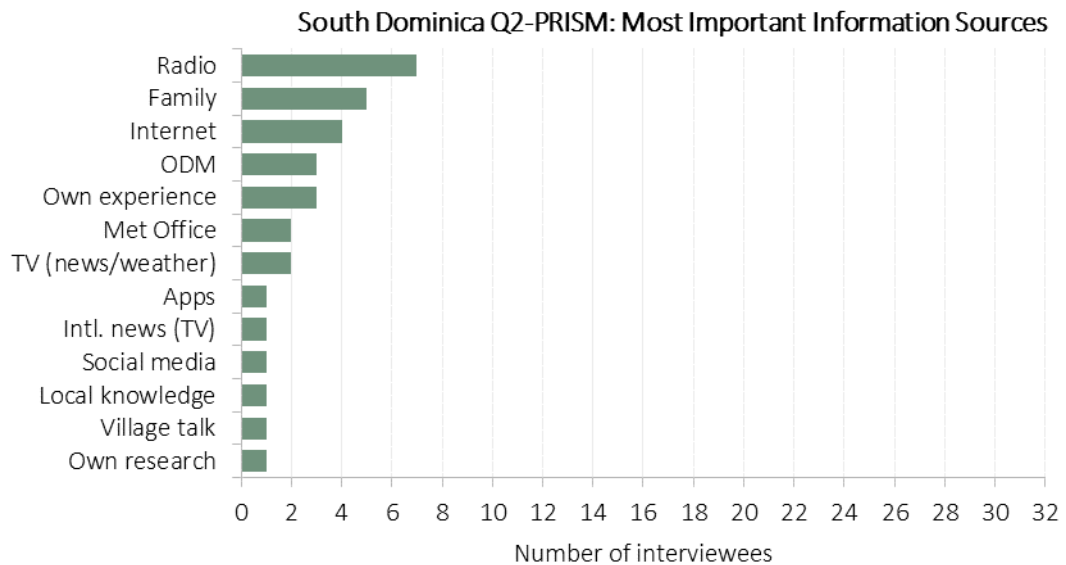South Dominica Q2-PRISM: Most Important Information Sources

Figure 31. South Dominica Q2-PRISM: Sources of Disaster-related Information Ranked by the Number of Interviewees Who Mentioned Them in Their Three 'Closest' (A) (Above) and as Their 'Closest' (B) (Bottom).

5.3.3.2   Formality and Informality in Information

Like Longyearbyen, formal sources are defined as those with an officially mandated role for disaster-related information dissemination within the Dominican DG framework. Such a distinction enabled 84% of sources to be labelled as either 'formal' or 'informal', with the remaining 16% binned under a 'mixed' category for transparency purposes. Table 23 shows the complete list of disaster-related information sources updated to reflect the formality/informality discussion.

Table 23. South Dominica Q2-PRISM: Disaster-Related Information Sources by Designation.

# Formal Sources:	# Informal Sources:
1 Intl./natl. campaigns (radio, TV, internet)	1 Experience
2 Local government	2 Family (island)
3 Met Office	3 Family (overseas)
4 Office for Disaster Management (ODM)	4 Friends (abroad)
5 Primary education	5 Friends (island)
6 Radio	6 International news (TV)
7 Red Cross trainings / publications	7 International researchers
8 TV (news/weather)	8 International weather website (NOAA)
	9 It's nature / God
# Mixed Sources:	10 Local knowledge
1 Internet	11 Neighbours
2 Phone apps	12 Own experience
3 Social media	13 Own research
	14 Village talk

Disaster-related governmental sources, such as the 'Met Office', 'ODM', and 'local government' are classified as formal actors, together amounting to 15 mentions by nine interviewees (28%). Traditional island media, specifically television- and radio-based news and weather forecasts, are also formal. Their addition raises the interviewee numbers that refer to formal sources to 26/81%. An exception is made for international news and/or radio forecasts on the radio, television, and the weather website *noaa.gov*, all of which, despite being formal DG-relevant institutions, are not part of Dominica's formal system. Further, six interviewees/19% explicitly considered them a means of bypassing the equivalent national services. As SD21 explained, "we have our own radio [on Dominica] but the information we're getting, theirs [the French islands'] is more advanced, [...] sometimes the information we get about hurricanes would be more thorough and more in-depth over there than we're getting over here". The information gained through relevant national and international campaigns, NGO training courses and publications, and school education are categorised as formal, adding three mentions for a total of 45 from 27 interviewees (84%).

Conversely, the sources 'village talk', 'own experience', 'local knowledge', 'experience', 'own research', 'neighbours', 'family' and 'friends' (on the island and abroad) are all informal, combining for 34 mentions

by 24 interviewees (75%). Conversations with visiting researchers by SD01, and a reliance on God expressed by SD24, can also be classified as 'informal', adding two mentions. Finally, as previously mentioned, international formal sources, like news and weather forecasts, are considered informal sources—adding six mentions—a total of 42 references—to informal sources by 26 interviewees (81%). Like Longyearbyen, the remaining sources—'internet', 'social media', and 'apps'—could not be identified as exclusively formal or informal, leading to a 'mixed' category with 17 mentions/16% by as many interviewees (53%).

Figure 32 shows the overall percentage of formal, informal, and mixed sources of disaster information. For the interviewees in SD, like in Longyearbyen, both formal and informal sources of information are important. However, in this case, interviewees had a slight preference for formal sources, though the designation of the 'undefined' category could tip the balance. On average, interviewees mentioned 1.4 formal sources (median=1.0), 1.3 informal sources (median=1.0) and 0.5 undefined sources (median=1.0).
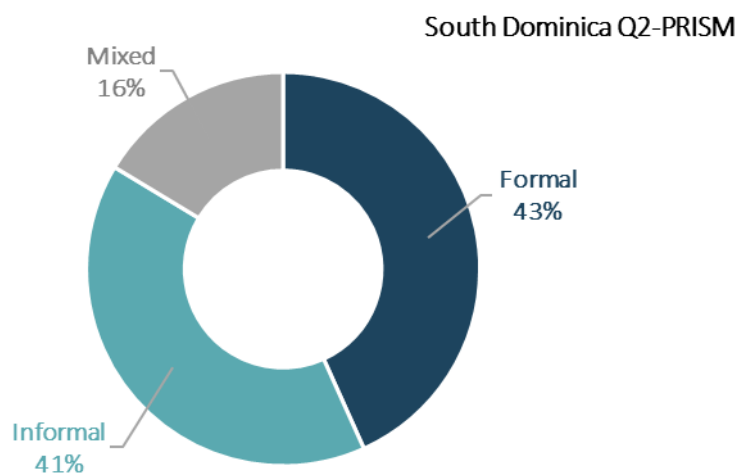
Figure 32. South Dominica Q2-PRISM: Disaster-Related Information Sources by Designation (in Percentage of Total Mentions).

Focusing on significance, Figure 33 shows the distribution of formal and informal sources, according to relative rank and the number of interviewees concerned. Twelve interviewees (38%) selected more formal sources compared with nine (28%) who mentioned more informal ones, with the 'mixed' sources able to tip the balance in 11 cases. Five interviewees (16%) did not choose any formal sources, while six others (19%) did not choose any informal ones.
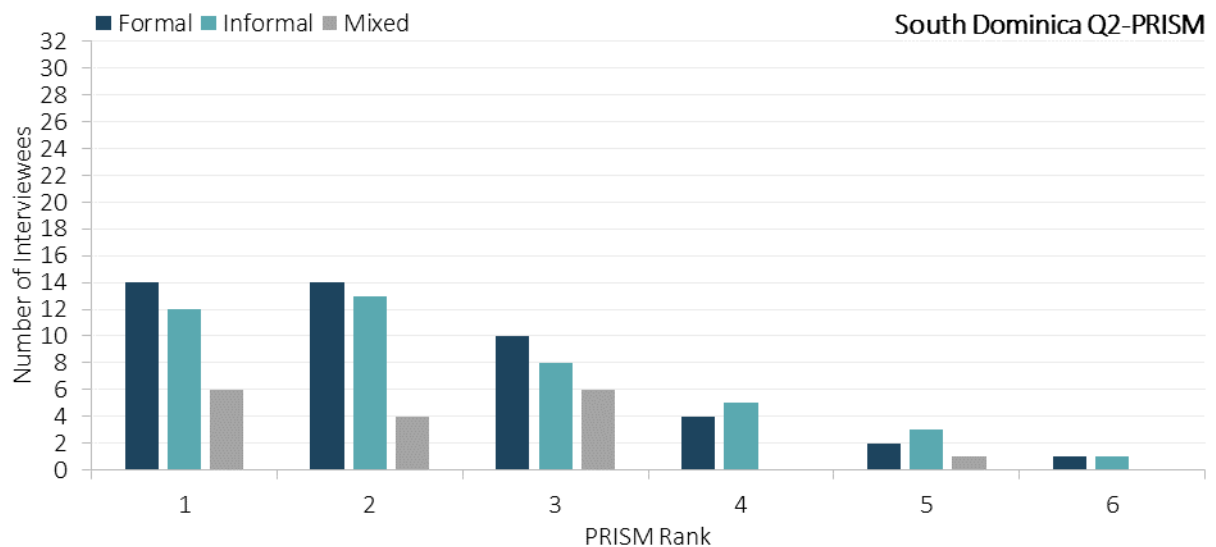
Figure 33. South Dominica Q2-PRISM: Q3-PRISM: Disaster-Related Information Sources Mentioned by Designation, and According to the Number of Interviewees and Rank.

Narrowing down the results to focus on interviewees' three most significant information sources reveals a similar pattern in numbers of mentions and the slight preference for formal sources, which increases by 1%. Six interviewees (19%) did not select any formal sources within their three most important, while eight others (25%) did not choose any informal ones. No interviewee selected only 'mixed' sources. Fourteen interviewees (44%) identified a formal source as their most important, compared to 12 (38%) who preferred an informal one, and six (19%) who chose one that could not be defined as either. This confirms the slight preference for formal sources of disaster-related information amongst interviewees, and the potential for the 'mixed' category, if identified as (in)formal, to affect findings.

5.3.3.3 Contributing Factors

Like Longyearbyen, in their consideration of disaster-related information sources, 14 interviewees (44%) refer to the reliability of sources. As explained by SD16:

> Communication is a big, big, big, big, big, big problem because even on the radio the radio will tell you one thing and the professionals will tell you something else and the streets will tell you something else and there's no definitive information to say 'yes this is it'.

To inform their choices of sources of information, interviewees referred to several contributing factors.

<u>Experience</u>

For South Dominican interviewees, consideration of disaster-related information sources is not hypothetical. All 32 interviewees (100%) experienced Hurricane Maria, 12 (38%) referred to Tropical Storm Erika, and five (16%) recalled Hurricane David (1979). Such direct experiences influenced their perceptions and their significance of information sources, as well as provided them with an empirical basis for their choices of sources and contributing factors. For seven interviewees (22%), experience was a direct

source of learning. As SD26 shared, "if you live through it, you definitely remember it and learn", while SD13 lamented the behaviour of those without experience, and how "before the hurricane, people [are] panicking and they don't know what to do". For SD15, experience can make a life-and-death difference, sharing that for those without it, "you could get caught in disasters and you could lose your life" whereas for him "it's quite easy and so simple, because I've been through it myself". SD24 extended the meaning of experience to that of others by describing it as passed down from "parents or grandparents". SD20 stresses the link between 'experience' and 'local knowledge', mentioned by three interviewees (9%), including two of those that referred to 'experience' as a source as well, explaining:

> I was born here but I been overseas for a while. [...] sometimes I'll be around and they [locals] just look up [at] the sky and be like "Storm's going to come", [...] and it makes me know storms come like this. They all know when it's going to rain.

This suggests that longevity in a location is a significant factor, together with, or offset by, relationships.

Relationships

Ten interviewees (31%) mentioned friends and/or family as sources of disaster-related information. SD14's re-enactment of her children calling to check on her before hurricanes—"Mama, move from the house, you know it's not a strong house"— suggests that relationships create an incentive for information sharing. Four interviewees (13%) identify overseas family and friends as a source of information. SD07's family in Antigua—typically ahead of Dominica on a storm path—call him to warn about arriving hurricanes. Both SD01 and SD21 have American family who share important information. Additionally, SD28 relies on friends with relevant expertise to inform him about hazards that are in his "blind spot", highlighting another major consideration—the reliability of the information provided.

Mandate

Eight interviewees (25%) refer specifically to the credibility of formal sources, such as the Met Office or ODM, due to what SD05 calls their 'official' status or mandate. SD27 is hesitant to refer to his own personal knowledge "because it's not official. It's mine", whereas he is convinced that "official warnings from the ODM, media, training people in the schools, it's a very important". SD31 is similarly convinced by formal sources, believing that if volcanoes become dangerous then "they will inform people". This is supported by radio's status as the most important source. However, three interviewees (9%) expressed their distrust of the national formal sources. According to SD20, "they don't really give us the full information". SD25 critiqued the Prime Minister for sharing "misinformation" on the radio, pre-Hurricane Maria, and D16 shared that "a lot of the stuff we get here is propaganda". Thus, and as specifically expressed by six interviewees, sourcing information from formal and informal sources abroad is important. As SD observed, "I feel like they [his family abroad] have more immediate and more advanced information". Conversely, four interviewees (13%) consider 'village talk' to be unreliable, or as SD22 put it, "sometimes people are saying what they want".

<u>Reliability</u>

Another reason for the information-source diversity is the reliability of the platforms (e.g. internet, TV, radio) used to access information, a topic referred to by 14 interviewees (44%). SD15 used to rely on his TV for information, but it hasn't functioned since Tropical Storm Erika, while SD32 cannot always afford to pay for mobile data for her cell phone, suggesting a link between wealth and information access. The reliability of radio as a low-tech solution may have contributed to its status as the highest-ranked source. As SD31 explained, "I know I have to get one [a radio] because I think it is important because at some point there is no internet". SD23 agreed, sharing that:

> [With the internet] you have to have the Wi-Fi service, your phone have to be fully charged. [...] you have to be in an area where you can get the service. But with the radio, you could be anywhere in this area and you get your radio station and you get your information.

The unreliability of certain platforms offers insights into the reliance on village talk—information may not always be the most accurate, but by virtue of the source proximity, it is accessible. Six interviewees (19%) refer to the community as a 'back-up' source, or as SD01 shared, "you know if I don't hear something from nobody [official], they will pass it on". Beyond simple word of mouth, SD16, who has a broken radio, also refers to the access of the local bar's radio and being able to hear her neighbour's radio as well, emphasising the importance of proximity in accessing information. SD23 feels the same way, explaining that "if my radio is not on, my neighbour's radio is on and she hears something she'll always alert me, I mean us in general in the community".

5.3.4   QUESTION 3: SOURCES OF HELP

For interviewees, identifying disaster-related sources of help was again rooted in past events. Rather than reflecting their belief about the most-significant sources, interviewees' answers were experience-based— which sources most helped them during past disasters, especially Hurricane Maria. Interviewees identified more sources of help (125) than sources of information (104) or risks (101). The average number of mentions was 3.9 (median=4.0); the least—one, and the most—seven. Segregating the data by marital status affected results, with married individuals identifying on average 4.9 sources (median=5.0) compared to unmarried ones who averaged 3.7 sources (median=4.0). No other differentiation yielded statistically significant differences.

5.3.4.1   Sources of Help Ranked

Table 24 shows the list of sources of help, ranked according to the number of interviewees who referred to them.

Table 24. South Dominica Q3-PRISM: Disaster-Related Help Sources According to the Number of Interviewees Who Mentioned Them.
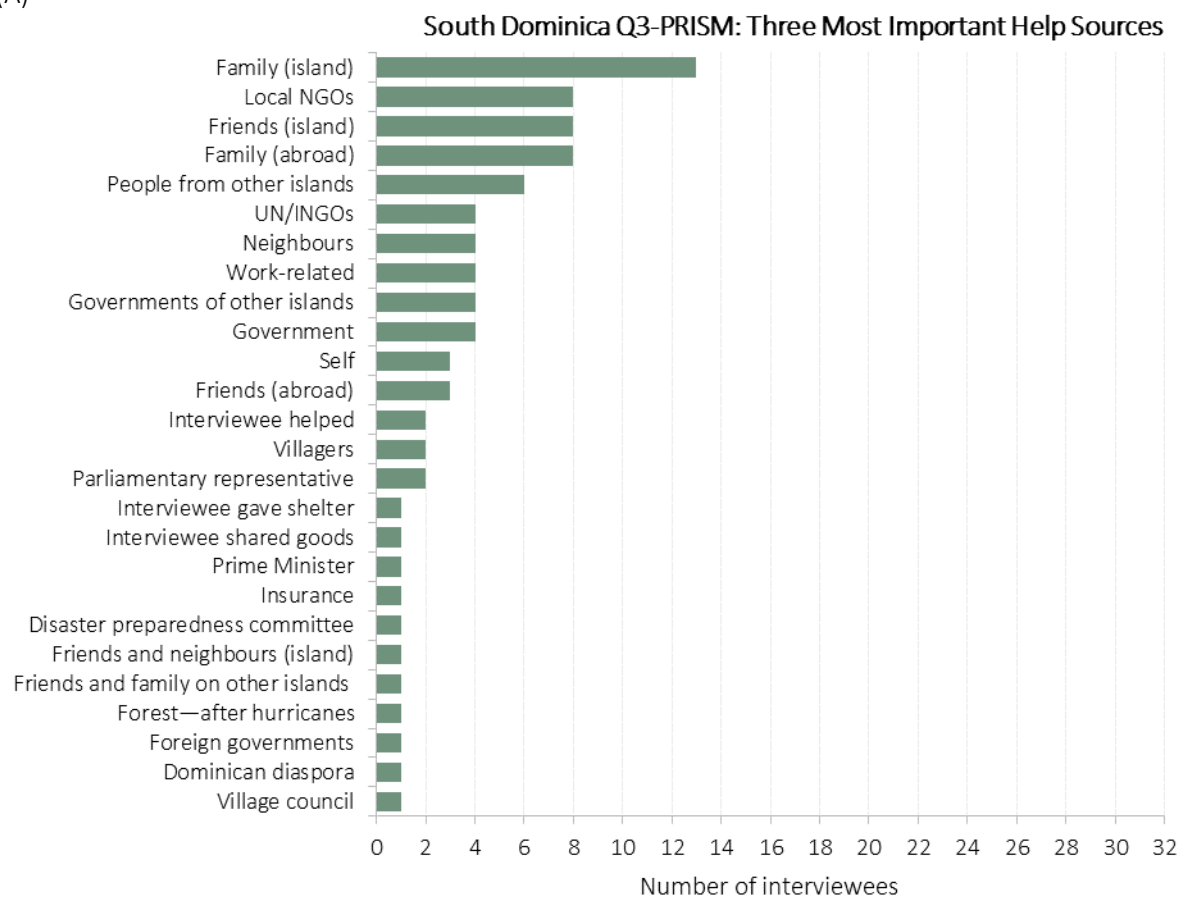
#	Source of Help	# of Interviewees	%
1	Family (island)	15	47%
2	Local NGOs	14	44%
3	Friends (island)	12	38%
4	Family (abroad)	11	34%
5	Government	10	31%
6	People from other islands	9	28%
7	UN / INGOs	6	19%
=8	Governments of other islands	5	16%
=8	Work-related	5	16%
=8	Parliamentary representative	5	16%
11	Friends (abroad)	4	13%
=11	Neighbours	4	13%
=11	Villagers	4	13%
14	Village council	3	9%
=14	Self	3	9%
16	Dominican diaspora	2	6%
=16	Foreign governments	2	6%
=16	Interviewee helped	2	6%
19	Family and friends on other islands	1	3%
=19	Family and friends (island)	1	3%
=19	Friends and neighbours	1	3%
=19	Forest—after hurricanes	1	3%
=19	Insurance	1	3%
=19	Prime Minister	1	3%
=19	Disaster preparedness committee	1	3%
=19	Interviewee shared goods	1	3%
=19	Interviewee gave shelter	1	3%

The lack of consensus on the source significance may have been affected by a persistent distinction between island and foreign sources, and sometimes by a further differentiation between Caribbean island-based international sources, and those from other countries. For example, family was divided between those on the island (15 interviewees/47%), those abroad (11 interviewees/34%), and combined categories such as 'family and friends'. Once adjusted for overlap, family was mentioned by 22 interviewees (69%). Similarly, the local and international NGO categories add up to 17 interviewee-references (53%) (adjusted for overlap), while variations on 'friends' total 14 interviewee mentions (44%). Finally, while the central government was referenced by 11 interviewees (34%), combining it with other local and national governmental sources (e.g. village council, prime minister, parliamentary representative, and disaster preparedness committee) totals 18 interviewee mentions (56%).

Examining the top-three sources per interviewee (Figure 34 [A]) emphasises the importance of family; with family on the island and abroad occupying the first and joint-second spot respectively, accounting for

20 interviewee-references (63%). Notably, only two interviewees who identified family as a source of help did not rank family in their top-three sources.

(A)

(B)

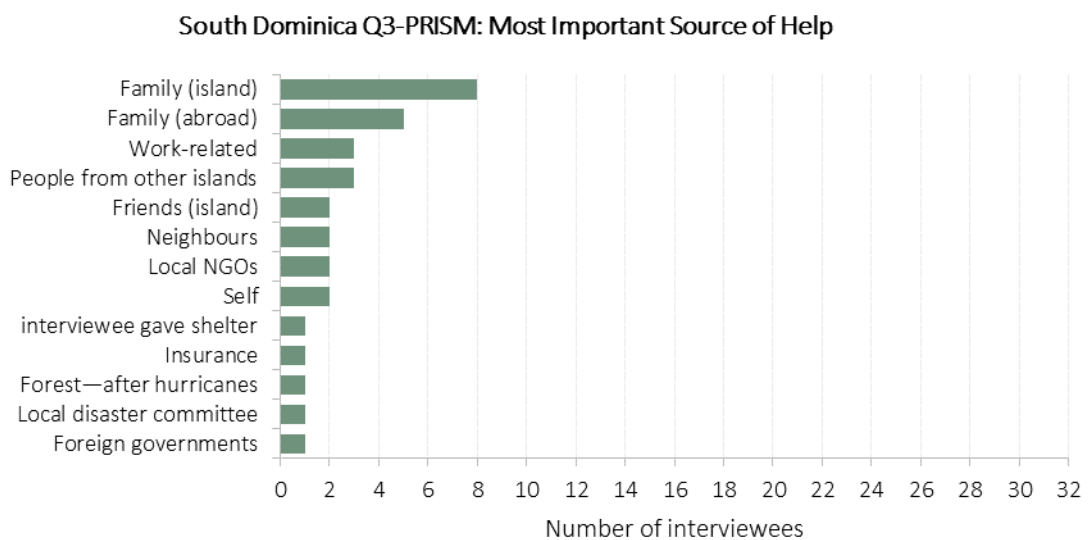**Figure 34.** South Dominica Q3-PRISM: Disaster-Related Help Sources Ranked by the Number of Interviewees Who Mentioned Them in Their Three 'Closest' (A) (Above), and as Their 'Closest' (B) (Bottom).

This pattern continues when considering the single most important source (Figure 34 [B]). Family once again ranked highest (first and second), totalling 13 interviewee mentions (41%). After 'family on the

island and abroad', there was significant diversity in the 'most important source' identification, with 19 interviewees referring to eleven different sources.

5.3.4.2 Formality and Informality in Disaster Assistance

In their consideration of disaster-related assistance sources, interviewees considered both formal and informal sources. Table 25 shows the sources of help according to designation.

Table 25. South Dominica Q3-PRISM: Disaster-Related Help Sources by Designation.

# Formal Sources:	# Informal Sources:
1 Foreign governments	1 Disaster preparedness committee
2 Government	2 Dominican diaspora
3 Governments of other islands	3 Family (abroad)
4 Insurance	4 Family (island)
5 Interviewee gave shelter	5 Family and friends (island)
6 Local NGOs	6 Family and friends on other islands
7 Parliamentary representative	7 Forest—after hurricanes
8 Prime Minister	8 Friends (abroad)
9 UN / INGOs	9 Friends (island)
10 Village council	10 Friends and neighbours
	11 Interviewee helped
	12 Interviewee shared goods
	13 Neighbours
	14 People from other islands
	15 Self
	16 Villagers
	17 Work-related

As before, formal sources are defined as those with an officially mandated role in DRR/R. Government in its various forms, including the prime minister, parliamentary representative, village council, and disaster-preparedness committee are all formal, combining for 20 mentions by 18 interviewees (56%). In this case, the aid and assistance on rule of law matters offered by neighbouring countries and beyond is also considered formal, as their assistance was formally requested by Dominica's government (IFRC, 2015; Japan International Cooperation Agency [JICA], 2017). Similarly, for NGOs, the means through which an organisation decides to respond, and the motivation, particularly for a UN agency or international NGO (INGO), can sometimes be informal—without the government's formal approval. For instance, what partly contributed to Dominica's selection as a 'most likely' case study was that the organisation, IsraAID, launched its island operations at the behest of the private owner of a nearby resort (Ch. 3.3.2), though this did fall under the scope of Dominica's request for international assistance. Additionally, interviewees did not refer to any informal component of NGO or INGO operations. Thus, UN agencies, INGOs, and local NGOs are considered formal entities. Finally, like Longyearbyen, insurance companies are also included in this category due to their formal role for those concerned. In

contrast, regardless of geographic location, sources such as family and friends can be categorised as informal, amounting to 45 mentions by 24 interviewees (75%). The same designation can be applied to self, neighbours, villagers, work-related sources, and the assistance offered by private people from neighbouring islands. Similarly, 'forest' mentions, the assistance 'bartered' with others, actions to help others, and references to spontaneous efforts by members of the diaspora, all fall outside of the formal DRR/R system.

Based on the numbers of sources mentioned, interviewees showed a clear preference for informal sources, with 77/125 mentions—62%, against 48/125—38% for formal actors (Figure 35).
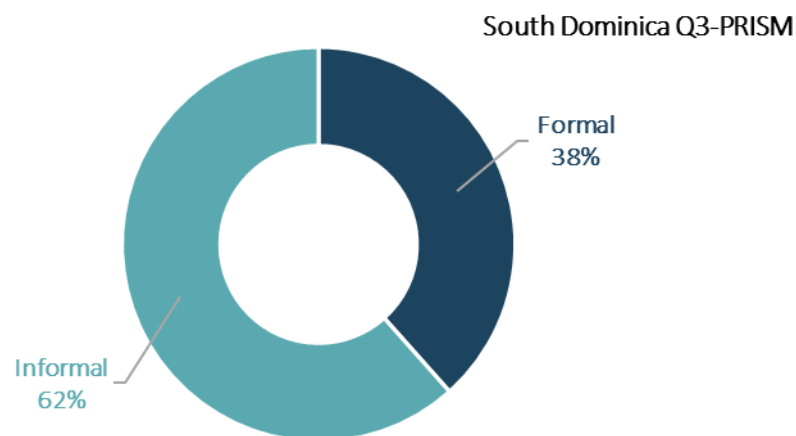
Figure 35. South Dominica Q3-PRISM: Disaster-Related Help Sources by Designation (in Percentage of Total Mentions).

