God's own country in trouble

A comparative content analysis of health and disaster management policies on the 2018 floods in Kerala, India

Clémentine Lucas de Peslouan & Ronniya Varghese

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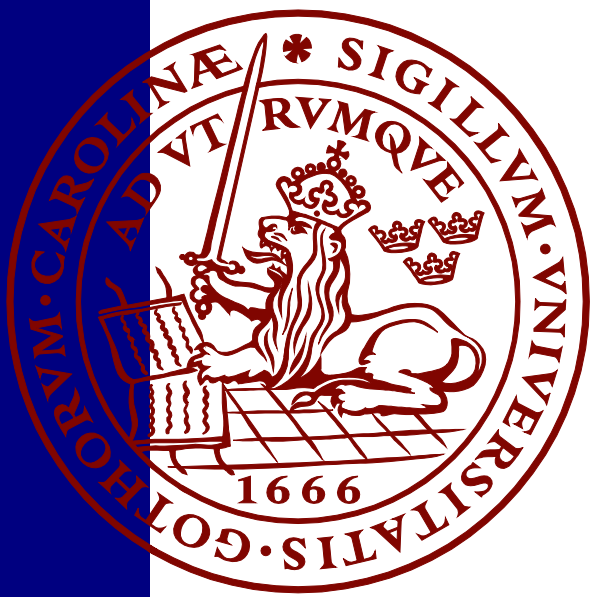

LUCSUS
Lund University Centre for Sustainability Studies

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Abstract

In 2018, the Indian state of Kerala experienced devastating floods that killed 433 people and displaced 1.4 million. The floods are becoming more frequent since then due to climate change. In this research, we compared international frameworks on health and disaster with national and state documents. We used content analysis and applied Walt and Gilson's framework of health policy analysis to comprehend and analyse the level of preparedness, the presence of a climate-resilient health system and the integration of the health and disaster departments at the national and state level. Through our analysis, focussing on the nexus between health, disasters and resilience, we see that there are major pitfalls in translation of the international recommendations. Although some important recommendations have been mentioned in the policy documents at the national and state level, they have failed to be adopted by the state after the floods in 2018.

Keywords: disaster risk reduction, resilience, Build Back Better, climate-resilient health system, climate-induced floods

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List of Abbreviations

BBB	Build Back Better
C&AG	Comptroller and Auditor General of India's Report on Preparedness and Response to Floods in Kerala
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EWE	Extreme Weather Event
EWS	Early Warning System
Health EDRM	Health Emergency and Disaster Risk Management
KSDMA	Kerala State Disaster Management Authority
MoHFW	Ministry of Health & Family Welfare
NAPCCHH	National Action Plan for Climate Change and Human Health
NAPCC	National Action Plan for Climate Change
NDMA	National Disaster Management Authority
NDMP	National Disaster Management Plan
NIDM	National Institute of Disaster Management
NHEROP	National Health Emergency Response Operations Plan
PDNA	Post Disaster Needs Assessment
SAPCC	State Action Plan for Climate Change
SAPCCHH	State Action Plan for Climate Change and Human Health
SDMA	State Disaster Management Authority

SDMP	State Disaster Management Plan
UHC	Universal Health Coverage
UNDRR	United Nations Office for Disaster Risk Reduction
UN	United Nations
WHO	World Health Organisation

1 Introduction

The state of Kerala, referred to as God's own country, experienced its worst floods in 2018 in over a century. The floods killed 433 and affected 5.4 million people, of which 1.4 million were displaced (Centre for Migration and Inclusive Development, 2019). Between June and 19th August 2018, Kerala received 42% more rain than usual (164% more from 1st to 19th August), resulting in 13 of the 14 districts being severely flooded, (see Appendix A) (CWC, 2018). According to the Comptroller and Auditor General[1] (C&AG), the disaster led to a state of shock and distress, primarily because Kerala was never considered to be prone to such extreme and devastating flooding (2021). The state, considered to have a health system on par with developed countries (Varughese & Purushothaman, 2021), had 450 public health facilities damaged during the floods (Centre for Migration and Inclusive Development, 2019).

Human-induced climate change triggers extreme weather events all over the world, increasing their frequency and intensity (IPCC, 2021). India is no exception to this, and moreover, the country is exposed to many hydro-meteorological hazards that are likely to worsen (NDMA, 2019). Among them, extreme precipitation and floods are increasing (NDMA, 2019), as an increase in heavy precipitation is observed since the 1950s (IPCC, 2021). Global warming is likely to intensify the variability of the water cycle, including extreme rainfall and monsoon precipitation (IPCC, 2021). Floods are one of the most common hazards affecting the state of Kerala, in the southwest of the country, which has 14,52% of its area prone to floods (KSDMA, 2016). Floods and related landslides are aggravated by land use, particularly due to increasing urbanisation and deforestation and have endangered lives and livelihoods (C&AG, 2021; KSDMA, 2016).

Actions taken by the Kerala government influenced the impact of the floods. Firstly, the management of the dams in the state, at their full capacity at the beginning of the floods, was not adapted to the intensity of the rainfall (CWC, 2018). The lack of real-time data and early warnings from the dams and meteorological stations slowed decision-making and prevented timely action (Centre for Migration and Inclusive Development, 2019; C&AG, 2021). The authorities had to release water during the disaster, adding pressure on already overflowing water bodies and did not inform nor evacuate the vulnerable populations downstream (CWC, 2018). Secondly, early warning systems were not operational and did not reach vulnerable locations on time, leaving populations distraught and unprepared (Centre for Migration and Inclusive Development, 2019). Thirdly, inadequate regulations allowed an increase in

[1] Comptroller and Auditor General is a constitutional authority responsible for auditing expenditures of the central and state governments of India.

built environment and deforestation, which altered the hydrological processes and drainage capacity of the soil and enhanced vulnerability (Centre for Migration and Inclusive Development, 2019; Mishra & Shah, 2018).

The 2018 floods are still recent, and floods of similar intensity have recurred since then. Research on Kerala has so far concentrated on the physical causes of the floods (Hunt & Menon, 2020), the application of Build Back Better (BBB) mechanisms at the community level (Neeraj et al., 2020; Vahanvati & Rafliana, 2019) and the health and recovery actions from a policy angle (Varughese & Purushothaman, 2021). Disaster risk reduction (DRR) documents at the international level, backed by the Sendai Framework for Disaster Risk Reduction (UNDRR, 2015), promote the inclusion of all sectors for societies to be resilient to disasters. Thus, focussing on the 2018 floods in Kerala, we want to examine the nexus between health and disaster at the policy level, comparing the international, national and state scales. We aim at understanding the governance settings regarding preparedness, integration of health and disaster and resilience in the context of a changing climate in a state prone to floods.

Examining the impact of extreme weather events on society by analysing policy documents, this research aims at identifying improvements towards more sustainable pathways. With an interdisciplinary perspective combining resilience and health resilience, disaster studies and governance, our study contributes to sustainability science.

This thesis will try to answer the following questions:

- What measures can be implemented at the national level in India and the state of Kerala to improve preparedness against climate-induced floods?
- Why are health and disaster management policies not better integrated at the national and state levels in comparison to international frameworks?
- How can India and Kerala have better climate-resilient policies?

2 Literature Review

2.1 Resilience

2.1.1 Defining resilience

The term resilience has been initially used in ecology (Gallopín, 2006) in the 1960s-70s (Folke, 2006) to observe how ecosystems reacted to human intervention (Adger, 2000) and opposed the equilibrium view (Folke, 2006). The concept then spread to other disciplines and is now used both in biophysical and social contexts, although sometimes with different meanings according to the sectors (Van De Pas et al., 2017). The resilience concept focuses on maintaining usual activities while dealing with disruptions, on the ability and opportunity to reorganise on the one hand, while trying to bring about new perspectives and structures on the other hand (Folke, 2006).

Resilience is a part of the capacity of response (Gallopín, 2006) and became consistently included in DRR research in the 2000s (Matyas & Pelling, 2014). Within DRR, resilience is usually appreciated in the scope of engineering, ecological or social angles (Vahanvati & Rafliana, 2019). Social resilience is the ability to repel external disruptions from social infrastructure, as a parallel with ecological resilience which looks at how ecosystems cope with shocks (Adger, 2000). To understand social resilience, it is necessary to look at various dimensions, across sectors, scales and disciplines, even if it generally focuses on the community level because of the institutional setting (Adger, 2000).

2.1.2 Resilience in the health context

The Ebola outbreak in West Africa in 2014-15 shed light on the importance of resilient health systems, especially regarding preparedness and response (Kruk et al., 2015; Van De Pas et al., 2017). The concept then became increasingly used in WHO reports, contributing to settling the approach (Van De Pas et al., 2017). Resilience in the health systems context is defined as the ability to maintain the regular activities of the health system while dealing with and overcoming a crisis or a shock and while constantly looking to improve performance (Barasa et al., 2017; Kruk et al., 2015). Health system resilience is thus characterised by preparedness and efficient response to crises, as well as learning and reorganisation (Kruk et al., 2015). Kruk et al. (2015) listed five elements that resilient health systems should embrace. Awareness concerns timely information and assessments while diversity involves the capacity to deal with and detect a wide range of conditions. Self-regulation implies the ability to mobilise resources efficiently during crises while maintaining core activities. Integration relates to the coordination and involvement of various actors and ensuring good communication, while adaptation is the capacity to change and transform. In addition to those five characteristics, there are several

preconditions to achieving resilient health systems (Kruk et al., 2015): global collaboration; a clear repartition of accountability and responsibility to regulate the response of various actors as well as the allocation of resources; and finally, a well-trained workforce.

According to Sheikh et al. (2011), health systems as complex systems are composed of "hardware" (p. 2), like technology, infrastructure and a budget and "software" (p. 2), encompassing knowledge, leadership and values. The software is key to a resilient system since it enables to identify the internal and external power dynamics, henceforth leading to change (Barasa et al., 2017). However, actions are usually focused on hardware elements (Barasa et al., 2017). Resilience is now presented as an objective to reach for health systems (Kutzina & Sparkesa, 2016), to accurately respond to people's changing needs (Blanchet et al., 2017).

