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# Detecting Disaster Root Causes

A Framework and an Analytic Tool  
for Practitioners



Editor:  
German Committee for Disaster Reduction (DKKV)

# Detecting Disaster Root Causes

## A Framework and an Analytic Tool for Practitioners

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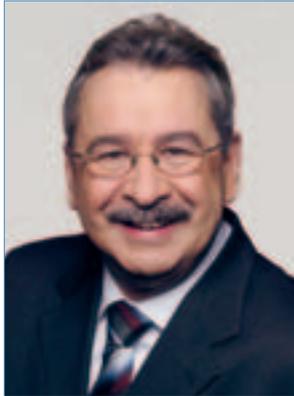
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# Preface



**Gerold Reichenbach**  
Chairperson DKKV

In recent decades the international community has managed to comprehensively improve its humanitarian system. Procedures and mechanisms have been coordinated with each other. New instruments, such as the Central Emergency Response Fund (CERF) and the cluster approach aimed to enable quicker and better coordinated aid. Decreasing number of fatalities with a simultaneously increasing number of disaster events can be seen as an indicator for improved humanitarian aid.

The German Committee for Disaster Reduction (DKKV) took the recommendations announced by the Advisory Group of the Hyogo Framework for Action (HFA) as an opportunity to deal with this problem context. This study contributes to the implementation of the recommendations formulated in the HFA mid-term review as well as to the post HFA debate. Through DKKV members we contacted experts and received access to reports and documents providing valuable information for the analysis of selected case studies. Without their support and active cooperation this study would not have been possible. The United Nations University – Institute for Environment and Human Security (UNU-EHS) was the “executive arm of DKKV” and was commissioned to prepare this study.

The study is a first and important step. It can serve as the basis for developing an instrument to identify disaster root causes. Further events need to be examined in order to test and refine the preliminary check list developed in this study. This tool can qualitatively improve our work and contribute to reduce disaster events.

But what do we know about root causes of disasters, the underlying causes, which determine that a natural event leads to a disaster at one location, but not at another location?

How can we identify root causes to address them in our projects?

Can generic statements, such as “it is the poverty” lead to differentiated conclusions that enable us to address these root causes? When can we identify these causes? Therefore, the aim must be to ask the right questions and collect information at a very early stage after the occurrence of an event. Do we need new instruments or is it possible to integrate the identification of root causes into existing assessment methods?

A handwritten signature in black ink, appearing to read 'Gerold Reichenbach', written in a cursive style.

**Gerold Reichenbach**  
German Committee for Disaster Reduction,  
Chairperson

# Foreword



**Jakob Rhyner**  
Director UNU-EHS  
UNU Vice-Rector

Newer studies underscore that the intensity and frequency of various so-called extreme weather events are going to increase due to predicted climate change. (IPCC, 2012) Thus, the international community as well as countries and municipalities will have to deal with increasing challenges in terms of coping with, and adapting to, natural hazards, such as floods, cyclones or heavy rainfall. Apart from climate change related hazards, certain countries also have to deal with exposure to seismological hazards, such as earthquakes. Although these natural hazards can

trigger the final event to become a disaster, there are other key factors and conditions that determine and influence whether an extreme event will lead to a disaster. Consequently, a sole focus on natural hazards falls too short. The Special Report on “Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation” (SREX) of the Intergovernmental Panel on Climate Change (IPCC) as well as the Advisory Group of the Hyogo Framework for Action (HFA) conclude that disasters and disaster risk need to be analyzed comprehensively in order to understand the contributing factors of disasters. It is also hoped that in-depth research will help humanitarian assistance and development agencies to understand and address root causes of disasters instead of only considering the symptoms.

This study presents a framework to consider underlying root causes and shows how these factors can be identified through the application of a check list. As this study follows a practical approach, it aims to support agencies and stakeholders involved in disaster risk management to identify efforts and intervention options in order to address root causes and drivers of disasters and disaster risk. In this regard,

one has also to take into account that as root causes or drivers of disaster risk are the underlying factors and structures they are often more difficult to change than revealed insecurities.

The study owes its practical relevance to, among others, the numerous practitioners who were involved in the development and discussion of the study. At this point I would also like to extend my sincere thanks to the authors as well as to the German Committee for Disaster Reduction (DKKV), which made this study possible through the financial sponsoring and support with corresponding know-how from practical experiences.

This study should contribute to the further discussion on assessing and addressing disaster root causes. In this regard, the readers are called upon to continue the discussion through comments, additions, and by practical implementation of the preliminary check list within their organizations.

**Prof. Dr. Jakob Rhyner**  
UNU Vice Rector in Europe  
Director United Nations University,  
Institute for Environment and Human Security (UNU-EHS)

# Executive Summary

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## HAITI

Workers pass rocks hand to hand along a line. The United Nations Mission in Haiti's Community Violence Reduction program is employing 1345 local residents in a Cash for Work program building rock walls and planting vegetation as a way of saving arable land and avoiding flooding in lower areas.



The two major communities dealing with Disaster Risk Reduction and Climate Change Adaptation underscore that there is still limited knowledge regarding disaster root causes. Particularly, the Advisory Group of the Hyogo Framework for Action (HFA) and the Special Report of the Intergovernmental Panel on Climate Change (IPCC) on “Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation” (SREX) stress that root causes and drivers of disasters need to be further analyzed. Although, natural hazards can trigger an event to become a disaster, there are other factors that determine whether an extreme event will lead to a disaster and causes extreme impacts. Therefore, enhanced knowledge is needed on vulnerability as well as on those factors and causes that actually lead to vulnerability and unsafe conditions. Detecting and understanding root causes of disasters will help agencies to avoid rebuilding vulnerability and high risk conditions. Hence, we have to broaden the focus from the analysis of symptoms of disasters and visible fragile conditions towards the identification of root causes.

The study aims to propose a framework to assess underlying drivers and root causes of disaster risk. In this context, it provides additional information to stakeholders involved in Disaster Risk Management and Humanitarian Assistance to prioritize efforts and intervention options to address these issues.

### Detecting Disaster Root Causes

The Hyogo Framework for Action (HFA) provides practical guide for different stakeholders to address key processes and measures to improve DRM at community as well as country level. It provides only limited information on drivers and root causes of disaster risk that, for example, influence vulnerability. In this regard, it does not yet provide a basis for assessing and identifying root causes of disasters. This also applies to assessment approaches, such as the Post-disaster Needs Assessment (PDNA), the Vulnerability and Capacity Assessment (VCA) or the Real-Time Evaluation (RTE). Although, the aforementioned approaches are important and also provide key insights for stakeholders working in disaster risk reduction, they often capture and systematically assess revealed losses and vulnerabilities.

The PDNAs, for example, clearly and comprehensively provide information on current needs and damages, but do not provide any hint *why* damages and needs emerge to a certain extent. This is similar to VCAs, which put more emphasis on revealed vulnerabilities and local risk perception, but do not differentiate between drivers and root causes. Nevertheless, a complementary application of these approaches provides a useful overview of current vulnerabilities, capacities or post-disaster conditions and forms a valuable basis for root cause analysis. However, a root cause analysis goes beyond this focus. It explores the “*why*”: Why are so many

poor people exposed to hazards? – Why do people have such a limited coping capacity or high susceptibility?

Against this background, this study proposes a framework and selected criteria to identify the multi-dimensional factors that determine specific characteristics of vulnerability, exposure and disaster risk. Compared to the Global Assessment Report (GAR) – which identifies certain risk drivers –, this framework goes one step further towards the roots to ask why certain drivers are distinctive. (UN/ISDR, 2011b)

The framework developed a matrix approach focusing on causal linkages between disaster impacts and underlying root causes. In contrast to most of the concepts that deal with disaster root causes this framework examines pre-disaster conditions – based on the disaster risk definition (see Wisner, et al., 2004) – as well as the DRM performances in every single phase of the disaster. Therefore the framework integrated the DRM cycle into the analysis approach, since it is assumed that even after a major disaster event limited risk management capacities or failures in risk management can enhance or extend the crises. In this context disasters are not just understood as a point in time, but more as a complex crises phenomenon that goes beyond a single event. In order to systematize the various root causes the following categories have been identified:

- Development
- Governance
- Awareness and Perception
- Political Environment
- Physical and Environmental Conditions

Assessing and detecting drivers and root causes of disaster risk is linked to various challenges. For example, a major challenge is to differentiate between drivers and root causes of disasters. Furthermore, assessment frameworks have to take into account that root causes are distant in time or space from the disaster event. Moreover, disaster root causes might manifest themselves in very different conditions. Apart from these assessment constraints, it is also evident that disaster root causes, such as national policies, governance or development status are highly dynamic and continuously change. Consequently, root causes and drivers are characterized by high levels of interaction and interdependency exacerbating their systematization. Finally, if identified, root causes need to be prioritized to guide DRM agencies in defining adequate and sufficient DRM interventions. This implies that out of a list of various root causes those need to be identified that are particularly key for the region or community and the agencies involved in DRM.

This framework is a first assessment step providing information on how root causes are linked to disaster risk and revealed disaster losses, thus assisting DRM agencies to identify and to address these factors at a very early stage

of their intervention. In this regard the study contributes to the international discussion on how to refine and amend current assessment and reporting tools to analyze disaster root causes in order to implement the goals defined in the HFA.

### Case Study Analyses

The study particularly is based on expert interviews and the analysis of specific case study reports on revealed disasters, such as the earthquake disaster in Haiti and the flood disaster in Pakistan. In this regard the study also differentiates between generic and place or hazard specific root causes. This distinction, however, is highly dependent on the level of abstraction. Place specific root causes of disaster risk were, for example, in the case of Mozambique and the Philippines problems in governance structures that lead to a lack of communication across scales. Due to missing communication across regional or national borders, downstream communities were not able to prepare for, and react to, respective flood impacts. Finally, root causes related to awareness and perception (e.g., culture, tradition or religious norms and beliefs) or to political environment (e.g., post civil war impacts) describe place specific factors. Physical and environmental conditions (e.g., climate change or natural climate variability) are very much hazard related.

### Addressing root causes of disasters

During the international workshop in September 2012 working groups revealed challenges and constraints as well as potential areas for the different agencies involved in DRM and humanitarian assistance to address drivers and root causes of disasters. Intervention options can be divided into the following three major groups:

- **Structural measures**  
(e.g., technical preparedness and construction)
- **Non-structural measures**  
(e.g., awareness and perception)
- **Paradigm shifts**  
(e.g., from disaster response to disaster preparedness)

During group discussions it became apparent that primarily agencies active in humanitarian assistance have often the capacity to address certain drivers through structural measures. With regard to non-structural measures, agencies, such as GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit) as a development agency and also IFRC (International Federation of Red Cross and Red Crescent Societies) stated that they could address root causes, such as deficits in awareness and risk perception, due to long-term projects in such countries. This also applies to paradigm shifts (e.g., set up of a new DRM legislation), which can only be promoted based on long-term engagement and comparatively ramified structures.