On average, interviewees mentioned 2.4 informal sources (median=2.5) compared to 1.5 for formal ones (median=1.5). Six interviewees did not select any formal sources in their Q3-PRISM diagram, while two (6%) did not choose any informal ones. Twenty interviewees (63%) identified more informal sources compared to seven (22%) who preferred formal ones.
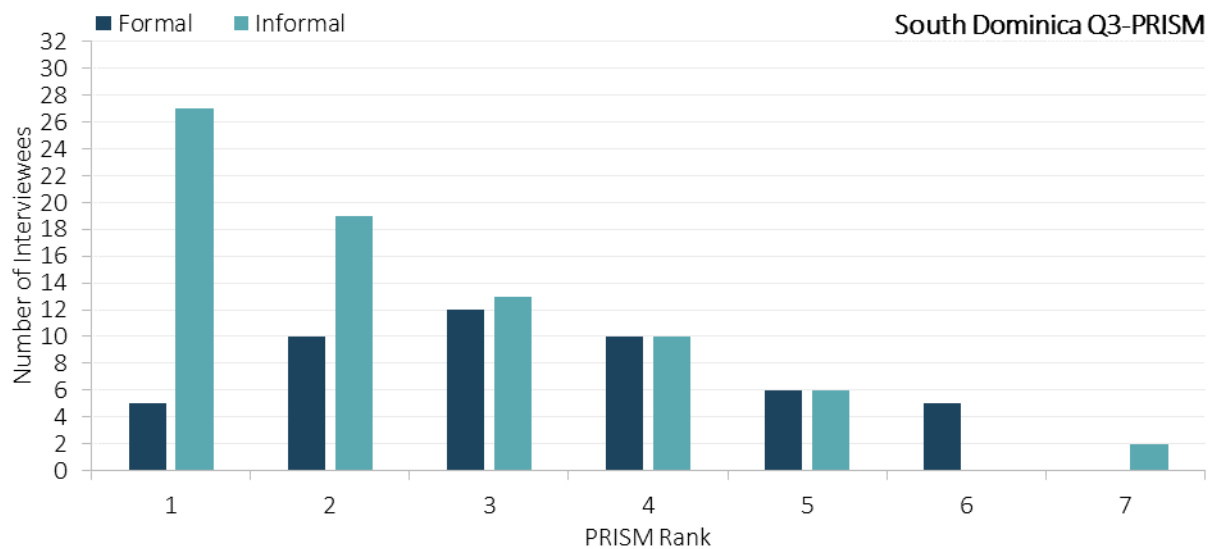
Figure 36. South Dominica Q3-PRISM: Disaster-Related Help Sources Mentioned by Designation, and According to the Number of Interviewees and Rank.

Focusing on the perceived importance of sources confirms a preference for informal sources which represent 68% of the top-three sources. For 24 interviewees (75%), informal sources dominated their top-three, compared to seven who chose a majority of formal ones, while one chose an equal number of each. Finally, in their choice of the single most important source, 27 interviewees (84%) favoured informal sources.

5.3.4.3   Contributing Factors

To explain their choices, interviewees referred to:

<u>Experience</u>

Experience was not directly identified as a disaster-related help source by any interviewees in their PRISM diagrams for Q3. However, all interviewees (100%) referred to their experience during and following Hurricane Maria, drawing on what occurred during the crisis to inform their answers. By not considering other scenarios, they revealed the influence of experience. Moreover, four interviewees (13%) also referred to experience gained from previous hurricanes. SD01 does not need emotional assistance from anyone "because I have been, I went through hurricanes already". SD15 learnt from the aftermath of Hurricane David (1979), "I realised what the people did. All elderly folks here, I saw what they did". SD08 summarises: "I think over the years because we've had so many hurricanes, we ourselves are getting better at this [disaster response]".

<u>Proximity</u>

References by 25 interviewees (78%) to neighbours, villagers, and in some cases family, friends, and work colleagues (when nearby), reveal the significance of proximity in determining help sources, particularly during the immediate aftermath where time is critical. As explained by SD08, "[y]ou cannot wait for any

sort of governmental help. [...] People have to help one another, and it has to be immediate". This is corroborated by SD28, "the first people who helped were our neighbours". For communities such as Scott's Head, this extended to neighbouring Martinique and its citizens. Fifty-seven percent of Scott's Head interviewees selected 'other islands people' as a source of help, two of which chose it as their most important source. In contrast, in the adjacent coastal community of Grand Bay, only 25% of interviewees referred to such assistance in their Q3-PRISM diagram, and none as their most importance source, suggesting correlating factors such as relationships. Overall, nine interviewees (28%) considered neighbouring countries' citizen aid as an important disaster-related help source. The significance of proximity also led interviewees to distinguish between sources. For example, family and friends on the island were mentioned by more interviewees and considered more important than those abroad (Figure 37).
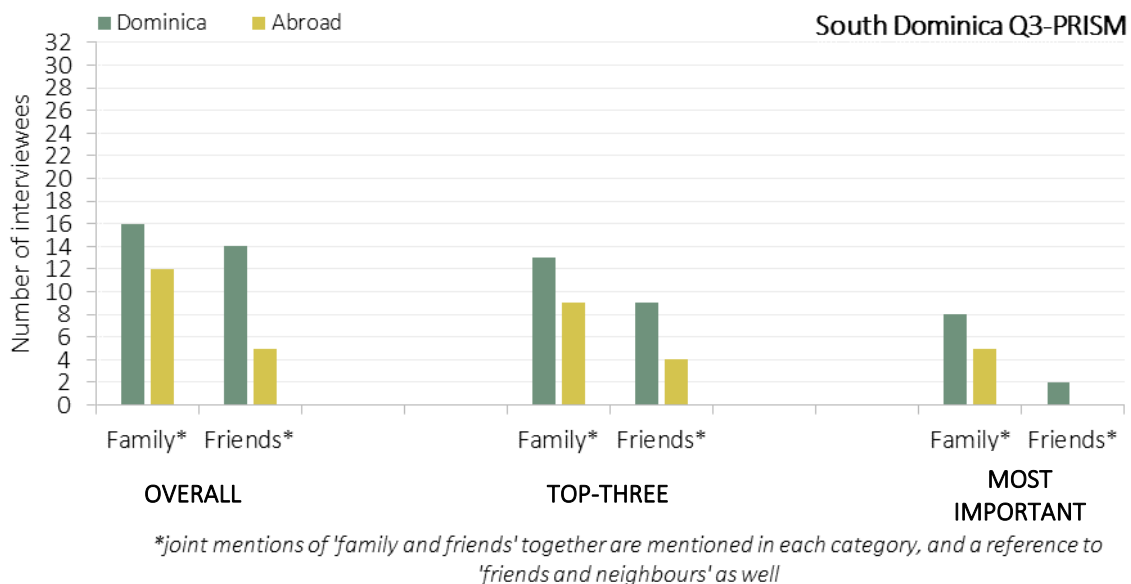
Figure 37. South Dominica Q3-PRISM: References to Family and Friends on the Island and Abroad According to the Number of Interviewees and Perceived Importance.

Proximity also included being in the 'right place at the right time'. SD28 recounted a story of being at the port exactly when a boat of strangers arrived filled with supplies:

> All of a sudden, these people just show up and so, because some people who I was with spoke French we just connected and we just added what they did to the mix and then we turned that over to people in the community.

Conversely, SD12's home was looted by people from her village; a reverse case of being in the 'wrong place at the wrong time', indicating that proximity's influence is not always positive. In a disaster context that affects the entire island, like Hurricane Maria, proximity may preclude assistance. Fourteen interviewees (44%) refer to their family, friends, and neighbours being in the same situation. As SD25 explained, "we're all in the same boat, how the hell are you [villagers] going to help me". Four interviewees (13%) explained that even the police and government were affected and could not help. This perspective

may also contribute to interviewees' distinction between island and foreign sources. SD14's comment that even her family overseas could not help because "they had a hurricane there too" challenges the notion of what constitutes proximity, and suggests that perhaps a better distinction would be between those affected by the crisis and those not. Regardless, this highlights the importance of a geographically diverse support network, especially in the context of emotional support, which received 16 interviewee mentions (50%).

<u>Relationships</u>

Family and friends are amongst the top-ranked sources, with 24 interviewee mentions (75%), 63% of which chose one of them as the most important source (47% of total). This suggests that kinship and/or relationships are significant for disaster-related help sources. Adding work-related relationships raises the total to 50 mentions (40%) by 25 interviewees (78%). Of these 25 interviewees, 72% chose a relationship-based source as their most important one (56% of total), suggesting that for those that consider relationships a source of help, it is a crucial one. SD24 explains that "[after Hurricane Maria] everybody ha[d] their own problem. But when you know one another [it's different]". SD09 shared that "family know what I need", while SD12 was offered shelter by her employer, sharing how "So seeing that they helped us, I mean, I hold it very dear to my heart". SD21 explained that in the case of one woman in his village, "guys that knew her, local guys just come by and help rebuild the house, help her build the home". Relationships, thus, contrast with proximity. As SD28 shared, "[proximity is important but] well obviously with relationships with people you know, there's going to be a bit more [...] involvement". Additionally, in large-scale disasters where 'everybody is affected', relationships can overcome physical-proximity limitations. This is exemplified by 13 interviewees (44%) who referred to family and friends abroad, five of whom (39%) chose such overseas sources as their most important (16% of total). For SD22 and SD25, their overseas family members even came to Dominica to help after the disaster. Similarly, relationships contributed to the support received from neighbouring islands. As SD06 shared, Scott's Head received a lot of support because "French people in Martinique love this community and they have a lot of friendship in the community". SD02 remembered the names of some of the people who came from Guadeloupe and Martinique to help, confirming that "they know some people in Scott's Head".

Relying on relationships is generally a characteristic of informal sources, yet it can also apply to an informal means of connecting to a formal source. SD14 was the only person interviewed to refer to the Prime Minister as a source, characterising all of the government's activities as personal efforts on his part, perhaps strengthening the bond to government through a personified source and sense of relationship to it. An informal relationship to a formal source can also provide access to power or resources inaccessible through formal interactions, a contributing factor considered below. One interviewee explained how his role in an INGO may have contributed to his own damaged home being prioritised by repair efforts of the same organisation. SD28 concurred, sharing that "we saw ourselves in like a favoured position in that

we really had minimal damage and we had access to some people with resources who were like sharing supplies, released supplies for us", though in this case he didn't see it as an opportunity to "can put our feet up" but as a responsibility to see "what can we do to stabilise things [in our community]?".

Relationships can also lead to the prioritisation of informal ties over formal roles or obligations. As SD15 shared, "after Maria it was so dramatic, police did not have time to look about law [...] they have to go and look for their children and safety, who made it, who did not made it [...] would you be worry about a store in town?". SD25 concurred, sharing that "security personnel were deeply affected as well [be]cause they have their private lives as well, their houses and whatever", leading to a government request for, and subsequent arrival of, international police from the neighbouring islands. Two interviewees referred to local officials prioritising their own families, an example of the influence of relationship and survival, another contributing factor discussed below. Similarly, six interviewees (19%) referred to the Dominican government's efforts to leverage and/or counteract the influence of relationships by requisitioning all private packages arriving in Dominica and rerouting them based on government-identified needs. Five out of the six interviewees (83%) were critical of these efforts. For one interviewee, relationship-based assistance is crucial, and he disagrees with the government requisition because "my mum is on insulin and after the storm obviously the hospitals, health centres, everything got damaged. So, my aunt is sending insulin for her, the insulin just goes to anybody else [...] that can't happen". Conversely, another interviewee mistrusted the government order because he alleged port workers themselves stole from the aid efforts to help their own families. These reasons showcase both sides of relationships, namely its motivation as a source of help, and its 'dark side' as a form of exclusion.

Six interviewees (19%) referred to looting, including SD12 whose home was ransacked by villagers, challenging the influence of relationships. As she explained, "these are people we know. These are people we, we invited home. These are people who we were on [the] block chilling with". SD26 suggested that this is because people only work together once their basic survival needs are met, suggesting that relationships may be secondary to personal survival. Eight interviewees (25%) supported this theory, stating that people had to help themselves first, before considering others. SD28 considered that this 'survival mentality' may have contributed to officials in formal sources "sharing [aid] but with an eye towards being taken care of [themselves]", an abuse of power considered below. Relationships may also influence a hierarchisation of informal assistance. As SD27 explained, after helping yourself "you look for your parents and your brothers and sisters, your immediate family and then friends". Thus, relationship-based assistance may marginalise those with fewer or no relationships, a situation exacerbated by proximity (or distance).

Trust, Propinquity, and Vested Interests

Thirteen interviewees (41%) mentioned aiding others in the community, and six interviewees (19%) refer to a general coming together of residents to help each other during the crisis. To explain this

phenomenon, SD24 and SD25 refer to similarity of circumstance, which can be understood as propinquity, with the former sharing that "we are still family because we're in the same village". SD11 explained how similarity of circumstance brought her village together despite the absence of relationships:

> [E]verybody there at the river, you make friends with everybody. But you'd never ever meet the same person twice. People were washing their little girls [t]here, and we'd help them shampoo and conditioner. You just sat everybody at the river—everybody had their own problems, some brought food. But by the river, we were all vulnerable because none of us had clothes.

SD16 recounts how one resident with a concrete home sheltered her and others, and how she in turn shared her bar's food and drinks with strangers. SD31 was similarly assisted by people to whom she offered shelter, while SD21 explains how:

> For example, you have my uncle and the guy across the street going to go get supplies. Just because the woman right here, she probably doesn't have a male in the house, got kids, they'll just grab some from whoever's in the neighbourhood, whoever's in the vicinity.

Community trust may have led to 'bartering' for assistance, identified as sources of help by two interviewees (6%) in their Q3-PRISM diagram. Finally, this sense of propinquity born of a common predicament may also have contributed to the support rendered by neighbouring countries and their citizens, sources named by 10 interviewees (31%). It may also explain references by two interviewees (6%) to assistance from the community diaspora.

Power, Mandate, and Corruption

In a disaster context of limited resources and high competition, the official mandate of formal institutions concentrates power and increases reliance on said formal institutions. For example, thanks to their mandate, the Red Cross was able to provide roofs to affected residents, leading SD23 to rank them second in her Q3-PRISM diagram. As she explained, "[without their help] 75% of the villagers' [houses] would be still covered with tarpaulin". As was already suggested in the section on relationships, the interaction of power with other contributing factors can lead to resources being hijacked for ulterior motives.

Twelve interviewees (38%) complained that government officials prioritised political supporters and friends during aid distribution. One interviewee described that "it was a struggle for me to get [aid] because of my political affiliation, because somehow they would say, ridicule me, they say "eh, eh, you coming for food? Our Prime Minister that buy the food for us". Another said that "If you're with them [the government], they will help you. If you're not with them, they will not help you". There was disagreement about the root cause of this phenomenon. For five of the interviewees in question (42%/12 and 16% of 32), the government misappropriation of aid money was a national strategy to gain support for their political party, with two accusing the government of buying votes with aid funding. As one interviewee explained, "He [the Prime Minister] wants everybody to think that the aid that they get is from the government['s political party]", with the result that "people who voted for the government will get two [aid

packages] and then people who they recognise that don't—[that] didn't vote for the government will get none". This perspective may explain D14's personification of all aid as coming from the Prime Minister himself. For four of these interviewees (33%/12 or 13%/32) who accused the government of corruption, there was no such top-down order, instead local officials were to blame. One suggested that:

> There are some things that he [the Prime Minister] maybe did put in place, that were not executed because- because of the divisions- the divisions between local parties [...] at the end of the day, people still carry those things on the inside that are hard to let go of.

This was echoed by another interviewee who explained that while not universal, sometimes "the village council they might be angry with you, and [say] I'm not going to help your family". This suggests an interaction between proximity/propinquity, relationships, and power. As one of the interviewees explained, "[t]hey [the local representatives] knows everybody, it's a small community because the minute you stand at [a] rally, they know where you are [politically]. They know whose party [rally] you would stand at and whose party you would not go to". Other claims of corruption include stories of prioritising wealthy families over impoverished ones, and local officials prioritising their families, as discussed in the relationships section. Corruption reasons notwithstanding, in the words of one interviewee, the end result is that "the people that needed the most help, didn't get help".

The power and mandate associated with formal sources can also have unintended side-effects. SD08 explained that by virtue of their mandate, the structure and responsibility inherent in formal organisations slowed their response, contributing to his claim that after a disaster "you cannot wait for any sort of governmental help", possibly contributing to the choice of informal sources. Finally, the power associated with the role of formal sources in DRR/R can also be misappropriated by informal sources. Three interviewees (9%) used their informal connections to bypass the government's private goods' confiscation; one by knowing the right port-authority people; another by using the formal mandate of the NGO he works for to receive private goods sent; and one by actually impersonating an NGO to bypass vehicle traffic and receive goods sent privately. The concentration effect of disasters on power also affected informal sources, irrespective of formal action. For some it had positive effects, such as SD11 that ranked her life partner first amongst her sources of help because "he did everything, everything". For others, it led to their exclusion because they could not compete for limited resources. Three interviewees share that they were unable to access the aid brought by private citizens because their age and physical condition prevented them gaining access to the beaches below. As D14 recalled, "I can't go down [...] but those that young they would go".

5.3.5 CASE STUDY SUMMARY

Findings from SD confirm the significance of both formal and informal sources of disaster-related information and assistance. Like Longyearbyen, a preference for informal sources of help emerged. Sharing their experiences from previous hurricanes, chief amongst them Hurricane Maria in 2017, interviewees highlighted the importance of relying on multiple sources from across the formality/informality spectrum to overcome limitations of time, distance, and reliability. Interviewees also offered insights into the positive and negative attributes associated with contributing factors across both formal and informal sources.

CHAPTER 6

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ANALYSIS AND DISCUSSION

This research explores informality in and for DRR/R. In short, informal disaster governance or IDG. The preceding chapters have introduced this dissertation (Ch. 1), explored IDG's constituent parts and established a conceptual framework that positions IDG within DS (Ch. 2), presented this research project's methodology (Ch. 3), its specific case studies (SD) (Ch. 4), and the empirical findings (Ch. 5).

This analytical chapter is geared at answering the research questions and fulfilling the objectives outlined in chapter 1 by considering the empirical evidence presented in chapter 4 in light of the conceptual framework developed in chapter 2. The aims of this research were to a) build an understanding of the phenomenon of IDG in Longyearbyen and South Dominica (SD) by examining how residents perceive DG, b) examine the factors that contribute to these perceptions, and c) consider the possible implications for DG. To consider these aims, this research project used the two case studies of Longyearbyen, Svalbard and South Dominica (SD), asking the questions of "How do residents of Longyearbyen and SD perceive the role of IDG within sources of disaster-related information and help", and "What factors influence these perceptions". Additional sub-questions considered "How residents of Longyearbyen and SD perceive IDG/FDG sources", "What contributes to interviewee choice of IDG or FDG", and finally "What are the implications of IDG's role for DG".

In line with these questions, this chapter is divided into (6.1) discussing the relevance and meaning of IDG through the eyes of disaster-affected people without official DRR/R mandates; (6.2) conceptualising IDG further by analysing the reasons why people choose IDG, FDG, or both; (6.3) identifying the often-ignored 'dark sides' of IDG, and (6.4) reflecting on the relevance of IDG (and this research) to DG.

6.1 POSITIONING INFORMALITY IN DRR/R

To begin understanding informality in DRR/R, sections 5.2.3.2, 5.2.4.2, 5.3.3.2, and 5.3.4.2 already began the analysis of IDG. Aimed at measuring the number of mentions per category and, thus, the relative importance people place on the respective sources, labelling sources of disaster information (Q2) and disaster help (Q3) as 'formal', 'informal', or 'mixed' was not clear-cut. From the outset, two challenges emerged. First, there is an irony to defining informality, the attempt to formalise the informal. Chapter

2.4 showed that the simplest but also most simplistic way to understand informality and formality is by treating them as opposites: Informal is what is not formal. However, as shown throughout chapter 2.4, informality and formality cannot be understood in these dualistic terms. Rather, they constitute a spectrum along which the formality or informality of actions and actors is fluid and contextual. Formality and informality exist, but they are not rigid. What is understood as formal or informal sometimes lies in the eye of the beholder, shifting depending on circumstances such as changing norms or who is in power. Formal and informal entities can present similar characteristics such as hierarchical structures or power relations. Hence, one cannot rely on the expected lines of formal entities as structured, rigid and/or hierarchical and informal ones as chaotic, with flat or no hierarchies, and/or flexible to set them apart. Informal actions may be based on long-standing norms and be inflexible but still be informal by virtue of having been pushed into the periphery by changed power configurations. For example, ancient local structures which may share organisational structures with formal institutions, may, in the blink of an eye or over long subtle processes, become informal by being ignored or abolished by formal systems, new laws, policies, or societal norms.

Thus, and second, if pinpointing informality is contextual and situational, the interviews performed during this research project should hold the answers. Yet, as explained in chapter 3, to avoid biasing and/or leading interviewees, neither the terms 'formal' or 'informal', nor any synonyms were used in the interview questions or the interviews in general, unless they were raised by the interviewees themselves. Interestingly, interviewees overwhelmingly did not explicitly characterise the sources they chose as either formal or informal. Rather, a dividing line was drawn between those with an official mandate to inform about or help in disasters, and those without (Ch. 6.2.4). Yet, even the concept of an 'official mandate' can be tricky. If S6 considers a friend working at the local Red Cross chapter to be a source of help, is the emphasis on the Red Cross or the personal connection? To assign a label, the designation of the actor was considered together with the nature of the action itself. In this case, S6 relies on the informal relationship to his friend, as opposed to the formal mechanisms of the Red Cross, revealing the source to be informal in nature.

Assigning a formal or informal label for Q2—sources of information—was especially challenging, due to the lack of clear demarcating lines for various means of accessing information. Newspapers, radio broadcast and television news programmes are amongst traditional formal platforms for disseminating disaster-related information, however, many of these sources are privately owned, raising questions regarding their mandate in 'official' communication strategies. Nevertheless, given the long-standing and continued widespread use of traditional media, such sources and their online equivalents were considered formal. An exception was made for international sources depending on the context. For instance, as previously mentioned, an official radio station may have the mandate to distribute disaster-related information; however, if that source is used unofficially by residents, e.g. from another country, should this source be considered formal or informal?

Thus, the characterisation of sources across the formality-informality spectrum was performed on the basis of both the context and, thus, the nature of each source as per interviewees' statements, and in consultation with the insights derived in chapter 2. While it was possible to establish some sources as either formal or informal within their respective contexts, others defied such a categorisation and were deemed 'mixed'. For instance, in Longyearbyen, social media, was used as an informal source of information by some interviewees, specifically referring to private chats or public (resident) group conversations. Others referred to FDG's use of social media to disseminate official disaster-related information, including sometimes through the aforementioned public groups—thus, making social media a formal source for some. Additionally, many interviewees referred to using it as both informal and formal source while some did not appear to be aware that some information on the local (informal) Facebook group was disseminated through formal actors. The full rationale for characterising each source as either formal, informal or mixed has been provided in the respective sections in chapter 5.

Figure 38 below shows the overall picture for both questions and case studies based on the number of references to formal, informal, or mixed sources.
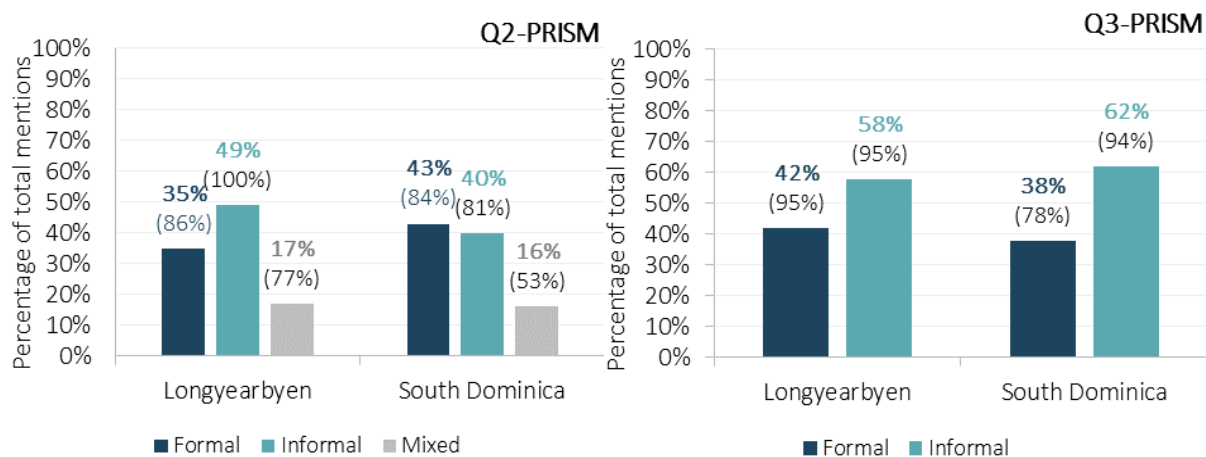
Figure 38. Q2-Q3 PRISM: Number of Formal, Informal, and Mixed Sources of Information (Left) and Help (Right) (Percentage of Total Mentions), and Percentage of Interviewees (Parentheses) Concerned by Location.

6.1.1 TERMINOLOGICAL CONFUSION NOTWITHSTANDING, INFORMAL DISASTER GOVERNANCE IS IMPORTANT

The findings from this research suggest that interviewees in Longyearbyen and SD consider the role of IDG in disasters to be significant. Overall, most interviewees mentioned informal sources of both disaster information and help. Additionally, and with the exception of sources of information in the SD case, more informal than formal sources were mentioned. Longyearbyen and SD present conflicting data concerning sources of information (Q2). Whereas Longyearbyen residents mentioned more informal sources (49% vs. 35%), interviewees in SD mentioned slightly more formal ones (43% vs. 40%). The difficulties associated with determining the formality of sources of information may contribute to the inconsistency between the two case study locations. Accordingly, in both locations, resolving the 'Mixed'

category could affect the overall picture. While there are only small differences in the numbers of formal and informal sources of information, in contrast, analysing the findings for Q3 reveals informal sources of disaster-related assistance outweigh formal ones amongst interviewees in both locations. 58% of all sources of help in Longyearbyen were informal, as were 62% of those in SD, with no 'mixed' category.