2.1.3 The resilience discourse

Some scholars criticised the main resilience discourse. Using the exceptional aspect of resilience as a way to deal with shocks, authorities sometimes do not follow democratic procedures in the name of achieving it: they use resilience to maintain the status quo (Topp et al., 2016; Van De Pas, 2017; Van De Pas et al., 2017). The focus lies on the permanency of crisis, ignoring alternative social or political pathways (Van De Pas, 2017). Authorities also use the resilience discourse to avoid solving systemic inequalities, meaning that resilience does not contribute to achieving a sustainable health system or Universal Health Coverage (UHC) (Van De Pas et al., 2017). A strong focus on infrastructure, finance or technology infers that actors are apolitical and neutral (MacKinnon & Driscoll Derickson, 2012), that there is no agency or power dynamics (Béné et al., 2012). Similarly, Joseph (2013) in Van De Pas et al. (2017) explains that governance is depoliticized, that there is no critical reflection on resilience and that the resilience discourse also is now also present in international organisations but does not always bring meaningful changes in practice. Likewise, Shiffman (2014) denounces that global health policies are made by powerful, interlinked interests. Moreover, the resilience discourse implies giving up on safety for the future, focusing on crises, uncertainty and accepting vulnerability, while limiting the objectives of health systems to be resilient (Barasa et al., 2017).

Scholars also have differing opinions on the link between vulnerability and resilience. Folke (2006) sees them as contrary, meaning that a vulnerable system has lost its resilience. Usually, resilience is seen as the strategy to reduce vulnerability but they are not antonyms and are both associated with perturbations (Gallopín, 2006). However, not all agree with this view. Some suggest that resilience is not a solution to vulnerability, but that they go together (Van De Pas et al., 2017), and that a resilient health system must accept and deal with vulnerability (Barasa et al., 2017).

2.2 Disasters

In the 1970s, the social vulnerability paradigm replaced the natural hazard paradigm that focused on the risk perspective (Gaillard, 2019; Kumar, 2018). The vulnerability paradigm states that hazards are common and must be examined in the context of society and distribution of wealth, since vulnerability is constructed by society (Gaillard, 2019). This is contradicting the idea, written by Hewitt (1983) in Gaillard (2019), that disasters will devastate populations and societies. Thus, according to the vulnerability paradigm, disasters are not natural, but the consequence of inequalities, rendering some more vulnerable (Gaillard, 2019).

The aim of disaster management is to keep damage made by disasters to a minimum to make recovery easier (Lee, 2019). Timmerman has defined resilience in the field of disaster as "the measure of a system's, or part of a system's, capacity to absorb and recover from the occurrence of a hazardous event" (1981, p. 21), which shows that resilience coincides with disaster management (Nath, 2018).

Busch and Givens (2013) identified the importance for governments to build and maintain partnerships with the private sector, in order to increase community resilience to disasters and improve efficiency in disaster management. They also specified that partnerships with clearly set responsibilities can enhance planning and optimise available resources to better answer community needs (Busch & Givens, 2013).

Since disasters destabilise the regular functioning of society, governance for DRR is designed to minimise death and losses (Nath, 2018). It requires optimal coordination between institutions at all scales for all steps of disaster management in order to reduce vulnerability (Nath, 2018). To overcome the complexity of actors' collaboration for disaster management and response, Takeda et al. (2017) identified several efficient points of focus to adapt to uncertainty: combining priorities and coordinating action; focusing on local authorities and communities; planning ahead to ensure timely action.

However, if coordination between sectors is promoted, the health and disaster sectors rarely interact in policies and governance (Ray-Bennett, 2013). Integrating health in all aspects of DRR, and not only into response and recovery, is a way to build capacity for communities and enhance preparedness for disasters (Dar et al., 2014; Ray-Bennett, 2013; Redwood-Campbell & Abrahams, 2011). It would also contribute to setting disaster management as a priority and making health infrastructures adapted to disasters (Dar et al., 2014; Ray-Bennett, 2013). Furthermore, some scholars determine features of health systems included in DRR strategies. Aitsi-Selmi and Murray (2015) state that health systems should follow a risk approach instead of a response-driven one to be better prepared. Dar et al. (2014)

and Kumar (2018) emphasise the importance of including local communities in designing health systems that are resilient to disasters, especially for their knowledge, risk awareness and response capacity.

Disaster studies have also been criticised, particularly for the hegemony of Western perspectives in the field. Gaillard (2019) denounces a bias in the way to perceive disasters: the concepts of vulnerability and disaster are applied worldwide but create a reliance on Western terminology because they cannot always be translated to local languages. Moreover, the funding for research comes from Western universities, with agendas that do not enable gathering consistent background information according to Killian (1956) in Gaillard (2019).

2.3 Build Back Better

Clinton (2006) and Christoplos (2006), cited in (Neeraj et al., 2020) consider disasters to be an opportunity to lead to a better society. According to Mannakkara and Wilkinson (2014, 2016), Build Back Better has three main dimensions: Firstly, DRR encompasses reducing risks for future disasters through the multi-hazard approach, while including education, early warning and land-use policies; Secondly, community recovery combines measures for the psycho-socio-economic conditions of a community; Lastly, effective implementation comprises the choice of adapted institutional measures to accelerate recovery, monitoring and evaluation.

The BBB strategy has received criticism for not considering socio-ecological or political dimensions (Vahanvati & Rafliana, 2019), as well as not encouraging reducing inequalities, but rather returning to the previous social order after a disaster (Nath, 2018).

2.4 Identification of the research gap

Research on resilience usually focuses on the community level, local authorities and on how they recover after a disaster, without focusing on the organisational level (Jung, 2016; Lee, 2019).
Moreover, the health and disaster sectors rarely interact in policies and governance (Ray-Bennett, 2013). In the Indian context, Nath (2018) identified several examples of the consequences of insufficient coordination between institutions during disaster occurrences. Nath further determined that there was no efficient collaboration between the various authorities and no converging activities (Nath, 2018). Moreover, Nath stated that more research was needed to bridge the content of the Sendai framework with community resilience, to look at the efficiency of the institutional arrangements for disaster management, as well as community empowerment and BBB (Nath, 2018).

As stated above, literature has previously investigated the resilience of health systems and health in the context of disasters. Research has also been conducted on the cohesion between policy and practice. The 2018 floods in Kerala are still recent events at the time of writing, and research has so far focused on the physical causes of the floods (Hunt & Menon, 2020), as well as on the recovery actions from a health and policy standpoint (Varughese & Purushothaman, 2021). The BBB and resilient recovery perspectives have so far only been examined using specific communities or districts as examples (Neeraj et al., 2020; Vahanvati & Rafliana, 2019). In this thesis, we compare the policy documents issued at the international, national and state levels, to examine the coherence between scales, and thereby discuss the nexus between resilience, disaster and health system perspectives.

3 Conceptual and Analytical Framework

In this section, we will define the concepts and introduce the model that will be used for our policy analysis.

3.1 Disaster Risk Reduction and Disaster Risk Management

According to the United Nations Office for Disaster Risk Reduction (UNDRR)(2022b), a disaster is defined as "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". Disaster Risk Reduction (DRR), on the other hand, helps to understand how regions prone to disasters are coping with past catastrophic events and are trying to manage the impact of ongoing catastrophes (UNDRR, 2022d). The regulation of DRR would then help build resilience and sustainability in the long run (UNDRR, 2022d). Furthermore, the UNDRR (2022c) defines Disaster Risk Management (DRM) as the implementation of policies associated with DRR while trying to prevent new disaster risks as well as reducing and managing the already existing disaster risk. This would ultimately lead to better resilience and reduction of losses due to disasters.

3.2 Resilience and Build Back Better

According to Folke (2006), resilience is defined as the ability to preserve the existing activities while handling disruptions. It deals with the capability to restructure while trying to introduce new structures and perspectives. Since the focus of this research is on how the health system in Kerala adapted in the face of calamity, we will use the concept of resilient health system in our analysis. Thus, according to the WHO, "a climate-resilient health system is one that is capable to anticipate, respond to, cope with, recover from and adapt to climate-related shocks and stress, so as to bring sustained improvements in population health, despite an unstable climate" (2015, p. 8).

Build Back Better (BBB) can be defined as the recovery, rehabilitation and reconstruction after a disaster, in order to incorporate resilience and DRR into society (UNDRR, 2022a). This enables repairing infrastructure and systems to strengthen economies, the environment and livelihoods (UNDRR, 2022a). Mitigation on the other hand can be defined as the lessening or minimising of the adverse impacts of hazardous events (UNDRR, 2022e). Thus, BBB is the idea of building back society after a disaster, with improved resilience, mitigation ability and management, in order to ensure that losses are at a minimum. BBB is one of the four main priorities in the Sendai Framework (UNDRR, 2015).

3.3 Relevance of health policy analysis

According to Buse et al. (2012), the health sector is important because it is in charge of safeguarding the population and overseeing individuals from birth to death. Moreover, health policy is generally affected by the relationship between human health and other policies, as well as the actions of distinct entities that impact health and the health system (Buse et al., 2012). Health policy also adapts to actions or inactions that have an effect on institutions, organisations, services and funding of health and health care systems (Buse et al., 2012). Finally, health policy analysis is associated with politics, which determines policy creation under different conditions.

Walt and Gilson (1994) use three points to justify the importance of policy analysis in health. Firstly, policy analysis offers a more comprehensive framework for thinking about health reform than approaches that concentrate on the technical features of the content of reform. Secondly, literature from political economy and other disciplines offers insights into the way policy analysis could be applied in the health sector. Thirdly, by using a simple analytical model which incorporates the concepts of context, process, actors and content (see Figure 1 below), policy-makers and researchers will be able to better understand the process of health policy reform and to plan for more effective implementation. The model can thus be used both retrospectively and prospectively (Walt & Gilson, 1994).

Therefore, we understand that health has an overall influence on society, from the individual level to a systemic scale. Since future climate-induced catastrophic events will not only affect health and livelihoods but society as a whole, it is necessary to look into health policy documents, in order to comprehend how prepared the health system is, and how it is integrated into disaster response.

Policy analysis is an intense task and given our limited time frame, we needed a comprehensive framework that is both relevant and applicable to a multi-scalar system with various components. The model also gives us an opportunity to analyse each layer individually enabling us to be more critical and understand their influence on each other. Thus, as it can be used both prospectively and retrospectively, we can analyse what is in place today and what could be implemented in the future, while adapting it to climate change and disaster management.

3.4 Walt and Gilson's model for health policy analysis

To analyse our data, we used Walt and Gilson's (1994) theory on health policy analysis to focus on the four elements of context, process, actors and content of the policy documents. According to Walt and Gilson (1994), traditional theories for health policy analysis only focus on the content of policies.