Based on the results from the analysis – particularly the studies and reports from the Earthquake 2010 in **Haiti**, the Tsunami 2004 in **Indonesia**, the Flood 2000 in **Mozambique**, the Flood 2010 in **Pakistan** as well as from the Typhoons 2009 in the **Philippines** – this study also formulated a preliminary check list. It aims to assess root causes and to identify their causal links to certain drivers that influence vulnerability, exposure and risk management capacities. The check list can support agencies and stakeholders involved in humanitarian assistance and development cooperation to determine and prioritize efforts and intervention options to address these issues. The check list focuses on two different processes and phenomena. The first concept or segment of criteria refers to pre-disaster conditions aiming to address root causes when dealing with unrevealed risks. The second approach focuses on an ex-post analysis, hence it deals with revealed disasters and provides information about the reasons why and how certain progresses and structures influenced disaster outcomes.

Both before and after disasters, the check list serves to provide overview information on current context conditions or post-disaster progresses. It can easily be transferred to any region and context dealing with different hazard types, such as floods, cyclones/typhoons, or earthquakes. The information gained through this check list can serve as a tool to define areas for DRM activities. These findings can be used for internal program planning procedures or to strengthen arguments to convince partners of specific measures that are required within project proposals.

### Recommendations

The lack of resources and capacities (e.g., financial, human and technical) and a low level of knowledge and education emerged in all case studies as major root causes for several drivers of disaster risk. Especially capacities and resources of agencies at the local level need to be strengthened in order to improve their performance. DRM requires competent staff to implement actions and improve DRM at the community level. Furthermore, awareness among decision makers and chief executives at the national as well as at the local level needs to be increased. Legal frameworks have to be established in order to guarantee the consideration of natural hazards and the vulnerability of different population groups, economic sectors or environmental services.

Apart from the general suggestions outlined above, case study specific recommendations can be formulated. The following issues are related to root causes identified in the study:

- In Haiti root causes of disaster risk are particularly linked to the limited functioning of institutions and general norms accepted in the society. Thus, functioning governmental structures need to be set up, that particularly

provide basic functions to the people, before an effective DRM can be established. Another driver of disaster risk in Haiti is also seen in the high poverty rate, which makes it nearly impossible for people at risk to build coping and adaptive capacities to deal with extreme events.

- Indonesia has developed important capacities after the Indian Ocean Tsunami. In this context the Early Warning System (EWS) should be strengthened and coastal management strategies, such as a coastal “Buffer Zone” regulation might need to be enforced, while at the same time ensuring that people have to have access to the sea. Legal frameworks are still weak in terms of their implementation and enforcement; hence they do not provide a sufficient measure to ensure that people do not settle in high risk zones along the coast. In this context restrictions for normal residents and their limited access to land needs to be considered as well. In this context restrictions for normal residents and their limited access to land needs to be considered as well.
- The analyzed extreme event in Mozambique occurred 12 years ago. The event triggered important changes and can be seen as a starting point leading to strong governmental commitment for DRM in the last years. However, the weak physical infrastructure conditions in the country as well as the institutional environment – programs often do not exist beyond change of government – are major issues, which need to be tackled in order to strengthen disaster preparedness and resilience building.
- In Pakistan various causes of disaster risk could be identified. Among them one key issue is the limited access to land particularly for poor rural farmers. The lack or limited access to land often does not allow poor farmers to build coping and adaptive capacities that could help them to survive such flood events or natural hazards. Furthermore, the massive engagement of external actors in the emergency management and recovery process also requires an improvement of coordination mechanisms within such crises in order to ensure that all people affected receive support.
- The Philippines are still confronted with major typhoons in the future. Therefore, improving typhoon forecasting capacities is essential. Furthermore, these forecasting capacities and the local knowledge needs to be better translated into Early Warning (EW) signals and systems at the national and local level. Also, the drainage infrastructure of major cities seems to be a key driver of risk and hence requires more comprehensive reconstruction in order to cope with future water discharge during monsoonal periods.
- Overall, the examples show that root causes of disaster differ in terms of the respective country, its cultural and development context as well as in terms of the hazard.

# 1. Introduction

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## HAITI

A boy stands surrounded by water in Raboto, a slum area of Gonaives, in the Artibonite Region. Hurricane Tomas heavily hit Gonaives flooding streets and houses and retarding the respond to the cholera outbreak that killed hundreds with thousands hospitalized.

The Advisory Group of the Hyogo Framework for Action (HFA) announced in their mid-term review *“that it would be important to define a common method for developing [...] an in-depth understanding of the elements that [...] contributed to [...] disaster[s].”* (UN/ISDR, 2011a, p. 62) Also, the Special Report of the Intergovernmental Panel on Climate Change (IPCC) on *“Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation”* (SREX) underscores: Root causes and drivers of disasters and disaster risk need to be analyzed in order to avoid that humanitarian assistance and reconstruction efforts rebuild vulnerable and high risk conditions. (IPCC, 2012, p. 75) Against this background this study, conducted by United Nations University – Institute for Environment and Human Security (UNU-EHS), aims, among other things, to develop a set of methodologies to assess underlying drivers as well as root causes of disaster risk. This research is particularly linked to the HFA Priority for Action 4 *“Reduce the underlying risk factors”*, which has not yet sufficiently been considered and implemented. (UN/ISDR, 2011a)

Although common understanding exists that disaster and disaster risk are influenced by different factors and processes, there is still limited knowledge regarding disaster root causes. This needs to be improved in order to sustainably reduce disaster risk. O’Keefe, et al. (1976) for example argue that not merely the symptoms<sup>1</sup> of disasters, but rather root causes need to be considered and alleviated in order to prevent future disasters occurring in the same manner as before. Furthermore, it is important to note that weather-related hazards or so called extreme events, such as floods and heat stress, are expected to increase in frequency and intensity due to climate change. (IPCC, 2012) Therefore, enhanced knowledge is needed on root causes in order to promote adequate Disaster Risk Management (DRM) interventions. However, it is evident that agencies involved in humanitarian assistance or DRM face certain challenges and constraints in addressing root causes or drivers of disaster.

## 1.1 Objectives of the study

Requested by the DKKV (German Committee for Disaster Reduction) and funded by the Federal Foreign Office, this study aims to propose analytic tools to identify disaster root causes and define areas for DRM interventions to address these. Thus, the research requires to go beyond an analysis of sudden-onset or creeping hazards that triggered an event to become a disaster. As disasters are observed to be the result of parallel developments, the study aims to examine the various context conditions and trends that heavily influence vulnerability, exposure, risk, and DRM. Understanding the factors that shape and determine certain vulnerabilities and patterns of exposure is key to un-

derstanding disaster risk and underlying factors. (Birkmann, 2011; Birkmann, 2006)

In order to answer these objectives, this report encompasses eight chapters starting with the definition of major, thematically relevant, terms. Chapter two introduces common frameworks that aim to identify disaster root causes. Different assessment and evaluation tools are introduced followed by the conceptualization of the analytic tool (chapter three). The developed analysis framework aims to identify root causes that triggered a specific natural hazard to become a disaster. Considering regional or national context conditions, it reveals the reasons *why* certain conditions were present and led to the occurrence of a disaster. This framework is a first step towards examining factors that are or were key in contributing to disaster risk and that can be seen as underlying factors determining different drivers of risk. Chapter four applies the framework to the selected case studies, while difficulties in detecting disaster root causes are discussed in chapter five. In all case studies, they will be distinguished between generic and place or hazard specific root causes. The second analytic tool is introduced in chapter six. It aims to support agencies involved in humanitarian assistance and development cooperation to assess drivers and root causes of disasters. Based on the case study results – particularly the studies and reports from the Earthquake 2010 in Haiti, the Tsunami 2004 in Indonesia, the Flood 2000 in Mozambique, the Flood 2010 in Pakistan as well as from the Typhoons 2009 in the Philippines – the preliminary check list follows a practical approach enabling different agencies to determine and prioritize efforts and measures in order to address these issues. Based on the international workshop results, chapter seven discusses agencies’ challenges and constraints in addressing root causes. Finally, chapter eight provides recommendations on how to enhance disaster risk management activities that can also address root causes and drivers of disasters and disaster risk.

As this study is positioned in the interface between science and policy, methodologies and criteria need to be scientifically robust as well as applicable and useful for practitioners. Moreover, its purpose is to contribute to the international discussion on how to refine and amend current assessment and reporting tools for analyzing disaster root causes in order to implement the goals defined in the HFA.

## 1.2 Definition of major terms

Before examining the case studies, the following chapter provides an overview of key terms and their interpretation within this study. It should also be noted that depending on the school of thought the definition will differ. However,

<sup>1</sup> Symptoms *“are not regarded as actual causes, but rather as signs of existing problems.”* (Andersen and Fagerhaug, 2006, p. 4)

this report primarily builds on the definitions used in the IPCC Special Report (IPCC, 2012), which was developed between researchers of the Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) communities. Moreover, particular terms relevant for DRM have been defined according to international standards set up by the United Nations International Strategy for Disaster Reduction (UN/ISDR). In this context the following are key terms:

- Disaster and Disaster Risk
- Disaster Risk Management (DRM)
- Root Causes
- Drivers
- Root Cause Analysis

**Disaster** describes the interaction of different natural as well as context specific socio-economic factors leading to a serious disruption. According to the IPCC SREX Report, disasters are *“severe alterations in the normal functioning of a community or a society due to hazardous physical events interacting with vulnerable social conditions, leading to widespread adverse human, material, economic, or environmental effects that require immediate emergency response to satisfy critical human needs and that may require external support for recovery.”* (IPCC, 2012, p. 5)

**Disaster Risk** describes the likelihood of a disaster over a predefined time period. It is described by complex interaction between the components extreme events, vulnerability and exposure. (IPCC, 2012)

**Disaster Risk Management (DRM)** is a highly dynamic process describing various phases of coping with, and recovering from, adverse disaster impacts as well as being prepared for, and adapting to, future stresses. It is defined as *“process for designing, implementing, and evaluating strategies, policies, and measures to improve the understanding of disaster risk, foster disaster risk reduction and transfer, and promote continuous improvement in disaster preparedness, response, and recovery practices, with the explicit purpose of increasing human security, well-being, quality of life, resilience, and sustainable development.”* (IPCC, 2012, p. 34) For the purpose of this report, the term disaster management should be treated as to be a synonym for disaster risk management, unless otherwise made explicit.

The so called **Disaster Risk Management Cycle** visualizes the cyclical nature of activities associated with DRM before, during, and after disasters and differentiates between four major areas: *“Response”, “Recovery”, “Mitigation”<sup>2</sup> and “Preparedness”<sup>3</sup>*. As these components and respective activities influence each other and act synergistically, they cannot be considered separately. Rather, it can be seen as a continuum, which constantly changes its condition depending on the interventions over time. Applied in practice, interventions are distinguished according to pre-disaster risk reduction, response to disasters and their impacts, as well as post-disaster recovery and reconstruction. DRR activities aim to reduce disaster risk through systematic analyses and management of causal disaster factors. This includes Risk Identification, Disaster Prevention<sup>4</sup> and Mitigation, as well as Disaster Preparedness. (IPCC, 2012; UN/ISDR, 2009)

**Root causes** *“are an interrelated set of widespread and general processes within a society. They are ‘distant’ in one, two or all of the following senses: spatially distant (arising in a distant centre of economic or political power), temporally distant (in past history), and finally, distant in the sense of being so profoundly bound up with cultural assumptions, ideology, beliefs and social relations in the actual lived existence of the people concerned that they are ‘invisible’ and ‘taken for granted.”* (Wisner, et al., 2004, p. 52) Thus, disaster root causes might involve processes and structures that go beyond an individual crises or event.