The picture that emerges from the above represents interviewees' perceived repertoire of sources and not the preference amongst them. However, considering interviewee preferences amongst sources offers valuable insights into the importance of IDG and FDG respectively. Capitalising on the possibilities of the revised PRISM methodology, chapter 5 provided detailed accounts of such preferences based on interviewee's top-three and top-one 'closest'[49] sources. For the purpose of this analysis, these can be summarised as follows (Figure 39).
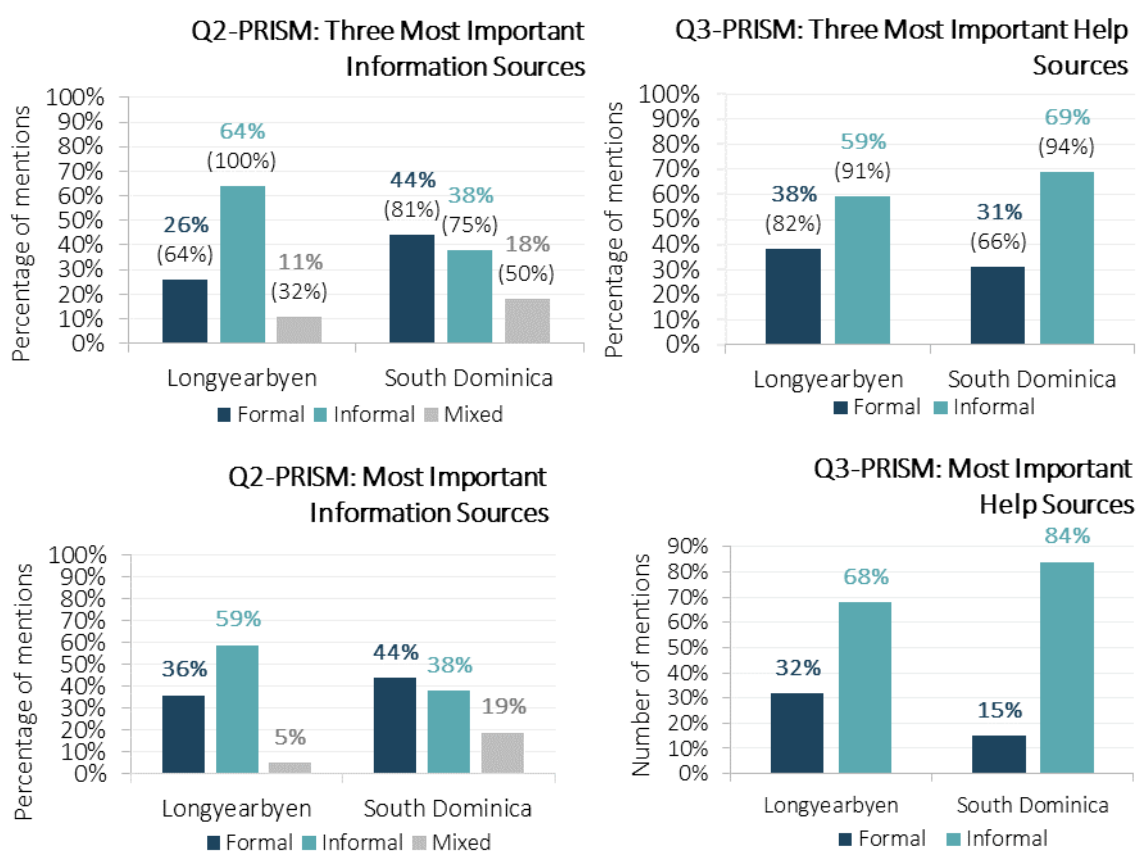
Figure 39. Top-Three (Top) and Top-One (Bottom) Sources of Disaster-Related Information (Q2) (Left) and Help (Q3) (Right) According to Percentage of Sources Mentioned (and Percentage of Interviewees Concerned) by Location and by Designation.

For Longyearbyen interviewees, focusing on the top-three and top-one ranking of sources of information (Q2) confirms and emphasises the preference for informal sources, with the proportion of mentions rising to 64% and 59% respectively. In SD, the dominance of formal sources persists but the proportion of

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[49] As explained in detail in chapter 3, the closer a source is placed next to the disk representing the individual in their respective PRISM board, the more important it is.

mentions only increases slightly from 43% to 44% for both 'preference-based' graphs. For Q3 (sources of help), the preference for informal sources becomes more pronounced as sources are narrowed based on their importance ('closeness') for interviewees. In Longyearbyen, where 58% of all sources mentioned are informal, the proportion rises to 59% amongst the top-three and 68% of the top-one. The picture on SD is similar, and even more pronounced as 62% of all sources mentioned by SD interviewees were informal, compared to 69% of the top-three, and an overwhelming 84% of the most important source (top-one).

Thus, while establishing the superior importance of either formal or informal sources in disaster-related information and help remains inconclusive, the characterisation of sources as (in)formal suggests that both FDG and IDG are significant, while highlighting the fluidity of what is (perceived as) formal or informal. As for their respective importance, the findings highlight an overall preference for informal sources. Stating the obvious, interviewees perceive informal sources both as crucial to informing as well as helping in disasters. Thus, the fact that we do not have an easy way to measure or identify what is informal across the spectrum of contexts and disasters, does not mean that we should not include and work with sources of IDG.

The results presented here are in line with the discussion on informality in chapter 2.4.1. While the term 'informal' is widely used across academic literature (Devas 1999; Alfaro d'Alençon et al., 2018:59–60), it is used loosely and with no agreement regarding its meaning. Despite some scholars' and fields' more critical engagement with the term (e.g. legalist and structuralist schools of thought), informality is still predominantly seen in dualistic terms. That is, informality is viewed as the opposite of formality "often accompanied by an assumption of formality as the 'norm' and informality as an anomaly" (Alfaro d'Alençon et al., 2018:60). However, as chapter 2.4 highlights, there is a range of states between these two extremes which in and of themselves can be contested depending on from which angle one considers them. The findings presented in chapter 5 and discussed above confirm this picture. People's behaviour in disasters with respect to sources of disaster-related information and help is fluid and so is the nature of these sources. This makes it difficult to define any universally valid and practical boundaries. Nonetheless, in most cases it was possible to pinpoint whether a source is formal or informal by virtue of the nature of a concrete practice in a given context which in itself, according to Alfaro d'Alençon et al. is defined by the "connections and actions amongst actors that participate in these [practices]" (2018:60).

A paradox emerges. On the one hand, the insights above, taken from the empirical findings and supported by some of the literature reviewed in chapter 2, allow for an understanding of IDG as *non-mandated disaster-related practices, arrangements, and processes based on informal connections and actions amongst actors that participate in these practices.*

At the same time, IDG considered in this way highlights the fuzziness of the term. Chapter 2 already mentioned that informality is, thus, often referred to as ephemeral in DS. In other fields, including the

related fields of urban studies, the discussion of informality has taken more of a centre-stage in which its dualistic and normative understandings have been challenged (Ch. 2.4.3). However, scholars such as Roy (2005, 2010, 2011), McFarlane (2012), Yiftachel (2009), and Alfaro d'Alençon (2018) have highlighted the significance of 'working' with informality over the mere pursuit of defining it. That is, to challenge the normative label of informality as anomaly and instead "recognise the agency of marginalised populations" (Alfaro d'Alençon, 2018:60). A wider understanding of the term 'marginalised' is key. The dualism underlying informality does not only relate to informality as the antonym of formality but also to the characterisation of its agents across marginalising factors: poverty, ethnicity, or gender, to name a few. However, as some scholars highlight, informality is not only related to the poor or, as it is often portrayed, the 'global South' but is equally embedded in the practices of middle classes in the 'global north' (Alfaro d'Alençon et al., 2018; McFarlane, 2012; Roy, 2011). Similarly, the evidence collected by this research project suggests that IDG matters across the spectrum of disaster-affected populations. Both in Longyearbyen and SD, interviews represented a range of societal backgrounds with little or no noteworthy difference between them in their perception of IDG's importance to them or reliance on IDG actors and practices.

6.1.2 DISPELLING THE FUNCTIONALIST NOTION: PEOPLE CHOOSE INFORMAL DISASTER GOVERNANCE IRRESPECTIVE OF FORMAL DISASTER GOVERNANCE

The findings show that both FDG and IDG are important in both Longyearbyen and SD. The narrowed focus on the Top-Three and Top-One sources of information and help (Figure 39) reveals a higher preference for IDG in SD than in Longyearbyen. A possible explanation for this difference lies in the interviewees' perceived disaster experience. 100% of SD's interviewees expressed having experienced a disaster first-hand, while in Longyearbyen only six interviewees (27%) did, with ten (45%) referring to experiencing disasters that only 'indirectly' affected them. For instance, S1 was present during the 2015 avalanche but her home was not affected, while S4 herself was not present but still referred to her friends' and parents' presence in Longyearbyen during the 2015 avalanche as 'indirect' disaster experience.

The effect of this difference is threefold. First, and consistent with structural explanations of informality (Ch. 2.4), Dominica's already financially under-resourced FDG's mechanisms have been further battered by the regular occurrence of disasters, negatively impacting their efficiency and effectiveness. As Dominica was experiencing Hurricane Maria in 2017, it had still not recovered from Tropical Storm Erika two years earlier. Thus, interviewees had direct experiences that showed them that FDG cannot be necessarily relied upon. Secondly, this perception is deepened by references by six interviewees (19%) to Dominica's FDG as corrupt and/or unaware of or insensitive towards marginalised segments of Dominica's population (e.g. people living in less accessible areas, women, unregistered foreigners, political 'opponents') and, thus, again perceived as a failure by some. Third, SD interviewees' first-hand and repeated experience with disasters, often in combination with contributing factors such as relationships and resulting networks,

encourages taking initiative rather than waiting on FDG to come, which may never happen, a claim supported by the omission of government as a source of assistance by 14 interviewees (44%), and of FDG entirely by seven (22%).

In contrast, Longyearbyen's FDG is perceived as more robust. This is partially due to it being more resourced, in turn, partially motivated by Svalbard's arguably 'harsh' conditions, and the high-level geo-political interest from Oslo to maintain a feasible presence in Arctic conditions. The combination of, thus far, less debilitating disasters, stronger, more accountable and vested institutions, and (to an extent as a result) resident's firmer trust in these, leads residents to perceive FDG as more reliable and successful. Still, nearly all of interviewees in Longyearbyen also referred to informal sources of help which, overall, outweigh formal ones even if by a smaller margin than in SD. However, that is not to say that Longyearbyen interviewees did not have grievances with FDG. As was discussed in the findings, four interviewees (18%) were dissatisfied with the government's lack of forewarning for residents living in the designated avalanche 'red zone', and/or deemed preparedness and warning measures ineffective. It is also conceivable that the discontent surrounding the 2015 avalanche over the lack of pre-established avalanche early warning systems as well as local emergency services' lack of urban search and rescue training despite existing precedents (Indreiten & Svarstad, 2016a, 2016b), also contributed to interviewee doubt vis-à-vis Longyearbyen's emergency services. Such incidents notwithstanding, combined Q3 mentions of the Governor's Office and emergency services cover 91% of Longyearbyen interviewees, compared with just 56% of interviewees on SD, suggesting high levels of trust in FDG. Still, nearly all interviewees in Longyearbyen (95%) also referred to informal sources of help which, overall, outweigh formal ones even if by a smaller margin than in SD.

This difference between Longyearbyen and SD as well as the seeming inconsistencies concerning Longyearbyen interviewees' attitudes towards FDG challenge the prevalent view that IDG occurs primarily due to FDG 'failure'. Insufficient or otherwise negatively perceived FDG emerges as an important factor in highlighting informal sources of both disaster-related information and help. However, the fact that in Longyearbyen IDG outweighs FDG despite overwhelming trust in, and reliance on what is perceived as effective FDG, highlights that IDG is an important tool or mode of operation irrespective of FDG's success. Longyearbyen interviewees' apparent trust in formal institutions does not preclude engagement with informal actors or action, let alone a preference for the latter. The implication is that the motivations driving informality are only partially connected to FDG's performance. Further, as the two case studies show, the IDG discussed here is by no means unique to so-called 'developing countries' as some of the related literature has been critiqued of (Alfaro d'Alençon et al., 2018; Ledeneva et al., 2018). Often, this assumption is made based on the argument that developing states have weaker institutions, and so, also FDG systems. Thus, again the underlying argument is that FDG failures, however defined, drive informality. Yet, in both locations, which on the development scale differ significantly, this research shows that IDG is important to and present in both locations and the motivations driving

informality are only partially connected to FDG's performance. Figure 40 shows a simplified representation of IDG's as both occurring independently of, and overlapping with, FDG.
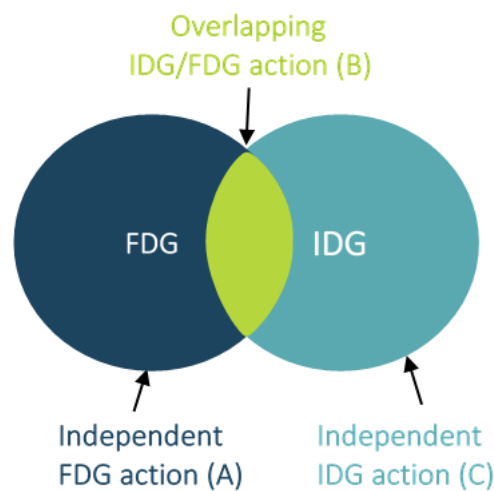
Figure 40. Conceptual Representation of the Space (B) Where IDG Occurs Irrespective of FDG.

This focus on extrinsic factors (functional/systemic) in driving informality is also common to other academic disciplines. Friedman et al.'s (2000) acclaimed study of the determinants of informal economic activities in 69 countries finds that tax rates, over-regulation, the legal environment, corruption, and public finance serve as key driving factors. In urban studies, Kamete explores urban informality in Southern Africa and finds that "the growth of [urban] informality is in many ways a direct response to the inability of the formality to deliver land, housing and jobs" (2013:28). The list of examples goes on. There is an undeniable logic to this. Unsustainable formal practices and frameworks—whether corruption's negative knock-off effects or ineffective FDG—create either the necessity or incentives for people to meet their needs and/or wants informaly. However, this research project—by directly asking people for the reasons behind their reliance on (in)formal actors and actions—shows that factors such as proximity/propinquity, experience, relationships, and power dynamics drive IDG irrespective of FDG successes and failures. The importance of such 'intrinsic' or underlying factors for people to informally act on DRR/R matters is commons sense and not new. However, the significance of such factors in determining individual choice of, and trust in, FDG and/or IDG remains underappreciated, and is investigated in the following four sections.

6.2 WHY DO PEOPLE CHOOSE FORMAL AND/OR INFORMAL DISASTER GOVERNANCE?

Having established the importance of informality in disasters as well as how this fluid concept may be understood within the disaster context, this sub-chapter reconsiders the empirical data derived through the interviews to explore the factors associated with the role of informal sources of information and help in DG. Specifically, it seeks to answer the question of: *What drives people to choose informal or formal sources of disaster-information and help?* Answering this question requires consideration of the reasons interviewees stated and discussed to explain their choices in the PRISM diagrams. As outlined in chapters 3 and 5, a template analysis was performed. The initial and final coding templates can be found in Appendices F and G. By analysing the factors that contributed to interviewee answers to each of the three questions across both case study locations, four dominant themes emerge. The results challenge the functionalist argument that informality is primarily driven by FDG (failure) (6.1.2), revealing that a combination of proximity (and propinquity), relationships, experience, and power influence interviewee choices of (in)formal sources of information and help. By considering these four themes, this study suggests that FDG and IDG are inter- but also independent.

6.2.1 PROXIMITY, PROPINQUITY, AND VESTED INTERESTS

Interviewees in both Longyearbyen and SD referred to proximity as a key driver for IDG—particularly as it refers to the provision of informal disaster assistance. The importance of proximity can be broken down into delivery speed and accessibility of disaster aid; local knowledge; and vested interest in long-term recovery and DRR/R. The limitations of proximity, and its role in IDG and FDG are considered next. A critical discussion of current attempts to leverage proximity in DS concludes this section. Notably, proximity can also refer to psychological proximity, which is further explored in this section as propinquity, and also in chapter 6.2.3 in the context of relationships.

6.2.1.1 Delivery Speed and Accessibility of Disaster Aid—Being 'There' Overcomes Communication and Transportation Barriers

Longyearbyen and SD interviewees perceived people in their immediate vicinity as the most likely sources of disaster assistance, showing the importance placed on the availability of immediate help. As was noted by three interviewees in each location, proximity begins with self, and the ability to support oneself. This perception was further strengthened through the relative isolation of both locations—Svalbard as an Arctic archipelago, and Dominica as an independent Caribbean island-nation—where outside help would not be easily forthcoming. Interviewees on Longyearbyen emphasised how Arctic conditions dictate particularly fast disaster response. The December 2015 avalanche disaster (during Svalbard's polar night period) underscored the reality that formal first responders (i.e. emergency services) are unlikely to be the first on scene, even in relatively small, contained locations such as Longyearbyen that have well-established SAR-

teams available within a few hundred metres of distance. In Longyearbyen, the local hospital is approximately 200 metres away from the location of the incident and formal first responders arrived on scene after 10–15 minutes. Nonetheless, as interviewees and the limited literature available on this incident confirm, by the time SAR-teams arrived on scene, survivors and nearby Longyearbyen residents were already on site and engaged in rescue efforts (Indreiten & Svarstad, 2016a; Tengesdal & Kruke, 2018).

Similarly, interviewees in SD attested to the importance of disaster help by people closest to them due to the damage caused to transportation and communication infrastructure. Referring especially to Hurricane Maria in 2017, interviewees experienced being physically cut off from Dominica's capital, Roseau, from where water, electricity, food, and other services typically come. In some cases, interviewees referred to being cut off for weeks without receiving any help. In the case of the village of Delice on SD's East coast, interviewees reported having to send villagers—mainly young men who had not suffered any, or only few, injuries—to cross the mountains separating them from Roseau, to get supplies and solicit the authorities' help, including to restore electricity (which was not reinstated until several months later). Similarly, in Scott's Head at the southern tip of Dominica, interviewees reported receiving informal help from other nearby islands long before Dominica's own FDG services reached them. In both cases people in one's proximity were perceived as those most likely to help them, a finding supported by research across DS and a core principle underlying concepts of self-help, emergence, convergence, (spontaneous) volunteerism, or zero-order responders, as outlined in chapter 2.4 (Briones et al., 2018; cf. Nelson, 1973; Roasa, 2013; Stallings & Quarantelli, 1985; Twigg & Mosel, 2017; Whittaker et al., 2015).

6.2.1.2 Access to Local Knowledge and Context

Proximity also refers to the knowledge necessary for effective DRR/R. The importance of local knowledge and the knowledge transfer between local actors and FDG has become a fundamental principle of participatory and community-based approaches to DRR/R (Curato & Calamba, 2020; Miller & Douglass, 2016a; Weichselgartner & Pigeon, 2015). As both the 2015 Longyearbyen avalanche showcases, local knowledge was essential both for residents' actions prior to the arrival of SAR teams as well as for the active guidance of FDG efforts once SAR teams were on site—the latter constituting an element rarely considered by DS and FDG practitioners. Specifically, Longyearbyen's SAR teams were prepared for rescue missions outside of the settlement but lacked the knowledge and training when it came to rescuing people from under collapsed buildings (Indreiten & Svarstad, 2016a:359–360). Essential information from informal actors, in this case neighbours, friends, and other knowledgeable bystanders, was crucial to understand the interior layout of the destroyed structures and to determine the best course of action for the rescue operation while minimising the risk of causing further harm to the victims. Similar experiences were made with respect the later 2017 avalanche as well as other incidents and emergencies across Svalbard, as outlined in 4.1.2 (Tengesdal & Kruke, 2018). The collaboration during the incident,

particularly SAR teams actively seeking to engage rather than replace IDG actors and knowledge on site, was recalled by the interviewees in particularly positive terms.

At the same time, UNIS Arctic Safety Centre researchers Indreiten and Svarstad, both of whom had been involved in leading and directing the rescue efforts following the avalanche, conclude from their reflections concerning the incident:

> The high numbers of volunteers need leadership and direction otherwise the scene could be chaotic and over-complex. [They are] a resource when it is used well, but this indicates multi-level leadership through the whole rescue operation. We experienced that the avalanche rescue competence among the members in the Red Cross avalanche group was best used as leaders for the volunteers, instead of shoveling, they were leaders for the different teams put together of volunteers. (Indreiten & Svarstad, 2016a:359)

This statement is consistent with FDG's views of IDG as outlined in chapter 2. The issue here is not necessarily that a large influx of volunteers requires some management. The example of the Israeli organisation *Lev Echad* provided in 2.4.2, illustrates how Israel's volunteering culture cumulated in the establishment of an organisation (initially an informal effort) to absorb the large influx of volunteers and match them with FDG needs, as communicated by municipalities and Israel's main FDG organisations. However, the difference in the statement above stems from the limited role attributed to these 'volunteers'. This is despite the fact that the authors, as well as interviewees for this study, acknowledge the invaluable role of informal responders beyond 'shoveling'. In fact, not only were IDG actors guiding FDG rescue efforts with critical knowledge about the destroyed buildings' interior layout, as the avalanche occurred, many of the formal first responders were notified using IDG communication infrastructure, namely, Longyearbyen's informal Facebook group (Ch. 6.4.2) (Indreiten & Svarstad, 2016a; Tengesdal & Kruke, 2018). Nonetheless, in the paper's section "What did we learn", the authors do not deduct the necessity for a different mode of FDG-IDG cooperation beyond 'managing volunteers', even though these were more partners than volunteers.

6.2.1.3 Empathy, Propinquity, and Vested Interests

Interviewees also referred to the perceived vested interest of people in their proximity. That is, interviewees largely assumed that seeing disaster-affected people will naturally propel bystanders—understood as people in one's proximity but unaffected by the disaster—to extend aid. Some disaster studies, especially earlier ones, have explored the psychological reasons behind such informal behaviour in disasters. Walster and Pilivian (1972) and Lerner (1970) described the phenomenon in psychological terms of equity theory, according to which the inequitable situation between disaster-affected people and bystanders creates psychological distress, a form of psychological arousal which elicits bystanders' motivation to respond. Others refer to intrinsic motivators such as empathy, sympathy, or altruism (Banfield & Dovidio, 2012; Barton, 1969; Dynes, 1994b; Russell & Mentzel, 1990; Shaskolsky, 1967). Moreover, such vested interest is also perceived to extend both to long-term help, much later after most

FDG actors have left, as well as to DRR activities in particular, long before FDG actors show interest to act. In Longyearbyen, the latter can be seen, for instance, through references to resident initiatives vis-à-vis pollution in the settlement and surrounding areas (Kelman et al., 2020). Prominently, informal pollution-related efforts have been driven by an informal team developing 'Project Isfjorden' (Miljødirektoratet et al., 2018), now in its third year, which has collected and removed several tons of plastic waste from Svalbard's shores. 'Voluntourism' initiatives by ship tourism operators, such as 'Clean Up Svalbard' (AECO, 2014) which is now in effect, combine tours with cleaning up trash around Svalbard.

Additionally, considering proximity within the wider context of propinquity—understood as the physical and psychological 'closeness' of people—explains how individuals nearby are more likely to care about disaster-affected people due to a feeling of care and responsibility towards one's neighbours and fellow members of the 'community' based on psychological impulse (Drabek et al., 1975; Neal et al., 1988; Young, 1954). Propinquity also has a reciprocal relationship on asking for assistance based on physical and psychological proximity (Neal et al., 1988:373). Conversely, Smith suggests that such intrinsic factors are not the only contributors to informal disaster behaviour; extrinsic factors—e.g. neighbours' vested interest in removing logistical bottlenecks that may affect them, as well as political and other power-related agendas—need to be equally considered (Smith, 1981).

6.2.1.4   Proximity is Not Always an Enabler

The above tension between the assumption of largely positively connotated intrinsic factors motivating people in, or near, a disaster site to extend their help, and extrinsic factors which may or may not be positive, is also reflected by this study. Despite proximity being stated as a key driver of IDG in both locations, there was also a pronounced difference between interviewees in Longyearbyen and SD in their perceptions of the importance of proximity. As stated above, for interviewees on Longyearbyen the provision of informal disaster assistance is directly tied to other people nearby. However, this perception is limited in that it is predominantly based on 'common sense expectations' and limited disaster experience. Most people on Longyearbyen experienced disasters only indirectly and/or disasters that were relatively contained in scope.

In contrast, interviewees on SD, all of whom experienced (debilitating) disasters, revealed that proximity was also a limiting factor. Put simply, when facing a disaster, people in one's vicinity are more likely to be similarly affected, and, therefore, unable to help. In a large-scale disaster such as Hurricane Maria in Dominica, the scale and scope of the impact may limit the ability to receive aid from people nearby. This is particularly true if considered within the vulnerability paradigm discussed in section 2.1. Vulnerable populations may be concentrated in a single area, for example poor people living on more affordable land in flood plains, leading to disproportionate impact in the immediate vicinity when compared to other locations (cf. Wisner et al, 2004:201–242).

The findings of this research show that severely disaster-affected people may not have the resources to support others regardless of proximity or propinquity. As research into the link between disaster assistance and proximity suggests, even in the case of medium- to low-impacted households, "Subjective deprivation reduces the sense of being morally required to help" (Barton, 1969:263–264; cf. Nelson 1973). Additionally, the positive factors linked with human proximity may be challenged by the limitation of resources of a physical space, and the resulting survival instincts of those in it. For example, SD12 shares that she was looted by acquaintances in the community, while SD28 tells the story of a community that assisted each other only after together looting a neighbouring warehouse to meet their basic needs.

Similarly, if proximity is an enabler of aid, then those in remote locations may find themselves marginalised. In an Arctic climate such as Longyearbyen's, being far away from a source of assistance may prove fatal, as explained by L14. In SD, interviewees referred to being excluded from aid due to the distance and difficulty of access from the capital. Here too, applying a vulnerability lens suggests that people in remote locations—already more vulnerable due to their distance from essential services—are less likely to receive FDG assistance. This finding corroborates previous data. For example, in Nepal after the 2015 earthquake, FDG actors struggled to reach 230,000 affected people amongst already vulnerable mountainous populations (IFRC, 2018:59). This marginalisation of remote populations can be further compounded by insecurity. In Syria and Somalia for instance, where conflict and the targeting of aid workers severely hampers access, aid efforts are restricted to safer zones—often the main urban centres that can be easily protected—with the result being that those in remote locations are both more at risk and receive less support from FDG actors. In such cases, the role of IDG has been highlighted as a possible solution (Haddad & Svoboda, 2017; Stoddard & Jillani, 2016).

6.2.1.5 Implications for Formal/Informal Disaster Governance

The influence of proximity on interviewees' DG-related choices may have contributed to the preference for IDG as a source of help. While local FDG actors such as the local council or the governor were mentioned, on average, people tend to be in closer physical proximity to informal actors than formal ones. This is also true for individuals working within FDG, who despite their profession spend much of their time away from work. Thus, it would follow that if proximity is a strong driver of disaster assistance, then it would lead to a preference for IDG. Additionally, in contrast to IDG, FDG only operates on the principle of proximity in a limited way. Assistance rendered by IDG can be on a 'first-come-first-served' basis, whereas FDG must follow directives and policies that may prohibit such action. While some FDG actors, e.g. a local council or local Red Cross chapter, operate on some basis of geographical proximity, this does not translate to helping people that they 'see' first. At least in principle, FDG operates instead on the principle of vulnerability, equal distribution, and mandate (e.g. IFRC code of conduct[50]).

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[50] See: https://media.ifrc.org/ifrc/who-we-are/the-movement/code-of-conduct/

Interviewees on SD corroborate this argument, referring to the bureaucratic procedures associated with receiving FDG assistance, and the delays involved.

