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Complex Disasters as Future Challenge  
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# Disaster Registries as Tools to Improve Understanding of Complex Disasters

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The term “complex disaster” and the debate on a qualitative shift in the disaster landscape has become more prominent in the general discourse of disaster management and response (1).

One challenge that has been underlined in these debates is the lack of openly available standardized high-quality data on disasters. This data is needed to better understand the dynamics of complex disasters, create improved risk assessment models, enable benchmarking and eventually improve disaster responses to complex disasters (2).

One suggestion to advance data quality is the use of disaster registries.

The research team at the Institute for Emergency Medicine at the University Hospital Schleswig-Holstein recently developed the online registry KatMedReg as part of the research project QUARZ-SAND. The registry is a national quality management system for medical disaster response units during mass casualty incidents. In the future, this registry will not only enable the electronic evaluation of missions and simulation exercises, but also help benchmarking and comparing different responses and response units to improve the overall medical disaster response outcome.

Other disaster registries were established in the past, such as the national Israeli DISAST-CIR (3) or the consensus based international Major Incident Reporting template (4), which does not seem to operate anymore.

Despite these national and international efforts, no common standard has been set regarding disaster data collection. Agreeing on a standard way of collecting data and establishing an international open access disaster registry could be one way of improving data quality and thus form the basis for improved risk assessment modelling and a better understanding of complex disasters.

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# Exploring disasters-in-the-making in Kalimpong, West Bengal, India

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This talk will discuss findings from my PhD research and reflect on how useful dominant contemporary approaches to understanding disasters and complexity are. This section of my findings considers how and why landslides occur in Kalimpong. The findings are discussed in relation to the ideas of 'disasters-in-the-making' and 'Disaster Risk Management Assemblages' (Donovan, 2017; McGowran and Donovan, 2021). The findings problematise some contemporary framings of disasters and risk. First and foremost, they problematise distinctions between man-made and natural disasters/hazards, as has been well documented elsewhere. However, other approaches that are largely based in ecological and/or systems-based approaches also struggle to provide the terminological and theoretical basis for explaining the complexity of these events, usually overlooking cultural and political components of disaster risk (Ahmed and Kelman, 2018). Perhaps at a more fundamental level, many of these theories lack reflexivity about how these framings of disaster exclude certain actors at the level of knowledge production, potentially reproducing problematic power relations (Lizarralde et al., 2020; Mills-Novoa et al., 2020). Assemblage theory provides a useful theoretical platform to address these issues as it is able to speak to the non-linearity and inherent complexity and multiplicity of disaster risk, but it is also oriented towards critiquing and deconstructing (Greenhough, 2012) the politics and power relations that underlie conceptual frameworks—itsself included—and disaster risk reduction initiatives. These arguments are expanded on through a discussion of stories and narratives of landslide disasters based on my empirical PhD research.

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# NATECH RISK MANAGEMENT IN INDONESIA

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Indonesia is located in a prone area to diverse type of disasters. The impact of Natech (Natural Triggered Technological Hazards) on industries and public health. Several major hazards industry's location in Indonesia is located within the high-risk zones. This paper describes risk management implementation in Indonesia for selected industry's location. Data was collected from literature review, in-depth interview, focus group discussion. Data was then analyzed using content analysis or thematic analysis. Result suggested that several Natech risks have been identified, current implementation of risk management, risk mitigation, relevant policies been developed, gaps were identified, and best practices in Indonesia for selected industries been reviewed. Several challenges been identified, gaps and opportunities, best practices related to Natech risk management in Indonesia been determined to provide future recommendations.

# Contextualising Floods in India: The Challenge of Reinterpreting Flood Risk Management from a Socio-Political Perspective

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Since the 1950s, the Indian government has advocated structural and non-structural measures to minimise the loss of lives, property, and ecology. Over the decades, the non-structural measures such as Flood Plain Zoning (FPZ) has gained momentum as a policy solution promoted at international and national platforms to minimise losses as well as a sustainable method to preserve and consciously develop floodplains.

Meanwhile, in recent years, the risks associated with flooding are exacerbating due to its rising frequency as a consequence of human-induced and topographical factors. For instance, in Uttarakhand, the 2013 flood is only one of the catastrophic flood events now. Whereas in Delhi, the flooding in low-lying colonies in 2010 was the first after 1978. While the 2013 Uttarakhand and 2010 Delhi floods were initially underlined as unparallel events, the frequency of breaches and similar events have come to demand a more nuanced, inter-disciplinary and multi-dimensional understanding of such disasters.

The research roots itself in the emerging body of literature that compellingly argues that disasters are not natural but socio-political in nature. Resultantly, it emphasises on disaster risks' relationship with the role of governance, the factors of society and the environment. Integral to the study, is also an acknowledgement of the gaps in integrating disaster risk management with governance.

In this research, we utilise the case of Uttarakhand and Delhi to uncover one such complex relationship that dictates the disaster impact and potential risks. It relies on the framework of political ecology to situate it at the intersection of three factors. First, the nature of differential power distribution between levels of governance, second, the anthropocentric interpretation of flooding as a hazard, and third, the socio-political positioning of the sections of the population who experience the disaster losses.

For this purpose, in this secondary research, we unfold the flooding events of 2013 Uttarakhand and 2010 Delhi to reinterpret them as complex disasters. The objective is to situate the discussions under the ambit of disaster discourse focused upon drawing correlations between complexities of day-to-day governance interactions and disaster events.