**Drivers** *“are processes and activities that ‘translate’ the effects of root causes both temporally and spatially into unsafe or vulnerable conditions and into risks.”* (Adopted from Wisner, et al., 2004)

**Root Cause Analysis** does not have a generally agreed definition. However, Andersen and Fagerhaug (2006, p. 12) describe it as *“a structured investigation that aims to identify the true cause of a problem and the actions necessary to eliminate it.”* In order to meet the objective to uncover the real causes of disasters various tools and approaches need to be applied. The current reality tree (CRT) or causal tree concept is a common analysis tool, when examining causes of specific conditions or characteristics.

2 This term needs to be clearly defined before use in this report, as the above mentioned schools of thought developed two different definitions. According to DRR, Mitigation describes the *“lessening or limitation of the adverse impacts of hazards and related disasters”*. CCA, in contrast, refers to *“the reduction of greenhouse gas emissions that are the source of climate change.”* (UN/ISDR, 2009, p. 19f) Due to the disaster context used in this study, this report will use the first definition.

3 Preparedness activities aim to build capacities in order to manage emergencies and to form the basis for adequate transition from response to sustainable recovery. Thus, it can be described as *“the knowledge and capacities developed by governments, professional response and recovery organizations,*

*communities and individuals to effectively anticipate, respond to, and recover from, the impacts of [...] hazards”* (UN/ISDR, 2009, p. 21)

4 (Disaster) prevention describes the *“avoidance of adverse impacts of hazards and related disasters”*. As disaster impacts cannot be completely avoided *“the task transforms to that of mitigation. [Thus,] [...] the terms prevention and mitigation are sometimes used interchangeably”* (UN/ISDR, 2009, p. 22)

## 2. Disaster root causes – state of the art

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### **INDONESIA**

Banda Aceh - Q. fishing in the ponds. Q. was fishing when the tsunami happened and found himself on top of a palm tree. When he came back to the village he found out he had lost all his relatives and is now left alone.

Despite the fact that the issues of disaster risk and root causes have been discussed for at least two decades, still common frameworks and systematic assessments are missing, which adequately address these concerns. Although Watts and Bohle (1993) and Wisner, et al. (2004) developed theoretical frameworks to consider root causes of crisis or disasters, these concepts are rather generic. Watts and Bohle (1993), for example, concentrate on the causal structure of vulnerability to identify reasons for a society's vulnerability to food insecurity and hunger. In contrast, Wisner, et al. (2004) use the common definition of disaster risk to identify root causes of disasters as a result of different development patterns that determine dynamic pressures, which then shape unsafe conditions. However, a limitation of the work by Wisner, et al. (2004) is that they present more general or macro-economic root causes that are based on the perspective of political economy and therefore, in some cases, underestimate the role of context specific and local root causes. (Birkmann, 2011)

## 2.1 Hyogo Framework for Action (HFA)

Apart from these theoretical frameworks, the HFA also needs to be mentioned in this context as it provides a practical approach and guide to addressing key processes and measures with regard to improving DRM at community as well as county level. The HFA identified the following five Priorities for Action providing clear measures for actors on how to implement their approach:

- 1) Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation;
- 2) Identify, assess and monitor disaster risks and enhance early warning;
- 3) Use knowledge, innovation and education to build a culture of safety and resilience at all levels;
- 4) Reduce the underlying risk factors; and
- 5) Strengthen disaster preparedness for effective response at all levels.

This framework recommends key activities for each priority and identifies critical tasks for risk reduction for different actors involved, such as states, regional or international organizations, and UN/ISDR. This multi-stakeholder approach is a prerequisite for adequate and sustainable implementation of DRM activities. Furthermore, HFA provides a monitoring system for states to analyze the progress of their DRM measures and activities independent from any hazard or event. Thus, HFA supports communities and countries to establish DRM mechanisms and to improve capacities to build resilience to natural hazards. (UN/ISDR, 2011a)

Until now, however, the self-monitoring system of the HFA linked to the progress reports submitted by countries led to many subjective evaluations of current conditions. Factors and processes, such as bad governance, corruption or political instabilities are often not mentioned as challenges or constraints in the implementation process, although some countries highly at risk also rank high in terms of corruption or state failure (e.g., Haiti). Furthermore, HFA does not yet provide a basis for assessing and identifying root causes of disasters – rather it provides key activities on how to improve DRM and build resilience to certain disasters.

Against this background, this study proposes a framework (see chapter 3.1) and selected criteria to identify the multi-dimensional characteristics and factors that determine specific characteristics of vulnerability, exposure and disaster risk. It aims to reveal reasons, such as *why* certain vulnerability conditions exist and lead to the occurrence of a disaster. Therefore, the conceptualization of the root cause analysis framework in this report is based on the disaster risk definition (defined in chapter 1.2) as well as the assumption of drivers and root causes (see Wisner, et al., 2004). However, most of the concepts that deal with root causes of disasters do not account for deficiencies in DRM as a root cause of continuous crises. This report, therefore also takes the DRM cycle into account as a key element to identify root causes of disasters that might occur in the aftermath of the major event. In this context disasters are not just understood as a point in time, but as a complex phenomenon that goes beyond a single event, such as in the case of Haiti. In addition to the DRM cycle, this study also considered environmental conditions as to be potential root causes of disasters, such as natural climate variability, climate change or geophysical conditions.

Thus, both frameworks can be used complementary. HFA primarily provided guidance to identify insufficiencies or failures during DRM. In combination with the developed framework, root causes and their causal link to drivers that influence vulnerability, exposure and risk management capacities can be identified.

## 2.2 Review of existing assessment and evaluation approaches

In times of crisis and disasters, and particularly in their aftermath, various assessment approaches are conducted by different actors in order to identify urgent needs, to assess damage and loss as well as to identify the conditions that might have contributed to the disaster. This information is often essential for the coordination of emergency intervention options. These assessments provide valuable informa-

tion on certain conditions in a country and form the basis for the analysis of factors leading to vulnerable conditions or deficits during disaster management. However, a real systematic assessment of root causes and drivers of disasters and disaster risk is often missing.

The following section introduces the selected assessment and evaluation approaches that are conducted in the context of such crises or disasters. Further reports, which have been used to identify root causes of disaster in this report are mentioned briefly in the method chapter and listed in Annex II.

#### Post-disaster Needs Assessment (PDNA)

The PDNA can be divided into two separate and complementary assessment methodologies. The first is the Damage and Loss Assessment (DaLA), a quantitative estimation of damage and loss in terms of economic flows and the impact it has on the overall performance of the economy – based on a sector-by-sector approach. The second methodology is the Human Recovery Needs Assessment (HRNA), which is conducted in order to determine the impact that the disaster has on human development and to identify the requirements to facilitate resilient recovery of human development and key infrastructures. Conducted by the government and supported by the World Bank, the European Commission (EC) and the United Nations Development Group (UNDG), this assessment starts immediately after the disaster and takes about six weeks. Thus, PDNA covers damage, losses, and economic as well as social impacts of the disaster and forms the basis for determining recovery and reconstruction needs. (GFDRR, 2010)

#### Vulnerability and Capacity Assessment (VCA)

The VCA has been developed by the International Federation of Red Cross and Red Crescent Societies (IFRC) in order to identify vulnerabilities and capacities at the grass root level. Compared to PDNA, the VCA approach primarily uses qualitative participatory methodologies to assess vulnerabilities and capacities of communities and single households to disaster risk. This local and community-based focus allows people to identify and understand their own level of risk. Furthermore, this information enables the identification of local priorities and leads to the development of intervention options (e.g., community-based disaster preparedness programmes at the rural and urban grass roots level) that contribute to DRM activities before disasters occur. This approach enables specific local needs to be considered and thus, leads to broader civil society involvement. (IFRC, 2006)

#### Real-Time Evaluation (RTE)

In contrast to PDNA and VCA, RTEs aim to evaluate emergency assistance performances right after disasters (e.g., emergency relief, response, recovery, etc.) during their course of implementation. RTEs are participatory in the sense of interactivity. Based on field visits and headquarter meetings, RTEs primarily aim to identify certain challenges and constraints in post-disaster emergency and recovery activities. Based on this information, lessons learned and recommendations are formulated in order to improve processes and coordination in disaster emergency periods. (Herson and Mitchell, 2005)

#### Assessment limits

As already mentioned various assessment approaches have been used for the analysis of the selected case studies. Approaches such as PDNA, VCA or RTE – applied in different time frames after an event – form a valuable basis for root cause analysis on the current vulnerability, capacity or post-disaster situation. However, these assessments do not look behind certain conditions. PDNAs, for example, clearly and comprehensively provide information on current needs and damages, but do not provide any hint as to *why* damages and needs emerge to a certain extent. This is similar to VCAs, which put more emphasis on revealed vulnerabilities and local risk perception, but do not differentiate between drivers and root causes. Nevertheless, a complementary application of PDNAs, VCAs and RTEs provides a useful overview of current vulnerabilities, capacities or post-disaster conditions and forms a valuable basis for root cause analysis. However, a root cause analysis goes beyond this focus. It explores the *why*: Why are so many poor people exposed to hazards? Why do people have such a limited coping capacity or high susceptibility?

### 3. Research design

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#### PHILIPPINES

Forest Management in the Upper Agno, Philippines. Two forestry officials inspect a „brush check dam“ intended to halt erosion of the gully. The entire dam was made from wood that was locally available.

Before introducing the disaster root cause analysis framework developed for this study, the research approach applied for the selected case studies will be described (see

Figure 1). The approach is divided into three steps: Scaling and Scoping, Root Cause Analysis, as well as Recommendations and Policy Options.