However, FDG's modus operandi does, in theory, reduce the marginalisation of, for instance, those in remote locations, or people with disabilities. SD14 shares how she could not access aid given by private individuals from neighbouring islands because of her age and the steep slope to the beach. Similarly, proximity does not guarantee propinquity, and other factors may limit or nullify the benefits of physical proximity. For instance, in urban settings, wealthy neighbourhoods may share borders with extremely impoverished ones, but that may not contribute to IDG actors helping each other across those lines (Roasa, 2013). Additionally, proximity-driven disaster-related access may marginalise foreigners, who do not have access to local knowledge or may not benefit from propinquity. These forms of discrimination should not theoretically occur with FDG, whose mandate is supposed to ensure equal distribution. In practice the reality may be different, as discussed in the sections on relationships and power, 6.2.3 and 6.2.4 respectively. Conversely, IDG's emphasis on proximity can sometimes mean the difference between life and death, as in the case of the 2015 Longyearbyen avalanche where neighbours and townspeople were first on the scene, and of critical significance.

6.2.1.6   Operationalising Informal Disaster Governance–Focused Proximity

The importance of proximity for informal disaster assistance is well-documented in DS, though not always directly theorised. Concepts such as emergence, volunteerism, or self-help, emphasise the operational aspects of how disasters encourage spontaneous, informal responses by the people in and/or near the disaster site usually well before FDG actors arrive (Ch. 2.3) (Briones et al., 2018; cf. Nelson, 1973; Roasa, 2013; Stallings & Quarantelli, 1985; Twigg & Mosel, 2017; Whittaker et al., 2015). Activities carried out cover the gamut of disaster response—SAR, shelter provision, medical and emotional aid, restoring basic services (e.g. communications, electricity, water), clearing debris, or rebuilding (Roasa, 2013; Stallings & Quarantelli, 1985; Whittaker et al., 2015). These informal actors have sometimes been deemed 'first responders'—a term which strictly speaking, refers to formal emergency services. More recently, some scholars have begun to distinguish between first responders and the efforts by informal actors in the immediate aftermath of a disaster as 'zero-order responders' to distinguish them from one another (Briones et al., 2018; Cutter, 2018). The case of the 2015 Longyearbyen avalanche, detailed in 6.2.3, further illustrates the potential contribution of proximity-driven IDG to DG.

However, limiting IDG as being primarily driven by proximity is inaccurate. Partially, this notion is strengthened by the often exclusively positive connotation of the concept of 'community' and is deeply rooted in DS literature. Fritz' (1961) and Barton's (1969) 'therapeutic' or 'altruistic community', Turner's

"resurgence of mechanical solidarity" (1967:62), or Shaskolsky's "acts of altruism" (1967:8) come to mind. Since then, a constant stream of disaster literature has attested to the important role of 'community'. However, as far as critics are concerned, it often wrongly presupposes geographic proximity as the underlying yet problematic 'glue' that binds people together and that, in a disaster, will propel them to come together and step in for one another (Titz et al., 2018). The findings of this research project corroborate such scholarly critique of the community concept.

Limitations notwithstanding, proximity-driven informal disaster response is an important resource for FDG. Decentralising and localising FDG and the implementation of participatory approaches have been the main tools to date to try and embrace the value of proximity in the sense of both physical/logistical proximity as well as the relationship-building inherent to this approach (Miller & Douglass, 2016a). However, despite the field's governance turn which, in theory, places a premium on utilising multiple stakeholders and their resources, informal actors are rarely incorporated by FDG (Twigg & Mosel, 2017). Decentralisation of DG predominantly focuses on decentralising DRR/R power and mandate to local (or upwards to international) formal bodies such as local governments while informal actors are, in theory, acknowledged, but they are not always identified as being linked, essential, constructive, and complementary agents to formal structures. Instead, informal actors are often supplanted by arriving external forces. In doing so, local context, power dynamics, and formal and informal local efforts are often disregarded.

This non-engagement is puzzling, especially considering IDG's reach. As this research project's case studies show, proximity in disasters may well lead to IDG taking on an international—and, thus, political— nature. Although interviewees in Longyearbyen did not directly refer to cases in which they actively reached out to their Russian counterparts in Barentsburg for disaster help, they did with respect to DRR. IDG action on DRR from a political perspective may be viewed as less contentious than IDG on DR issues but examples of disasters around the globe, including here in the case of SD, show that IDG actors do reach out across borders for DR. More crippling disasters may lead to a situation where such help is necessary and solicited, irrespective of the official diplomatic relations between, in this case, Norway and Russia. Such possibilities lead to extrapolating this situational principle, where the concept of the bordered identity-specific nation-state is challenged not just by constructivist and/or proximity-driven IR theories, but also by globalisation, and by the general interconnectedness phenomena that is presently occurring. The emerging model seems to posit an amalgamating or fusing of identities that, in turn, generate a spectrum of activities that effectively may ignore borders and thereby bypass or over-rule traditional (static) notions of the 'identities-borders-orders' triad (Albert et al., 2001; Vertovec, 2009:86–90). Boulding's concept of the 'loss of strength gradient' (1962) as well as other scholastic claims that proximity and not frontiers/boundaries is the determinator/motivator of human interaction (for a detailed discussion, see Starr & Thomas, 2002) are powerful arguments that informal interactions that transcend existing political realities may be difficult to reverse or refute/negate, fuelling new strategically consequential geopolitics.

(Toope, 2008; Tsai, 2006; Wolf & Pfohl, 2014). In this way, IDG significantly links to political and power dynamics which are discussed in section 6.2.4.

6.2.2   RELATIONSHIPS AND TRUST

6.2.2.1   Relationships and the Trust They Engender

The evidence from both SD and Longyearbyen suggests that relationships strongly influence the choices of disaster-related information and help, with friends, family, and work colleagues amongst the sources most mentioned by interviewees during both Q2 and Q3. The importance of relationships is demonstrated through the vested interests on which they rely, trust they build, and access to resources that they provide. Discussion, trust, and credibility—factors that have DG implications—are considered next. Providing balance, relationships as an excluder is then briefly explored. This is followed by a discussion of the perceived association of relationships with IDG, while the treatment of relationships in this context within DS concludes this section.

6.2.2.2   Vested interests—Human Nature, Propinquity and Beyond

The link between proximity/propinquity and relationship-building (Drabek et al., 1975; Nahemow & Lawton, 1975; Colistra et al. 2019) suggests that the significance of relationships in disasters is driven by the importance of proximity and propinquity, as discussed in the previous sections (6.2.1). In other words, family, friends, and neighbours may be viewed as significant sources of disaster-related information and assistance because they are typically in close physical proximity, a factor that may have kindled the relationship in the first place. However, references by interviewees in both Longyearbyen and SD to family and friends abroad also indicates otherwise, particularly in the latter location where the scale of the 2017 Hurricane Maria disaster reduced the significance of proximity-only-based sources. An alternate, and commonly stated reason for why people with whom one has close relationships are so important for disaster assistance is the perception that they are more emotionally invested and, thus, more likely to help in the first place, and to help quickly. SD28 supports this notion, explaining that "[proximity is important but] well obviously with relationships with people you know, there's going to be a bit more [...] involvement". L01 adds that "family you can trust because they are emotionally invested, they are interested in helping". For those with whom there is a strong link (e.g. family and friends), there is the added attribute of 'knowing' the person, and, therefore, being better acquainted with their needs. As SD09 explains, "family know what I need".

Drabek et al. (1975) highlight the importance of kin as a source of help in disasters and link the frequency of interaction between family members with the amount of help received and offered in disaster contexts. The research on this issue is inconclusive. Neal et al. (1988) suggest that as opposed to assistance through other forms of relationship such as friends or neighbours that may be based on reciprocal terms, family-

based support may result from a sense of duty towards one another; though such factors may vary depending on the cultural and social norms (Binder & Baker, 2016; Elliott & Pais, 2006; Erikson, 1976; Lee & Sung, 1998). Conversely, Marcum et al. (2017) find reciprocity a more prevalent factor in family-based support while suggesting imbalanced reciprocity within friendship ties and, thus, their deactivation, particularly over time in, in long-term disaster recovery. However, if unsupported by FDG, relying on family-based support may also result in burdening, overwhelming, and entrenching, as well as creating new, vulnerabilities (Meyer, 2017). Motivations notwithstanding, relationships offer an impetus for giving and receiving disaster-related assistance that goes 'beyond' the intrinsic factors, proximity, and propinquity mentioned in 6.2.1, though the latter two can be catalysts for relationships as well (Nahemow & Lawton, 1975). They offer direct access to resources and potentially to a network of additional support extending far beyond direct links (Carrero et al., 2018; Faas & Jones, 2017; Parthasarathy, 2015; Roasa, 2013). Depending on the quality and strength of the bond, relationships also provide credibility, a feature which was especially important to interviewees when sifting through disaster-related information.

6.2.2.3 Trust: Overcoming Stigma

Relationships can provide a bridge to requesting assistance. L06 explains how for "financial [assistance], it's always easy to approach family [...] they know me. The support is coming from someone you've had a long-time interaction with". However, asking for help may also be challenged by overcoming stigmas and is, thus, not always straightforward. L9 and L18 verbalise such a stigma, explaining that it is very hard to request assistance, and they would both try to help themselves first before asking others for help. Asking for help is perceived to be psychologically 'costly'. It can negatively affect the self-confidence and self-respect of the person making the request and impact the power dynamics inherent in the relationship with the 'giver'. The request may also be refused, be perceived as costly to the giver, or result in feelings of indebtedness, all of which may lead to self-stigmatisation and inhibit requesting help in the first place (DePaulo & Fisher, 1980; Fothergill, 2003; Kwesell & Jung, 2019). Further, the stigma can be compounded when in social settings, as revealed by social impact theory (Latané, 1981).

The example of the 'Super Puma Club' in Longyearbyen is a case in point. The perception of the settlement, and the archipelago of Svalbard as a whole, to be a place for resilient, self-sufficient people used to hardship, stigmatises asking for help. Both L9 and L18 link their hesitancy in soliciting help to the location and the associated stereotype. L9 shares that "I don't ask for help here. It's very difficult". This stigma has taken the form of the fictious 'Super Puma Club' (after the AS332 Super Puma Helicopter used to rescue people) which people who request formal emergency help are risking to involuntary join, particularly if the perception is that they have brought the emergency upon themselves. L21, a member of the local emergency services explains; "imagine that story and how that affects people. They don't want to look stupid, they don't want to join the Super Puma Club". This association has very real implications during emergencies, with people hesitant to ask for formal help, perhaps endangering their lives due to

the associated shame. In such cases, having relationships with whom one feels comfortable, can be a critical source of assistance. L05 explains that a personal connection with someone at the emergency services could make the difference between her calling the said services, or not doing so.

6.2.2.4   (Priority) Access to Resources

For both Longyearbyen and SD interviewees, relationships provide a means of gaining priority access to resources, when and if needed. Simply put, after a crisis "everybody has their own problem. But when you know one another [...] it's different" (SD24). This extends from informal information to informal forms of assistance, including physical assistance, relief items, financial contributions, and emotional support. In SD, where the scale of Hurricane Maria reduced the significance of proximity as a contributing factor to receiving assistance (cd. 6.2.1), relationships abroad were particularly important in providing access to resources, specifically emotional support. Further, the level of support received (or given) may be linked to the relationship in question. SD27 explains that after helping oneself "you look for your parents and your brothers and sisters, your immediate family and then friends", a position supported by SD22's assertion that "family always comes first". Though this may not be true for everyone, nor in every culture and social context, the strength of a particular bond may determine its level of priority with the other participant involved. Both case study locations also highlight the role of informal relationships in overcoming functional and geographic boundaries which are one of the key elements to impede FDG efforts (Ch. 2.3). In hurricane-affected SD, private citizens from the neighbouring French islands of Guadeloupe and Martinique, with a connection to an isolated coastal community, provided support before the Dominican government could—showing the power of relationships to overcome physical and political boundaries.

Another related factor is the ability of relationships to overcome a lack of expertise, experience, and/or grant access to a larger network of relationships (Parthasarathy, 2015). For example, L06 and L19 refer to friends who have more expertise than them (the experience of others is further discussed in 6.2.3). In this context, interviewees such as L06 emphasised their informal relationships with disaster-relevant experts, revealing that the perceived credibility of official information sources (that informal ones may lack), could be augmented by the advantage of being able to informally discuss an issue, thereby leading to the crafting of a more tailor-made, informed course of action for oneself and others. The use of relationships to tap into a wider network was particularly pronounced amongst interviewees in both locations when it came to disaster-related information, providing an outlet to discuss different perspectives, and corroborate information. Essentially, the intersection of relationships and credibility highlights the importance of trust and a multiplicity of perspectives for disaster-related information, which are the topics of the next section.

6.2.2.5 Discussion, Trust, and Credibility

In both case study locations, interviewees expressed doubt over the trustworthiness of formal and informal disaster information, prompting a clear preference for relying on a multiplicity of input and perspectives, with most interviewees mentioning that both formal and informal sources are important to them. While the credibility of formal sources is determined by their mandate (6.2.4) and interviewees' experiences (6.2.3), informal sources offer something that formal ones generally cannot or do not: the possibility to draw on relationships and actively discuss the information as well as connect such information to peoples' experiences and/or stories passed on by family members or friends. Concerning the latter, information that is passed on through stories of experiences with which interviewees have an intimate relationship, was considered particularly trustworthy across the interviews in Longyearbyen and SD. For instance, such information may be more specific to an individual's personal context and be, thus, more relevant. As for the former, informal exchange of disaster-related information enables people to actively engage with knowledge rather than just absorb it. Debating incoming information from multiple sources not only helps establish its credibility, but, according to Longyearbyen and SD, also entails ownership. That is, by allowing individuals to process information together, possible DRR/R actions may be enabled/catalysed as the concrete examples mentioned above and across both case study location demonstrate. Through its deeper engagement with disaster information, this informal exchange opens up avenues for people's activism and the exercising of accountability both mutually as well as for/on FDG actors (6.2.4).

Additionally, informal sources of disaster information were perceived as being more available. This may sound strange and a factor possibly better placed under the theme of 'availability of information' rather than relationships, particularly when considering the 'information age' in which we live, with information being readily available 24/7 online. Yet, when considering people's preference for active engagement with such information, interviewees' perception of formal information being less available starts to make sense. This may be partially due to language barriers as those experienced by the sizable international community in Longyearbyen, where informal disaster information sources became particularly important in the translation from the predominantly Norwegian sources into English, Russian, or Thai.

6.2.2.6 Relationships as an Excluder—the 'Dark Sides'

Whether it is by providing the impetus to assist others, easing the stigma associated with requesting help, or granting access to resources and credible information, the advantages that relationships can offer in disaster situations are clear. However, there are drawbacks as well. First, considering relationships an important factor in disasters means that those with fewer relationship, at least in the disaster location (e.g. foreigners), may be at a disadvantage. For example, those without accessible family, such as SD31 or Longyearbyen's foreign workers (e.g. the sizable Thai population working across Longyearbyen's gastronomy sector), may not be able to rely on that network. Additionally, as the latter case shows, assuming relationships or a functioning network based on presumed similarities (e.g. an ethnic identity)

is not necessarily a driver of relationships (Ch. 6.2.1). L10, after spending years in Norway and Longyearbyen, confirms that while relationships within Longyearbyen's foreign populations exist, not only are there individuals who are not engaging within those (e.g. due to preferences and/or the high turnover of foreign workers in Longyearbyen), but relationships outside of this 'group', namely, with Norwegian nationals who speak the language and understand "how things work", have been experienced by L10 as more useful and important when it comes to emergencies and disasters. However, a lack of similarities—'lower' or less propinquity—may still be an obstacle to relationships. Being a foreigner, particularly one that is visibly so, may have contributed to L10 sharing that "people are not so helpful" and that in Longyearbyen "you're on your own", an account shared by L20 who is also a foreigner, but contrasts with L02 who felt that "everybody would help out if anything happens", an opinion shared by eight interviewees (36%), seven of whom were Norwegians (and the remaining one a citizen of neighbouring Sweden). The result is that foreigners may be at a 'double' disadvantage when it comes to forming relationships, thus, disenfranchising them further and exacerbating their vulnerability.

Further, interpersonal bonds within certain groups may provide access to more resources than within others. One interviewee in SD explains how his connection to an INGO may have contributed to his house being fixed sooner by the said organisation, perhaps in the process taking the place of someone who may have needed the support more but lacked the network. Thus, relationships may also lead to the exclusion of those without networks that grant access to power (Ch. 6.2.4), disenfranchising them further. This is especially noteworthy when a government official, or someone with a formal role of power, chooses to prioritise personal bonds over their official mandate. SD15 shares how after Hurricane Maria, the police force disregarded their job because they "were taking care of their own families [...], [they] did not have time to look about law". Others accused government officials of diverting aid to political connections or even their own families, linking relationships with corruption.

6.2.2.7 The Perceived Association of Relationships with Informal Disaster Governance

Relationships are an integral part of any interaction between people and organisations. For the purposes of this study, focusing on the perceptions of individuals, the focus is on relationships between individuals. Such interpersonal relationships are characteristic of IDG sources, significantly contributing to its observed importance amongst interviewees. Friends and family feature amongst the top-three most important sources of disaster-related assistance in both locations. Though present within FDG as well, informal human (as opposed to 'organisational') relationships are not viewed as the main determinant of FDG action, where the priorities and objectives are (supposed to be) based on the mandate and objectives of a particular role within a larger entity. Formally, a person within an FDG organisation is not operating based on their individual preferences, priorities, and relationships, but instead is acting as a representative of the objectives and activities determined by a larger organisation and its leadership and governance structure. For example, the beneficiaries of an NGO's disaster assistance are not supposed to be selected

based on who they know, or any other factor except their vulnerability and need. Depending on the nature of the FDG entity, such values of non-discrimination are enshrined in laws, constitutions, and organisational charters (e.g. the IFRC code of conduct[51]). Through such systems, FDG is meant to counteract the 'dark sides' of relationship-driven disaster-related activities, such as individual bias and discrimination. The instances of FDG corruption in Dominica detailed by SD interviewees are only considered nefarious due to their status as representatives of FDG. Instances of people giving and receiving aid from family members were not labelled as such, revealing the difference in expectations of 'fairness' and 'equality' from FDG and IDG.

However, official roles and structures notwithstanding, FDG remains made up of individuals, with their own personal (thus, informal) relationships. This is illustrated by an interviewee's description of the 2013 Colorado flood in Crow and Albright's study of inter-organisational relationships between local and state FDG actors, sharing that "These incidents are not technical incidents, they're a people incidents" (2019:269). As was discussed in chapter 2.4, (in)formality is not a dichotomy between extremes, but a spectrum, and FDG has informal engagements and characteristics. A member of the emergency services or a public servant still has an informal network of personal relationships, including one or several of family, friends, acquaintances, work colleagues, etc. While the collaboration of personnel has been shown to be significant in fostering trust and learning within FDG (Crow & Albright, 2019; Kalkman & de Waard, 2017; Wachtendorf, 2000), acting on the basis of interpersonal relationships is not sanctioned within FDG unless such action is in line with the institution's decisions and objectives. As such, accessing FDG sources of disaster-related information and assistance through relationships and subsequent non-mandated action is considered a form of IDG. Similarly, IDG frameworks such as indigenous systems (e.g. Albanian Kanun and aspects of New Zealand's Maori population, discussed in chapter 2.4) present similar governance structures to FDG, but in the context of disaster-related action, the lack of mandate is what determines their IDG status.

Thus, while FDG theoretically inhibits the benefits and disadvantages of interpersonal relationships, in reality the individuals within FDG are subjected to the same dynamics, and particularly so in disasters, the stakes of which may test personal values and loyalties. The example of the police force in Dominica abandoning their post in the aftermath of Hurricane Maria to tend to the needs of their families, is a case in point. The role of relationships in driving IDG disaster-related action, and the tension between the personal priorities and the professional assistance mandate of FDG actors, is recognised in DS, but similarly to IDG as a whole, its significance remains undervalued and limited to fringe concepts as discussed below and in chapters 2.3 and 2.4.

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[51] Available at: https://www.ifrc.org/Global/Publications/disasters/code-of-conduct/code-english.pdf

6.2.2.8 Relationships in Disaster Science: Transcending Networks and Complexity

The role of relationships is well-recognised by disaster literature (Ch. 2.4.2). DS concepts dealing with informality emphasise the importance of people acting immediately after a disaster and before any FDG actors are on scene. However, the role of relationships within this action remains understudied. Instead, intra- and inter-organisational relationships (also incarnations of 'collaborative governance') have tended to be the most emphasised ones with references made to their importance for effective DG (Quarantelli, 1988; Comfort & Kapucu, 2006; Curnin et al., 2015; Granot, 1997; Kalkman & de Waard, 2017; Lu, 2017; Raju & van Niekerk, 2013; Wachtendorf, 2000). Recognising the private sectors' disaster-related actions and their potential to add resources and value to DRR/R, additional focus has been put on public-private relationships and the need for better coordination, collaboration, and cooperation (Chen et al., 2013; Fontainha et al., 2017; Tiernan et al., 2018). On the 'people' level, various concepts (e.g. self-help, social network theories) emphasise the importance of kin, friends, and acquaintances while also highlighting how individuals with fewer (close) relationships have less access to resources to aid them mitigating, preparing for, avoiding, responding to, and recovering from a disaster (Carrero et al., 2018; Drabek et al., 1975; Faas & Jones, 2017; Marcum et al., 2017; Melo Zurita et al., 2018; Meyer, 2017; Sadri et al., 2018).

The focus on relationships in, and for, formal and informal DRR/R, is also expressed by the growing interest in, and application of, (social) network approaches to DS (Carrero et al., 2018; Chatfield & Reddick, 2017; Helbing et al., 2006; e.g. Jones & Faas, 2017; Marcum et al., 2017; Pant et al., 2008; Park & Johnston, 2019; Roasa, 2013; Roberts, 2000; Weber & Khademian, 2008). Network approaches highlight, amongst others, the role of system interdependencies in the propagation or 'cascading' of disasters (Helbing, 2013; Helbing et al., 2006; Perrow, 1984; Pescaroli & Alexander, 2016). Similarly, social network approaches see informal networks as fundamental to disaster preparedness, response, and recovery and highlight how little understood these networks are (Carrero et al., 2018). As outlined in chapter 2, network approaches try to make up for this lack of understanding by exploring these disaster-related or -relevant relationships through visualising these relationships as networks and analysing aspects such as the strength of ties between actors, the connectivity of core versus periphery actors, or directionality. Yet, despite their recent popularity, network approaches to informality in DRR/R which, in theory, aim to bring informality to the fore and help operationalise it, show significant limitations in doing so. Rooted in complexity science, network approaches tend to opaque informality by their overwhelming focus on 'technical' aspects. While advancing the understanding of networks' functional nature, this technocratic and predominantly quantitative focus abstracts networks into tools while missing out on an equally deep investigation of the drivers (the 'why') for these networks. In line with functionalist approaches to informality, the failure or insufficiency of FDG is assumed as a key driver. Operationalising these relationships is seen as surgical intervention by which, once again, top-down mechanisms—FDG or

other—can 'activate' or 'deactivate' network nodes, "dismantle" network structures, and overall, improve 'systems' (Helbing, 2013; Helbing et al., 2006, 2015; Ren et al., 2019).

As such, viewing informality in DRR/R through the lens of networks has, thus far, perhaps overemphasised these approaches' origins in complexity science, inundating DS with further technocratic approaches and semantics as critiqued by some scholars (cf. Kelman, 2018). In doing so, the simple principle that motivates network approaches to DS, particularly social network analysis, gets lost, namely, putting people and their relationships at the centre of DRR/R. As this research project shows, the connections amongst people, as well as between them and FDG, strongly drive and/or catalyse IDG. Particularly with respect to the latter, and assertions across DS that FDG-IDG relationships are key to successful DG, this relationship has been insufficiently explored in science and, in fact, is less common in practice too (Fontainha et al., 2017; Preisendörfer, 2016). Moreover, these relationships still maintain FDG's status as the conceptual and operational centre of the IDG-FDG relationship. A recent statement in Natural Hazard Center (NHC) report by Williams (2020) is a case in point:

> One of the most espoused best practices in disaster recovery is the importance of relationships between local emergency management offices and residents, businesses, and local organizations. [...] This practice is commonly understood to build trust, foster resident familiarity with emergency management processes, and better attune emergency man[a]gers to the needs, concerns, and priorities of a wide variety of community members.

Fontainha et al.'s (2017) literature review of public-private-people disaster stakeholder relationships shows how, despite the intention to highlight the importance of IDG and the IDG-FDG relationship, these elements are viewed as a component of 'stakeholder management' by an 'orchestrating' FDG. In their study of inter-organisational relationships, Crow and Albright (2019) highlight the role of non-coercive, collaborative relationship models that are 'akin to peers' in fostering successful disaster recovery. To yield similar benefits, such approaches to relationships should be extended to IDG actors, who, as this study confirms, may not wish to be 'managed' and, where they seek involvement, prefer to be seen as partners in the process. This is also confirmed by previous studies, which show that even when informal actors approach FDG and express the wish to help, they do not necessarily expect to become affiliated and managed volunteers (Harris et al., 2017). Instead, while offering their specific knowledge and efforts to partner with or help guide FDG action, IDG actors may wish to "do their own thing" and remain separate from formal organisations and their efforts (Harris et al., 2017:354; Lavine & Thompson, 2004). This is confirmed by Simsa et al. (2018), showing how spontaneous volunteers, thus, IDG actors, often substituted FDG in the European 2015 refugee crisis, exhibiting high levels of structured self-organisation necessitating autonomy and partnership as crucial elements for the efficiency of their work. Yet, as Harris et al. further point out, FDG actors often perceive their possibilities to engage with informal actors to either exclude them or to incorporate them into the official response, and best practices for FDG to avoid thinking along these extremes—Harris et al.'s words the 'involvement/exclusion paradox'—are needed (2017:367).

Additionally, a DRR perspective is missing from current DS research on informality, and when it is there, it is taken as the prerogative of those few that can muster an understanding of such 'complexity'. This politicises DRR/R further and reinforces the perceived necessity for exclusive professionalisation of the field rather than viewing it as everyone's domain of responsibility, formal DRR/R-mandated professionals and informal non-mandated, simply put—all people alike. As such, this limited conceptualisation of the FDG-IDG relationship perpetuates the politics of FDG (FDG as mighty technological power-house, thus, driving exclusion of informal sectors (as per section 6.2.4) while a deeper reading of disasters as a vulnerability-driven domain offering individual responsibility regardless of access to expensive technologies and knowledge, is relegated to a subordinate role. Thus, DRR takes a backseat to DR. Disasters become driven by complexity or complex 'networked interactions' that are deemed 'difficult to uncontrollable' for people and, thus, require even more complex solutions such as proposed by Helbing with the need to establish 'Global Systems Science' to "create the required knowledge" (Helbing, 2013:51). Such propositions perpetuate the semantics of disasters as 'unpredictable', 'unprecedented', or 'complex', and informality/ people's informal actions as 'uncontrollable', 'chaotic', 'ephemeral', or 'invisible'[52], and so reinforce the politicisation of FDG as *deus ex machina*.