However, solely focussing on content diverts attention from measuring the effectiveness of the implemented policy and on the process of implementation (Walt & Gilson, 1994). Furthermore, Walt and Gilson (1994) argue that their framework is relevant because policies are intrinsically tied to the social circumstances in which they are created. They are the outcome of complex social, political and economic interactions. According to Buse et al. (2012), the Walt and Gilson (1994) model simplifies highly sophisticated relationships into these four elements and can be applied in any situation and scale. Scale can be defined as a spatial, temporal, quantitative or analytical dimension used to study objects and processes. In the case of our research, we make use of three different scales: international, national and state. The inclusion of documents at these three different scales helps us to better understand and visualise the aspects of international frameworks that were adopted or ignored by India and Kerala. This in turn enables us to answer our research questions while identifying potential improvements.

Figure 1.

A model for policy analysis

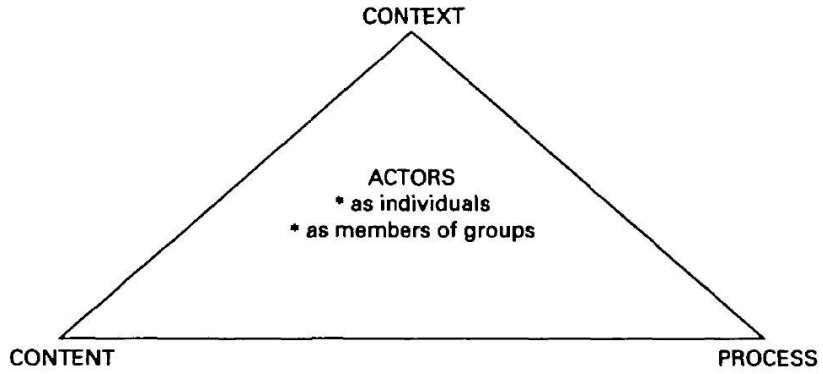


Figure 1. A model for health policy analysis

Note. From "Reforming the health sector in developing countries: The central role of policy analysis", by G. Walt and L. Gilson, 1994, *Health Policy and Planning*, 9(4), p. 354

3.4.1 Elements of the Walt and Gilson theory

As shown in Figure 1, the model is centred around four elements: context, process, actors and content (Walt & Gilson, 1994). Firstly, the context is dependent on social factors and on the state of society. Buse et al. (2012) cite Leichter's (1979) four kinds of contextual factors that can influence policies: situational factors, which are temporary and specific; structural factors, which are permanent features of society; cultural factors, like religion or languages spoken; and international or exogenous factors.

In the case of our study, the context was extremely relevant, because it enabled us to include the aspect of climate change in our analysis, a disruptive factor that requires responses like disaster management, resilience and adaptation.

The process element of the model looks at how issues get onto the policy agenda, how they are affected by actors and power distribution and structures (Walt & Gilson, 1994). Walt and Gilson refer to the work of Grindle and Thomas (1991), which includes mapping out the process, identifying critical factors that affect the policy, comparing policy-making in times of crisis or not, as well as analysing the role of actors and decision-making processes, including resources and potential responses. This approach gave us insights into how prepared the state was for the floods and how much importance is given to cross-departmental collaboration and climate-resilient health systems. We focussed on comparing the significance of topics at the various levels rather than on the implementation process.

Actors, both individuals and organisations drafting policies are central to the model (Buse et al., 2012). This element includes understanding the actors' behaviour when formulating and implementing policies, along with their interests and the exercise of power in relation to other actors (Buse et al., 2012). Buse et al. also mentions the conflict between individuals' agency and the structure of organisations that condition and determine their power and actions. For our study, we thought that the relation between actors at different scales was interesting to investigate, since the international frameworks have an advising role, recommending actions to the other levels, but without being legally binding. Furthermore, between the national and state levels, it was relevant to explore accountability and how responsibility was shared, especially since the federal and state governments have distinct roles but their financial and political interests are intertwined. We did not look at conflicts between actors, nor who influenced policy-making. Instead, we used the international frameworks to analyse the involvement of the various actors.

Finally, the content element is the result of the three previously mentioned dimensions (Walt & Gilson, 1994). We will examine it using content analysis, to investigate the links and gaps between our chosen documents and try to identify potential improvements.

3.4.2 Drawbacks of the model

The Walt and Gilson (1994) model is the only one we found theorising health policy analysis, while not solely concentrating on the content and being easily adaptable to various scales, DRR and resilience. Thus, it guided us throughout our analysis. However, this process has some drawbacks. Firstly, it is a very broad framework, leaving a lot of room for extrapolation. Secondly, it is not particularly focusing on disruptive events like climate change and disasters. Therefore, even if the model includes content,

maybe some factors should be added, especially regarding the influence of and adaptation to material damage and landscape degradation. Thirdly, the model is not made for a comparison of several documents, but rather for an in-depth analysis of just one specific policy. In addition, the four components of the model are intertwined to an extent that it is challenging to separate them when conducting the analysis. Lastly, we realised the model focuses a lot on power relations, but we were more interested in accountability.

4 Methodology

4.1 Epistemological stance

In this thesis, we use the pragmatist approach to reality. This perspective implies that knowledge stems from experience, which is the product of a transaction with nature and reality rather than its representation (Stanford Encyclopedia of Philosophy, 2021). In our research, we examine policy documents to pinpoint gaps and pitfalls, as well as to identify potential improvements. Thus, we analyse the significance of words and topics in the policy documents to understand their perception of disasters and actions to reduce their impact.

4.2 Data collection

4.2.1 Policy analysis

In this research, we are analysing policy documents in order to understand how the state of Kerala handled the floods in 2018, and to comprehend how the state and the country are preparing to deal with the increasing frequency of climate-related disasters, while mitigating their effects. Policy analysis has varying definitions. Dror (1993), as cited in Walt and Gilson (1994), defines policy analysis as 'approaches, methods, methodologies and techniques for improving discrete policy decisions' (p. 358). Similarly, Paul et al. (1989) in Walt and Gilson (1994) define policy analysis as 'the task of analysing and evaluating public policy options in the context of given goals for choice by policymakers or other relevant actors' (p. 358). Lindblom (1959) in Walt and Gilson (1994) also follows Dror's definition of policy analysis, evaluating decision making processes in organisations. Lindblom's approach is descriptive, argues in favour of incrementalism and acknowledges a process of bargaining between different interest groups in the process of policymaking. This approach also pays attention to the role of actors in decision-making (Walt & Gilson, 1994). These definitions show that policy-making is largely associated with the content of policy, actors involved need to be rational and have specific skill sets to make proper choices among well-defined policy alternatives to advance complex but compatible goals (Walt & Gilson, 1994).

4.2.2 Content analysis

In order to examine the policy documents, we are using the method of content analysis. It is an approach to analysing documents and texts that seek to quantify content into predetermined categories in a systematic and replicable manner (Bryman, 2012).

According to Bryman (2012), the process makes sure that the results obtained are such that the probability of partiality or bias by the analyst(s) on a personal level is at its minimum. The rules in question may reflect the researcher's interests and might therefore be a product of subjective bias, but the key point is that once formulated, the rules can or should be applied without the intrusion of bias (Bryman, 2012).

4.3 Sampling

4.3.1 Scale selection

In order to answer our research questions, we looked into policy documents at three different scales (international, national and state). We chose those distinct levels to grasp the dynamics and structures of decision-making, to understand how much of the international frameworks have been adopted at the national level, and how much of the national recommendations have translated to the state level. It also helped to analyse the distribution of accountability between the different authorities and to see how the country and state integrate climate change and health into policy. Therefore, using our research questions as a guiding principle, we specifically focussed on policies related to disaster management, health and resilience of the health system. Moreover, we wanted to see how the situation was handled by the authorities and how they are planning on handling the risk of similar future events.

Firstly, we decided to analyse guiding frameworks at the international level to comprehend the most recent recommendations for health system resilience and disaster management made by international bodies, namely WHO and the UN. Secondly, we examined the measures that have been set at the national level by the Government of India, in particular regarding the connection between climate change, disaster management and resilient health systems. Lastly, we examined the same measures at the state level to understand how much of the national and international suggestions have been adopted at the local level.

4.3.2 Data selection

We chose to study recent documents, the oldest being from 2010, as the websites we searched on (WHO, UN, national and state authorities) only showed entries from up to fifteen years ago. Moreover, the climate change, resilience and disaster risk management areas are fast-evolving disciplines and international institutions usually build their reports on previous versions, thus it made sense to focus on updated versions.

The data collection was carried out February 21, 2022, using incognito mode for the search and Google as a browser. We chose to use Google because we were focussing on policy documents and thus academic search engines would not be appropriate. Even if Google has specific algorithms that influence the outcomes of a search, it is the most widely used search engine in the world, thus making our process easily replicable.

International

At the international level, we wanted to include frameworks that provide guidelines for better health system management in the context of disaster management and risk reduction, as well as for building resilience to disasters and indirectly climate change. Moreover, we wanted the frameworks to detail how to adapt existing systems and make them more efficient, especially with respect to health.

With respect to disaster risk management, the relevant international framework is the Sendai Framework for DRR adopted by the UN member states in 2015.

Then, we started by looking at the WHO website, as the institution oversees international health indicators, and "coordinates global response to health emergencies" (WHO, 2022) within the scope of the UN. We started the search using the keyword "disaster" (see Appendix B, Figure B1) and narrowed the search to publications so that the results were specific to official reports and frameworks. We managed to find the "Health Emergency and Disaster Risk Management Framework", "WHO Guidance on Preparing for National Response to Health Emergencies and Disasters", "Guidance for health sector assessment to support the post-disaster recovery process" and "Everyone's business: Whole-of-society action to manage health risks and reduce socioeconomic impacts of emergencies and disasters operational guidance". The remaining documents were discarded because they were specific to COVID-19, unrelated diseases, minutes of meetings and summaries of documents we already had.

Next, we searched using the keywords "climate–health resilience". Most results were discarded, as they were country-specific or COVID-19-related. The "Operational Framework for building climateresilient health systems", from 2015, was kept for further analysis.

National

According to the Indian Constitution, health is a matter of the individual states (Government of India, 2021), but the central government influences them through national laws and holistic plans. The central government is also responsible for allocating funds to the states, especially in the context of disasters, under the National Disaster Management Act, 2005 (Disaster Management Division, 2017).

Therefore, we wanted to know if climate change is included in the National Health Policy and if health is included in climate change and disaster management plans. International documents recommend collaboration between the health and disaster sectors to simultaneously reduce the impacts of disasters and their health risks (see Appendix B, Figure B2) (WHO, 2019). We found the National Health Policy, 2017 on the website of the Ministry of Health and Family Welfare. We searched for the latest health policy of the central government, excluding policies specific to diseases, pathologies, vaccines, drafts, and older policy documents.