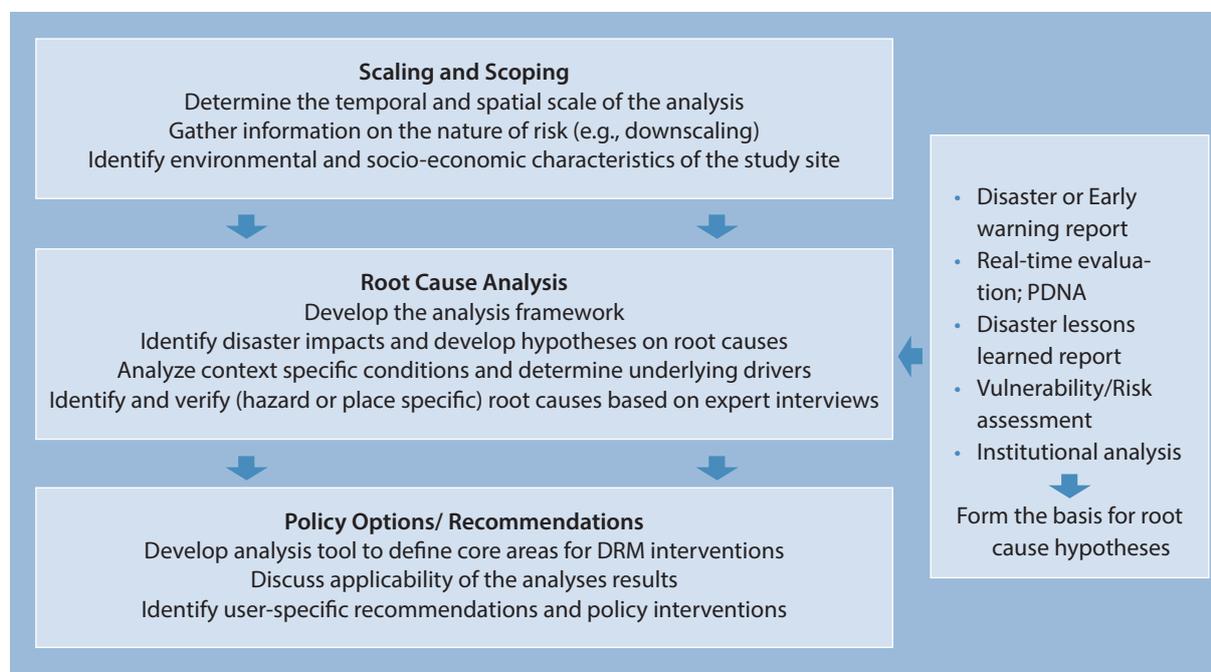


Figure 1: Research approach, adopted from GIWA (2002), UNDG (2008) and WWF (n/a)

Prior to the selection of the case studies the following main research questions have been formulated:

- How to develop a framework for understanding and analyzing disasters in different phases and with regard to the various drivers and root causes that contributed to the disaster?
- Which lessons learned are formulated after a disaster (with regard to root causes and context conditions that created the background for the occurrence of a disaster)?
- How to systematize the multi-dimensional problem context of disasters and drivers?
- What kind of analytic tool would help to identify drivers and root causes of disaster risks after a disaster occurred?
- Which recommendations can be derived from the study and the expert interviews for different stakeholders in DRR and humanitarian assistance?

A broad literature review served to formulate core research areas and to provide guidance for the further development of specific methodologies to ensure a systematic approach for the development of analytical tools. Selected case studies served the purpose of applying the developed framework and thus, to identify certain disaster root causes. Therefore, the temporal and spatial scale of the analysis has been defined to reach from the national to the local level encompassing a time frame of before and after the disas-

ter. This required broad and comprehensive data analysis in order to determine the nature of risk as well as the main environmental and socio-economic characteristics of the study site. Consequently, the availability of, and the access to, literature, including peer-reviewed journals, gray literature and country reports on which root cause assumptions can be identified, turned out to be a prerequisite for the case study selection. In this context it was decided to focus on scientific papers or reports produced by institutions that are credible and active in emergency support, rehabilitation and relief. The following organizations were also identified as being in close cooperation with DKKV: Aktion Deutschland Hilft (ADH), Care Deutschland, the German Red Cross (GRC), GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit), Malteser International, and Welthungerhilfe.

In addition, countries that had faced major disasters in the past were selected as representative case studies. Apart from having experienced recent disasters, the selected countries are potentially exposed to various natural hazards, such as sea level rise, earthquakes, floods, cyclones, or draughts. Therefore, these countries were seen as having an urgent need for adequate and sustainable DRM measures. Furthermore, the countries were selected depending on where they were located, as the aim was to examine at least one case study on the continents of America, Africa, and

Asia and to represent specific country types (e.g., Haiti as a fragile state and coastal island, or Indonesia with a decentralized governance system facing multiple-hazards). With regard to natural hazard types, droughts have not been considered due to insufficient or nonexistent data basis as well as difficulties in determining causal relations and temporal as well as spatial dimensions of slow-onset hazards and their root causes. This does not mean that identifying root causes of drought related disasters is not important, however, within the short time span of the study it was not possible.

The preliminary selection process and the data that was gathered provided useful information for the root cause analysis (second step), which was carried out for the selected case studies. Based on the developed framework (see chapter 3.1. for more detail) the case studies were examined and various documents were assessed – e.g., stakeholder reviews and reports, as well as PDNAs, RTEs, VCAs and context analysis. Questions on the vulnerability, exposure and different DRM phases as well as their linkage to potential root causes were formulated in order to identify root cause hypotheses. Furthermore, context specific conditions were analyzed and underlying drivers determined in order to establish the causal relation of disaster impacts and root causes.

In combination with 29 expert interviews, the gathered information formed the basis to assess and verify the multi-dimensional characteristics and factors leading to the disasters. Experts from a wide range of different national and international organizations involved in DRM have been interviewed, such as Mr. Kühn (Welthungerhilfe, Haiti), Ms. Rafliana (Indonesian Institute of Science), Ms. Gerster (World Food Programme for Mozambique), Mr. Durrani (Pakistan Red Crescent), and Mr. Daep (Albay Public Safety and Emergency Management Office in the Philippines) – Annex I shows the entire list of interview partners<sup>5</sup>. Particularly, since most reports do not sufficiently address root causes and drivers of disasters, these expert interviews are a key source to further enhance the knowledge about general and local specific drivers of disaster risk.

Based on the case study results (see chapter four) a second analytic tool has been developed to assess drivers and root causes of disasters. Following a practical approach, it aims to check relevant links between root causes and drivers that influence vulnerability, exposure and risk management capacities. This can support agencies and stakeholders involved in humanitarian assistance and development cooperation to identify efforts and intervention options to address these issues. The international expert workshop (27/28 September 2012) aimed to discuss the design and

core components of this tool (see chapter six for in-depth information). Furthermore, it contributed to the formulation of recommendations on how to apply the methods to identify root causes and drivers of disaster risk. Finally, this report identifies recommendations related to the root causes identified in the study.

### 3.1 Conceptual framework

The framework bases on a matrix approach with two key axes (see Figure 2). The horizontal X-Axis describes the two main subjects of investigation. The first is the pre-disaster condition of a society or community exposed to natural hazards (vulnerability and disaster risk). The second includes the entire range of activities related to DRM – this primarily refers to post-disaster activities. Thus, this framework takes the DRM cycle into account, since it is assumed that even after a major disaster event, limited risk management capacities or failures in risk management can enhance or extend the crises. For both subjects of intervention different elements of risk are outlined in the analysis levels. The Y-Axis shows the progression of each analysis level from observed impacts and insecurities (drivers) to underlying patterns and structures (root causes). Compared to the Global Assessment Report (GAR) – which identifies certain risk drivers –, this framework goes one step further towards the roots to ask why certain drivers are distinctive. (UN/ISDR, 2011b)

This generic concept was a preliminary step towards the development of the analysis framework, which aims to illustrate the various causal interconnections between certain vulnerability or DRM characteristics (drivers) and their root causes. Therefore, it is essential to differentiate between drivers and root causes of disasters. Drivers are processes and activities that translate the effects of root causes into risks. Root causes, in contrast, involve processes and structures that go beyond an individual crises or event and influence specific drivers of risk, vulnerability and DRM. This difference is a major challenge when detecting disaster root causes. These issues are discussed further in chapter five.

Figure 3 shows the disaster root cause analysis framework developed for this study, which clearly reveals the multi-dimensional character of root causes. The current reality tree (CRT) or causal tree concept seems the adequate analysis tool as it examines the respective causes of specific conditions or characteristics step by step. According to Doggett (2005, p. 43) the CRT *“is a complex tool for pinpointing root causes and causal interdependencies. The CRT builds chains of causes and effects”* and is the *“only method that has mechanism for testing logic”*. This framework can easily be transferred into any natural hazard related disaster context. It

<sup>5</sup> In order to guarantee privacy and ensure confidentiality, the data will be anonymized before use.

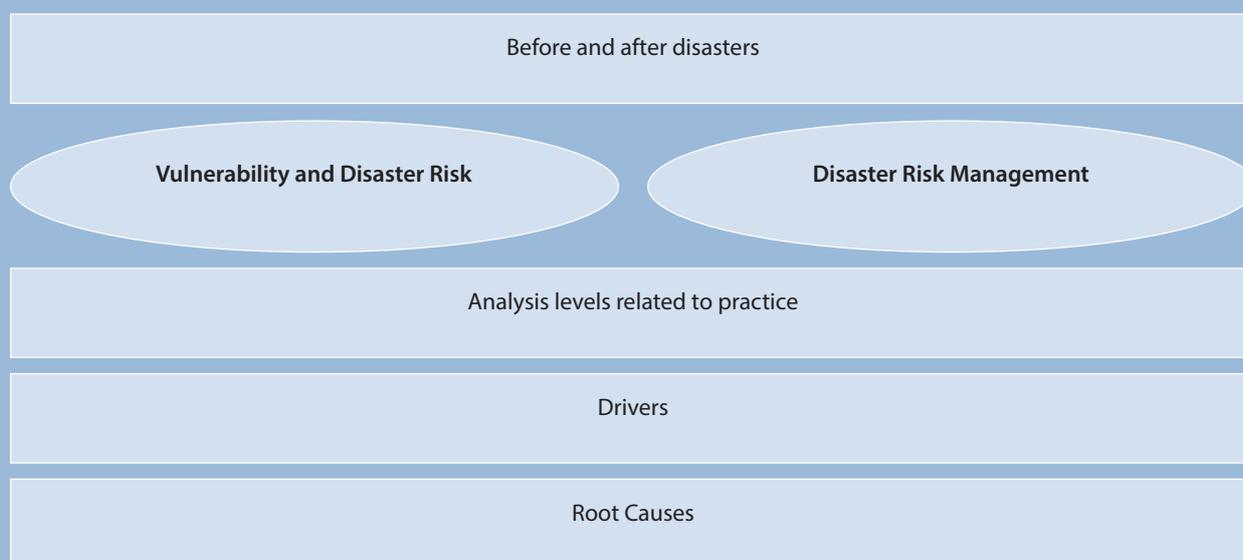


Figure 2: Generic analysis concept, own figure

aims to approach root causes through various analysis levels and thus, tries to look beyond certain structures or factors. Similar to the Forensic Disaster Analysis Approach (IRDR, 2011), this framework analyzes disasters from an ex-post perspective. Therefore, it differentiates between several analyses levels, which include the components of the disaster risk definition introduced in chapter 1.3. *Vulnerability*<sup>6</sup> (encompassing *Susceptibility as well as Coping and Adaptive Capacity*), *Exposure*<sup>7</sup> and *Extreme Events*<sup>8</sup> relate to more generic characteristics of a society or community exposed to respective events. Furthermore, this framework considers the disaster risk management cycle components,

which provide information on constraints and thus, help to identify further disaster root causes. It needs to be considered that DRM per se does not describe root causes, rather, deficits and insufficiencies during DRM processes can also be seen as certain drivers of the chronic crisis and therefore linked to specific disaster root causes. DRM is divided into different phases, which in practice often take place simultaneously and thus, can hardly be separated. The analysis framework considers the following phases: *Response*<sup>9</sup>, *Recovery*<sup>10</sup>, and *Disaster Risk Reduction*<sup>11</sup>.