In summary, relationships are both a resource for IDG action as well as can catalyse and drive IDG, irrespective of FDG's successes, failures, or absence. The resulting IDG activities can influence IDG-FDG relations, and DG as a whole. Analysing relationships and their ability to discriminate and marginalise also brings home the importance of not romanticising IDG (Ch. 6.3). Conversely, the evidence from this study shows that interpersonal relationships are pervasive, and people within FDG organisations are also affected by their links to family, friends, etc. Recognising the role of relationships and subsequently that of IDG, characterised as both IDG actors, and IDG interactions between FDG actors, emphasises the importance of an IDG-inclusive DG framework that goes beyond current FDG-centric 'stakeholder management' models.

6.2.3   EXPERIENCE, MEMORIES, AND KNOWLEDGE

6.2.3.1   Own and Others' Experiences Matter

Chiming with other scholarly accounts (Antonacopolou, 2008; Garde-Hansen et al., 2016; Haughton et al., 2015; McEwen et al., 2017; Monteil et al., 2020), this study's findings indicate that IDG can emerge as a result of individual and collective disaster experiences. Experience as referred to by interviewees in both locations can be understood as so-called 'lay knowledge' or 'actionable knowledge' (Antonacopolou, 2008). This is knowledge which is acquired through lived experience, experiential, observational, cultural,

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[52] E.g. see a UNISDR 2017 workshop titled *Invisible Threads: the role of informal networks*.
https://www.unisdr.org/conferences/2017/globalplatform/en/programme/ignite-stage/view/713

and intergenerational learning, influenced by memory—processes of remembering and forgetting—which informs present and (anticipated) future action. As articulated by Mishra and Suar in the context of risk perceptions and disaster cognition, "'Seeing is believing', and people trust the things that they experience" (2007:155).

Next to one's own, disaster experience can refer to others' experiences, including those of other individuals (e.g. friends, family, neighbours, or people 'one has heard of'), or collective experiences and memories which through sharing practices become processed and entangled with one's own experiences (Garde-Hansen et al., 2016; McEwen et al., 2017; Weinstein, 1989). Thus, others' experiences can serve as a proxy for one's own experience. This is supported by the fact that many of the interviewees who[53] did not have their own disaster experience still shared experiences of others as a significant source of disaster learning. Interviewees who had not directly experienced a disaster characterised themselves as having 'indirectly' done so when someone they knew had, or if the location in which they lived had been affected by one. Both positive and negative examples of others' disaster experience were highlighted for their power to demonstrate one's own vulnerability ("It can also happen to me") as well as provide disaster-relevant learning opportunities. In some cases, this extended to the experiences of past generations, stretching beyond interviewees' lifetimes with the sharing of personal or collective narratives, physical markers, practices, and collective or "folk memories" (McEwen et al., 2017:17), all contributing to a person's feeling of having a degree of disaster experience themselves. The aforementioned contributing factors of relationships and/or propinquity may act as amplifiers of sharing and relying on others' experiences. Knowing a person with said disaster experience added credibility and truth to the shared experience. As Yu et al. (2020) confirm, this combination of disaster experience and a more intimate relationship with FDG as per section 6.2.2 above, may enhance peoples' disaster preparedness and response capabilities. However, the research on this topic is inconclusive and more research is necessary, for instance, on the role of intervening/moderating factors. As Yu et al. themselves find, in the context of rural Northwestern China, the above proved to be the case for people with high self-efficacy, but not those with low self-efficacy (2020:10-11).

6.2.3.2 Experience is not Limited to DRR/R

Beyond people's (in)direct experience with disasters, disaster experience refers also to experiences with FDG or IDG actors in general. People's positive or negative experiences with FDG or IDG impact their engagement with either. Han et al.'s (2011) study of earthquake survivors in China reveals how people who are inclined to trust formal authorities, e.g. the government, are inclined to do so even more with respect to disasters, while those with prior distrust tend to have less trust towards FDG. The results of this

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[53] The majority of interviewees without own/direct disaster experience were based in Longyearbyen; nearly all SD interviewees reported direct disaster experience.

research project support Han et al.'s finding. As elaborated on in chapter 4, Svalbard has strong formal institutions that largely evoke trust amongst its residents which itself is rooted in Norway's own status as a country with the third-highest levels of trust in government in the Organisation for Economic Co-operation and Development (OECD) (2020). The said higher trust level may also be due to Svalbard's relatively isolated and contained setting, facilitating more intimate relationships/flatter hierarchies between members of the public and FDG officials, which suggests that relationships are an intervening factor (Ch. 6.2.3). Longyearbyen's residents' relatively positive experiences with FDG actors—often as a consequence of seeing FDG present when it matters, knowing FDG actors (a result of formal and informal relationships between the two as well as community training initiatives)—was equated with higher trust in FDG actors' interest (if not always ability) to help. This trust provides an incentive for active engagement with FDG on important issues, whether soliciting help or engaging in DRR-related discussions and efforts. Conversely, SD interviewees' often negative experiences with FDG—whether based on FDG's operational failures or rooted in fears related to diverging political affiliations—predisposed some interviewees to not expect or seek FDG help, and in some cases, to avoid it altogether.

6.2.3.3   Experiences Drive Risk Perceptions, Disaster-Related Information/Help

<u>Risk Perceptions</u>

In both case studies, interviewees underlined their experiences as an important guiding factor across the three dimensions of this research project: risk perceptions, sources of disaster information, and sources of disaster help. In terms of risk perceptions, interviewees' own disaster experiences increased not only their risk awareness but also the significance attributed to the risk. This is in line with Hoffmann and Muttarak (2017:35), who suggest that people's disaster experience can influence risk perceptions and subsequent preparedness behaviour by increasing the "awareness about the potential for destruction, demonstrate benefits of preparation and evacuation, and enhance knowledge on how to recover in its aftermath as well as how to cope with subsequent disaster threats". This is supported by other research linking experience with protective behaviour and the reduction of optimism bias (Mishra & Suar, 2007; Weinstein, 1989). However, past experience can also lead to a representativeness bias (Brooks et al., 2019), such as the disregard amongst some SD interviewees for the risks posed by earthquakes, exemplified in the words of SD12, "I felt earthquake[s], but it was nothing".

Conversely, the absence of experience had opposite effects on interviewees. For some, it led them to disregard the conveyed significance of a risk—even when this contradicted formal information and FDG efforts, representing another form of representativeness or optimism bias. For others though, the lack of experience led to increased risk awareness. These interviewees felt they lacked the context to determine their level of preparedness and ability to respond to a disaster. Thus, experience as an informal driver or indicator of disaster risk perceptions is not straightforward and suggests other intervening factors such as

risk/disaster severity, psychological factors (e.g. fear), or beliefs and attitudes (e.g. religious beliefs) (Weinstein, 1989).

Disaster Information

Both in Longyearbyen and SD, experience was also considered a powerful tool of disaster information. In contrast with the structured knowledge acquired through traditional media, weather forecasts, or safety and disaster-related courses, experiential learning constitutes a largely informal form of information gathering and analysis. Some interviewees felt that their or others' disaster experience was a more reliable 'teacher'—one, that can be trusted and, moreover, is most applicable to the local context. However, others emphasised the opposite, seeing the value of experience-based disaster learning in its accessibility but not necessarily its truth content. This tension between the reliability of a person's or a collective's tangible experiences as a source of information, and knowledge communicated through FDG channels, can be explained through 'trust' as a key intervening variable. As was discussed, (6.2.2 and 6.2.3) trust is influenced by many intervening factors, including experience that is not disaster related.

Trust in FDG is also a function of experiences with FDG in disaster settings. For Longyearbyen, despite the relatively high level of official disaster-related communication, the possibility of an avalanche within the settlement was largely missed as opposed to avalanches 'in the field', that is, outside of the settlement. Therefore, local FDG actors were not prepared for urban avalanche rescue efforts (Indreiten & Svarstad, 2016b). As several interviewees remarked, this was an avoidable oversight given similar prior incidents in the settlement, such as the 1953 slush avalanche that killed two people and destroyed several houses (Indreiten & Svarstad, 2016b). Perhaps such experience did not extend to long-term institutional memory and/or learning due to the high turnover of Longyearbyen's political elite. Nonetheless, it hurt the trust placed in FDG by residents, leading some interviewees to reconsider their initial emphasis on the importance of FDG, instead highlighting their own need to self-inform about risks and disasters. Similarly, in SD, SD25 referred to what was perceived to be misinformed government warnings for Tropical Storm Erika as a reason not to trust FDG conveyed data, while SD13 considered lack of experience as the cause of some villagers' panic and subsequent spread of rumours and misinformation prior to Hurricane Maria. Overall, interviewees recognised how both own/collective experience and 'expert' expertise are fallible, and gaining multiplicity of perspectives is the preferred approach.

Disaster Help and Beyond

Experience is also a crucial factor in opting for informal and formal sources of disaster help. This finding is consistent with literature on the effects of disaster training/scenarios on the confidence of formal disaster responders (Grock et al., 2017). While both direct and indirect disaster experience can create trauma that may hinder people's protective action in a related situation (e.g. Hansson et al., 1982), interviewees in this research project showed that previous experiences in disaster settings can also contribute to people's

confidence and ability to help themselves and others with respect to DRR/R. The result of experience may be linked to the overall impact of the crisis and the quality of the assistance received. For example, L04's positive experience with emergency services in a crisis (Ch. 5.2.4.3) contributed to her trust in FDG, but perhaps the result would have been different if the incident itself and the long-term effects had been more significant, and/or the assistance rendered by the emergency services less impressive. As some SD interviewees reported, their often negative experiences with Dominica's FDG across several disasters contributed to a feeling that FDG would not be forthcoming whether based on FDG inability or unwillingness (e.g. due to political marginalisation) to help.

Furthermore, the disaster experience of others was seen as a resource of knowledge and capability, prompting people to seek or rely on their help. As SD15 explained, "[after Hurricane David in 1979,] I realised what the people did. All elderly folks here, I saw what they did". This is further in line with studies on informal disaster networks that detail emerging networks of people with relevant capabilities building an experience pool that can act in times of crisis, but then submerges post-disaster, potentially re-emerging during the next one (Parthasarathy, 2015; Roasa, 2013). Also, the experience of others led some interviewees to assess their own risk and so engage and invest in DRR both for themselves as well as the community at large. In Longyearbyen, the 2015 avalanche brought home the awareness of avalanche risk for the settlement at large with interviewees, such as L06, actively seeking out and engaging with risk maps relevant to their own location. In some cases, the interviewees reported moving accommodation as a result and/or warning others of the risks and, individually or collectively, seeking active engagement with FDG actors to minimise risks, e.g. through the installation of snow fences or demanding from FDG actors to improve risk communication. Similarly, in SD interviewees perceived some of their actions to fall into the DRR category. This can be seen in the decision of interviewees regarding what materials to use to rebuild their houses. Rather than being just a function of affordability, some interviewees explained their decision in terms of their own and others' past hurricane experiences, coping strategies, and lessons learnt on how to minimise risk and respond to disasters. For example, SD15 compares the virtues of building with wood and cement in relation to earthquake and hurricane hazards, based on his experiences and observations of the experience of others.

Yet, for others, light, vulnerable structures were preferred due to their low cost in time and money, allowing people to meet their basic needs relatively quickly and continue with their lives post-disaster. Of course, in DRR terms, this logic also represents the 'bouncing back' sentiment that has increasingly become critiqued across DS and practice (Bogardi & Fekete, 2018; Kelman et al., 2016; Manyena et al., 2011). Thus, own and others' disaster experience may predispose an individual to confidence in one's own or others' ability to make the right decisions and act appropriately when preparing for or facing a disaster, a perception that may or may not be misplaced. Knowledge derived from experience may be locally more appropriate and valuable, although it may be misguided by locked-in perceptions, thereby negatively affecting chances of progress concerning reducing disaster vulnerabilities (cf. Dewey, 1997

[1910]: 147-150). In DS, this is also referred to this as the 'preparedness gap' (DeYoung & Peters, 2016; Gowan et al., 2014)—the difference between perceived and actual disaster preparedness, which itself is a function of a the here-illustrated own and others' previous disaster experience as well as other social, psychological, evolutionary factors (e.g. social pressures, biases) (DeYoung & Peters, 2016; Gowan et al., 2014; Johnson, 2004). Johnson (2004), using the example of wars, refers to this as 'positive illusions', the result of the aforementioned factors, leading to either under- or overconfidence in one own's abilities, with the potential to wreak havoc in either case if such confidence is not aligned with reality.

6.2.3.4 Informal Experience as an Under-Appreciated but Also Potentially Misleading Form of Learning in Disaster Governance

Subsequent to the above, this study emphasises three key interrelated take-aways as they relate to the value placed (or not) on people's experiences, the limits of experience-based learning for DRR/R, and how experiences relate to the relationship between IDG-FDG. First, the value people give to their direct and indirect experience and knowledge in shaping their DRR/R perceptions and actions stands in stark contrast to the limited value placed on it by FDG, despite an appreciation for calling on 'local' knowledge when necessary. While engaging local stakeholders and knowledge transfer is now often recognised as an important factor in formal disaster policies and practice, nonetheless, local knowledge is still often excluded, leading to a 'splintered' DRR/R approach (Cutter et al., 2015). When it is not excluded, peoples experiences are rarely viewed as more than complementary knowledge, no match for the ostensibly advanced, progressive experience held by FDG 'experts' and subsequent guidelines and tools which, on balance, seek to unify knowledge and translate it into 'comprehensive' and/or 'national' guidelines that do little to acknowledge distinct local history and experiences (Griffiths, 2009). Conversely, when local experience and knowledge is valued, such as in the context of the DG paradigm, it is often portrayed as 'good' vis-à-vis the problematic and out of touch knowledge of formal, external experts (Haughton et al., 2015). Such rationale speaks to the dissatisfaction with the elevation of formal and/or scientific knowledge as universally accepted, and the 'degradation' of local experiences and knowledge to the supposedly less significant form of 'lay' knowledge—but effectively, leads to an ostensible rivalry and equally unhealthy imbalance between the value placed on local vs. 'expert' knowledge (Haughton et al., 2015; Lane et al., 2011).

Moreover, less attention has been paid to the intersection of local knowledge, local actors' desire to act on it, and the role of, and relationship with, FDG on this matter. In fact, it is sometimes critiqued that community-based/participatory approaches rarely exceed the limited and top-down activity of knowledge transfer (Ch. 2.3.3). Yet, people's experiences interact and are influenced by FDG beyond knowledge transfer. As the findings confirm, interviewees do not only share their knowledge with FDG actors upon request, but, vice versa, learn from expert experiences (and their experiences with 'experts') and 'download' knowledge, synthesize it with their own experiences, make their own decisions, and act upon them (Mishra & Suar, 2007; Weinstein, 1989). Within this context, if people develop positive and active

relationships with FDG, they are more likely to use information and help provided by FDG (DeYoung & Peters, 2016; Paton, 2003; Paton et al., 2008). The findings here emphasise that this relationship must allow for a bidirectional flow of experience-based and other knowledge and decision-making. Yet, in the current DG system, relatively little value is placed on people's input in, and for, DRR/R (Chs. 2.3.3, 2.4.2). Interviewees also revealed assumptions that such a splintered approach and limited engagement sometimes arose due to a lack of FDG time and incentives. Additionally, experience and resulting knowledge was sometimes viewed as source of power that is not readily or unconditionally shared by FDG. As section 6.2.4 below elaborates on in more depth, these accounts speak to the power differentials between IDG and FDG.

Following from the above, disaster experience, despite the advantages intuitively ascribed to it, does not automatically translate to learning and knowledge that is needed and/or relevant to a particular context (cf. Johnson, 2004). Next to the factors already mentioned in the section above, experience is fundamentally also dependent on memory, in itself a highly complex, intertwined, and ambiguous concept and, importantly, a function of own but also collective experiences and derived lessons, influenced by processes of forgetting and remembering and other intervening factors and biases—e.g. relational ways of knowing embedded in cultural and psychological pressures (Carr, 1961; Garde-Hansen et al., 2016; Griffiths, 2009; McEwen et al., 2017; Monteil et al., 2020). In the disaster context, the memory of a disaster is also a memory of the feelings experienced and/or associated with it, and is, in and of itself, influenced by, as well as generates, processes of "remembering, forgetting, and abscencing" (Monteil et al., 2020:287) or 'active forgetting' and 'active remembering' (McEwen et al., 2017). Subsequently, people's (as FDG's) decision-making, including in disasters, is subject to misperceptions and tendencies to fit incoming information into existing views and theories derived from these experiences (cf. Jervis, 1968, 1976).

Additionally, there are significant limitations to experiential learning with respect to interdependence of risk (Beck, 1992, 2009; Perrow, 1984) and "learning from cases that have not yet been experienced" (Egner et al., 2016:6). That is, as experiential learning refers to past events, experience can become a false guide when uncritically applied to future disasters which may present different characteristics. This is particularly the case today, given the interdependence of various systems—e.g. energy, transportation, food or water supply, communications, politics, finance—which creates new risks and situations that surpass most individuals' ability to understand, much less control or act upon (Helbing, 2013). Experience, one's own or others', is understood to be useful when it refers to similar events both in terms of post-disaster efforts and, more importantly and where possible, when it translates to actual vulnerability reduction. In Longyearbyen, though interviewees did express reservations regarding the 'false alarms' and subsequent evacuations that resulted from heightened sensitivity to avalanche warnings, the disasters in 2015 and 2017 did change the behaviour of both FDG and IDG, increasing preparedness and mitigation (e.g. snow fences, and increased monitoring) as well as reducing the settlement's associated vulnerability (e.g. red

zone where people are prohibited from living anymore). While in most cases these experiences were equated with increased confidence and better preparedness, preparedness was not always understood in the DS sense of minimising one's risk and/or increasing one's adaptive capacity. As discussed previously, for some interviewees, experience resulted in either overconfidence or resignation. That is, either the perception that having been in a disaster removed a person's fear and prepared them to tackle future disasters; or the perception of disasters being a normal, unavoidable part of live which cannot be prevented and, thus, must be accepted 'as they come'. As such, the importance placed on experience within DG is both a resource and an obstacle for effective DRR/R as it acts in contradictory ways in that it can both aid DRR/R as well as hinder it by heightening people's disaster vulnerability (McKinnon, 2019). Although relatively little is understood about the actual processes of experiential disaster learning, especially on the societal level (Egner et al., 2016), the topic itself and its critical role vis-à-vis DRR/R is increasingly emphasised (Garde-Hansen et al.,2017; McEwen et al., 2017).

Crucially, such 'flawed' recollection/understanding of experiences, individual or collective, influences IDG. This connection has been perhaps most notably developed by the concept of 'strategic culture'[54] according to which influential (thus, not all) experiences create, via the above listed variables (e.g. memory, mis/perceptions, emotions), a context for and driver of people's (and nations') security- and, thus, also disaster-related actions (Gray, 1981; Johnston, 1995; Snyder, 1977; Uz Zaman, 2009). Strategic culture represents the sum of influential experience-based ideas, conditioned emotional responses, and patterns of habitual behaviour that are relatively persistent in how they translate into preferred modes of operation (ibid.). Accordingly, experiences and what people individually and collectively take away from them, creates and entrenches action, that is difficult to divert from it. Though the exact processes and actual longevity of strategic culture change are contested, scholars convert on the idea that it takes further influential experiences—predominantly in the form of 'shocks'[55] (e.g. 9/11)—which, "once absorbed, coded and culturally translated" may change people's previous strategic culture(s)[56] and subsequent (habits of) action (Gray, 1999:52). Combining strategic culture insight with those of this study's interviews creates a powerful dynamic. People's experiences are a force to be reckoned with, driving their actions as well as coding incoming FDG information and action and pitting them against each other. If FDG action disregards local strategic culture, that is, creating the link between past experiences, memory, and resulting action, such policies and action is likely to be disapproved of and buy-in difficult to come by. Conversely,

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[54] A concept originally developed in the first half of the 20th century by anthropologists and sociologists (e.g. Claude Lévi-Strauss, Clifford Gertz, Margaret Mead) then linked to state behaviour and further developed by IR/political science scholars (cf. Lantis, 2002).

[55] The term 'shocks' is used across strategic culture literature to denote significant events that create the conditions based on which strategic cultures may change. Other disciplines, such as DS, may disagree with the term.

[56] According to Johnston (1999:45), there can be more than one strategic culture though there is usually one that is dominant (or upheld by its 'keepers' to remain dominant).

attempting to change people's perhaps unhelpful acts of IDG, must be seen in this context. People's experiences and subsequent IDG action is unlikely to be overridden by mere 'expert' knowledge and action and the concept of strategic culture gives insights into understanding the depth of this issue. Simultaneously, the results here suggest that not only 'external shocks' but also closer relationships and active engagement between FDG and IDG may be able to positively affect DRR/R, beyond unhelpful historical lessons and entrenched habits of action (on both 'sides').

Mika and Kelman's 'shealing' or 'slow healing' establishes another related variable (2020). Shealing denotes the process of slow healing following a disaster and so recognises the disjunction between individual and community-level immediate, early, and swift recovery needs versus their long-term, gradual needs. As such, shealing draws attention to the different pace at which some experiences are processed and recovered from, providing insight into how and why some experiences—individual or collective—persist trans-generationally and translate into learning and action down the line. This contrasts and complements scholars who are doubtful of individuals' and societies' ability to learn from disasters (Egner et al., 2016:19). Predominantly, such doubt refers less to the ability to learn—as post-disaster 'lessons learnt' or 'best practices' reports attest to—as much as to the ability to act on what has been learnt. Put differently, learning is the ability to change. In fact, as Monteil et al. (2020) suggest, disaster learning is a function of memory and directly influences recovery and more generally subsequent DRR/R. Thus, experience, trauma, and shealing may positively and negatively affect experiential disaster learning and action.

6.2.4   POWER

As discussed throughout chapter 2, power is assumed to be an important component of IDG. It is a driving force in disasters, where survival, resource limitation and competition can play an even greater role than in everyday life (Hewitt, 1983, 1997; Wisner et al., 2004). The findings of this study confirm this assumption. Power emerges as a characteristic that underlies the contributing factors that drive IDG. The above sections elaborated on the ways in which power dynamics push and pull in different directions within the IDG contributing factors of proximity/propinquity, relationships, and experience. Power also emerges as a contributing factor to IDG in and of itself, particularly through the prism of DRR-R-mandate, which lies at the heart of the FDG/IDG divide. It also expresses itself, in an interrelated manner, through processes of creating and crossing boundaries, misuse of power, and corruption. This section discusses how power manifested in the SD and Longyearbyen interviews, and how power affected interviewees' choice for IDG and/or FDG.

6.2.4.1   Mandate and the Dominance of Power Over Other Contributing Factors

In the disaster context, FDG's mandate is typically understood as actors who possess the formal, official, and/or legal legitimacy to act on disaster-relevant matters. Conversely, the absence of such a mandate is

the characteristic that determines the informality of sources of disaster information and help. With this distinction comes significant access to resources, decision-making power, and authority. Therefore, mandate emerges as a determinant of power dynamics within the IDG-FDG relationship, but also, as discussed in 6.3, within IDG itself.

In their interviews, Longyearbyen and SD residents explained their choice of formal sources for information and help based on the legitimacy granted by FDG's mandate, and the resulting access to resources, technology, and specialised services. As L08 shared, "[i]n [an] avalanche you need avalanche dogs, you need [a] search [and rescue] team, and the only one who can scramble that at an appropriate level is the Governor's Office". In SD, 11 interviewees (34%) referred to the Red Cross's ability to fix roofs, with SD23 expressing that "[without their help] 75% of the villagers' [homes] would be still covered with tarpaulin", which was incidentally provided by the government, another FDG source.

Given interviewees' perceived correlation of FDG's mandate with FDG's ability (not just power) to act, peoples' positive or negative experience should influence their buy-in and, thus, their IDG/FDG engagement. Both case studies showcase people's varying experiences with FDG. Most SD interviewees were critical of FDG's interest and ability to help, while Longyearbyen residents provided a mixed picture. In Longyearbyen, despite strong institutions and FDG, people's trust was shaken when it became clear that FDG actors had not prepared for avalanches in the settlement, despite previous incidents and several warnings (cf. above). Some interviewees felt betrayed and angry that FDG actors knowingly let people live in danger zones. This feeling was likely augmented by the more intimate relationships between Longyearbyen IDG and FDG actors. After this incident, some interviewees reported that they no longer trusted Longyearbyen's FDG actors, and their renewed or increased DRR/R efforts were now evaluated more critically. This erosion of FDG's power shows how its mandate, after all, is a product of both its relationship with the people, and a construct based on perceptions and buy-in. Once eroded, re-building people's acceptance of FDG's mandate takes more than new FDG efforts/initiatives; it is a function of renewed trust.

Yet, the influence of negative experiences on FDG's perceived importance is not clear-cut. Formal (thus FDG) disaster-related information is perceived across both case studies as potentially more credible and reliable. This was the case, even when interviewees gave conflicting information, e.g. by recounting instances where FDG actors' disaster information was experienced as unreliable. Despite the many critiques of FDG information by Longyearbyen interviewees, the same people—and overall more than half of the interviewees—emphasised the perceived credibility and reliability of information by official, mandated actors.

SD interviewees also appreciated formal sources of information as potentially more reliable than 'local' or 'informal' information. 'Expert' sources, especially the Met Office, were highlighted as important to

augment knowledge derived from one's own and others' experience and/or 'village talk'. In some instances, the interviewees highlighted the importance of the information channel over the actual source, which happened to be FDG. Radio and schools, for instance, were particularly important for learning and receiving disaster information, though the importance placed on these sources was partially driven by their accessibility rather than the quality of information. However, rather than undermine the perceived significance of FDG sources, this fact points to FDG's dominance of resources (in this case communication platforms). Moreover, though 12 SD interviewees (38%) expressed mistrust of their government, they included FDG information sources from other countries in their choices. This further highlights the credibility afforded FDG, even if these sources are deemed IDG in a particular country, by virtue of their external and non-mandated role in national DRR/R mechanisms.

Nonetheless, for most interviewees, the (perceived) qualities of formal or mandated disaster-related information did not mean that FDG information was necessarily better or could/should replace informal disaster information. Despite interviewees expressing that formal disaster information may be more reliable, only 6/54 interviewees (11%), across both locations, referred exclusively to formal disaster information sources. Instead, interviewees highlighted the importance and advantages (speed, local relevance, trust) of informal or informally attained disaster knowledge and information. However, in the same vein, interviewees were also aware of the limitations of informal disaster information, expressing concern about its potential to be distorted by peoples' psychological biases, experiences, agendas, or tendencies to over- or understate information.

Thus, a paradox emerges. FDG actors' official disaster-related mandates contribute to their perceived relevance, even in cases when such relevance has been chipped away at, or disproved, through people's own experiences. The perceived reliability of formal sources of information is not a neat function of its actual reliability but also indicates that formal disaster information serves as a sort of insurance. That is, people attempt to make decisions by accumulating and making sense of various forms of available information. This approach is reflected by the importance placed on both FDG and IDG sources of information—with 40/54 interviewees (74%) selecting formal and also informal sources—as well as different channels/forms of disaster information and communication within them. As Longyearbyen interviewees highlighted, formal safety training courses offered to residents by FDG actors in Longyearbyen were particularly appreciated. This tension between interviewees' diverging perceptions of the reliability of both formal and informal disaster information is supported by interviewees' stated preference for multiple/hybrid forms of disaster information, indicating that formal and informal disaster information sources are, in fact, seen as complementary.