Further, to get an idea of the recommendations by the central government to the state, we searched for a report by the C&AG. The C&AG is the constitutional authority responsible for auditing all expenses of the central and state governments where funds are allocated through taxpayers' money. We went to the C&AG's website, selected the audit reports option, and checked for audit reports specific to the state. The one we decided to analyse was about the preparedness and response of the state to the floods. Since we specifically wanted to see how the state responded to the floods, we excluded reports on public sector undertakings, economic sector, revenue sector, general and social sector and local self-government institutions.

Next, we wanted to know if the country had any strategic plan for dealing with disasters. Hence on an incognito window in Google chrome, we typed the keywords "National Disaster Plan, GoI" which led us to the plan that was formulated in 2016. The National Disaster Management Plan (NDMP), 2016 was designed as a country-specific disaster plan document after the Sendai Framework and includes recommendations from it (UNDRR, 2016).

At the international level, we have the document titled, "Guidance for health sector assessment to support the post-disaster recovery process". This document highlights the importance of the rebuilding process after a disaster. In order to see if such tools for assessment had been formulated by India, we searched via Google for "post-disaster assessment India" and got the respective document.

Then, the WHO Guidance on Preparing for National Response to Health Emergencies and Disasters on the international scale mentions that countries should have a national action plan for health security. In the case of India, this plan is still ongoing and has not been published yet. But instead, we were directed to the National Action Plan on Climate Change and Human Health (NAPCCHH). Since the floods are exacerbated by climate change (IPCC, 2021), we thought it would be interesting to see what the country says about the effects on health of climate change-induced floods.

In line with the international documents on health emergency DRM and climate-resilient health systems, we wanted to further see if India had any documentation for health resilience to climate

change and disaster management in the country. A Google search using the keywords “health resilience to climate change and disaster management India” directed us to the Health Adaptation and Resilience to Climate Change and Related Disasters document published by the National Institute of Disaster Management (NIDM), Ministry of Home Affairs, Government of India. This document has a specific case study on the Kerala floods of 2018.

State

To get the state health bill, we checked the website of the Kerala State Assembly which is also called ‘Niyamasabha’ in Malayalam, the local language of the state. Amongst the list of recently published bills was the Kerala Public Health Bill, 2021 (see Appendix B, Figure B3). We excluded entries not related to health or climate change.

To get access to the disaster management plan of the state we typed the keywords “Kerala disaster management plan” in an incognito window. This took us to the state disaster management website where we found the Kerala State Disaster Management Plan (SDMP).

In order to maintain uniformity across the documents analysed, we also got the Kerala State Action Plan on Climate Change and Human Health (SAPCCHH). The state C&AG does not have any specific report other than the national C&AG report. Furthermore, the Kerala PDNA document was excluded because it was created in collaboration with other international stakeholders. The sole role of the government of Kerala in this document was the narration of the incidents that unfolded from June to August 2018. It did not involve any laws or recommendations by the Government of Kerala that the responsible authorities should follow to tackle post-disaster conditions.

4.4 Analysis process

4.4.1 Data analysis

After we gathered and selected the documents we wanted to analyse, we started by reading the international frameworks, to understand the current and lastly updated reference reports regarding disaster management, risk reduction, and health system resilience. Already possessing knowledge about the 2018 floods in Kerala, we could exemplify and illustrate the recommendations of the frameworks while reading. Moreover, initiating the data analysis with this scale seemed relevant in identifying key aspects to look for in national and state-specific reports. Similarly, we could start to pinpoint specific keywords to use for quantitative content analysis. Keeping our research questions in mind, while reading our selected documents, we identified common themes, topics and keywords to look at more in-depth.

Once we were done reading the documents, we formulated six themes: BBB, governance, health, communication and planning, preparedness and resilience. These themes, along with the identified categories under them, were then entered into the software NVivo as 'nodes'. In total, we listed 21 nodes, split into six categories as can be seen in the coding manual (Table 1).

Table 1.

Coding manual

BBB	GOVERNANCE	HEALTH AND DISASTER	INFORMATION, COMMUNICATION, PLANNING	PREPAREDNESS	RESILIENCE
BBB	Community empowerment & participation	Mutual inclusion of health and disaster	Information & Data	Training health workforce	Resilience
	Cross-sectoral collaboration		Communication	Risk assessment and management	
	Cross-scale cooperation		Research (future scenarios)	DRR	
	Responsibility and Accountability		Capacity assessment	Vulnerability	
	Leadership & Policy-makers		Monitoring	Risk-informed & scenario-based planning	
	Finance (health & disasters)		Early Warning System		
	Stakeholders				

Note. The 21 nodes have been categorised into six themes.

4.4.2 Node identification

Preparedness

In order to answer our first research question, we analysed the details in the nodes related to information, communication, planning and preparedness. We chose to focus on these nodes for several reasons. Firstly, according to the definition of DRM stated in the Theory section, countries must: prevent new disaster risk; contribute to minimising losses due to disasters; and build better resilience (UNDRR, 2022c). The nodes corresponding to this definition are risk-informed planning, communication among the respective stakeholders, as well as preparedness. Secondly, according to the Sendai Framework (UNDRR, 2015), countries should try and address existing challenges and prepare for future ones by focusing on monitoring, assessing and understanding disaster risk and sharing such information. Thirdly, in Kerala, the post-floods assessment done by the C&AG (2021) states that, in certain locations, 75% of the population reported not having received any warning from their local authorities and 73% said they were not aware of evacuation steps. The report also highlights the importance of EWS, forecasts and functioning information systems, to notify the authorities when a disaster is about to occur. Thus, we believe that focussing on these four themes will help us get a better understanding of India and Kerala's preparedness to tackle disasters.

Policy integration

To answer our second research question, we focussed on the governance aspect. Governance has varying definitions. In our case, we concentrated on the emphasis on the role of governments in steering, controlling and guiding different sectors (Evans, 2012). Therefore, we examined governance with respect to inclusion of stakeholders, community participation and the distribution of responsibilities and leadership needed to guide pre and post disaster activities. We also looked into finance, because financial support enables the necessary actions. The international reports we analysed are mostly by the WHO. They concentrate on the interconnectedness of health for resilience and DRR and state the importance of including health in all aspects of disaster risk management. Hence, we wanted to analyse the emphasis that the central government and the state give to these aspects.

Climate resilience

For the third question on resilience, we have taken into consideration the nodes on BBB, preparedness, governance and resilience. The floods in Kerala have been a recurring catastrophic event since 2018. Building a resilient system is thus vital since the state needs to recover as efficiently as possible after a disaster. Without the presence of a resilient system, the health operations could collapse and limit service delivery, which could worsen the situation (WHO, 2015). Therefore, we were interested to see how the reports approached the topics at the various levels. We also focussed on BBB because the floods are a recent event and it would be a good opportunity to 'Build Back Better' to be more resilient to future calamities.

Lastly, governance seemed important to look at for resilience because efficient preparedness, DRR strategies and BBB implementation rely on coordination between global, national, regional and local levels. Moreover, the governance of the health system should be expanded to communities, integrating dialogue and exchange of information, to protect community health, increase capacity and ensure resilience (WHO, 2015).

4.4.3 NVivo

NVivo is a qualitative data analysis software which helped us with content analysis. To code the documents, we added them to the software and categorised the files as international, national and state. The table of themes and important areas of focus under them was then entered into NVivo as nodes. Therefore, after we successfully categorised our themes and areas of focus as nodes and added all our documents to the software, we started our process of content analysis.

4.5 Our research process

Given the circumstances during the pandemic, we thought that it would be too complicated to carry out primary data collection. Especially because our topic is related to the health system, we figured that the workforce that we could have interviewed would be too busy handling the pandemic, and we did not want to bother them with our questions. Regarding our topic, it would have been interesting to spend time in Kerala to see the effects of the floods on the field for ourselves and to interview several kinds of stakeholders. However, travelling to Kerala for the thesis seemed irresponsible in the current context. Therefore, we decided instead to resort to secondary data collection.

After reading about our topic, we decided to conduct a policy analysis of official documents at various scales, relating to disaster management, the health system and resilience to investigate the nexus between them, according to our research questions. Once we agreed on how to proceed, we simultaneously searched for relevant reports to analyse and came up with a final list. Then, we looked for a theory that would help us analyse the documents. To organise our process, we decided to divide the tasks, with frequent discussion sessions and continuous updates on our progress. One of us started to focus on the theory part, while the other read the documents to identify the first patterns for the analysis. We chose to work in this way to ensure consistency and to avoid being too influenced by each other's ideas. Thus, we could compare what we understood from the methods, as well as what we thought of as interesting axes of analysis would be in the documents.

For the data analysis, we agreed on precise coding criteria and how to categorise them, and we conducted the analysis together, constantly discussing. We then thought about ways to link our preliminary findings with the theory, as well as the ways in which they answered our research questions.

4.6 Methods limitations

We chose policy analysis over other methods for our study, since we did not have the time or capacity to look at the implementation of the frameworks and bills in the field. It could have also been relevant to complement our analysis with reports from NGOs that are possibly more transparent. Another option would have been to add interviews with health practitioners, health or DRR policymakers to compare their insight with our findings. But due to time constraints and the pandemic, this was not possible. Nevertheless, policy documents might ignore some important aspects and populations' needs.

On the international scale, almost all documents were from the WHO. Although the focus of these documents is different, they are quite repetitive. In comparison, we could only find three documents at the state level which lead to lesser representation of the scale.

Updating the policies has been slow: the floods happened a few years ago and the national and local documents have not been adapted yet. This can also be explained by the Covid-19 pandemic, which shifted the priorities of the governments, delaying policy processes for climate change and disasters. The sanitary threat was to be addressed nationally in the shorter term more urgently than the state climatic threat. Furthermore, India and Kerala have been tackling long-run issues such as air pollution, malnutrition, heat stress and vector-borne diseases for years. The occurrence of floods is a more recent event. This could be the reason for the lack of policy or relevant information on the subject.

The National Action Plan for Climate Change (NAPCC) was first formulated in 2008, when policymakers decided to design a plan for the varying impacts of climate change on the country. The State Action Plan for Climate Change (SAPCC) was initiated to tackle the specific effects for each state. Originally, the plans for eight sectors did not include health, which was only added in 2015. However, we noticed that both the NAPCCHH and SAPCCHH did not address health issues with climate-induced disasters.

Although it has been seven years since the Sendai Framework has been published, there is a pressing need to prepare for frequent disasters, especially to the extent that Kerala has faced in the last few years. We expected the NDMP and SDMP to be more aligned to the Sendai Framework, because the documents claim to be based on the Sendai Framework. The NDMP was last updated in 2019 and took into account the most recent events, while the NAPCCHH is from 2018. The SDMP is older than the NDMP, thus not including the 2018 and 2019 floods and the lessons learnt from them. Lastly, the SAPCCHH has not been implemented yet, but still lacks key concepts that we analysed in this thesis, even if the previous version was insufficient for the 2018 floods.