- 6 **Vulnerability** with its multi-dimensional and dynamic character is an often discussed term, which has various definitions and includes different components depending on the respective school of thought. The following report defines vulnerability within the broader context of disaster risk “as the propensity or predisposition to be adversely affected” (IPCC, 2012, p. 32) Adopted from Wisner, et al. (2004, p. 11) this includes the “characteristics of a person or group and their situation that influences their capacity to anticipate, cope with, resist, recover from, and adapt to the adverse effects of physical events.” Thus, vulnerability includes the society’s **susceptibility** as well as its **coping and adaptive capacity**.
- 7 **Exposure** can be described as “the presence (location) of people, livelihoods, environmental services and resources, infrastructure, or economic, social, or cultural assets in places that could be adversely affected by physical events and which, thereby, are subject to potential future harm, loss, or damage.” (IPCC, 2012, p. 32)
- 8 **Extreme Events** in this study include weather or climate-related events – associated with climate variability under stable or changing climate conditions – as well as geophysical impacts, such as earthquakes. Normal physical phenomena “can also lead to extreme conditions or impacts, either by crossing a critical threshold in a social, ecological, or physical system or by occurring simultaneously with other events.” (IPCC, 2012, p. 115) Thus, it needs to be considered that dimension and extremity of an event depend on the

context in which it occurs. (IPCC, 2012)

- 9 **Response** encompasses (early) warning activities before and during the event as well as evacuation and emergency supply activities in various sectors (e.g., health, sanitation, nutrition, etc.). The United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) ensures inter-cluster coordination at all phases of the response phase. (UNOCHA, 2012a)
- 10 **Recovery** aims “to stabilize local and national capacities from further deterioration [...] [to] provide the foundation for [...] spontaneous recovery activities within the affected population. This encompasses the restoration of basic services, livelihoods, shelter, governance, [...] environment and social dimensions.” (UNDP, 2008, p.7) This provides the basis for long-term reconstruction and development, which should proceed under national coordination mechanisms. (UNDP, 2008)
- 11 Risk Identification, Disaster Prevention and Mitigation as well as Disaster Preparedness activities are summarized by the term **Pre-Disaster Risk Reduction (DRR)**. It needs to be considered that DRR activities are rather superordinated and thus, are also related to Response and Recovery. However, in this study DRR describes an individual analysis level. Whereas the analysis levels Response and Recovery exclusively consider processes, DRR primarily refers to DRM structures and policies.

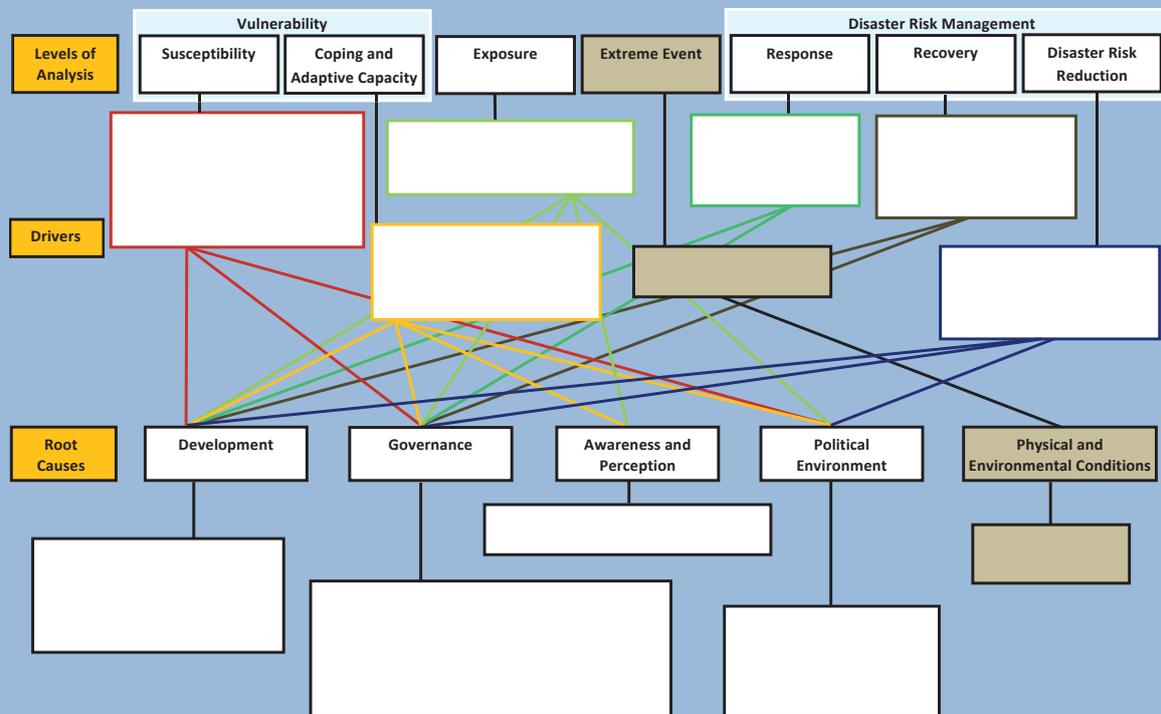


Figure 3: Disaster root cause analysis framework, own figure

For each analysis level different drivers are determined. Vulnerable conditions, for example, manifest in marginalization processes, low level of awareness, fragile livelihood activities or food insecurities. Due to the limited space, it needs to be considered that the lists cannot be comprehensive. Thus, only those factors, which expert interview partners mentioned as to be most important, are listed. The boxes are colored in order to illustrate their causal relations to different root cause categories. In order to cluster and systematize the identified root causes, five categories have been developed – *Development*; *Governance*; *Awareness and Perception*; *Political Environment* and *Physical and Environmental Conditions*. **Development** includes criteria, which are related to the national level of development, such as resources and capacities (e.g., financial, human, or technical), equipment (e.g., logistics, communication, etc.), knowledge and education, etc. These factors are primarily linked to the HFA Priority for Action 3 “Use knowledge, innovation, and education to build a culture of safety and resilience at all levels” as well as to Priority for Action 4 “Reduce the underlying risk factors”. The category **Governance**, in contrast, includes factors related to international as well as national policies and governance issues with regard to DRM. Apart

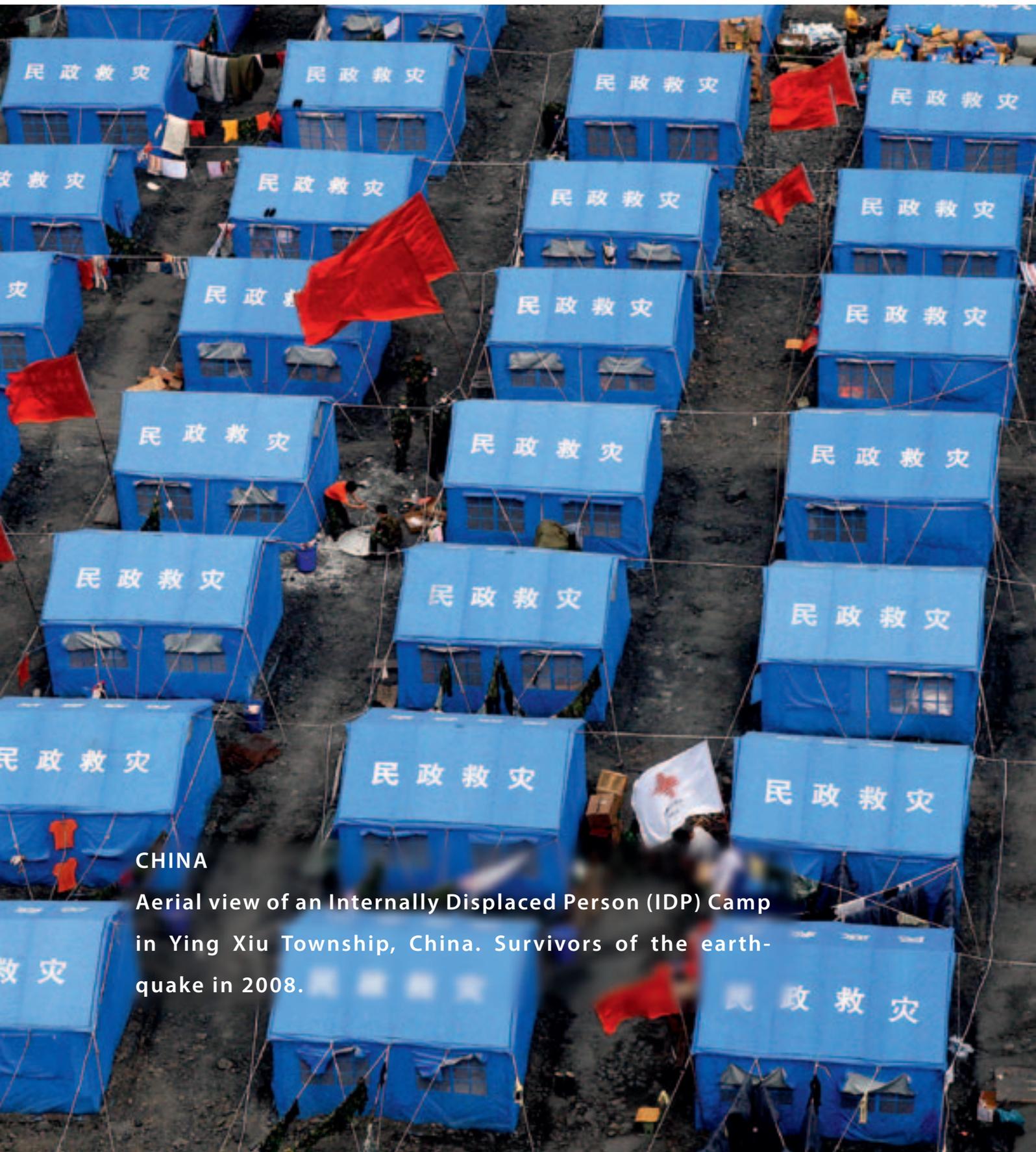
from root causes, such as corruption or lack of leadership, these factors are linked to Priority for Action 1 “Ensure that DRR is a national and a local priority with a strong institutional basis for implementation” and Priority for Action 5 “Strengthen disaster preparedness for effective response at all levels”. **Awareness and Perception** describes both the reasons for failed perceptions as well as the influencing factors, such as culture, tradition or religious norms and beliefs. This, to some extent, is linked to Priority for Action 3. However, factors describing the **Political Environment**, such as post civil war impacts or political instabilities are not considered within HFA. This also applies to **Physical and Environmental Conditions**, which influenced the extreme event and its dimension. This includes natural climate variability, climate change, and geophysical conditions, such as topography, geographical position, geological faults or proximity to the earthquake epicenter.