This paradox is also evident in respect to IDG/FDG for disaster assistance. As mentioned above, FDG's mandate was similarly important with respect to disaster help (Q3). However, the influence of people's experiences with FDG is similarly to sources of information not straightforward. For instance, although

people's negative FDG experiences may have increased their emphasis on IDG, this did not necessarily lessen the perceived potential significance of FDG and, thus, reliance on FDG. Simply put, due to FDG's projected power, people may not perceive to have a choice. This is supported by the fact that though 12 SD interviewees (38%) expressed direct mistrust in the authorities, half of them still included government in their Q3-PRISM. The Longyearbyen interviews revealed that context is important here. FDG's mandate power was perceived as particularly important vis-à-vis 'large-scale' disasters, where the need for a certain level of resources was beyond the reach of any actor except FDG. As L02 explained, "we're just normal people [...] we can't handle accidents or disasters [...]—No, it has to be from the Governor's Office".

Conversely, IDG actors establish (perceived) mandate through trust, access, and action. Despite recognising the mandate of FDG actors, some SD interviewees decided not to count on FDG. They lamented their marginalisation in the delivery of aid—with prioritisation based on political affiliation, FDG interest and agenda (e.g. helping those in strategic locations)—or the difficulty of access, which in itself, was often connected to FDG's interests (e.g. villages in the periphery, that do not serve as show-cases and/or tourist destinations, were not a priority). Disillusioned with FDG, South Dominicans (some of whom were interviewed in this research project) took initiatives and established legitimacy/mandate amongst the people, and, in some cases, even with FDG. For example, following Hurricane Maria in 2017, informal actors in Dominica personally requested assistance from IsraAID, an international NGO until then unmandated in the country. IsraAID stepped in, drew on local knowledge and IDG resources, and helped with relief as well as long-term development efforts, eventually integrating as an FDG actor working hand-in-hand with United Nations Children's Fund (UNICEF) and the Dominica Ministry of Education and Human Resources to improve DRR/R in education (UNICEF, 2020; SD27). What begins as an informal act can have lasting effects on the FDG apparatus.

6.2.4.2 Accountability

A central feature of formal democratic governance is its perceived accountability—enforced through institutions such as elections and bureaucracy for the public sector (Tsai, 2007:355)—and contracts, memoranda of understanding, and by-laws for NGOs (Romzek et al., 2012:442). Within a DS context, this system is meant to ensure equal delivery of services based on needs alone, as is discussed in the previous section on relationships (6.2.3). The claim of accountability, and in reverse manner, the perception and/or claim of non-accountability of IDG, directly translates into a precarious power differential, with the purported result that IDG discriminates and excludes, whereas FDG includes and distributes equally. However, accountability is not a given characteristic of FDG; in fact, the many accounts of FDG misconduct, and the limited success of initiatives to improve FDG accountability practices, tell a different story (Kirsch et al., 2012). While in theory, FDG is subject to formal accountability measures, in practice, this is not always the case, nor are these standards always achieved (Twigg, 1999). By virtue of

their mandate, people within FDG have access to great power, particularly in the context of disasters. In such situations, the loyalty to their mandated role may be tested, as was discussed in section 6.2.3, leading to the very corruption and discrimination that formal accountability mechanisms are supposed to prevent. Twelve SD interviewees (38%) alleged government politicisation of aid, the favouring of the families of public officials, and prioritisation of the wealthy and powerful at the expense of the impoverished and vulnerable.

Instead, FDG accountability is, to no small degree, a function of FDG claiming and projecting accountability to position itself as a legitimate actor (Czada, 2001; Mayntz, 2004; Wolf & Pfohl, 2014). In this (orthodox) context, informal actors and their actions become, by near-default, 'illegitimate'. Thus, claims to accountability are also tools that can be misused to project and uphold power, while rendering 'informal' those without the knowledge of, and means to, obtain legitimacy within formal accountability systems and standards (Czada, 2001). This situation is compounded by FDG's simplistic claims that IDG is not (held) accountable (Martin & Nolte. 2019), as reiterated by experts interviewed in the context of this study. Naturally, IDG is not held to the same standards as FDG; IDG actors are, in fact, playing by different rules. As mentioned in section 6.2.3, IDG actors are not generally expected to provide aid to others based on need alone. It is commonly accepted that people will assist their family, friends, and community (amongst others) without accusations of discrimination. However, it is important to remember that the lack of obvious formal disaster-related accountability standards placed on IDG actors neither absolves them of legal accountability, nor of informal accountability standards. Concerning the former, national and constitutional laws governing citizens and organisations apply to FDG and IDG actors and actions alike. Looting, for instance, such as SD12 suffered at the hands of local villagers, is illegal— irrespective of the DRR/R mandate of the actor(s) involved. Concerning the latter, particularly within the often proximity and/or relationship-based context of IDG, accountability may be even stronger than "can be buil[t] amidst a work team struck of strangers" (Waldman et al., 2017:400), as is relatively common for FDG. Waldman et al. show how informal actors across four Canadian case studies act as 'key enablers' or 'brokers' for FDG actors, precisely because their pre-existing relationships and/or local relevance enhance (perceived) accountability and, thus, trust. Similarly, Dewi et al. (2019) find that in Indonesia NGOs sometimes purposefully draw on informal actors to enhance their perceived accountability by the beneficiaries of their efforts.

Thus, formal mechanisms are not the only form of accountability that governs IDG (nor, for that matter, FDG). Status as (in)formal, notwithstanding, individuals and organisations operate within societal and/or community norms and boundaries, whereby elements such as trust, personal loyalties, and the influence of social groups, can exert collective influence on action—often referred to as 'social accountability' or 'informal accountability' (Abdel-Samad & Flanigan, 2019; Baez-Camargo & Ledeneva, 2017; Romzek et al., 2012; Tsai, 2007). That is not to say that IDG is immune from accountability issues. Following Hurricane Maria, several SD interviewees pointed to situations where IDG accountability was lacking.

For example, one interviewee impersonated FDG to bypass traffic to aid-distribution points, while another used their NGO ties to receive items at the port authority, despite government confiscation of all private packages.

6.2.4.3 Boundaries, Scope, and Reach

The previously discussed functionalist perspectives represent informal actors as constrained by function/mandate (meeting immediate DRR/R needs), time (until FDG actors take charge), and space (within the disaster's geographic/political boundaries). Yet, the reach of IDG often goes beyond these (perceived) boundaries. The aid provided by private citizens from neighbouring French islands to SD communities after Hurricane Maria, is an example of such timely, cross-boundary assistance. Additionally, some disaster scenarios require IDG actors to take responsibility for their own DRR/R well beyond the immediate disaster response, particularly when FDG actors are absent—e.g. when a disaster has not been officially declared, in locations/states with weak FDG systems, or when the lack of funds or incentives diminishes FDG involvement. In this context, informal actors may take responsibility for long-term disaster-related needs, recovery, and development, which can outlast any initial disaster response by years or more. Both Longyearbyen and SD showcase this. In the former, the previously described informal long-term pollution-related DRR initiatives have been formed—including by involving the assistance of people from the neighbouring Russian settlement of Barentsburg as well as from abroad; in the latter, by the time Hurricane Maria hit in 2017, interviewees reported to have been engaged in informal long-term recovery efforts following the 2015 Tropical Storm Erika, including rebuilding roads and housing along SD's remote East coast with villages officially abandoned by FDG. These efforts cannot be understood exclusively through terms like 'volunteerism' or 'self-help', which tend to emphasise limited engagement concerning informal actors' time and responsibility.

Following from the above, IDG may have far-reaching societal and political implications. Such informal DRR/R actions do not take place in a vacuum but may challenge norms and introduce new ones. Within this dynamic is a complex and complicated interplay between power, culture, and norms, in that existing FDG shapes informal action (Toope, 2008). However, the reverse also occurs. Informal actors may equally set new norms against which (future) FDG actions are pitched and accepted, or not (Tsai, 2006). These can be understood as being in between (i) Nye's (1990:167) concept of 'soft power' from 'intangible power resources such as culture, ideology, and institutions', and (ii) realist accounts around norm generation. Put differently, IDG actors have the potential to define norms—through negotiation within emerging hybrid relationships (e.g. beyond state-state, private-private), or through (in)direct coercion—by establishing path dependencies through appealing alternatives that may seep into peoples' strategic cultures, in turn, influencing the acceptance of, and changes to, FDG's strategic culture (Levin et al., 2012; Tsai, 2006; Wolf & Pfohl, 2014). For instance, the assistance rendered by Barentsburg residents to tourists

following the Aurora boat crash in 2018 is an example whereby Norwegian and Russian national diplomatic efforts were secondary to the reality on the ground.

Thus, IDG may establish an environment within which FDG is accepted, enabled, constrained, or rejected. Following Helmke & Levitsky's (2004, 2006) framework, FDG and IDG either converge by being complementary or substitutive; or diverge, resulting in either competing or tolerating behaviour, without approving of, or engaging with, the other. FDG is embedded within shared expectations which create the 'rules of the game', dictating the effectiveness and stability of the current framework. Through the establishment of informal standards, IDG blurs classic dividing lines between formal/informal, public/ private, or national/non-national. Disasters sometimes provide people with increased opportunities to catalyse systemic change, by introducing informal norms which, through repetition, diffusion, buy-in, and adoption by a critical mass may "take on an institutional quality of their own" (Tsai, 2006:118; cf. Birmann et al., 2010). This may potentially lead to such informal norms' ultimate institutionalisation by motivating, enabling, even forcing, formal authorities, such as FDG leaders and political elites, "to reform the original formal institutions" (2006:118). For instance, Birkmann and von Teichman (2010) show how following the Indian Ocean Tsunami (2004) formal, but equally, IDG actors brought about systemic change across legal/political, organisational, economic, social, and environmental dimensions.

Simply put, individuals' or groups' informal, but nonetheless de facto, exercise of power has the potential to create conditions that can shape collective action and influence FDG. Disaster literature on informal DRR/R pays little attention to this "reverse relationship, where formal institutions have to adapt to informal rules – if not actually emerging from them" (Foweraker, 2007:407). When formal institutions respond to disasters, they do not operate within a vacuum. Borrowing from O'Donnell, they are "plunged into a deep sea of preexisting informal rules and institutions" (2006:289). Thus, in the study of DG, both informal and formal, rather than making "simplistic divisions between either public or private actors, national governments or communities", the fluid relations between these actors must receive more attention (Fisher & Surminski 2012:20).

In other cases, IDG may eschew any formal engagement, partially thanks to the apposite focus on vulnerability as the root cause of disasters (Hewitt, 1983; Lewis, 1999; Wisner et al., 2004), DS has recently paid more attention to those FDG ignores or bypasses. But what about turning this around to ask, 'What does it mean to ignore FDG'? IDG that is neither recognised nor legitimised by FDG may be still more legitimate to the disaster-affected population in meeting existing demands. 'Governance beyond/without government' (Ng, 2016; Peters & Pierre, 1998; Rosenau & Czempiel, 1992) becomes possible and, in order to achieve civic goals, desired in establishing new alliances. In his study of Pacific Island communities, Kelman (2015) demonstrates how governments can not only be complemented, but effectively bypassed, especially when additional driving or enabling factors play a role, such as obtaining external funding, or when the distance to the national capital is perceived as too far for governments to

act effectively. Thus, informal DRR/R is as much about shifting identities as it is deeply political, whether in standard 'us versus them' terms or as 'agonistic pluralism', where the other's legitimacy is recognised yet not reconciled (Mouffe, 2013).

6.2.4.4   The (Im)Balance of Power

Overall, interviewees' accounts hover between perceptions of FDG's expected role, and actual experiences with FDG limitations, shaking people's image of, and trust in, FDG. This reflects the same tension in DS between FDG's self-image and perceived role versus its realistic limitations. As elaborated on in chapter 2.3 of this study, DG approaches to DRR/R seek, amongst other reasons, to create more equitable DRR/R, to overcome such limitations through sharing of DRR/R responsibilities, and thus, also power. However, in practice, FDG actors are critiqued as still portraying themselves as main actors within DG through the mobilisation of symbols, icons, narratives, discourses, and performances (Button, 2012; Marchezini, 2015:364). In this narrative, FDG actors are positioned as 'experts' with access and ability to operate technology, and thus, the dominant and/or only legitimate actors vis-à-vis people who are not formally affiliated with FDG. Claims to mandate, accountability, and expertise are all tools that can be misused to project and uphold power. Disasters are disruptive situations whereby the balance of power can shift. As Oliver-Smith and Hoffman detail, "under certain circumstances, the performance of state-level organizations in the disaster process also becomes a catalyst for readjusting the character of relations and interaction between local communities and the structures of the larger society." (2002:10). However, by maintaining a narrative whereby individuals and groups are viewed as passive victims in need of "salvation by external heroes" (Marchezini, 2015:365), power remains in FDG hands. Whereas, the 'untold' stories, such as Marchezini's account of the 2010 flooding in São Luiz do Paraitinga, Brazil, reveal significant IDG action. During the initial emergency operations, the local rafting team performed rescues, before being displaced by arriving 'professional' FDG actors (in this case the Army and Military Fire Department), who disregarded their 'amateur' assistance. Lacking the local knowledge of the area, the boats of FDG actors capsized, ironically requiring the aid of the IDG actors they displaced. This turn of events notwithstanding, mainstream media widely reported on the exploits of FDG, maintaining the disaster FDG-centred disaster narrative (2015:365-366). This posture is reminiscent of the persistent belief that during disasters people are helpless and 'mass panic' reigns, a myth addressed in chapter 2.

Goldstein adds that the excessive focus and display of FDG's (legal) authority, technocratic 'expertise', and/or locally unattainable technology, reinforces people's perception of incapacity and helplessness (Goldstein, 2008:24), potentially undermining people's informal DRR/R efforts. This sentiment was echoed by interviewees in this research project. Even in light of evidence to the contrary, interviewees would perceive their own role in DG as small and/or inferior when compared to FDG. This refers to both knowledge and disaster assistance. In SD, D27 was hesitant to refer to his own personal knowledge "because it's not official. It's mine", whereas he was convinced that "official warnings from the ODM,

media, training people into the schools, it's very important". Some Longyearbyen interviewees referred to IDG resources (Facebook groups, skidoos) as no match for FDG's (often exclusive) access to technical equipment (e.g. early warning systems, rescue helicopters). In the long-term, imbalanced relations between FDG and IDG lead to a "devaluation of social life" (Marchezini, 2018:146) whereby state-level institutions determine the path of recovery, with at best token input from local citizens, thereby reinforcing their mandate and increasing their power.

This sentiment remains reinforced and valid despite critiques, and the ostensible shift to participatory or community-based DRR/R (Czada, 2001:339; Radcliffe, 2016). Thus, even within the DG turn, the existence and persistence of IDG challenges FDG's operational principle. Informality continues to be treated as an anomaly that—if it is to be perceived as useful rather than 'in the way'—needs to be 'converted' into participation within the confines of the FDG system—e.g. through knowledge sharing or volunteerism; in other cases, it is often terminated, or simply tolerated or ignored. This is similar to the urban informality context, where Kamete finds that common ways of formal actors to deal with urban informality are through de-informalisation as forced conversion, repressive tolerance, or 'frontal aggression'—acts of eradication and dislocation (2013:23-25). Translating this to the field of DS, research is necessary on FDG's attempts to formalise informality, including its various modes of 'de-informalising' IDG practices, such as (forcefully) converting, including, ignoring, or eradicating IDG. The here presented findings, corroborated by many of DS's concepts (2.3.2), offer a critique (though the eyes of the 'end users') of FDG's perception and handling of informality, which essentially still follows the logic of top–down strategies designed to 'manage' and 'de-informalise' through (tokenised) participation. However, this limited lens does little to recentre power, necessary for participation to go beyond tokenism towards of collaborative decision-making (Hore et al., 2020). The result is an attempt to create an unachievable 'perfect' FDG, or defend a formal order, based on the misperception that these cannot co-exist with IDG's 'disorder', 'disobedience', and other 'dark sides', discussed throughout this section (6.2) and expanded upon in the next (6.3).

Power issues, marginalisation, lack of accountability, ulterior motives, inefficiencies, harmful uninformed action, and the lot, all constitute allegations that are equally valid for both FDG and IDG. Yet, such critiques or blame does not lead FDG to question or contest its own legitimacy, acceptability, not to mention its very existence. Attempts have been, and are being made, to improve FDG based on such critiques, but this rarely is taken as impetus to self-reflect on FDG as a whole, but rather to apply improvement measures to individual aspects of the existing FDG system. In other words, while the critique of FDG has triggered the investment of resources into FDG working, functioning, and behaving better, these have not led to the expectation to 'convert' FDG and/or shed FDG's formality, as is done with IDG. The assumption is not that there is something wrong with the very existence of formality, but only with elements thereof, which need to be ameliorated. In Kamete's words, "there is no justification why things should be different when it comes to informality [...] there is simply no logic or justice in citing

some wrongs to justify the wholesale wiping out or de-informalization of informality" (2013:27). Thus, one possible deduction is that FDG is not always aimed at improving the lives of the people that its practices are supposed to help, but rather to uphold FDG structures and cater to the authorities' whims.

Motivations notwithstanding, the desired 'perfect' FDG system, largely inspired by Western notions, has not been and cannot be realised. By exploring the drivers of IDG actions and actors, and exploring their perceptions vis-à-vis FDG, a critique of top–down FDG policies that are fixated on the formalisation of IDG emerges that poses questions about the modernist rationalisations underpinning FDG actions. Yet, effectively, none of the strategies to 'manage' IDG have translated, or can translate, into its disappearance or full integration on the ground. Instead, the deep-seated drivers and breadth of IDG show that they are already a part of DG, rendering informality inevitable. Thus, the answer must lie in collaboration between IDG and FDG that emphasises responsibility- and power-sharing, a notion discussed in 6.4.2.

6.2.4.5　Responsibility versus Burdening

Finally, discussions of power and the relationship between formal and non-formal modes of DRR/R raise questions of responsibility. How much responsibility lies with 'ordinary people' to meet their DRR/R-related needs? Scholars point to self-reliance and -governance prior to the industrialisation era, which saw the creation of today's FDG systems, described people as having been largely responsible for coping for themselves in calamities, supported only by kin and community (Helsloot & Ruitenberg, 2004; Kirschenbaum, 2004). With the creation of FDG, perceptions of DRR/R, at least across much of the Western World, shifted to being viewed as the realm of governmental and organisational responsibility. Wolensky and Miller (1981) view this tension as the root of disappointment: citizens expect FDG action, and when FDG does not meet these expectations, perceptions of FDG ineffectiveness emerge. However, formal institutions are incapable of tackling all aspects of DRR/R themselves, and some ask whether they even should (Helsloot & Ruitenberg, 2004:98). Thus, recognition is needed that FDG systems are not and cannot be the *deus ex machina* they are sometimes expected to be (Stringham, 2015).

By contrast, some scholars worry that these attitudes will unreasonably increase the burden on disaster-affected populations, while absolving FDG from responsibility. Soto cautions against tendencies to reduce such IDG efforts to slogans about resilience or strength. Instead, IDG can (and should) entail demanding engagement and accountability from FDG: "these mutual aid efforts do not—and should not—replace the state's obligation to its people" (2020:304). This concern is consistent with the aforementioned critiques on resilience research concerning indigenous populations (Reid, 2018, 2019). Informal actors' level of involvement must happen with care, or such a shift could problematically imply that people's failure to reduce disaster risks, or respond to disasters, is exclusively due to their own or their community's failings, culture, or "attitudes of indifference" (Nygren, 2016:347).

Importantly, as this research project's findings emphasise, people's wish to be active partners in DG does not translate into a refusal of equally active FDG leadership (Wolensky & Miller, 1981). This is particularly true concerning FDG provision of guidance and financial support which, as Meyer's 2017 study on social network resources for individual disaster assistance in Florida shows, may be less forthcoming within IDG than non-financial resources, especially amongst the most vulnerable populations. Overall, more balanced distribution of responsibility must be part of DG, but disproportionately shifting responsibility to informal actors does not enable; rather it adds burdens which further entrench vulnerabilities and power differentials. As Radcliffe puts it, an overemphasis of people's disaster action as the panacea, especially vis-à-vis particularly vulnerable populations, may constitute no more than an "(often colonialising) avenue for the delivery of slimmed down services and humanitarian relief" (Radcliffe, 2016:240).

Thus, while IDG pushed to formal governance tiers may produce more equitable DRR/R (Maskrey, 1989, 2011, Parthasarathy, 2015, 2018; Twigg & Mosel, 2017; Wilkinson, 2012; Wisner et al., 2004), more thought is necessary to explore the distribution of responsibility between FDG and IDG, including via handmaiden variables, such as resource availability within informal DRR/R networks (Meyer, 2017). Such an investigation could provide insights into how DG, in its proper 'inclusive' sense, could be achieved.

6.3 DARK SIDES OF INFORMAL DISASTER GOVERNANCE

The previous sections have already brought to light the various ways in which IDG, much like FDG, has limitations and can lead to negative outcomes. IDG cannot and should not be seen in a near-theological context of a panacea vis-s-vis 'dysfunctional' FDG. Thus, the purpose of this section is to balance the discussion by specifically highlighting IDG's negative aspects (or 'dark sides'), drawing both on theory and empirical evidence from the case studies. Informal efforts are subject to many of the 'dark sides' of FDG in general. Any form of governance can produce unintended path dependencies or adverse impacts, implying caution is inevitably warranted. Presenting these drawbacks is particularly important in the case of informal action, since a lack of focused attention on the topic may not have resulted in the same countermeasures applied to FDG. Informality has as much potential as FDG to result in harm or less positive outcomes and could benefit from lessons drawn from FDG and related formal mechanisms (Cooke & Kothari, 2001; Hickey & Mohan, 2004). Network approaches to (informal) DRR/R, for instance, clearly demonstrate this. In the study of networks, the neutrality of the related terms, including 'community' or participation', takes away the bias inherent in disaster terminology. This encourages the notion that issues of power, as well as access resulting from factors such as one's social status, gender, or other interests are, or can be, an integral part of the interaction between members of these groups or networks. The latter hinges on imbalance in distributions of power inherent in any system, unregulated

or otherwise (Pretty, 1995), but informality produces its own challenges where, as per the sections above, accountability, monitoring, and enforcement are not necessarily expected, in the same way they might be in formal systems.

Informal efforts may intentionally or unintentionally circumvent institutional and governmental policies and strategies. While in some cases such informal action may be helpful, it may be detrimental in others. In either scenario, informal action can be tacitly or even explicitly permitted, or be perceived as challenging formal organisations and structures, including governments, leading to tensions and/or putting informal actors at direct risk of censorship, punishment, or persecution. Conversely, similar aspects may be at play with respect to vertical governance relations when stronger parties usurp the attention of formal institutions. Bradford (1998) illustrates the Government of Ontario's efforts to improve occupational health and safety policies were undermined by advantaged private sector representatives, gained access to senior officials through informal channels. Thus, while governments can acknowledge their limitations and allow or actively support informal actors, intra-community power relations can also hinder such activities, particularly when powerful locals play active roles in formal structures.

A significant and related issue is the potential for conflict, extending not only to the access to resources for DG, but also to resource control. In informal situations, water, electricity, or similar 'mafias' may appear (Mahadevia, 2014) where the potential to provide aid to the disaster-affected population at exorbitant prices surfaces, or prioritising/restricting the certain groups' access, along with price gouging for basic supplies and services (Noy, 2008). More powerful actors may take advantage of informal settings (or within them) for their own purposes, especially in contexts characterised by weak governance, including when FDG is simple but profoundly questioned and its role in flux (Alfaro d'Alençon et al., 2018:60). Tendler (2002) refers to these anti-development dynamics as 'the devil's deal', perpetuating dependence rather than healthy, participatory governance and political empowerment.

Meanwhile, FDG actors may sometimes encourage informal action because it assists them in meeting their own objectives. In traditional formal institutions, the presence of (unsanctioned) informal set-ups does not often grant weaker actors opportunities to vocalise or pursue their preferences, providing powerful actors with more freedom to dictate actions on the basis of their presumed superior agenda-setting power and bargaining leverage. Personalities can make a difference in this regard. For example, the personal friendship between the Greek and Turkish foreign ministers in 1999 assisted both countries in pursuing rapprochement in the wake of post-earthquake mutual aid, as well as the backlash to it, following earthquakes that hit each country in August-September 1999 (Ker-Lindsay, 2000). Powerful players, even ministers within formal institutions of elected government, can have strong incentives to steer institutional design and actions towards higher levels of informality to suit their vested interests.

Finally, despite the resourcefulness, creativity, and flexibility often inherent in IDG settings—even without being dominated or taken over by powerful players—resources, skills, transparency, and accountability can hamper effectiveness as a result of disorganisation, inadequate training, and being tasked with responsibilities without concomitant resources (Meyer, 2017). People implementing DRR/R can face the dilemma of conflicting group loyalties when they find themselves caught between obligations to family, other groups they belong to or identify with, and emerging groups. Killian (1952) describes this as a conflict between ordinarily non-conflicting multiple group loyalties, which can impede informal efforts by making its positive aspects appear to entail disloyal and intractable choices. Thus, IDG cannot necessarily be relied upon, in the same way as it is expected of FDG (Helsloot & Ruitenberg, 2004).

Ultimately, research into DG must include consideration of equitable distribution of power between formal and informal, public and private parties—in other words, engagement with the political rather than just technocratic dimension of DRR/R co-production (McMillan et al., 2014). Doing so has the potential to advance the original intent underlining the paradigm shift from DRR/R management to governance—a source of insight to bring about systemic change toward a more just, equitable, and effective DG system that relies on—and sees the downsides of—both its formal and informal actors and their efforts.

6.4 WHAT NEXT FOR INFORMAL DISASTER GOVERNANCE?

What are the implications of IDG, as analysed and outlined in chapter 6.2, for DG? Chapter 2.4 reviewed the literature necessary to understand how IDG is, and is not, dealt with by DS and FDG. Many concepts exist to account for informality, or aspects thereof, in DRR/R. Some of these have been around for decades. The concepts of self-help, convergence, emergence, and volunteerism are prominent examples. Others have emerged more recently, and some in response to DS's 'governance turn'. The idea of so-called 'participatory' or 'community-based' approaches to DRR/R especially embody this category, other terms and concepts include local DG, disaster para-diplomacy, and the more recent term of zero-order responders. A more extensive list, including some of the most common concepts, has been provided in Table 5, chapter 2.4. If many varying approaches and concepts dealing with (elements of) IDG have already been proposed, then why are we still creating new concepts to assert the importance of informal actors and actions—ones that often just repeat the old ones (or elements thereof)? Why are we still discussing best practices? What is missing? This section summarises why DG measures to date have not been successful and offers a new framework for considering IDG's significant role within DG.