The national and state health bills do not have consistent mention of disasters, even if healthcare delivery is to be maintained during disasters. Furthermore, we started by focusing on health systems with regard to floods, but we had to shift our focus due to the unavailability of health reports related to disasters at the state and country levels.

4.7 Positionality

To conduct our research, we had to define the categories (nodes) that we wanted to look at in-depth to analyse the data. As environmental students, our choice is biased by our knowledge of sustainability and governance. Moreover, we did not go to the field in Kerala during the research, thus we viewed the topic from a distance. Since one of us is from Kerala, our decisions were influenced by her

awareness of the events and local context. One of us has never been to India, therefore she could have been affected by her Western European vision of the country and have unconscious prejudice.

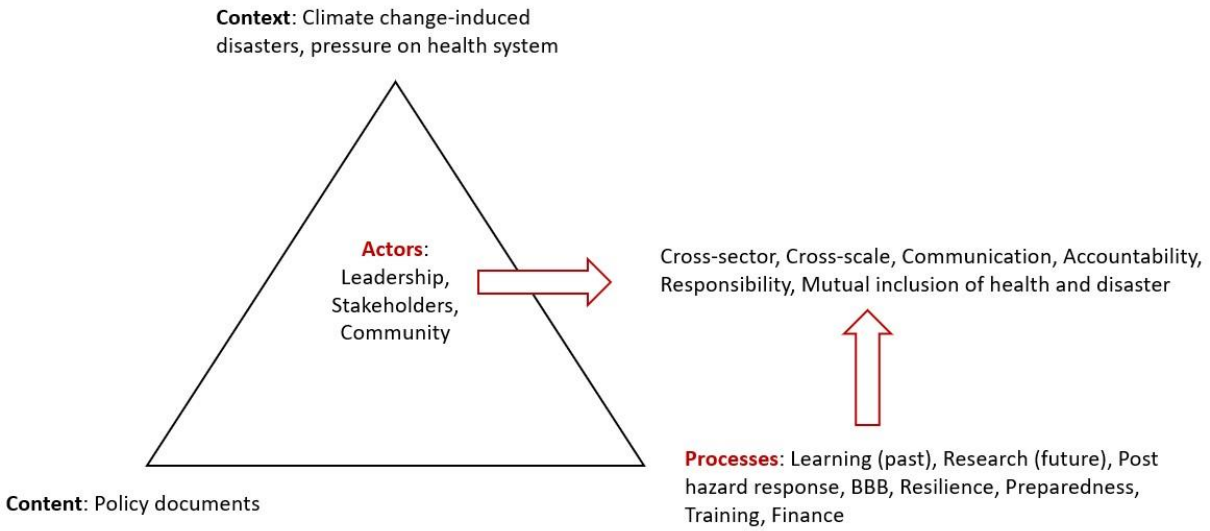
Moreover, the theoretical framework we are using for our analysis, the Walt and Gilson (1994) model for health policy analysis, is based on Western concepts and knowledge production. Thus, applying it to an Asian country might enhance this Western bias by ignoring country-specific characteristics that it cannot grasp.

5 Results

We analysed 6 documents at the international level, 6 at the national level and 3 at the state level. At the international level Sendai Framework, Health EDRM and Operational Framework for Climate Resilient health system can be categorised as the main documents, as the others are explicitly based on them. In this section, we present the outcome of our coding per node or group of nodes. Figure 2 is a visualisation of the documents on the international scale, according to Walt and Gilson (1994).

Figure 2.

Application of the Walt and Gilson (1994) model at the international scale



Note. The nodes between the arrows are common to both actors and processes. Adapted from "Reforming the health sector in developing countries: The central role of policy analysis", by G. Walt and L. Gilson, 1994, Health Policy and Planning, 9(4), p. 354

5.1 Preparedness and EWS

Preparedness is not extensively detailed at the three different scales. On the international scale, only the Sendai Framework specifically discusses it. At the national and state levels, both the NDMP and SDMP discuss preparedness. The various aspects of preparedness (see Table 1 in the Methodology section) are more prominent in the three main documents on the international scale, as seen in Appendix C, Tables C1 and C2. At the national and state levels, they are specific to the NDMP and SDMP.

Similarly, EWS is more common in the Sendai Framework, Health EDRM and the Operational framework for Climate resilient health system compared to the national and state levels. On the national and state scales, only the NDMP and NAPCCHH and the SDMP and SAPCCHH respectively discuss it.

5.2 Assessment and Monitoring

We have analysed two types of assessment: capacity and risk assessment. At the international scale, as seen in Tables C1 and C2, capacity assessment, as compared to risk assessment, is discussed more, especially in the Health EDRM. The same pattern follows at the national and state levels, where risk assessment is specific to a few documents, whereas capacity assessment is more frequently mentioned. At the national and state levels, the NDMP and SDMP specifically allude to risk assessment. On the other end, like the international scale, capacity assessment is mentioned in all the documents at the national and state levels.

Monitoring, like capacity assessment, is present on all three scales, but not as detailed as capacity assessment. Although the topic is present in almost all international documents, we observe disparities at the national and state level.

5.3 Communication and Information

Communication is also clearly described at the three levels, as seen in Table C2. It is more detailed in the three main documents and in Everyone's business at the international level. At the national and state levels, communication is only extensively cited in the NAPCCHH and Kerala SDMP.

Information is almost as frequent as communication, even if more international documents cite it. The theme has been cited the most in the NAPCCHH and NDMP at the national level, and in the SDMP at the state level.

5.4 Stakeholders, Responsibility and Finance

Stakeholders is one of the most widely detailed categories in all three scales (see Table C3). Once again, the three main documents on the international scale elaborate on stakeholders more than the remaining three. At the national and state levels, it is the NDMP and SDMP that detail stakeholders. Leadership, on the other end, although present at the three scales, is less cited. The theme is uniformly represented at the international level, but only discussed in the NDMP, NAPCCHH, SDMP and the Kerala Public Health Act at the other scales.

At all three levels, cross-sectoral collaboration is more detailed than cross-scale cooperation. On the international scale, both concepts are, as previously, detailed in the three main documents and mentioned in the remaining. Cross-scale and cross-sectoral collaboration have been identified as important aspects at the national and state levels and have hence been given importance. Both aspects are more detailed in the NDMP and SDMP.

Finance is extensively reiterated at the three levels. The NDMP and National Health Policy discuss it at the national scale and SDMP at the state level. On the other hand, the concept of responsibility has not been extensively discussed at the international level but got more prominence at the national and state levels.

5.5 Community

As seen in Table C3, inclusion of community is one of the most cited factors in the documents. At the international level, the need for community inclusion has been highlighted in the three main documents and in Everyone's business. At the national and state levels, community participation has been given significant importance by almost all the documents, with the NDMP and SDMP discussing it the most at the national and state level respectively.

5.6 Mutual inclusion of health and disaster in policies

This aspect of inclusion of health in disaster policies and disaster in health bills is more common at the international and state levels, whereas it is limited to a few documents at the national level (see Table C2).

5.7 DRR, BBB and Resilience

DRR is mentioned throughout the international scale but is more prominent in the Sendai Framework. At the national and state levels, we see that it is quite conspicuous in the NDMP and the SDMP. BBB, like DRR, is present in the Sendai Framework at the international level but also in other documents. At the national and state levels, the NDMP and SDMP discuss it. At the international level, the three main documents reiterate the importance of resilience, but references are limited to the NDMP and SDMP at the national and state levels.

6 Discussion

In this section, we will analyse in detail the gaps we identified between the international documents and the national and state reports.

6.1 Preparedness

We observed that preparedness, one of the four main priorities of the Sendai Framework is limited to it at the international scale (UNDRR, 2015). The Framework mentions that being prepared is a prerequisite to having a better system to tackle disasters, as well as to help post-disaster recovery. Thus, preparedness is described as a holistic factor that plays an important role in pre and post-disaster conditions (see Figure 3 below).

Looking at India and Kerala, we found that the topic was only specifically discussed in the NDMP and the SDMP (NDMP, 2019; KSDMA, 2016). In both policy documents, the overall description of preparedness corresponds to the Sendai Framework. However, they both further detail pre-disaster preparedness, even if they do not clarify how post-disaster recovery preparedness should be done.

DRR and risk assessment will be separately discussed below. The other aspects of preparedness, training health workers and vulnerability, will be discussed here. At the international level, regarding training, the Health EDRM focuses on the need for a skilled technical workforce (WHO, 2019), while the Sendai Framework mentions that peer learning is important to be prepared to tackle disasters (UNDRR, 2015).

At the national and state level, although various documents elaborate on the need for training for disaster management and mention the steps to be taken, they do not give concrete examples of the occurrence of training events. Only the SDMP provides an example of training from 2014 (KSDMA, 2016).

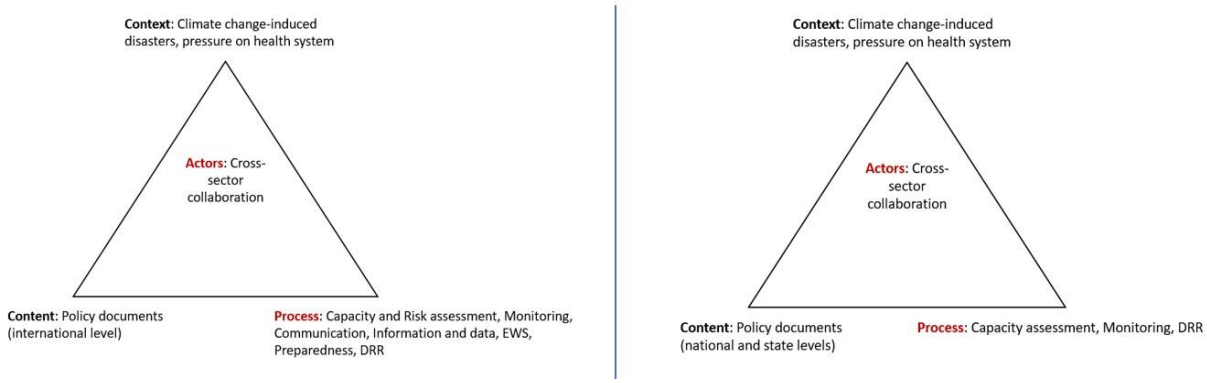
However, when the C&AG (2021) conducted an assessment to analyse the training carried out in Kerala, they identified inefficiencies. The report pinpointed that, although the state had trained volunteers in flood-prone districts, they were not equipped with emergency responder kits. When the floods occurred, they were thus not able to help the community. In some places, a sufficient number of trained volunteers was missing, since the state took time to recruit them, despite the infrastructure being ready. Moreover, implementing regular training exercises would help the state prepare an effective plan of action to save lives in future disasters. Thus, the state and the country need to practically carry out pre- and post-disaster training events to ensure continuous and up-to-date

education among the communities and workforce. They can then create a training course or plan of action to be followed, focussing on the most conspicuous local vulnerabilities.