It is important to note that both *Drivers* and *Root Causes* are highly interlinked and interconnected, however, in this study they are seen as separate features. Moreover, they tend to reinforce each other and thus, are difficult to differentiate. Due to the framework’s complexity these inter-

dependencies cannot be further visualized. Consequently, they are discussed in the following chapter in order to avoid confusion. Due to methodological reasons, this framework cannot prioritize or classify root causes with regard to their influence on the respective disaster. However, expert interviews outlined the most important disaster root causes within the case studies, such as corruption and lack of leadership in Haiti, lack of communication across borders in Mozambique or feudal power and land ownership structures in Pakistan. It is evident that these factors are subject to change; however, this analytic framework provides a first frame to examine factors that are or were key in contributing to disaster risk and that can be seen as underlying factors determining different drivers of risk. Consequently, this framework does not consider the dynamic of changes. Moreover, it needs to be considered that root causes and driving factors are related to the respective case study and its regional/national context conditions.

## 4. Case study analysis

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CHINA

Aerial view of an Internally Displaced Person (IDP) Camp in Ying Xiu Township, China. Survivors of the earthquake in 2008.

The application of the developed framework to the selected case studies forms the analytical part of this study. The following chapters present and discuss the examined case studies and provide detailed figures to highlight the linkages between drivers and root causes<sup>12</sup>. It should be noted that all case studies are exposed to different natural hazards due to their **geographical position**. For example, Haiti and Indonesia are located on a geological fault, the Philippines have to deal with a typhoon pathway that crosses the country, and Pakistan as well as Mozambique are prone to monsoonal rainfalls accompanied by extreme flood situations.

#### 4.1 Haiti

Considering **Physical and Environmental Conditions** in Haiti, especially geophysical conditions, were key in terms of the dimension and impacts of the earthquake in 2010. The country is located on a **geological fault** between the Caribbean and North American plate, making it highly exposed to earthquakes. These active plate boundaries generated the earthquake, which measured 7.3 on the Richter Scale in January 2010. Due to the **close proximity to the epicenter** the country's capital Port-au-Prince had to deal with massive structural damages, more than 310,000 deaths and about 3 million affected people. Especially in Port-au-Prince basic infrastructures (e.g., logistic, health system, water and electricity supply, etc.) broke down and governmental as well as public buildings collapsed.<sup>13</sup> In addition, the death of major parts of the government and UN-Agency staff lead to the loss of institutional capacity and exacerbated the already difficult government coordination of relief and recovery efforts. Finally, the **natural weather conditions** in Haiti brought Hurricane Tomas, which worsened the cholera situation in October by further spreading polluted bodies of water. (GoH, 2010; Khazai, Daniell and Wenzel, 2011; Margesson and Taft-Morales, 2010; Wisner, 2011; UNICEF, 2012)

In addition to the geographical conditions, the **Political Environment** in Haiti was a major root cause for pre- and post-disaster drivers. (Interview No. 4) The political past is primarily characterized by **instability and violent conflicts**. (Mowat, 2011) Due to external political control, as well as several military coups, domestic government structures finally broke down. This is the major reason why development issues, such as poverty alleviation, livelihood generating activities, or food insecurity have not been addressed in the past and nor have adequate DRM structures been put in place. (Interview No. 3) Accompanied by an **instable security situation** this led to insufficient emergency relief activities as certain regions have been shunned by international agencies. Furthermore, the Haitian Government as well as institutional structures are **highly centralized**. Thus, properly established DRM agencies were lacking across the country and those that were in place primarily existed in Port-au-Prince. These centralized structures suffered from

the massive breakdown of governmental buildings as well as the death of major parts of the government and UN-Agency staff in Port-au-Prince. (Interview No. 4)

**Awareness and Perception** was primarily characterized by **failed perception of the National Government** and the **ignorance of humanitarian standards**. Although, the Haitian Government had been advised of the country's exposure to earthquakes, the risk had been neglected and was not taken seriously. (Interview No. 3) Consequently, emergency plans were not put in place and the government continued to concentrate on disaster response instead of following disaster preparedness approaches. Considering the response and recovery phases, several experts recognized the ignorance of humanitarian standards by different NGOs and international agencies involved. During disaster situations it often becomes evident that many agencies – even without adequate expertise – follow short-term rather than long-term engagements. Due to their mandates they only stay for very short emergency relief periods and often do not consider context conditions, such as language, culture, or religion during their operations. Additionally, this temporally limited engagement on the ground can be counterproductive and exacerbates relief actions. (Interview No. 5 and 6) Apart from these administrative issues, foreign emergency relief agencies introduced the cholera virus several months after the earthquake, which easily spread due to poor hygienic conditions. (Interview No. 1 and 2)

It needs to be considered that the aforementioned short-term emergency engagements are closely linked to the **inflexible international donor mechanisms**. For example, the high amount of donations after the 2010 earthquake provided incentives for international agencies to carry out emergency relief, although some of them were even inexperienced in this field. Most of the international agencies draw big parts of their budget from international donations. This led to an excess of emergency relief organizations, which left the country after donations were stopped. (Interview No. 3) This rather short-term and unsustainable approach exacerbated the implementation of long-term LRRD (Linking Relief, Rehabilitation and Development) approaches.

<sup>12</sup> The complete case study analysis frameworks are presented in Annex III.

<sup>13</sup> About 180.000 buildings have been destroyed or damaged. Leogane, for example, was more or less completely destroyed (90% of the buildings collapsed). (UNOCHA, 2012b)

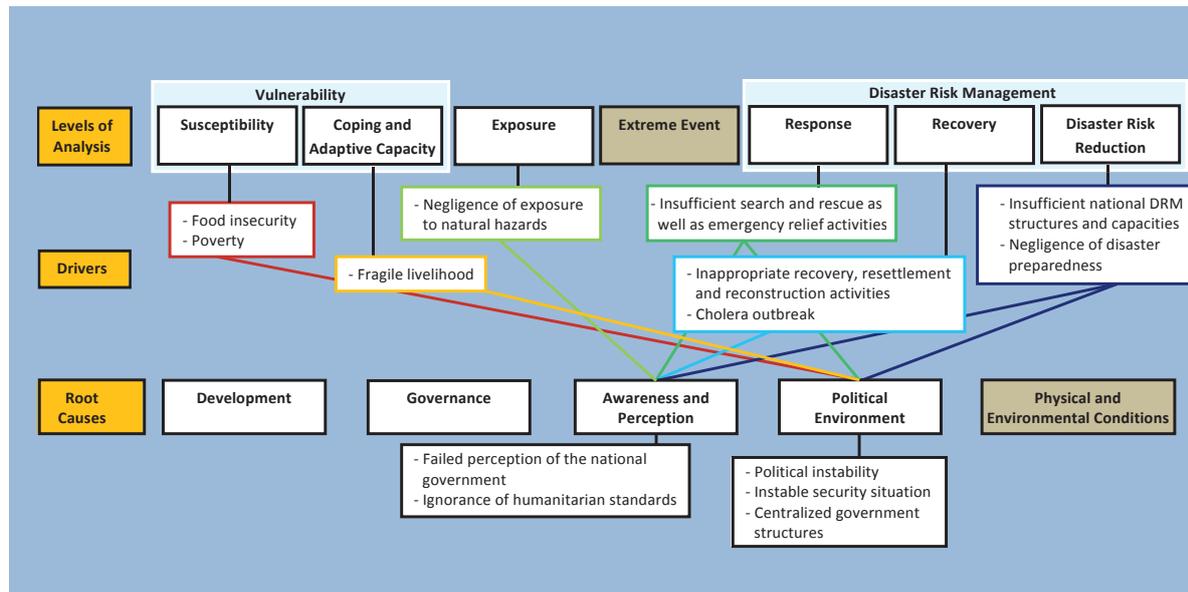


Figure 4: Case study Haiti, causal linkages between drivers and root causes, own figure

The most important root cause in Haiti is **corruption and the lack of governmental leadership** accompanied by a **missing legal framework and weak law enforcement**. (Hidalgo and Théodate, 2012; Oxfam, 2010) The country is characterized by one of the highest corruption rates in the world and is commonly termed as to be a failed state. (Interview No. 4) The National Government does not meet the task of guaranteeing civil protection and considering the requirements of those people most in need. The *“leading elite often pursue their own political and economic interests without considering the public welfare.”* (Interview No. 3) This is the main reason for the very high level of susceptibility and low coping capacities of the population. Factors, such as high poverty or severe food insecurities have not yet been addressed. Additionally, no one feels responsible for the improvement of the weak sanitation and health system or key infrastructures. This also applies to any DRM operations, such as the set up of structures, disaster risk insurances, preparedness, recovery and reconstruction activities or awareness raising campaigns. *“Even during the disaster, corruption was present as locals abused the emergency situation to become enriched.”* (Interview No. 3)

Apart from this obvious corruption, missing leadership also became evident during the response and recovery. There was only a very insufficient coordination mechanism of humanitarian aid in Haiti leading to chaotic conditions during emergency relief and recovery. Agencies primarily concentrated on IDP (Internally Displaced Person) camps in Port-au-Prince instead of supporting those people who remained in rural areas. (Interview No. 6) Furthermore, *“everyone did whatever he accounts to be necessary without having a superior authority. Thus, even today stakeholders have to deal with failures, which can be ascribed to this lack of leadership.”* (Interview No. 5) Additionally, this was accompanied

by **improper communication among agencies**. Emergency relief goods, for example, were ordered without prior consultation of among agencies involved. This led to confusing conditions at the provisional UN logistic center at the airport. (Interview No. 6) Miscommunication also became evident with regard to medical care. Although an adequate amount of physicians was guaranteed after several days, the demand on nurses for the medical follow-up treatment has not been communicated. (Interview No. 3)

Considering the recovery phase it became evident that agencies failed in planning shelters. This was primarily due to **opaque land ownership structures** as well as the **missing consideration of civil society’s basic needs**. (Fischer, et al., 2010) Often unclear land ownership led to conflicts when agencies planned to set up shelter. *“If these very sensible issues are not clarified and regulated before a disaster occurs, it will be impossible to handle it ex-post.”* (Interview No. 3) Additionally, basic civil society needs, such as access to infrastructures or to livelihood generating activities were not considered. Thus, *“housings had to be demolished after construction as the population didn’t accept these permanent resettlement sides.”* (Interview No. 3)

Haiti primarily had to deal with **Development** issues, such as a **lack of resources and capacities** (e.g., financial, human or technical). This is a major reason why the population was and still is characterized by high susceptibility and low coping capacities. Furthermore, essential DRM structures could not be set up across the country from the national to the local level. These operational constraints also caused rather insufficient recovery activities, which is why *“people are still living in temporary shelter”*. (Interview No. 4) Due to the **lack of equipment and technical capacities** Haiti had insufficient infrastructures (e.g., communication, electricity, etc.)