6.4.1 INTEGRATING INFORMAL DISASTER GOVERNANCE IS NOT ENOUGH

Throughout this study, the dominant FDG-centred narrative has been discussed, including its limitations and critiques. Common to these critiques is the idea that DRR/R does not and should not happen only on the FDG level. First, there has been increased critique vis-à-vis FDG's limitations to act—be it due to

limited resources or other reasons—and, thus, its imperfect effectiveness. As a result, people may have to act where FDG may not be sufficient or forthcoming. Second, going beyond functionalist critiques of DG, people threatened by, or finding themselves in, a disaster tend to act irrespective of FDG involvement and the success of such involvement. Third, given FDG's limitations to act, as well as the disaster field's increased professionalisation, the connection to the 'ground' has been compromised, with critique being voiced over FDG's potential to cause harm rather than benefit the affected populations. To improve these limitations, DG approaches—understood as the decentralisation of central DRR/R to regional and local levels—have been proposed and increasingly implemented. Though, notably, such decentralisation still mainly involves formal actors, such as municipalities or local dedicated DR agency chapters.

The evidence brought forward in this research project supports these critiques of FDG-dominance, namely, by highlighting the need for consulting and collaborating with informal DRR/R actors and efforts. It is *not* the argument of this research project that FDG efforts are 'bad', nor that the DG approach is misguided. Plenty of decentralised, inclusive, participatory DRR/R projects constitute genuine and successful efforts to govern rather than authoritatively managed 'expert'-led DRR/R. For instance, models of community-based care-givers in Israel, more recently also adapted throughout the United States, Canada, and Brazil, constitute models of successful vertical cooperation between trained first responders and laypersons that is based on systematic collaboration with IDG (Hoffman, 2014; Luckritz, 2015). The NGO *United Hatzallah*[57] is a case in point. *United Hatzallah* tackled the question of how to reduce the time it takes for medical personnel to arrive at the scene of an emergency (Tatz, 2017). Recognising that sufficiently increasing FDG coverage is not feasible nor cost-effective, the NGO instead decided to rely on those who are most likely to be in closest proximity when an emergency occurs: bystanders, neighbours, friends, family, or in other words, IDG. *United Hatzallah* decided to build a citizen engagement model that provides training to IDG actors, and then includes them in a network of autonomous first aid laypeople whose movement is monitored, and called into action when and if needed, depending on who is closest.

What the findings of this research project, brought to their logical conclusions, do take issue with is the predominance of, and desire for, FDG to remain at the centre, thereby maintaining a system that by design is biased against informality. The reviewed approaches (Chs. 2.3.3, 2.4) might reflect a sincere desire to 'improve' disaster-affected peoples' lives, by creating avenues for them to be involved in more open and inclusive DRR/R. However, such intent does not exorcise the underlying quest for the betterment of orderly, top-down FDG, and the epistemic marginalisation of informality, so as to defend FDG's position as the ultimate form of modern DG, as discussed in 6.2.4, and conceptually illustrated in Figure 41 below.

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[57] http://israelrescue.org/

Figure 41. DG According to FDG (Left), and the Shift from DM to DG (Right).

The DRR/R-mandated authorities' focus on formality and the professionalisation of the field is fuelled by many motivations but is operationally a product of the (post-) industrialisation which sought to formalise systems to deal with crises, emergencies, and disasters. FDG's typical structural characteristics give little space for disasters as social situations, in which the people who are directly, indirectly, and even not personally affected, act (or wish to act), unless their acts can be converted to fit FDG's structures. IDG, and the principles on which it rests, challenge FDG's conviction that informality is an anomaly that needs to be 'converted' into participation within the confines of the FDG system—e.g. most commonly through knowledge sharing or volunteerism—if it is to be useful rather than 'in the way'. Beyond the conceptual irony of trying to be inclusive by formalising the informal—representing something of an oxymoron—the findings presented by this research project are evidence that this approach is inherently flawed. IDG is significant (6.1.1) and occurs irrespective of FDG (6.1.2). Furthermore, by delving into the question of 'why' people choose a particular source of DG information or help, this study reveals that instead of aligning themselves according to an artificial and fluid designation of what is formal and informal, people rely on underlying contributing factors to inform their decision(s). These factors—proximity/propinquity, relationships, experience, and power—which are common to both FDG and IDG (but can manifest themselves differently) offer insights into the reasons for the persisting and significant role of IDG. Integrating IDG into FDG negates the very reasons for their complementary role in DG. Thus, the deep-seated drivers of IDG show that informality is an inevitable and necessary part of DG—not FDG—the realisation of which can spark a change of strategy from integration to true collaboration.

6.4.2 TOWARDS FORMAL/INFORMAL COLLABORATION FOR DISASTER GOVERNANCE

The previous section explained that IDG does not constitute actors and acts that need to be brought into DG by FDG. IDG is, by definition, part of DG—that is, engaging in DRR/R, formally or informally, constitutes DG as per the very meaning of this term. Each agent acting on their or others' DRR/R needs, is a disaster 'manager' to a certain degree. This is not dissimilar to the argument that diplomacy is not only conducted by the highest political echelons and in dedicated political corridors, but equally by members of society engaging in every day and/or cross-border dialogue (Diamond & McDonald 1996; Constantinou, 2016; Cheuk, 2016; Cornago, 2013; Marsden et al., 2016). People acting on DRR/R are,

thus, already engaging and constituting DG. FDG forms another part of DG. Neither IDG nor FDG alone make up DG; DG consists of both of them. Thus, rather than FDG needing to convert and include these informal actors into systems of pre-defined best practices, this research project suggests that a mindset shift is necessary by which these IDG actors become an integral part, not of FDG, but of DG at large. This shift is represented by Figure 42, conceptually illustrating the equal—at times independent, at times overlapping—roles of FDG and IDG within DG, and thus, the (kind of) re-centering of power that is currently missing in DG (Hore et al., 2020).
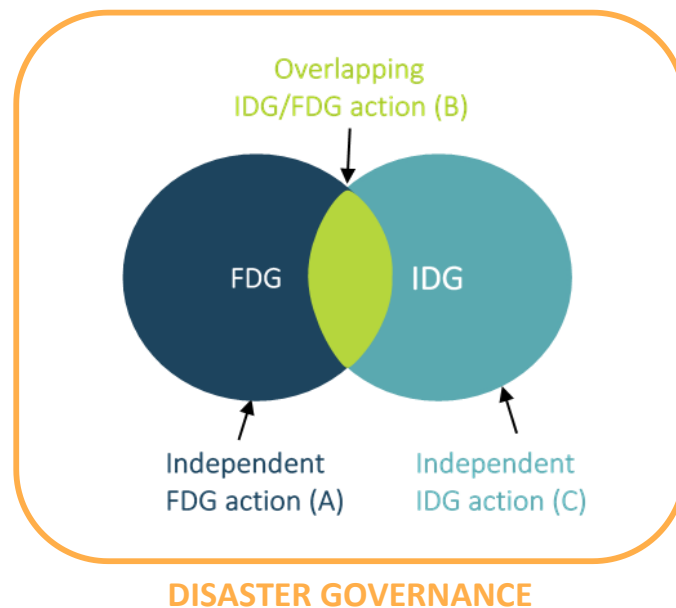

Figure 42. Conceptual Representation of Disaster Governance That Recognises the Significant Roles of FDG and IDG.

The findings from this research highlight the significance of IDG, while also emphasising the importance of collaboration across the (in)formality spectrum. Interviewees in Longyearbyen and SD considered both FDG and IDG to be important. Further, they did not distinguish between the (in)formality of sources, nor did they explicitly refer to any such distinction. As was discussed in 2.4, defining the line between what constitutes FDG and what is IDG, is challenging, and actors change status depending on the circumstance. For example, Dominica's parliamentary representatives are formal actors, but when they choose to prioritise personal relationships or abuse their power for political gain, they are essentially abandoning their formal mandate and engaging in IDG action. Thus, given the fluidity with which actors and activities cross the boundaries of what is ostensibly an artificial formal/informal divide, the above Figure 42, with its clear distinctions between IDG and FDG, may still not be an adequate representation of the necessary conceptual shift. Instead, the emphasis should be on a dynamic and ongoing collaboration between FDG and IDG without demarcations or one system dominating the another, as shown in Figure 43.
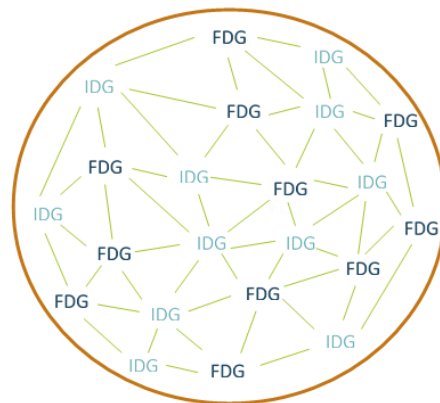
Figure 43. Conceptual Representation of Collaborative DG with (In)Formality as a Fluid Spectrum.

This complementary and collaborative model is supported by the findings from Longyearbyen and SD. When sourcing information, interviewees depended on informal sources that are often more accessible but not always reliable, with official communiqués offering confirmation. As L10 shares, with town talk, "you don't believe it, but then you started to look at it", before going to official sources to confirm, while L05, for instance, heard about the recent helicopter crash (October 2018) informally from a friend employed in a formal institution, before official news emerged. Thus, this combination of FDG and IDG, in practice, already constitutes people's realities as, to them, this combination offers the best of both worlds, as per the theoretical underpinnings of DG.

This is also true for sources of help, with interviewees preferring to rely on informal sources, when possible, largely as a result of the proximity of, and ease of access to, relationships, while still acknowledging and appreciating the significance of formal sources' capacity and authority to provide support on a different scale. L19 highlights the combination of the two, suggesting that while he trusts the expertise of formal institutions, he trusts most those with whom he has an informal link in the form of a personal relationship. L12 offers another and inversed example of the strength of this formal-informal connection, relying on the assistance of a friend who does not have a formal role in disaster response, but has a formally trained rescue dog. Similarly, L06 trusts a friend who is a formally trained psychologist, while SD28 shared how being in a position of power, thanks to FDG, also brought with it social responsibility to go beyond the role and serve the community as a lay leader, and thus, IDG.

Similarly, FDG can initiate positive interactions with IDG by avoiding attempts to 'control' or 'de-informalise' it, (re)balancing the power dynamic. For example, Longyearbyen's FDG actors' efforts to actively engage with residents via informal channels, such as the local Facebook group, were welcomed and encouraged. They positively contributed to people's trust in, and acceptance of, FDG. The presence and interaction of Longyearbyen's FDG with the settlement's residents was an important new dimension, which evoked positive feelings amongst the interviewees towards FDG agents and practices in Longyearbyen. Beyond that, FDG's interest in, and engagement with, IDG efforts, over and above what

is traditionally understood as participatory methods of DRR/R, emerged as another key principle contributing to people's buy-in. To illustrate: in principle, Longyearbyen's above-mentioned Facebook group can be understood as part of the settlement's IDG mechanisms. Although it has been established as a group for dialogue on many kinds of interests and issues, its very nature is to offer and seek information, as well as to help. Given Svalbard's unique environment, many of these issues relate to aspects of safety, risk, emergencies, and disasters. Amongst others, the group functions as an early warning system for everyday risks (e.g. polar bear sightings), as well as emerging social issues and risk potential (e.g. the legal predicament of foreign workers during the ongoing Covid-19 pandemic). In addition to the FB group's thematic coverage, it also helps break down language barriers. Much of the engagement occurs in Norwegian and English, which can be translated at the click of a button to other languages using the integrated Facebook translation function, thereby reducing the marginalisation of non-Norwegian and non-English speakers in Longyearbyen. Furthermore, the FB group offers an easy way to stay informed for people new to the settlement, including tourists, who may not (yet) be familiar with the settlement's official communication and emergency help sources (e.g. Governor's Office).

According to the interviewees, the efforts by Longyearbyen's FDG actors to actively interact with the residents' Facebook group, not only provided an increased sense of risk awareness and safety, but also led to a feeling of FDG engaging on residents', rather than just FDG, terms. For one, FDG actors did not disregard the value people in Longyearbyen place on the Facebook group, but instead adapted themselves to a mechanism thought out and established by the people. Secondly, the town's FDG actors also used the platform to gain insights about emerging issues and needs, and then act on them. Crucially, during the 2015 avalanche, the FB group was used by residents and rescue teams alike to call on formal actors (Indreiten & Svarstad, 2016a:359). More recently, this new cooperation expressed itself through FDG's engagement with the group during the Covid-19 pandemic, during which people communicated needs amongst themselves and created new initiatives—such as mental health counselling—which were then further supported and promoted by Longyearbyen's FDG actors (Sabbatini, 2020a).

These Longyearbyen and SD examples offer insights into how underlying factors contribute to people choosing FDG and/or IDG sources. Analysing these contributing factors—proximity/propinquity, relationships, experience, and power—and their common and different manifestations within FDG and IDG—reveals the significant role that both play in DG, and the potential for effective DRR/R when they collaborate on equal terms, with the common goal to reduce vulnerabilities and safeguard people.

CHAPTER 7

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CONCLUSION

This chapter summarises this study's overall contributions. Section 7.1 considers the overall achievements of this study in the context of the research questions presented at the beginning of this thesis. Section 7.2 reflects on the limitations of this research, and 7.3 offers recommendations for further study. Section 7.4 outlines some practical and policy implications of the study for the field of DRR/R, and section 7.5 offers a few final words to complete the thesis.

7.1   ACHIEVEMENTS OF THIS THESIS

This research concerned itself with the role of informality in DRR/R. Its aims were to a) build an understanding of the phenomenon of IDG in Longyearbyen and SD by examining how residents perceive DG, b) examine the factors that contribute to these perceptions, and c) consider the possible implications for DG. To achieve these three aims, this study reviewed the academic literature relevant to this topic, and then applied it to the two case studies of Longyearbyen and SD. The perceived role of IDG in the lives of interviewees was investigated, and the contributing factors—proximity/propinquity, relationships, experience, and power—identified and discussed, revealing their role in informing interviewees' choices of FDG and/or IDG. Finally, based on the evidence that IDG is perceived by interviewees to be significant in DRR/R, a new, and IDG-inclusive conceptualisation of DG was proposed. The key highlights from this research within the context of the 54 interviewees from Longyearbyen and SD are:

1) IDG is perceived to play a significant role in DRR/R (6.1.1);
2) IDG occurs irrespective of FDG and its failures (6.1.2);
3) Both FDG and IDG can have positive and negative implications in DRR/R—'dark sides' (6.3);
4) Proximity/propinquity, relationships, experience, and power all contribute to perceptions of disaster-related sources of information and help (6.2);
5) The similarities and differences in the way in which these four contributing factors are linked with FDG and IDG offers insights into why interviewees choose to engage with one or both (6.2);
6) The respective significance of IDG and FDG in DRR/R, suggests that efforts to integrate IDG into FDG-centred models should be replaced with a collaborative framework for DG. (6.4).

This study represents an original theoretical, methodological, and empirical contribution to knowledge, each of which is expanded on individually in the sections below.

7.1.1 THEORETICAL ACHIEVEMENT: INFORMAL DISASTER GOVERNANCE—A NEW FRAMEWORK TO RECOGNISE THE IMPORTANCE OF AN OLD NOTION

Current (academic) reflection on IDG—and its preoccupation with either interorganisational informality or narrow concepts such as first/zero-order responders, self-organisation, convergence, emergence, and volunteerism—is insufficient to account for the major role of IDG actors and their activities. The study of informality itself is highly complex and can produce ostensible contradictions, such as formalising informality and seeking informal aspects within formality.

As with disasters themselves—the lack of definitional consensus and the power connected with who decides on what constitutes a 'disaster'—informal actors have long suffered from a lack of voice due, in part, to an inherent absence of a basic conceptualisation of the term. Thus, I suggest the term IDG to indicate the increased role that informality plays vis-à-vis what is currently acknowledged. Overarchingly, the 'informality' in IDG, refers to informal actors and actions in DRR/R, broadly understood as individuals or groups (any actors) acting voluntarily, in an impromptu or unplanned manner, or because they feel they must, yet without having been formally mandated and without any formal, systematic, or necessarily structured fashion. Fundamentally, rather than being an opposite to 'formal', or simply what is not formal, IDG is about people developing their own roles and pursuing their own actions, irrespective of official, expected, or defined positions and mandates.

I emphasise the notion of 'framework' to avoid presenting IDG as merely a new packaging for an old concept (or multitudes thereof). Informal DRR/R does not need new names but rather a framework that is filled with both long-standing and new literature connecting theory and practice. In 6.3, I introduce the concept of IDG's 'dark sides' or negative aspects, as a means of balancing the ostensibly positive nature of IDG, especially when considering literature on community-based or participatory DRR/R. Any form of governance can produce unintended path dependencies or adverse impacts—implying caution is inevitably warranted.

Conceptually, IDG also entails going beyond the simplistic rhetoric of formal versus informal, of informal as non-formal, or of top-down versus bottom-up approaches for DG. In particular, IDG and FDG do not represent discrete, separate bubbles. Instead, they sit on a continuum and overlap significantly, with different levels of formality and informality, rather than being either exclusively formal or informal. A formal entity can act informally, the status of an actor or action can change, and informal activities can have the power to affect formal structures and FDG. Thus, embracing the role of IDG, and the nuance that accompanies it, 'completes' the picture of DG and represents an original theoretical contribution to DS.

Finally, the focus of this study is IDG, but the findings offer broader interviewee perspectives on DG—encompassing, for instance, data on interviewee perceptions of disaster risks and their relative significance—which lends itself to further analysis.

7.1.2 PRISM—AN INNOVATIVE APPROACH TO INTERVIEWS

This research is based on primary data collection at the individual level in the two case studies of Longyearbyen and SD. The data were collected using a unique combination of semi-structured open-ended interviews and the Pictorial Representation of Illness and Self Measure (PRISM) tool, specifically adapted from clinical psychological research. Approached alone, the interviews provide qualitative information based on interviewee perceptions. As this research centres on the DRR/R perspectives of Longyearbyen and SD residents, it also sought to determine the relative significance of the identified sources of information and help, and in doing so, establish the role of IDG in DRR/R. Eliciting answers from interviewees provides direct and indirect data, yet it relies on the researcher to analyse and interpret the information shared. Thus, establishing the significance of a given source is usually filtered through the researcher's lens, and the ability to compare the data across multiple interviewees is limited.

The use of the PRISM tool, specifically revised for the purposes of this thesis, enhances this endeavour. It helps focus the interview and offers an additional "numerically descriptive aspect [...] of accounts" (Maxwell, 2017:125), essentially clarifying and corroborating the perspectives expressed verbally by the interviewees. The resulting data is clear, classifiable, and quantifiable, facilitating analysis. In this case, thanks to the PRISM diagram generated for each interview question, clear disaster risks and sources of disaster-related information as well as help were generated, and their relative significance ranked, by and for, each interviewee.

Using the PRISM tool also promotes respect and fairness between the interviewer and interviewee. It enables the interviewee to (physically) see exactly what is being collected, ensure their words are not being misinterpreted, and validate the PRISM diagram in question. Thus, it redresses some of the power imbalance inherent in interview-based research.

By using the PRISM tool outside of longitudinal clinical research and applying it in cross-sectional semi-structured interviews for the first time in DS, this study offers an original methodological contribution.

7.1.3 EMPIRICAL CONTRIBUTION

As a practitioner, my motivation for investigating informality is rooted in the pursuit of more effective DRR/R. The IDG framework is only useful if it serves the needs of the populations affected by disasters—people. Thus, much like the 1980s/90s 'Voice of the Poor' project initiated by the World Bank to collect the perceptions and voices of the poor across the world through a participatory poverty assessment

(Narayan, Chambers, et al., 2000; Narayan, Patel, et al., 2000; Narayan & Petesch, 2002), or Grump, Kelman, and Germano's 'Many Strong Voices' initiative[58], rather than focus my research on theoretical constructs (only), and exclusively seek the advice of DRR/R 'experts', I instead sought out the experience and perspectives of the 'end user' to guide my discussion.

Thus, subjective human experiences form the core of this research, and following Max Weber's tradition of *Verstehen*, understanding the conditions in which IDG occurs, and its constitutive structures and patterns, are this study's main concerns (King & Brooks, 2017:3).

The resulting data collected from 54 open-ended, semi-structured, PRISM-assisted interviews in Longyearbyen and SD represents new empirical information that contributes to the body of knowledge in DS. As shown in chapter 2, the literature on informality in disasters is long-standing but limited. This extends to empirical evidence. This research adds the first informality-centred empirical data on either location to the DS body of knowledge. Additionally, this study represents the first comprehensive disaster research on Svalbard, an understudied part of the world.

7.2 LIMITATIONS

The findings of this study are subject to the conditions in which they took place, potentially limiting the impact of its conclusions. This research was conducted using a specific research approach, design, and method, and was based on a set number of interviewees from two case studies. At every step of this process, choices were made which, ultimately, influenced the results. The rationale for the selection of each element of the methodology is presented in chapter 3. Selecting a qualitative approach, case study method, and non-representative sampling strategy directly affected the ability to make inferences on the general population based on the data collected. This was compounded by the sample size which was limited due to resource constraints (e.g. time, logistics/accessibility, availability) (Ch. 3.5.1.3).

Aware of these constraints, this research investigated the role of IDG for a defined population and developed a theoretical framework that could be transferred to other locations. Thus, the two case study locations were selected because they were critical cases 'most likely' to feature dominant IDG, meaning that if IDG was not significant in either location, then it can be assumed not to be a widespread phenomenon (details in 3.3.3). This was a useful (and accepted) approach for developing a framework for IDG and examining its contributing factors and significance in DG. While this may be considered a limitation, by ensuring the study is valid and reliable, and leaving audit trails (as detailed in 3.8), the IDG framework can be 'transferred' to other case studies. This offers the first of several avenues for further research that feature in the next section of this chapter.

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[58] http://www.manystrongvoices.org/

The application of the revised **PRISM** model during data collection presented a significant contribution to research but also added limitations to this study. For instance, when presenting the question on disaster risks in SD, some interviewees expressed a wish to put the risks they fear the most as far away from them as possible, as opposed to close to them, in keeping with the instructions. In the words of SD14, risks should be "far away from me [...] because I'm scared [...] I don't want it closer to me; I want it far from me", while SD15 and SD24 expressed a wish to put hurricanes far away to reduce their impact. The instructions were clarified, and the **PRISM** exercise continued as planned, but this offered a new perspective for this methodological innovation. Similarly, for Q3 in SD, 11 interviewees (34%) considered the question of what sources helped Dominica, as opposed to their own particular case, prompting further questioning to shift the focus back to them. This may suggest a methodological limitation linked to the interviewer being a foreigner, prompting interviewees to take on a 'representative' role for the island as a whole. Similarly, initial confusion surrounded sources of information, which was meant to elicit a list of actors, and instead, in both locations, also resulted in references to platforms such as Facebook, the internet, or books. Additional questioning resolved most of these challenges, but the precise nature of the **PRISM** tool does require a corresponding clarity of questioning beyond that of traditional interviewing techniques.

Similarly, during the analysis, this study focused on the relative ranking of interviewee answers to the three questions posed, but did not consider actual distance or angularity, nor was a quantitative lens applied and statistical significance considered, as it would have changed the nature of this study, and been beyond its scope and objective as well. Rather than being a limitation, per se, adding a quantitative side to the use of **PRISM** for the study of IDG, including applying it to the data collected by this research project, constitutes an area for further research (cf. below).

Finally, this research was conducted by a single person, with a particular identity, subjectivity, and positionality. This undoubtedly influenced results. Chapter 3 explicitly presented the subjective nature of this (and all) research, particularly from the perspective of a critical realist. By engaging in self-reflection, and using audit trails to document it, I hope to provide the reader with a transparent theoretical template applicable to other cases that contributes to the evolution of the IDG framework, and to DG at large.

7.3 SUGGESTED AVENUES FOR FURTHER RESEARCH

Research is an ongoing process. Every question answered leads to new ones, expanding the body of knowledge but also revealing how much remains to be discovered. This study highlights the role of IDG in DS, opening up new avenues for further research, including the following.

7.3.1 IN TERMS OF INFORMAL DISASTER GOVERNANCE

This study explored and analysed IDG in two locations—Longyearbyen and SD. Both were 'most likely' case studies and facilitated the development of the IDG framework. Exploring IDG in other cases and in different parts of the world would assist the further development and positioning of IDG. Particularly, exploring locations and cases that are 'least likely' to feature IDG may offer important insights, as will a consideration of the role of IDG across different disciplinary, linguistic, cultural, and ethnic settings. Crucially, integrating non-Western researchers', practitioners', and peoples' insights would both enrichen the body of knowledge and contribute to efforts to decolonise DS, a central pillar of the current FDG-IDG dynamics (Gaillard, 2019)[59].

These efforts need to further address the level of analysis problem in DS, and additional IDG studies offer a way. DRR/R or DG are still predominantly explored through the eyes of, or with overwhelming focus on, formal organisations as (the only relevant) active actors. As this study has shown, co-producing science with multiple stakeholders, including, the very people affected by them, can lead to fruitful outcomes, more effective DRR/R, and the paradigm shift DS critically requires (Ismail-Zadeh et al., 2017). This paradigm shift also refers to power 'in the field'. In contrast, research on IDG-denominations misses important links between how peoples' IDG choices have the *power* to affect formal disaster agencies, the context in which FDG operates, and is (not) accepted, and even change larger DRR/R-related norms (Birkmann & von Teichman, 2010). Systematic studies are required to explore this important connection and rebalance power within the construction of DG. In this sense, we must emphasise empirical IDG data that look more to positive IDG examples and successes, rather than just viewing IDG through the lens of DG failures (cf. functionalist lens, Chs. 2.3, 2.4, 6.1.2).

Additionally, insights from other disciplines will help further unpack factors that contribute to people's choice for IDG (or FDG) and advance the IDG framework. Thus, some disaster scholars calls for DS to engage with broader interdisciplinary empirics and insights from other related fields, such as climate change adaptation (Birkmann & von Teichman, 2010; Kelman, 2017b; Dias et al., 2019). But as this study's findings support, research on informality in disasters must further engage with supposedly unrelated disciplines, such as IR, management, or urban studies—the latter has a rich history exploring informality in disaster-related contexts which needs to be unpacked and considered in IDG studies. In a similar vein, this thesis's findings have shown that the study of IDG must extend to the deep origins of human societies and integrate insights from history, psychology, even (evolutionary) biology, because social facts underlying disaster behaviour—including vulnerabilities—have psychological and biological roots (e.g. overconfidence bias). Despite communication and collaboration challenges, the benefits of

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[59] See also *Power, Prestige & Forgotten Values: A Disaster Studies Manifesto*. https://www.ipetitions.com/petition/power-prestige-forgotten-values-a-disaster

integration with these fields offers new knowledge, research methods, and consilience that will help DS and practice progress.

Finally, this research focused on a qualitative exploration of IDG. A quantitative study based on a representative sample of the populations in either or both case studies could add another perspective to this research's findings. This could provide a basis to make inferences on the wider populations of these locations, thus, contributing to IDG's generalisability.