Nevertheless, vulnerability is not a salient topic in the reports. However, discussing it further in the context of preparedness could help authorities identify possible weaknesses and exposed populations to be able to protect them.

Figure 3.

Application of the Walt and Gilson (1994) model to assess preparedness at the national and state level compared to the international level



Note. Adapted from "Reforming the health sector in developing countries: The central role of policy analysis", by G. Walt and L. Gilson, 1994, Health Policy and Planning, 9(4), p. 354

6.2 Assessment and Monitoring

At the three different scales, we see that capacity assessment gets more importance than risk assessment. Capacity assessment includes reviewing the existing quantity of equipment and infrastructure and comparing it to the needs. Risk assessment, on the other hand, means understanding vulnerabilities present at different scales (WHO, 2019). As mentioned above, there is a low emphasis on vulnerability. Thus, the gap between mentions of risk and capacity assessment could be due to the more tangible side of capacity, resting on previous disasters. It also seems challenging to comprehend risk without understanding vulnerabilities. Therefore, we interpret that the challenges to identifying vulnerabilities at the state and national levels can explain that capacity assessment is more detailed than risk assessment (see Figure 3 above).

Monitoring for efficient response to disasters is mentioned at the three scales, including capacity, planning, risk and progress of recovery. But there is no mention of monitoring health systems at the national and state levels. This can be explained by the fact that health and disaster planning is not integrated at those levels, as will be detailed further.

6.3 Communication and Information

The use of communication to spread necessary information amongst stakeholders, media and decision-makers has been extensively expressed in the documents at the different scales. The SAPCCHH and SDMP go into detail regarding the aspects of communication (Department of Environment and Climate Change, 2020; KSDMA, 2016). They remain broad regarding Early Warning System (EWS), mentioning that it should be used to communicate the occurrence of floods for the vulnerable to be prepared. They do not discuss the EWS distribution between authorities or their implementation. Moreover, the C&AG (2021) highlights that EWS at critical places were not functioning when the floods happened. The report also pinpoints that first responders were not equipped with fail-safe devices and were instead reliant on traditional communication devices, vulnerable to floods. In the documents, EWS is also associated with preparedness. EWS is described as important to be prepared to tackle disasters (WHO, 2019). At the national level, the NDMP emphasises it in relation to disasters (NDMA, 2019). At the state level, the documents do not differentiate between health and disaster EWS. They remain broad, accentuating the need to have EWS tools for preparedness for floods.

The state documents also consider educating vulnerable populations on steps to take during floods and distributing informative brochures. This shows that the state is eager to spread awareness among local populations. In general, it demonstrates that the officials have discussed and planned communication to a certain extent, including effective communication to the vulnerable. However, these channels of communication are not practically implemented. This fact has been highlighted by the C&AG report (2021): a survey conducted by the C&AG showed that the majority of the population was not aware of the warnings, their meaning and steps for evacuation. Moreover, when the authorities decided to release water from the dams, the communities downstream were not informed or evacuated (CWC, 2018). This indicates that the state has to take more efforts in this aspect to make sure that local communities are made aware and evacuated in a timely manner. Furthermore, the national and state documents do not refer to the use of data for DRR, real-time information and data for analysis, and insights from indigenous communities.

Concerning information and data collection, the national and state governments suggest creating maps to assess areas prone to floods. However, the C&AG (2021) emphasises that the state used outdated maps to identify risk locations during floods. The topology of Kerala is constantly changing due to

increased urbanisation and deforestation (Centre for Migration and Inclusive Development, 2019), accentuating the need for detailed maps. Thus, frequently updating these maps would contribute to better availability of information and data.

6.4 DRR and BBB

At the international level, as mentioned in the results, the Sendai Framework stresses the importance of DRR (UNDRR, 2015). It discusses various steps that can be formulated by countries to carry out effective DRR and DRM. At the national level, the NDMP extensively talks about DRR (NDMA, 2019), mentioning how it should be controlled and methods of increasing awareness. This is relevant because, with the increasing frequency of floods, DRR must remain noteworthy. Even at the state level (see Figure 3 above and Figure 4 below), DRR is given significance by the SDMP (KSDMA, 2016). It shows that India and Kerala are concerned with reducing possible disaster risks. DRR can be considered as a factor helping to ensure BBB, since strengthening of DRR helps communities to build back better for the future (UNDRR, 2022d). However, we noticed that the national and state documents only focus on BBB with respect to DRR and its necessity for post-disaster recovery. Thus, according to Mannakkara and Wilkinson (2014, 2016), the documents fail to discuss the three dimensions of BBB, simply mentioning DRR, but ignoring its components (early warning, land-use policies), as well as community recovery and effective implementation. Although India and Kerala understand the concept of DRR, more research is needed to enhance BBB in the context of land-use change and EWS and enforce it.

6.5 Finance

The documents on the international scale acknowledge disasters are costly and state that funding must be made available for recovery, post-disaster response and climate-sensitive diseases (UNDRR, 2015; WHO, 2015; 2019). They state that an impact assessment of past disasters on financial systems is vital, while countries should promote research initiatives for preparing for future ones (WHO, 2015; 2019). Funding should be based on reviewing existing plans, capacity and risk assessment, mapping of resources and incorporating climate change (WHO, 2015; 2019).

The National Health Policy states that funds should be allocated for shaping the overall health system (MoHFW, 2017). The stress is on the need to provide funds for training health workers to be prepared for disasters and funding for infrastructure capable of withstanding floods. The NDMP specifically talks about funding DRR and how funds should be allocated for mitigation and preparedness (NDMA, 2019). Likewise, the SDMP details fund allocation for training health workers and communicating on DRR through audio and visuals (KSDMA, 2016).

However, the country and state governments do not refer to research or estimations of the costs of past and future disasters. Allocating funds for calamities ensures that the post-disaster phase will be swift and ensures efficient recovery (see Figures 4 and 5 below). Therefore, it would be ideal to emphasise this aspect. Furthermore, the central government is required by law to provide the state with 75% of the funds for post-disaster recovery (KSDMA, 2016). There have been a lot of speculations about fund allocation from the 2018 floods, and it is possible that the fund allocation was inadequate and diverted to deal with the pandemic (India Today, 2020; Khopdi, 2020).

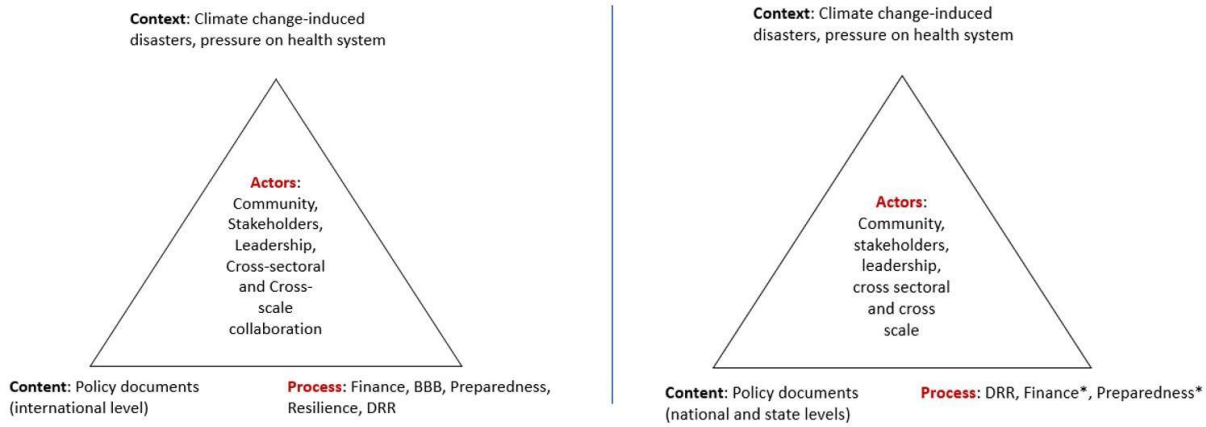
6.6 Resilience

The WHO (2015) applies Folke's (2006) definition of resilience. It emphasises the importance of monitoring, communicating and preparing for changing climate-related risks, recovering from crises and learning from experience. The Sendai Framework discusses resilience along similar lines (UNDRR, 2015). However, at the national level, the NDMP, which is the only document mentioning resilience, stresses the relevance of DRR in building resilience through the involvement of relevant stakeholders (see Figure 4 below) (NDMA, 2019). Likewise, the SDMP reiterates the need for DRR (KSDMA, 2016).

As seen in the theory section, DRR focuses on past and current catastrophes in order to build resilience in the long run (UNDRR, 2022). Resilient health systems imply preparedness (see Figure 4) (Kruk et al., 2015), however, as discussed above, India and Kerala do not fulfil all preparedness criteria. Kruk et al. also state that communication and the ability to mobilise resources through task distribution are significant to improve resilience. As examined above, India and Kerala are missing effective communication and responsibility distribution to carry out tasks. Folke (2006) emphasises that identifying vulnerabilities is critical to building resilience. Nevertheless, we observed through our analysis that there is a lack of focus on vulnerabilities by the state and country.

Figure 4.