Furthermore, the government did not have any capacities to conduct search and rescue activities. Buried by heavy constructions survivors could not be rescued in time. (Interview No. 3) Apart from these response delays, the government is still not able to remove demolition materials and provide adequate recovery and reconstruction assistance. This particularly applies to the current urban development, which is still characterized by **inadequate planning** in combination with **missing building codes**. Population growth is not the causal factor but rather a driver for marginalization processes and uncontrolled urbanization leading to the dense collection of buildings and settlement in high-exposure zones, such as hill slopes. Currently, urban planning processes do not sufficiently consider population growth, disaster risk and exposure to natural hazards. (Interview No. 4; Grünewald, Binder and Georges, 2010) Furthermore, the lack of building guidelines increases the susceptibility and therefore the risk of being affected by natural hazards. This lack of consideration is linked to a **lack of knowledge and education** leading to a very low level of awareness about natural hazards as well as on how to cope with these events. Responsible staff at national DRM agencies, for example, was not adequately trained and as a result, was overextended by the disaster situation. (Fischer, et al., 2010) Furthermore, *“Haiti suffers from a certain brain drain as qualified national staff leaves the country due to the lack of options.”* (Interview No. 4)

## 4.2 Indonesia

Indonesia is located within a highly earthquake-prone region – the so called “Pacific Ring of Fire”, which describes active plate boundaries along Pacific coast lines. Seismic activities along this **geological fault** generated the December 2004 earthquake at the South Western coastline of Indonesia. The earthquake measured 9.0 on the Richter Scale and was one of the strongest recorded in recent history. This triggered an enormous tsunami affecting various countries and more than 5 million people in low-lying coastal areas. The **epicenter** was **in close proximity** to the Indonesian coast line – about 150 km South-East of Banda Aceh – and generated waves that reached the northern parts of Indonesia after a few minutes. The province of Aceh in Indonesia suffered most from this event. (ADPC, 2005; BAPPENAS, 2005; EM-DAT, 2012; Wisner, 2011) Heavy logistics (e.g., boats, etc.) and important infrastructure, such as harbors and the airport were completely destroyed and needed to be reconstructed for response activities. As well, several areas were not accessible, which resulted in insufficient or delayed emergency relief activities. Due to the mountainous **topography** access roads only exist parallel to the coast line and, the destroyed coastal roads first needed to be cleared before relief agencies were able to access the respective regions. (Interview No. 7)



Figure 5: Tent city for shelter, Port-au-Prince/Haiti

The **Political Environment** in Indonesia is primarily influenced by **post civil conflict impacts**, which were present in Banda Aceh/West Sumatra. The people in the province of Aceh had to deal with a conflict between the military and the Free Aceh Movement (FAM) that lasted over 20 years. FAM pursued independence efforts in West Sumatra, which led to an unstable security situation and resulted in IDPs migrating from conflict regions. Due to the long lasting civil conflict, the population was characterized by very

high susceptibility and low coping capacities. Furthermore, basic infrastructures (e.g., communication, sanitation and health, etc.) were destroyed or malfunctioning. It needs to be considered that the conflict was still ongoing when the tsunami hit the coast. Due to the government's focus on military activities paradigm shift from response to disaster preparedness has totally been neglected. (Interview No. 7 and 10; Tjhin, 2005)

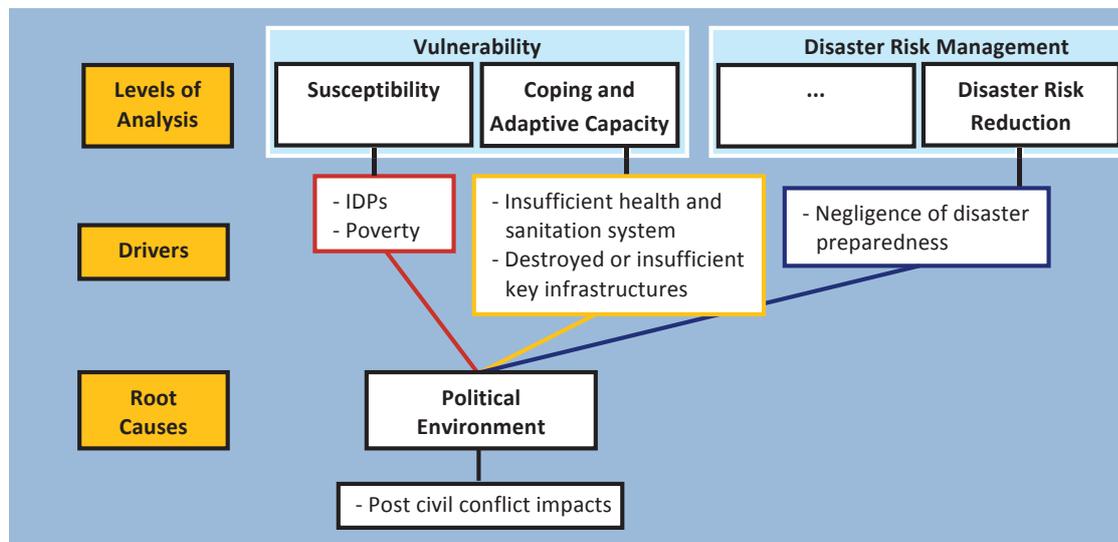


Figure 6: Case study Indonesia, causal linkages between drivers and root causes, own figure

When **Awareness and Perception** was examined, the analysis revealed two major factors. The first is the **failed perception of the National Government** of Indonesia – this is one of the underestimated disaster root causes in Indonesia. Although Indonesia has been hit by a tsunami wave in 1992<sup>14</sup> the National Government did not take this hazard seriously. Neither emergency plans nor adequate DRM infrastructure and capacities (e.g., EWSs) were developed. (Interview No. 8) During the disaster especially international military agencies **ignored humanitarian standards**. “*International staff did not show sensitivity with regard to language, culture or religion.*” (Interview No. 7) The National Government was overextended and not able to restrict these insufficiencies. This caused aggravated circumstances and mistrust of emergency relief agencies involved in response activities.

**Inflexible international donor mechanisms and inadequate national funding mechanisms** were major root causes for insufficient recovery and reconstruction activities in Indonesia after the disaster. (Interview No. 11) Emergency aid donations are only provided for short-term relief activities preventing agencies to implement long-term LRRD approaches. Therefore, the early recovery and sustainable

reconstruction activities of Indonesia post-tsunami were characterized by a certain lack of funding. Although national funding mechanisms in Indonesia consider DRM by law, only a small percentage of the national expenditure was available for respective investments after the tsunami. (ADPC, 2005; Interview No. 8) This precludes adequate investments at all levels to reduce risk and organize DRM. Local governments in Indonesia have their own budget to implement activities according to requirements (GoI, 2005), however, “*the available amount for DRM measures accounts less than 1% of the total budget. Thus, in every hazard situation cities depend on the national contingency fund.*” (Interview No. 11) Apart from these financial constraints, there was a certain **lack of visible governmental commitment for DRM and development**. Factors determining the level of development, such as poverty, fragile livelihoods or health system conditions were not adequately addressed by the central government. Furthermore, access to basic infrastructure was and still is not sufficiently guaranteed. (Interview No. 10) The lack of consideration of these facts, as well as the government's low level of engagement to act heavily influenced the people's susceptibility and coping capacity.

<sup>14</sup> An earthquake followed by tsunami waves hit Flores Island/Indonesia killing at least 2,000 people. (Interview No. 8)

Additionally, Indonesia was characterized by a very low level of disaster preparedness prior to the tsunami event. DRM infrastructure (e.g., EWSs) or agencies organizing awareness campaigns on preparedness and response have not been established at all. (Interview No. 9) This in turn is closely linked to the national legal environment. *“Compared to the disaster risk in Indonesia efforts to improve the implementation of legal frameworks and to strengthen practice throughout the nation was very low.”* (Interview No. 10) Regulations for maintenance responsibilities of key infrastructures or standing operating procedures of DRM activities have not yet been established. This **lack of legal frameworks and the insufficient law enforcement** especially becomes apparent with regard to environmental degradation. Mangrove forests have been cleared along the coast line increasing the exposure to natural hazards. In some areas, coastal mangroves were an important buffer zone that reduced the exposure of people to coastal hazards. (Wisner, 2011)

However, due to lack of access to land or the potential opportunity for livelihood generation people very often settled along beaches to maintain direct access to livelihood generating activities. (Interview No. 9) Local Government Units (LGUs) in Indonesia have not yet enforced a law which prohibits people to build their houses along the coast. This also applies to **building guidelines and codes**. Proper law enforcement is still lacking in Indonesia, which has led to an insufficient built environment. Additionally, the government failed in establishing overall national building standards during the recovery and reconstruction phase. (Interview No. 10) This **insufficient management and coordination of international actors** also became a source of additional insecurity during the response phase. Due to the lack of experience, responsible agencies – especially at the local level – were not able to coordinate international emergency relief activities. (Gol, 2005) Furthermore, international agencies and the National Government did not consider the needs of the affected population although there was a vibrant civil society during the disaster. Due to the **lacking consideration of civil society’s basic needs** resettlement sites in Indonesia have been built up without proper access to key infrastructures or livelihood generating activities. (Tjhin, 2005) Furthermore, *“cultural aspects have often not been considered sufficiently or at all. Due to incompatibilities with their culture people didn’t want to live in these resettlement sites.”* (Interview No. 11)

The scope of activity in Indonesia was primarily influenced by the overall **lack of resources and capacities** (e.g., financial, human, or technical). Particularly with regard to the level of vulnerability, the government had limited abilities to address factors, such as poverty, the insufficient health and sanitation system or insufficient access to key infrastructures. These constraints can also be transferred to recovery and reconstruction activities. Due to the lack of hu-



Figure 7: Aftermath of Indian Ocean Tsunami, Aceh/Indonesia

man and financial capacities, DRM structures and staff were overextended and could not adequately respond. LGUs in particular had very limited capacities with regard to the establishment of adequate DRM agencies or the coordination of incoming international actors. Moreover, the implementation of DRM activities or mechanisms to transfer risk (e.g., natural hazard insurance system) was lacking. (Interview No. 9) Apart from these financial constraints, the government failed in conducting rapid needs assessments. Expert interview partners stated that the government was not able to identify those people most in need.