7.3.2   IN TERMS OF PRISM

Despite its nature as a multi- and transdisciplinary field, DS is surprisingly stagnant when it comes to methodological diversity and innovation. In qualitative DS, surveys, focus groups, and interviews often represent the sole investigative tools (Schumann et al., 2019). The innovative adaptation of the PRISM tool to disaster studies, offers a qualitative and quantitative dimension that complements semi-structured interviews by depicting more authentic results and generating richer, more valid, and contextualised data. PRISM allows interviewees to easily generate a visual representation of their input, and verify or potentially adjust it at any point during the interview; thus, going beyond initial impressions, subsequent path-dependencies, and so-called 'party lines'. Similarly, for the interviewer, PRISM is interesting and helpful. It encourages interviewees to discuss their choices, often without the interviewers' probing; thus, minimising biases associated with qualitative research and interviews. It also enables the researcher to more accurately understand the interviewees' thoughts and thought processes, while affording more time to reflect on worthy subsequent questions/probing in the semi-structured interviews. Using PRISM for further studies into IDG, and other as difficult-to-understand labelled phenomena, offers scholars and, importantly, policy-/decision-makers, a visual, tangible illustration of these phenomena and their drivers through the eyes of disaster-affected people.

The PRISM tool also offers the possibility of further exploration into a number of IDG scholarly inquiries left unaddressed. The here generated data and new IDG-data could be further analysed quantitatively. Perhaps, the precise distances between the measured risks, sources of disaster information and help, and the 'self', could offer additional analytical data, especially when combined with interviewees' demographic information. Further, in the hands of psychologically trained scholars, richer data on the psychological factors relevant to peoples' choices for IDG/FDG could be gathered that reveal further important insights. Finally, true to its nature in clinical research, researchers would do well to conduct longitudinal disaster-related PRISM-studies, measuring changes in interviewees' responses over time and/or changes pre- and post-disaster.

7.3.3 IN TERMS OF DISASTER RISKS

Finally, the first interview question used in this research ("What kinds of disasters or disaster risks do you feel are relevant in your life") was primarily used as an 'ice-breaker'. However, the findings revealed a link between the factors that contribute to disaster risk perceptions and those that inform the choices of disaster-related sources of information and help. This should be explored further as it could provide valuable insights into how to raise public awareness of disaster risks and galvanise the appropriate DRR/R action across both FDG and IDG.

7.4 RECOMMENDATIONS FOR DRR/R POLICY AND PRACTICE

This research bears relevance to the local, national, regional, as well as global, or theoretical meta-levels. At the local level, the outcomes of this study allow the researcher, as well as the community, to understand their unique make-up concerning the formal and informal means of dealing with disasters. Without suggesting statistical generalisability, this study is of further value to the national level. The promotion of this research may raise awareness amongst the relevant authorities and prompt the integration of these findings into their DRR/R strategy and initiatives for the concerned populations, as well as serve to replicate the study in other communities. At the global or meta-level, the unique and original contribution of this PhD is in proposing IDG as a framework to encompass new and existing interconnected theories and concepts that touch upon informality in DS and practice, and in doing so, ensure informality is accurately represented within DG.

In drawing on the theoretical and empirical discussion in this thesis, including the lessons from each case study, the focus for recommendations is on high-level conceptual aspects to ensure an adequate academic grounding in how IDG studies and actions develop, while aiming to provide baselines for overcoming IDG's dark sides. The following (selected) policy-recommendations are offered:

1. Informality is not a new concept for DRR/R, but IDG presents a novel framework for it, so it should be used to understand informality in DRR/R and how to best recognise and apply it.

2. Words matter and the labelling, including translations beyond English, need to be considered carefully, with the tenets taken seriously and applied in practice. Using IDG as a unified framework with a clear name supports this approach and ensures an appropriate balance with the extensive work on, and acceptance of, FDG.

3. Efforts to 'integrate' IDG into existing FDG frameworks—whether top-down or bottom-up— should focus instead on collaborating with IDG without attempted 'structuring'.

4. DG policy needs to consider the role that contributing factors (e.g. proximity/propinquity, relationships, experience, and power) have in determining people's choice of IDG and/or FDG.

5. Accepting and applying IDG completes DG. By extension, an IDG-FDG dialogue may bring about the changes necessary for DG to become more efficient and effective, a stated need and goal within much DRR/R research and practice.

7.5 FINAL WORDS

The key tenet upon which this thesis is based is that informality is a fundamental part of DRR/R and, thus, of any DG approach to disasters. Put simply, DG without IDG is not DG. Consequently, this study argues for the need to adjust existing DRR/R approaches to this reality. By acknowledging the role of informal actors in DRR/R, and working together, formal and informal actors can better reduce disaster risks, prepare for, respond to, and recover from disasters, thereby contributing to more effective DG. Thus, the ultimate contribution of this research project is to fully acknowledge and identify the role of informal actors and action in DRR/R and promote greater understanding as to how the roles and actions of the different DRR/R actors, formal and informal, can be better reconciled to ensure more effective and efficient outcomes. While this research is limited to two case studies, the empirical evidence born out of the disaster realities of Arctic Svalbard and Caribbean Dominica will echo in other places, offering a useful analytical framework for understanding IDG.

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APPENDICES

APPENDIX A: ACADEMIC PUBLICATIONS

Duda, P. I., Kelman, I., & Glick, N. (2020). Informal disaster governance. *Politics and Governance, 8*(4), 375–385. http://dx.doi.org/10.17645/pag.v8i4.3077

Saville, S., Brode-Roger, D., Albert, M., Ferguson, L., Vindal Ødegaard, C., Sokolíčková, Z., Iversen, L., La Cour, E., Meyer, A., & Duda, P. I. (2020). Social sciences in the Arctic and beyond. *Eco Magazine: Environment Coastal & Offshore, Special Polar Issue*, 126–130. https://digital.ecomagazine.com/publication/frame.php?i=674747&p=&pn=&ver=html5&view=articleBrowser&article_id=3771593

Kelman, I., Sydnes, A. K., Duda, P. I., Nikitina, E., & Webersik, C. (2020). Norway-Russia disaster diplomacy for Svalbard. *Safety Science, 130*, 104896. https://doi.org/10.1016/j.ssci.2020.104896

Duda, P. I. (2019). Informal disaster governance in the Arctic. In D. R. Menezes, & H. N. Nicol (Eds.), *The North American Arctic* (pp. 289–308). UCL Press. https://www.uclpress.co.uk/products/126973?_pos=1&_sid=7b3c55872&_ss=r

Duda, P. I., & Kelman, I. (2019). Arctic disaster risk reduction and response as triumph? In N. Sellheim, Y. V. Zaika, & I. Kelman (Eds.), *Arctic triumph* (pp. 147–162). Springer, Cham. https://doi.org/10.1007/978-3-030-05523-3_9

Duda, P. I. (2017). Arcticness: In the making of the beholder. In I. Kelman (Ed.), *Arcticness* (pp. 40–47). UCL Press. https://www.uclpress.co.uk/products/88283

The following papers have been submitted:

Duda, P. I., Glick, N., & Kelman, I. *The friendly giant. Dealing with disasters in the Russian settlement of Barentsburg, Svalbard.*

Duda, P. I., & Kelman, I. *Informal disaster diplomacy.*

APPENDIX B: SUPPLEMENTARY SEARCH SOURCES

Table 26. Supplementary Search Sources.

Source	Explanation
Other databases	Additional resources were handpicked using Google Scholar, WorldCat, and OpenGrey. This step was crucial to identify indirect IDG derivatives (e.g. 'volunteerism', 'local governance') Google Scholar was especially useful to retrieve oblique information.
Known experts	Publications of scientists known to the researcher for having conducted research relevant to IDG were scanned.
'Cited by' snowballing	Bibliographies of the most relevant literature were scanned for further readings.
Literature in other languages	Non-English literature that is accessible to the author was searched. German, Polish, Hebrew, and French equivalent key terms for "informal disaster governance", "informal disaster management", 'informal disaster response', and 'informal disaster risk reduction' were searched using Google Scholar. For each key term and language, the first thirty hits were checked for relevant results. While no direct or directly related literature about the concept of IDG was found, the review of the results helped understand which other and/or related concepts are connected with informality in disasters, such as 'climate change', 'migration support', 'informal volunteering', or 'informality in organisational contexts/governance'. To a lesser extent, the role of the state and the potential threat of informal DRR/R to its formal apparatus of dealing with disasters was mentioned. These results were considered in the overall literature review and its foci.
Grey literature	In addition to academic and peer-reviewed literature, the references list was supplemented by grey literature. Defined as unconventional literature, grey literature offers information that often remains untapped. This is particularly true if, as in the case of this study, a topic has not, or has been only marginally covered in academia. Searching grey literature may be challenging due to the sheer amount and kinds of sources available. This is especially true with the availability on the internet of numerous blogs, social media, and automated Google translations for various types of sources. Thus, only the sources that deal with this topic in a comprehensive manner were selected. For an illustrative example, see Roasa (2013).
Individual 'smart' recommendations	As a special feature, the used reference manager ('Sciwheel') scans all imported references for key words and suggests other similar and, thus, potentially relevant articles. Throughout this literature review, this tool was useful to stay up-to-date with relevant new publications, which were reviewed and then included, to continuously update the list of consulted references. The same was done by following the recommendations generated by academia.edu, researchgate.net, and the 'Recommended' feature of Springer Nature.

APPENDIX C: INFORMATION SHEET AND CONSENT FORM

<div align="center">

INFORMATION SHEET

</div>

Informal Disaster Governance in Disaster Risk Reduction and Response
Researcher: Patrizia Isabelle Duda

I would like to invite you to participate in my research by sharing your expertise. To decide if you participate you will need the following additional information about the process.

What is the study about?

As part of my doctorate degree at UCL, I am researching the ways people use their informal networks for disaster risk reduction and response. Before I can theorise my ideas about this topic, I need to understand peoples' perceptions and use of their informal networks in disaster contexts. This will be done in two stages. The first stage will be interviews like the one you are invited to discuss the content and design of the tool. Afterwards the reliability of the gathered data will be tested within focus groups which will be shown the aggregated results of the first stage. If you wish, you may be invited to participate in this stage as well.

How will you be involved?

We will talk in person or Skype (or another platform you prefer) for between 30 and 60 minutes about your perceptions of hazards and disasters in your area as well as who (would) you seek out for support. In addition, we will try to draw a representation of this support network. You can end the interview at any time and anything you say will only be used if you give your expressed consent. I will make notes during the interview which I will destroy immediately should you withdraw consent during the interview.

Your data and who will have access it?

Data management will follow the 1988 Data Protection Act. I will not keep information about you that could identify you to someone else. No questions will be asked that can identify you or anyone else. Any electronic notes will be stored safely in a password protected file on a university computer for the duration of the project. Following completion of the project, I will store the data for 10 years before deleting the file in accordance with UCL research data storage policy.

The data will only be used for my research. Results from the analysis of the data will be published for academic and wider audiences and presented at conferences. In any publication resulting from this research, all participants will be fully anonymised.

At a glance:

- Your name will be made anonymous.
- Because of the potential numbers involved, I cannot anonymise the names of all individuals in a participatory map. However, for the purposes of dissemination, publication, and training, the surnames and other clearly identifiable names will be removed or anonymised.
- With your permission, the production of the social map will be recorded using a digital video recorder and/or audio recorder. You have the right to listen to and watch these recordings at any time following the exercise, up until the end of the research.
- If you agree to a video recording, it will be set so your face will not be seen in the recording
- The audio recording will be transcribed. The process of anonymisation will take place after transcription, but before the formal analysis of transcripts.

- All data will be kept secure, either in a password protected computer or locked filing cabinet.
- If you wish to stop the exercise, at any point, you are free to do so.
- If you mention something during the interview which subsequently you feel you rather had not disclosed, this will not be used for the purpose of transcription or dissemination.

Who has reviewed the study?
The research study has been approved under the regulations of the University College London's Institute for Risk and Disaster Reduction.

Who do I speak to if problems arise?
If there is a problem, please let me know. You can contact me via these details:

Patrizia Isabelle Duda, Institute for Risk and Disaster Reduction, University College London
London WC1E 6BT, United Kingdom, patrizia.duda.15@ucl.ac.uk, +972-587827827

If you have a formal complaint or are concerned that this research is being conducted improperly, please contact Dr. Ilan Kelman at Institute for Risk and Disaster Reduction, University College London, London WC1E 6BT, at i.kelman@ucl.ac.uk.

Can you change your mind?
You have no obligation to participate in this study. You may discontinue your involvement at any time before we hang up.

Thank you very much for your time.

Informed Consent Form
UCL PhD Research Project

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

Project Title: Informal Disaster Governance in Disaster Risk Reduction and Response

Researcher: Patrizia Isabelle Duda

Thank you for your interest in taking part in this research. Before you agree to take part, the person organising the research must explain the project to you.

If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you to decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

Participant's Statement

I agree that:

- I have read the notes written above and the Information Sheet, and understand what the study involves.
- I understand that if I decide at any time that I no longer wish to take part in this project, I can notify the researchers involved and withdraw immediately.
- I consent to the processing of my personal information for the purposes of this research study.
- I understand that such information will be treated as strictly confidential and handled in accordance with the provisions of the Data Protection Act 1998.
- I agree that the research project named above has been explained to me to my satisfaction and I agree to take part in this study.
- I understand that my participation will be audio recorded and I consent to use of this material as part of the project.
- I understand that the information I have submitted will be published as a report and I will be sent a copy. Confidentiality and anonymity will be maintained, and it will not be possible to identify me from any publications.

Please initial the relevant box.

I am willing to take part in the study.   ☐

I am not willing to take part in the study.   ☐

I am willing to be voice recorded as part in the study.   ☐

Your Name: ....

Your Signature (electronic or scanned): ....

Date: ....

APPENDIX D: INTERVIEW SUMMARY FORM

<div align="center">

INTERVIEW SUMMARY FORM

</div>

Interviewee pseudonym: _____

Date of interview: _____

I- INTERVIEWEE INFORMATION

II- INTERVIEW DATA:

Question 1:
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Question 2:
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Question 3:
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III- INSIGHTS FROM NON-VERBAL CUES

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APPENDIX E: DATA MANAGEMENT PLAN

LONDON'S GLOBAL UNIVERSITY
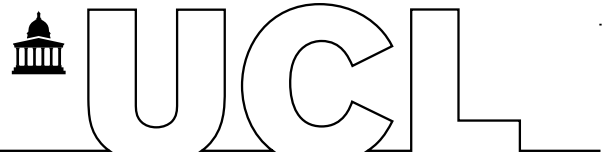
UCL Data Management Plan Template

You should aim to use the questions and headings provided as guidance. If you would like for the RDM team to provide feedback where possible, please send your plan as a MS Word document to lib-researchsupport@ucl.ac.uk.

For more information on managing research outputs, see here: https://www.ucl.ac.uk/library/research-support/research-data-management

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CONTACT INFORMATION

Name: Patrizia Isabelle Duda

Department/Faculty: Institute for Risk and Disaster Reduction (IRDR) at the Faculty for Maths and Physical Sciences (MAPS)

STUDY INFORMATION

- **Funder/Funding scheme (if applicable):** N/A

- **Brief aims and objectives:** This data collection process is undertaken as part of a PhD research project. The study investigates the role of informal disaster governance amongst interviewees in Longyearbyen, Svalbard and South Dominica.

COLLECTION OF DATA AND STUDY MATERIALS

- **Are these digital or non-digital data/materials?** The data gathered will be digital

- **Are these new or existing data/materials?** The data will be new

- **Types:** The type of file collected will be:
    - Audio recordings of interviews,
    - MS PowerPoint files that include three PRISM diagrams, and generic non-identifiable information about interviewees

- **File Formats**: WAV, MS Powerpoint (.pptx)

- **Expected volume:** 2-3 GB

- **Methods of data/materials collection:** Semi-structured, open-ended interviews, assisted by a revised version of the PRISM tool

- **Approaches to ensuring quality**: Interview summary forms to be filled to ensure nothing is missed during the interviews. Audio recordings will be listened to several times, transcribed, and checked for consistency. PRISM diagrams provide an additional level of validation.

STORAGE, SECURITY AND BACKUP

- **Where will you store your data/study materials?** Data will be kept on external, password protected hard drives, with backup via a secured cloud service

- **Approaches to securing data and study materials:** The data will exist in multiple copies that will remain with the researcher. These will be directly anonymised, and password protected.

- **What is your backup strategy?** The data will be backed up daily on the researcher's laptop, external hard drives, and online via a cloud service, all of which are password protected.

- **Are you using any personal, identifiable or pseudonymised data?** None of the data will be identifiable. It will be recorded in an anonymised and pseudonymised form (e.g. interviewee L_05).

ARCHIVING, PRESERVATION AND CURATION

- **Which archive or repository?** The data is for the researcher's PhD alone, and will be kept on external, password protected, hard drives, and a similarly protected cloud service.

- **How long for will you preserve the data/output?** 10 years

- **Which unique identifiers have been utilised?** N/A

- **Have you considered the formats of the data/material?** They will be kept in password protected zipped folders (.zip)

- **How will you curate the data/materials on a medium to longer-term basis?** It will remain on a cloud service and on password-protected hard drives, with multiple backups. These will be kept in separate safe locations.

- **If applicable, how will you dispose of any research materials?** Once the 10-year period is finished, it will be deleted.

DISCOVERY, ACCESS AND SHARING

- **Approaches to making your research discoverable:** The data itself will not be made available, in accordance with the information consent forms signed by interviewees. Anonymised findings will feature in the researcher's PhD and in related publications.

- **Limits of data access and sharing:** The data is limited to the researcher's PhD and associated publications and will not be shared or accessed by anyone else or for any other purpose.

- **Data access statements/protocols or criteria:** N/A

- **Ethical issues:** N/A

- **Usage licenses:** N/A

- **Data sharing statement:** N/A

Metadata

- **Examples of metadata:** Codebooks, interview summaries, commentary for coding,
- **Formats:** .pdf, .mx20
- **Types:** descriptive
- **Standards:** N/A
- **Catalogues:** N/A
- **Restrictions:** The data is restricted to use by the researcher alone, and for the purposes of the PhD and associated publications alone. The same applies to the data's archiving after completion.

Rights and Responsibilities

- **Principal/Lead investigators:** Patrizia Isabelle Duda
- **Copyright owners:** Patrizia Isabelle Duda
- **Creating and maintaining metadata:** N/A
- **Ensuring compliance with relevant applicable laws:** Patrizia Isabelle Duda

APPENDIX F: TEMPLATE ANALYSIS: A PRIORI THEMES

The a priori themes used in this thesis followed the basic structure of the interview questions, with influences from the research questions.

Table 27. Template Analysis a Priori Themes.

#	A Priori Theme
1	Q1 - Disaster Risks
2	Q2 - Information Sources
3	Q3 - Help Sources
4	FDG
5	IDG
6	Reasons

APPENDIX G: TEMPLATE ANALYSIS: INITIAL TEMPLATE

LONGYEARBYEN (Initial Template)

- **Q1 Risks**
  - **Risks**
    - Avalanches
    - Polar bears
    - Extreme weather
    - Landslides
    - Snowmobile accidents
    - Earthquakes
    - Permafrost melting
    - Access to healthcare
    - Climate change
    - Snow blindness
    - Boat accidents
    - Vehicle accidents
    - Fires
    - Rabies
    - Crevasses
    - Icey conditions
    - Reindeer
    - Floods
    - Unsafe buildings
    - Rockfalls
    - Slush slides
    - Sports accidents
    - Terror attacks
    - Tourists
    - Trekking accidents
    - Bird attacks
    - Disease outbreaks
    - Crossing water
    - Mining accidents
  - **Perceptions (Contributing factors?)**
    - Attitude
    - Preparedness defines level of risk
    - Speaking about disasters influences fears (more)
    - Control/power to affect the situation
    - Potential consequences
    - FDG trust - influenced by experience
    - Exposure - freq. activity/sighting (e.g. trips or avalanches)
    - History - hearing stories of disasters/direct experience
    - Climate Change is increasing risks
    - Personal DRR (knowledge/experience/preparedness)
    - Vulnerabilities are increasing
    - It's nature - you can't control it
    - Trusts gov
    - FDG acted and learnt
    - FDG do not fully understand the risk - lack of trust?
    - FDG overreacting now
    - Distinguishes risks from fears in his head
    - Feels very safe on Svalbard
    - Svalbard is special - has many risks
    - Story of bird attack and how knowledge reduces risk/fear

- **Q2 - Sources of Information**
  - **Info Sources**
    - **FDG**
      - Disaster/safety courses
      - Emergency organisations
      - Governor's Office
      - Hospital
      - Local government
      - Local newspaper
      - News (via radio/TV)
      - Norwegian Polar Institute
      - Police
      - Primary education
      - Tourist info center
      - Weather forecasts
      - Profession-related blog
    - **IDG**
      - Acquaintances
      - Church
      - Family
      - Flatmates
      - Friends
      - Girlfriend
      - Guides
      - Icepeople (news site)
      - Own experience
      - Town talk
      - TV documentaries
      - Work-related
    - **Unclear**
      - Books
      - Internet searches
      - Social media
  - **Perceptions (Contributing factors?)**
    - Difficulty of access for minority groups
    - Asks others how they get their info
    - People's stories are the most influential
    - Should use ALL sources
    - IDG more accessible because of relationships
    - Friends have their own opinions
    - Trusts FDG because it's official
    - Family not on Svalbard is not the same
    - Town talk is not always reliable
    - Family not on Svalbard is not the same
    - Town talk is not always reliable

- **Q3 - Sources of Help**
  - **Help Sources**
    - **FDG**
      - Central government
      - Emergency services
      - Fire department
      - Government
      - Governor's Office (Sysselmannen)
      - Guide (when in a group)
      - Hospital
      - Insurance
      - Local government (Lokalstyre)
      - Red Cross
      - Store Norske
      - Trauma centre
      - Work related
    - **IDG**
      - Bystanders
      - Church
      - Family
      - Flatmates
      - Flatmates and neighbours
      - Friends
      - Neighbours
      - Partner
      - Self
      - Townspeople
      - Work-related
  - **Factors influencing Selection**
    - Hard to ask / stigma
    - Those with professional capacity
    - Community
    - Those who understand the context
    - Answer is circumstantial
    - Distinction between Norwegians & others
    - Svalbard is different - you need to help yourself
    - Those nearby if not affected themselves
    - FDG is fast and has many resources
    - IDG will come quicker
    - FDG has the power/resources to help
    - First I need to help myself
    - Svalbard is a tight knit communtiy

- **Other Themes**
  - Tight knit community
  - Experience
  - Communication
  - IDG and FDG combine well
  - Loss of trust in IDG
  - Proximity
  - Power
  - Cascading disasters
  - Resources
  - FDG overreact now

Figure 44. Initial Coding Template (After a First Round of Coding on the Longyearbyen Data).

APPENDIX H: TEMPLATE ANALYSIS: FINAL TEMPLATE

1. LONGYEARBYEN FINAL TEMPLATE

LONGYEARBYEN - FINAL TEMPLATE

- **Q1 Risks**
  - **Risks**
    - Avalanches
    - Polar bears
    - Extreme weather
    - Landslides
    - Snowmobile accidents
    - Earthquakes
    - Permafrost melting
    - Access to healthcare
    - Climate change
    - Snow blindness
    - Boat accidents
    - Vehicle accidents
    - Fires
    - Rabies
    - Crevasses
    - Icey conditions
    - Reindeer
    - Floods
    - Unsafe buildings
    - Rockfalls
    - Slush slides
    - Sports accidents
    - Terror attacks
    - Tourists
    - Trekking accidents
    - Bird attacks
    - Disease outbreaks
    - Crossing water
    - Mining accidents
  - **Factors influencing perception**
    - Experience
    - Exposure
    - Knowledge and Control
    - Attitude

- **Q2 - Sources of Information**
  - **Info Sources**
    - **FDG**
      - Disaster/safety courses
      - Emergency organisations
      - Governor's Office
      - Hospital
      - Local government
      - Local newspaper
      - News (via radio/TV)
      - Norwegian Polar Institute
      - Police
      - Primary education
      - Tourist info center
      - Weather forecasts
      - Profession-related blog
    - **IDG**
      - Acquaintances
      - Church
      - Family
      - Flatmates
      - Friends
      - Girlfriend
      - Guides
      - Icepeople (news site)
      - Own experience
      - Town talk
      - TV documentaries
      - Work-related
    - **Mixed**
      - Books
      - Internet searches
      - Social media
  - **Factors influencing Selection**
    - Multiplicity of perspectives
    - Experience
    - Relationships
    - Mandate

- **Q3 - Sources of Help**
  - **Help Sources**
    - **FDG**
      - Central government
      - Emergency services
      - Fire department
      - Government
      - Governor's Office (Sysselmannen)
      - Guide (when in a group)
      - Hospital
      - Insurance
      - Local government (Lokalstyre)
      - Red Cross
      - Store Norske
      - Trauma centre
      - Work related
    - **IDG**
      - Bystanders
      - Church
      - Family
      - Flatmates
      - Flatmates and neighbours
      - Friends
      - Neighbours
      - Partner
      - Self
      - Townspeople
      - Work-related
  - **Factors influencing Selection**
    - Experience
    - Proximity
    - Trust, propinquity, and vested interests
    - Relationships
    - The power of mandate
    - Stigma against asking for help

Figure 45. Final Coding Template (Longyearbyen).

2. SOUTH DOMINICA FINAL TEMPLATE

SOUTH DOMINICA - FINAL TEMPLATE

- **Q1 Risks**
  - **Risks**
    - Hurricane
    - Earthquakes
    - Volcano
    - Storms / heavy rain / flash flood
    - Landslide
    - Tsunamis
    - Floods
    - Health
    - Aftermath of hurricane
    - Bad roads
    - Being homeless
    - Diseases
    - Droughts and resulting famine
    - Losing husband/family
    - Wildfires affecting house
    - Accident in nature
  - **Factors influencing perception**
    - Experience
    - Exposure and frequency
    - Knowledge and Control
    - Attitude

- **Q2 - Sources of Information**
  - **Info Sources**
    - **FDG**
      - Intl./natl. campaigns (radio, TV, internet)
      - Local government
      - Met Office
      - Office for Disaster Management (ODM)
      - Primary education
      - Radio
      - Red Cross trainings / publications
      - TV (news/weather)
    - **IDG**
      - Experience
      - Family (island)
      - Family (overseas)
      - Friends (abroad)
      - Friends (island)
      - International news (TV)
      - International researchers
      - International weather website (NOAA)
      - It's nature / God
      - Local knowledge
      - Neighbours
      - Own experience
      - Own research
      - Village talk
    - **Mixed**
      - Internet
      - Phone apps
      - Social media
  - **Factors influencing Selection**
    - Experience
    - Relationships
    - Mandate
    - Reliability

- **Q3 - Sources of Help**
  - **Help Sources**
    - **FDG**
      - Foreign governments
      - Government
      - Governments of other islands
      - Insurance
      - Interviewee gave shelter
      - Local NGOs
      - Parliamentary representative
      - Prime Minister
      - UN / INGOs
      - Village council
    - **IDG**
      - Disaster preparedness committee
      - Dominican diaspora
      - Family (abroad)
      - Family (island)
      - Family and friends (island)
      - Family and friends on other islands
      - Forest—after hurricanes
      - Friends (abroad)
      - Friends (island)
      - Friends and neighbours
      - Interviewee helped
      - Interviewee shared goods
      - Neighbours
      - People from other islands
      - Self
      - Villagers
      - Work-related
  - **Factors influencing Selection**
    - Experience
    - Proximity
    - Relationships
    - Trust, propinquity, and vested interests
    - Power, mandate, and corruption

Figure 46. Final Coding Template (South Dominica).