Application of the Walt and Gilson (1994) model to assess resilience at the national and state level compared to the international level



Note. The nodes with an asterisk are limited at the national and state level. Adapted from "Reforming the health sector in developing countries: The central role of policy analysis", by G. Walt and L. Gilson, 1994, Health Policy and Planning, 9(4), p. 354

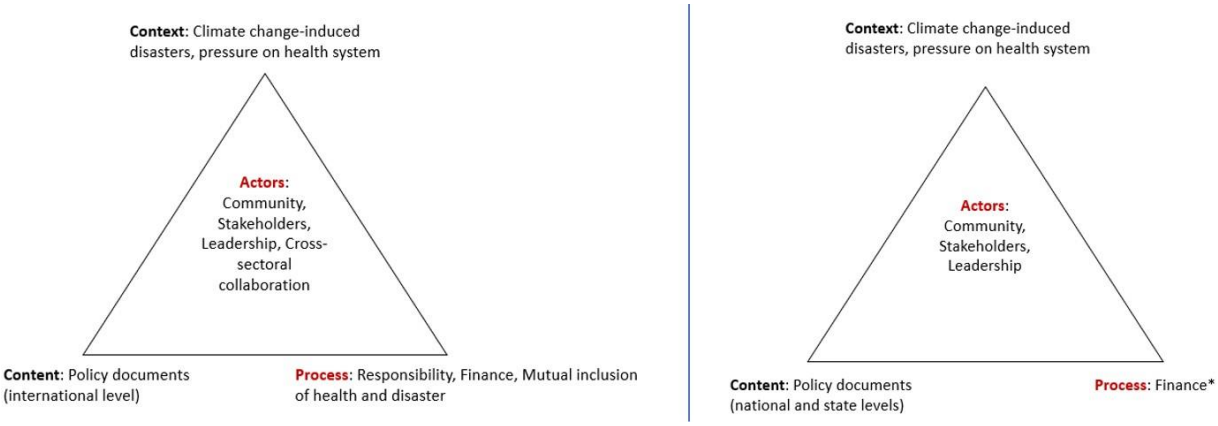
6.7 Mutual inclusion of health and disaster

On the international scale, the documents explicitly highlight the need for collaboration between health and disaster departments. They emphasise that both sectors should work closely together for pre-flood preparedness and that health systems should be involved in management, to ensure appropriate care for the affected (WHO, 2010). The documents also highlight the need to ensure collaboration and communication between the departments to raise awareness about climate change and its possible outcomes (WHO, 2015). The WHO (2021) mentions the International Health Regulations (2005) that state that the health sector must be prepared to respond to emergencies. Similarly, DRM is described as a "whole-of-society action" (WHO, 2020, p. 1) involving the close coordination of health and disaster authorities to contribute to building a resilient society through better management of emergencies (see Figure 5 below). Moreover, a climate-resilient health sector should expand its sphere of influence to include sectors affecting health, like the disaster management area (WHO, 2015). Lastly, the Sendai Framework stresses the interconnectedness of both domains asserting that the core aim of DRR is to protect communities' lives and health (UNDRR, 2015).

At the national and state levels, most documents acknowledge the link between health and disasters. Nevertheless, none of them emphasises a need for integration of both sectors at the policy level to improve efficiency, preparedness and resilience. As stated by the WHO (2010; 2020), those sectors should collaborate for adequate DRM, as they depend on each other during emergencies. Thus, this integration should be highlighted, in order to ensure efficient use of shared resources, common planning, vision and efficiency in times of crisis.

Figure 5.

Application of the Walt and Gilson (1994) model to assess the mutual inclusion of health and disaster at the national and state level compared to the international level



Note. The node with an asterisk is limited at the national and state level. Adapted from "Reforming the health sector in developing countries: The central role of policy analysis", by G. Walt and L. Gilson, 1994, Health Policy and Planning, 9(4), p. 354

6.8 Community

The international documents highlight relevant aspects regarding community inclusion. They state the need to involve community members in risk identification and decision-making (see Figure 4 above) (WHO, 2015). They describe that the community, civil society and private sector will help ensure that strategies for health and disaster are appropriate and efficient, bringing knowledge on the local context (UNDRR, 2015; WHO, 2019). However, the national and state governments do not emphasise the inclusion of community. They only discuss the inclusion of communities broadly, through the collaboration of stakeholders between departments, NGOs, local community groups and voluntary agencies (MoHFW, 2018). They also stress the usefulness of including elderly people since they possess

substantial knowledge. Kerala states that training and educating local communities on disasters is important (SDMP, 2016), as well as community empowerment to respond to EWE health risks (Department of Environment and Climate Change, 2020).

Although community inclusion is acknowledged, more work is needed to increase participation, even regarding policy formulations. Kerala has numerous indigenous communities also largely affected by these floods. Therefore, indigenous communities should be given as much importance as locals to voice their concerns and frame policies according to their needs.

6.9 Stakeholders and Responsibility

6.9.1 Leaders, Policymakers and Stakeholders

These three nodes were relatively homogeneous at all levels. International documents mention that leaders should plan and implement policies and strategies, including health, disaster and post-disaster programmes, in accordance with budget cycles and national plans (UNDRR, 2015; WHO, 2019). The national documents only mention the need to trickle down legislative action through the support of relevant stakeholders. The NDMP strictly focuses on legislation associated with DRR strategies (NDMA, 2019), while the SDMP emphasises the need to support vulnerable populations in policy implementations (KSDMA, 2016). Aspects of inclusion of vulnerable communities in policy implementation play a strategic role because they are the most affected by disasters.

Regarding stakeholders, the Health EDRM and Sendai Framework on the international scale stress on inclusion of public and private stakeholders to carry out efficient assessments (UNDRR, 2015; WHO, 2019). They also highlight the importance of representatives to advocate for health and disaster at the international levels and for better planning and disaster preparedness. The NDMP stresses on inclusion of stakeholders in disaster management departments (NDMA, 2019), while the inclusion of stakeholders from other departments is mentioned in the NAPCCHH (MoHFW, 2018). On the other hand, the SDMP mentions training stakeholders such as NGOs, and voluntary agencies to familiarise them with catastrophic events (KSDMA, 2016).

We understand that the inclusion of stakeholders is important, especially for the distribution of tasks during an emergency. Planning the attribution of responsibilities could be a step for the state and country to take. This could help avoid mismanagement or lack of support from necessary stakeholders in times of need.

6.9.2 Responsibility

This node has not received significant importance at the three different scales. At the international level, the Health EDRM states that it is necessary that national policies clearly highlight responsibilities of all involved stakeholders in policies (WHO, 2019). But at the national and state levels, although the documents do mention the distribution of responsibilities, there are no defined objectives to mainstream it. For example, as analysed above in training and communication, we realise there are no notable distributions of responsibilities in place to effectively carry out the steps needed.

6.9.3 Cross-sectoral collaboration and Cross-scale cooperation

The importance of cross-sectoral collaboration is stressed at all levels. In the international documents, gaps in coordination across sectors are identified to hinder approaches to tackle different hazards and misplace the attention on reaction instead of prevention of disasters (WHO, 2019). Moreover, coordinated collective action by various ministries could contribute to reducing the consequences of disasters by improving the focus on relevant operations (WHO, 2015; 2019). Establishing cross-sectoral action could also improve communication and merge insights for understanding information (WHO, 2015). Similarly, at the national level, the NDMP (NDMA, 2019) and NAPCCHH (MoHFW, 2018) reiterate the importance of cross-sector coordination for DRR plans and health respectively. Finally, the SDMP states that cross-sector collaboration is important for action (KSDMA, 2016).

For cross-scale collaboration, at the international level, the documents highlight the significance of inclusion of multiple scales for better health management and disaster risk governance (UNDRR, 2015; WHO, 2019). They explain that, for effective implementation, dealing with health emergencies and disaster risk management requires the active participation of stakeholders at all levels of society (WHO, 2019). Hence, this will lead to coherence across “policies, plans, processes and programmes” (UNDRR, 2015, p. 15). Participation of communities and indigenous knowledge is also pinpointed to help better understand vulnerabilities (UNDRR, 2015; WHO, 2019).

On the national scale, the same ideas are reiterated. The NDMP mentions the devolution of responsibilities by involving the federal and state governments, in order to smoothen recovery by training workforce and allocating funds (NDMA, 2019). The report also highlights the necessity to include in all projects and throughout all scales. Similarly, the National Health Policy states that decentralisation leads to better decision making, along with increased accountability and participation of local bodies (MoHFW, 2017).

At the state level, the SDMP recommends sharing actions and responsibilities to manage risk, by formulating plans for local communities and learning from disasters across the country and world (KSDMA, 2016).

6.10 Summary of the discussion

From our analysis, we see that India and Kerala were not prepared to handle the floods efficiently and still need to improve preparedness for future disasters. They should further develop and use EWS, properly allocate responsibilities amongst the government officials and identify vulnerabilities in order to enhance risk management. Furthermore, to improve preparedness and resilience to future disasters, India and the state need to integrate health and disaster policies. Currently, India and Kerala associate resilience with DRR. However, holistic research, community inclusion, and cross-sector and cross-scale collaboration need to be initiated to widen the focus of resilience and include preparedness, communication and monitoring.

7 Conclusion

In this thesis, we explored the governance settings in India and Kerala regarding preparedness, integration of health, disaster and resilience in the context of a changing climate. We investigated the nexus between health and disaster at the policy level, comparing international, national and state documents and deepening previous knowledge of the events and governance settings. Our aim was to identify gaps and possible improvements toward more sustainable paths in a flood-prone state. Kerala seemed a good example for our study in light of the recency and expected increasing frequency of the floods. Moreover, India is a federal country, which enabled us to compare three scales and identify gaps. Throughout our analysis, we found that the state and country lack key aspects of preparedness, especially the use of EWS, a clear division of responsibility and identification of vulnerabilities, that they need to enhance before the next floods. Moreover, their approach to resilience should be more holistic, including communication and collaboration between all stakeholders, preparedness and vulnerability in addition to DRR. This will partly rely on the integration of health and disaster policies.

India and Kerala are affected by numerous effects of climate change, floods are a more recent addition to the list. The country and state already have mechanisms in place to tackle other types of disasters which have been more frequent in the past. India and Kerala should now consider floods as a priority and start implementing the necessary channels to tackle them, as identified above. Future research could thus compare countries' actions and best practices to create a platform of knowledge on effective management of health during the onset of floods. Furthermore, additional studies could focus on identifying gaps in policy and accountability between levels and authorities.

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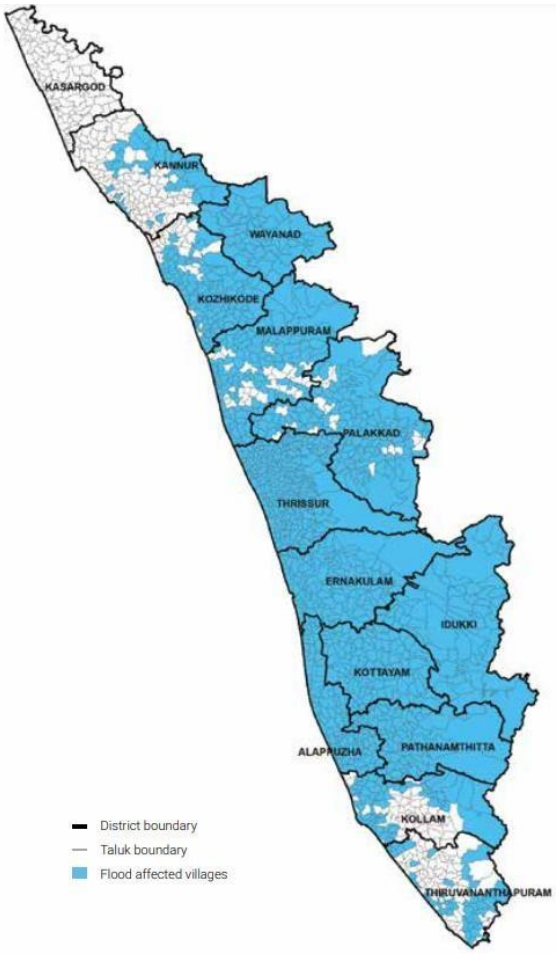
9 Appendix A

MAP OF THE AREAS AFFECTED BY THE 2018-FLOODS



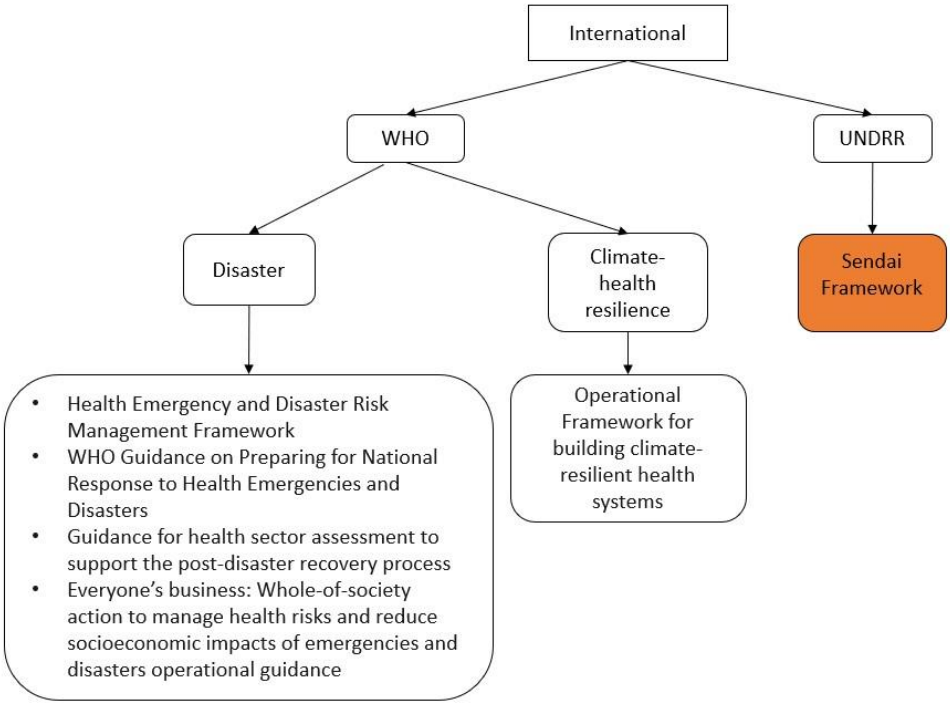
Note. From *Leaving No One Behind: Lessons from the Kerala Disasters*, by Center for Migration and Inclusive development, 2019, https://floodresilience.net/resources/item/leavingno-one-behind-lessons-from-the-kerala-disasters/

10 Appendix B

VISUALISATION OF DATA COLLECTION

Figure B1.

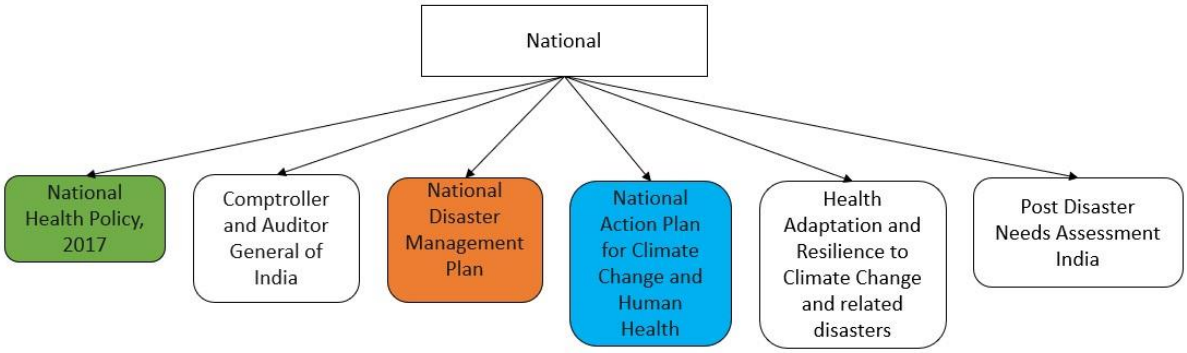
Visualisation of the sampling process at the international level



Note. The colour-coding shows the adaptation of the documents at the different levels.

Figure B2.

Visualisation of the sampling process at the national level

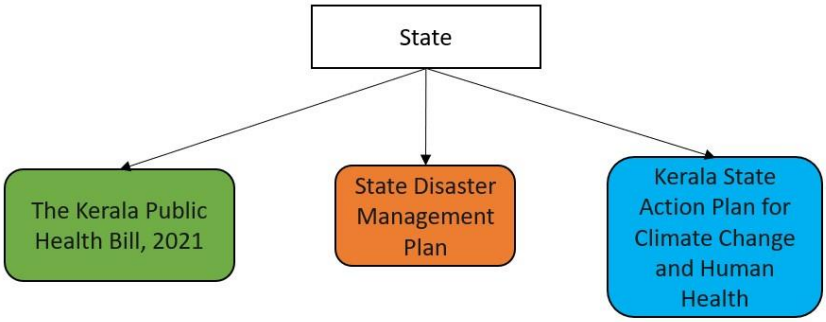


Note. The colour-coding shows the adaptation of the documents at the different levels.

Appendix B (continued)

Figure B3.

Visualisation of the sampling process at the state level



Note. The colour-coding shows the adaptation of the documents at the different levels.

11 Appendix C

COUNT OF OCCURENCES PER NODES AND REPORT

Table C1.

Detailed count for the nodes under 9reparedness per report

	Preparedness					
	DRR	Preparedness	Risk assessment and management	Risk-informed & scenario-based planning	Training health workforce	Vulnerability
Sendai Framework	24	11	4	7	6	0
Health Emergency & Disaster Risk Management	5	0	14	15	10	2
Operational Framework for Climate Resilient health system	1	0	8	10	5	6
Everyone's business	1	0	0	1	1	1
Guidance for Health sector assessment to support the post disaster recovery process	1	1	0	2		2
WHO Guidance for Preparing for national response to health emergencies & disasters	2	1	2	3	0	3
Health Adaptation & resilience to CC & related disasters	1	0	0	2	2	0
National Health Policy 2017	0	0	2	0	3	
NDMP 2019	51	8	20	14	5	6
PDNA	0	1	0	4	0	0
C&AG	7	1	2	9	6	1
NAPCCHH	2	4	0	6	8	4
Kerala Public Health Act	2	0	0	0	0	0
Kerala SDMP	12	4	13	9	14	7
Kerala SAPCCHH	1	1	0	1	7	1
TOTAL	110	32	65	83	67	33
International	34	13	28	38	22	14
National	61	14	24	35	24	11
State	15	5	13	10	21	8

Appendix C (continued)

Table C2.

Detailed count for the nodes under BBB, Mutual inclusion of health and disasters, Information, communications and planning and Resilience per report

	BBB	Health and disasters	Information, Communication & Planning							Resilience
	BBB	Mutual inclusion of health & disaster	Capacity assessment	Communication	Early Warning System	Information & data	Learning, iterative process (past)	Monitoring	Research (future scenarios)	Resilience
Sendai Framework	8	19	2	7	4	15	2	1	5	20
Health Emergency & Disaster Risk Management	4	17	23	10	6	4	3	7	1	4
Operational Framework for Climate Resilient health system	1	35	4	11	4	9	1	8	8	33
Everyone's business	0	9	2	4	0	1	0	0	1	0
Guidance for Health sector assessment to support the post disaster recovery process	5	38	6	0	0	3	2	2	1	1
WHO Guidance for Preparing for national response to health emergencies & disasters	5	8	4	0	0	3	2	2	1	1
Health Adaptation & resilience to CC & related disasters	0	5	1	0	0	0	0	0	0	1
National Health Policy 2017	0	1	8	2	0	6	1	2	0	0
NDMP 2019	16	12	6	5	6	8	4	7	1	11
PDNA	2	0	4	1	0	5	0	0	0	0
C&AG	3	0	4	8	1	6	2	2	1	0
NAPCCHH	0	8	13	14	4	8	1	6	7	2
Kerala Public Health Act	0	8	4	0	0	0	0	2	0	0
Kerala SDMP	2	3	7	19	7	13	4	4	5	3
Kerala SAPCCHH	0	7	4	6	3	2	0	0	1	0
TOTAL	46	170	92	87	35	83	22	43	32	76
International	23	126	41	32	14	35	10	20	17	59
National	21	26	36	30	11	33	8	17	9	14
State	2	18	15	25	10	15	4	6	6	3

Table C3.

Detailed count for the nodes under Governance per report

	Governance								
	Accountability	Cross-scale coperation	Cross-sectoral collaboration	Finance	Governance	Inclusive Community Empowerment & Participation	Leadership & Policy Makers	Responsibility	Stakeholders
Sendai Framework	0	11	11	10	2	6	3	0	21
Health Emergency & Disaster Risk Management	0	24	31	10		21	5	7	32
Operational Framework for Climate Resilient health system	1	4	15	12	3	13	3	1	10
Everyone's business	1	8	5	0	0	8	2		7
Guidance for Health sector assessment to support the post disaster recovery process	0	1	5	7	1	0	2	0	8
WHO Guidance for Preparing for national response to health emergencies & disasters	0	1	5	7	1	0	2	8	8
Health Adaptation & resilience to CC & related disasters	0	0	0	1	0	0	0	0	2
National Health Policy 2017	3	6	9	10	1	9	4	1	0
NDMP 2019	1	19	32	27	4	22	8	8	17
PDNA	2	3	3	4	0	3	0	6	9
C&AG	1	0	1	3	0	7	4	3	1
NAPCCHH	0	2	14	3	0	9	9	0	9
Kerala Public Health Act	0	1	1	1	0	0	4	2	1
Kerala SDMP	0	5	6	10	0	12	5	5	5
Kerala SAPCCHH	1	0	2	1	0	2	0	0	0
TOTAL	10	85	140	106	12	112	51	41	130
International	2	49	72	46	7	48	17	16	86
National	7	30	59	48	5	50	25	18	38
State	1	6	9	12	0	14	9	7	6