In addition, the National Government of Indonesia finished funding when the allotted number of facilities/houses was built, even though the amount was not sufficient to meet the demand. Due to this lack of recovery assistance livelihood opportunities are still inadequate – now 8 years later. (Interview No. 10 and 11) Furthermore, it needs to be con-

sidered that Indonesian agencies were **not adequately equipped** to carry out street clearances or recovery activities. Another major root cause for insufficient pre- as well as post-disaster activities was **the absence of** general as well as scientific **knowledge** on natural hazards and in particular on Tsunami's. This was also closely linked to the low level of **education** and the limited functioning and existence of DRM structures in the conflict zone. Responsible agencies were not able to implement and structure emergency plans or to manage activities to raise the level of awareness. Especially local decision makers were insufficiently aware about natural hazards and the importance of DRM. (Interview No. 8) This also became evident with regard to **urban and land use planning**. Accompanied by missing legal frameworks this is a major root cause for the environmental degradation processes as well as uncontrolled urbanization. (Cochard, et al., 2008; Interview No. 11) Furthermore, planning did not adequately consider disaster risk and exposure to natural hazards – e.g., key infrastructures are often closely located to the sea. (ADPC, 2005) The drainage infrastructures in Banda Aceh, for example, allowed the direct access for sea water to reach inner cities causing damage in areas far away from the coast line. (Interview No. 10)

### 4.3 Mozambique

In Mozambique, the **Physical and Environmental Conditions** played a major role in determining the dimension of the disaster. Due to the very plain **topography**, the country regularly faces riverine floods on various rivers draining through Southern and Central Mozambique, such as Zambezi, Limpopo, Save, or Incomati. (EM-DAT, 2012) This was exceeded in 2000 as an unlikely succession of tropical storms followed by strong monsoonal rainfalls causing large scale inundations and affecting more than 4.5 million people. (Christie and Hanlon, 2001) Due to the long-lasting inundations agricultural land and harvest have been destroyed and key infrastructure (e.g., irrigation systems, emergency services, electricity, transportation, etc.) were damaged. Furthermore, this flood was accompanied by an unusually high spring tide that prevented water to properly discharge. (Interview No. 13) Scientists assume that the recorded continuous and extreme rainfalls from October 1999 until March 2000 were influenced by ENSO. This **natural climate variability** might also be influenced by the **global climate change** even if it is not possible to provide evidence through a single natural event. (Christie and Hanlon, 2001; WB, 2000; Wiles, Selvester and Fidalgo, 2005)

During the flood in 2000, the **Political Environment** in Mozambique was primarily characterized as being influenced by **colonial power structures** and **post civil war impacts**. In 1994 the civil war was finished and IDPs started to return. Due to the long lasting civil war, the population was characterized by very high susceptibility and low coping ca-

pacities – in particular, high poverty and malnutrition rates were evident. (Interview No. 14 and 15) Furthermore, basic infrastructures (e.g., communication, sanitation and health, roads, etc.) as well as meteorological stations and river measurements devices were destroyed or malfunctioning. Thus, forecasting capacities were very limited and the distribution of warnings (via telecommunication) and relief goods (via roads) insufficient. (Interview No. 12) Due to the short time period after the end of the civil war even colonial power structures existed. Consequently, most parts of the population had no access to power or education, which further degraded their level of vulnerability. (Interview No. 16)

**Awareness and Perception** was primarily characterized by two factors. The first is **the failed international perception** leading to delayed search and rescue activities. The international community hesitated to act. (Interview No. 14) However, it needs to be highlighted that immediate action by the South African Military was a major reason for comparatively few casualties. (Christie and Hanlon, 2001; Interview No. 13) Most of them were farmers, who **traditionally** settle in high-exposure floodplains characterized by very fertile soils. (Interview No. 12)

In terms of DRM **Governance**, Mozambique is a special case study. In 2000, approaches such as LRRD, or the prioritization of disaster preparedness instead of response activities, did not exist. However, agencies had to deal with **inflexible international donor mechanisms** as they were not able to easily shift funding according to requirements. This meant that although *“emergency relief activities were ‘flooded’ with donations, donors dictated deadlines till activities must be implemented and money sold.”* (Interview No. 15) Consequently, most of the agencies involved in response activities left the country instead of implementing long-term activities to recover from the flood. Thus, *“even 8 years later certain road stretches have not been reconstructed.”* (Interview No. 14) Apart from this insufficient finance structure, Mozambique was characterized by a certain **lack of governmental commitment for DRM and development**. Urgent needs, such as poverty alleviation or food security activities were not considered. Furthermore, efforts of the National Government of Mozambique to provide adequate livelihood generation activities or to improve the health and sanitation system were lacking. This also applies to activities to strengthen DRM structures from the national to the local level or to raise awareness among the population. (Wiles, Selvester and Fidalgo, 2005)

However, it needs to be considered that this lack of governmental commitment is closely linked to **corruption** and the existing **colonial power structures**. Furthermore, the widespread corruption led to very limited response capacities. For example, the INGC (Instituto Nacional de Gestao des Calamidades) used to be adequately equipped in terms of logistics, but due to corruption among staff, the equipment



Figure 8: The main street in Maputo has been eroded and washed away due to long lasting rainfalls and inundations, Mozambique

ment and responsible agencies were totally overextended in **coordinating international actors** leading to chaotic distribution of relief goods and long lasting recovery activities. *“Due to the lack of certain standing operating procedures, people even died during relief distribution.”* (Interview No. 13) Furthermore, **lack of communication across borders** complicated response activities. Heavy rainfall filled several water reservoirs located in South Africa, which drain through Southern Mozambique. As they tended to overflow, upstream communities released large amounts of water without informing downstream communities. Thus, miscommunication between dam engineers and DRM agencies negatively affected the ability for the downstream population to prepare for and react to this additional flood wave. (Hanlon and Christie 2001; Wisner, 2011)

Considering root causes with regard to **Development** issues, it became evident that the **lack of resources and capacities** (e.g., financial, human, technical) was one of the major root causes for the low level of preparedness in Mozambique. Starting with financial constraints, it needs to be considered that approximately 90% of the national budget was externally financed without including any DRM initiatives. Thus, the government was not able to set up sufficient DRM structures and capacities in terms of preparedness, response and recovery. (Interview No. 14; Wiles, Selvester and Fidalgo, 2005) Emergency plans did not exist at community or district level and INGC was overextended with regard to managing and coordinating response or recovery activities. Furthermore, warnings did not reach remote areas and people at the local level (Last Mile Early Warning) although district administrative had information about further flood waves. (Interview No. 13) Apart from DRM, the government was not able to address drivers of vulnerability. Large areas, for example, did not have adequate access to basic infrastructures and the old colonial dam and river infrastructures did not meet the standards in 2000. Water reservoirs, for example, often did not have gates to release water when reservoirs tend to overflow. (Interview No. 16)

has been stolen or used for private business. Even today adequate equipment or storage depots (e.g., for food items) do not exist or are used for other purpose. (Interview No. 16) During the disaster it became evident that the govern-

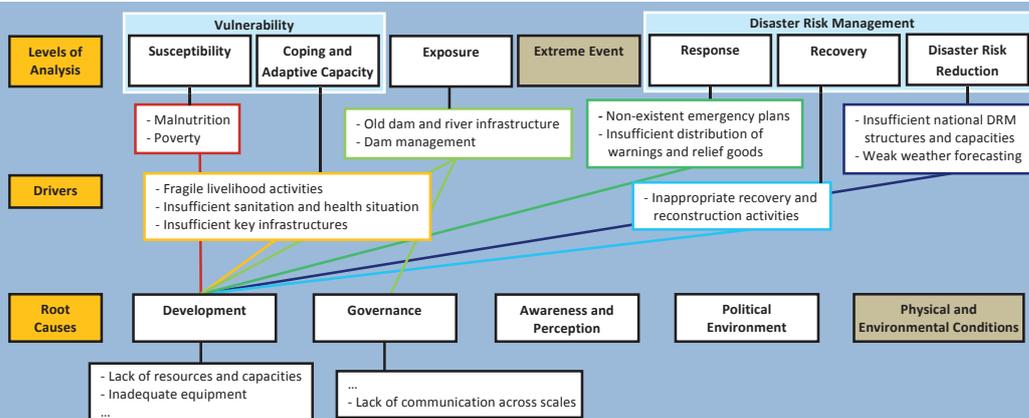


Figure 9: Case study Mozambique, causal linkages between drivers and root causes, own figure

This is further rooted in **the inadequate equipment** of relevant agencies in Mozambique. The road system, for example, was and still is, in a very poor condition. Thus, main roads, such as the connecting road between Southern and Northern Mozambique were washed away during the flood preventing emergency agencies to reach remote and isolated areas. Due to the inadequate equipment of national agencies in terms of heavy logistics (e.g., boats, helicopter, etc.) distribution of relief goods remained insufficient. Recovery, reconstruction and weather forecast capacities have to deal with this lack of equipment. (Interview No. 17) Apart from these technical constraints, experts highlighted the **lack of knowledge and education** as a severe impediment to overall DRM. Due to the low level of education and knowledge, including government staff, decision makers in DRM agencies tended to be overextended during the flood. (Interview No. 15) Furthermore, their level of awareness about natural hazards as well as on how to cope with impacts was very low. This also applied to urban planning agencies. **Urban and land use planning** did not sufficiently consider disaster risk or exposure to natural hazards. This is one reason why people still settle in high-exposure floodplains. Furthermore, **building codes lack** in Mozambique leading to weak housing structures that cannot resist any kind of natural impact. (Hanlon and Christie, 2001)

#### 4.4 Pakistan

During the data analysis for this case study it was noted that expert interview partners and document analysis revealed vast regional differences with regard to socio-economic as well as cultural aspects in Pakistan. Even national assistants from Pakistan had difficulties to adequately cope with regional differences in terms of language, tradition or religion leading to certain constraints in the response and recovery activities. (Interview No. 18) This may have influenced the disaster and its dimension and thus, need to be considered separately when identifying disaster root causes.

With regard to **Physical and Environmental Conditions** in Pakistan, three root causes have been particularly named by experts and in several reports that were examined. (Interview No. 19, 21 and 23; Mustafa and Wrathall, 2011) The mountainous **topography** was the most important and crucial factor why the atypical weather situation triggered flash floods in the Kyber Pakhtunkhwa Province (KPK) in Northern Pakistan. Two converging depressions with high intensity monsoonal rainfalls were accompanied by extraordinary high snowmelt (the previous winter brought intense snowfalls) leading to several landslides, mudflows, and flash floods in KPK. Although, a single natural event cannot solely be attributed to the global climate change, weather anomalies observed within last decades – including the monsoonal rainfalls 2010 in Pakistan – can be linked to the anthropogenic **climate change**. Additionally, the re-

corded high intensity rainfalls in Pakistan 2010 are scientifically assumed to be influenced by certain **natural climate variability**, such as the ENSO. (Mustafa and Wrathall, 2011)

The flash floods in Northern Pakistan resulted in massive infrastructure destruction (e.g., roads, bridges, irrigation canals, housings, etc.) and significant numbers of deaths/injuries. *“Three quarters of deaths during the flood have been observed in KPK.”* (Interview No.19) The **topography** and landslide impacts complicated the access to northern regions leading to insufficient search and rescue activities as well as insufficient distribution of relief goods. (Interview No. 21) However, flood levels in Northern Pakistan rapidly discharged and returned to normal status. Thus, displaced people in KPK were able to return to their lands after a couple of days. Due to its flat topography, the Southern Provinces Punjab and Sindh, in contrast, had to deal with inundations (along the Indus River Basin) for several months. Consequently, huge areas – about one fifth of Pakistan’s total land area – have been inundated and affected more than 21 million people. The so called Pakistan “breadbasket” (Southern Provinces Sindh and Punjab) had to deal with extensive harvest, livestock and crop losses as well as destruction of agricultural land and infrastructure – 80% of food reserves were destroyed. (Polastro, et al., 2011) Additionally, drinking and wastewater problems, occasional diseases outbreaks and food insecurities arose in southern districts. Thus, the Pakistan Government decided to extend the official response phase by three months. Another flood in Southern Pakistan in spring 2011 further exacerbated the problems they were experiencing with regard to recovery and re-establishment of their livelihoods. (ADB, 2010; DEC, 2011; Khazai, Daniell and Wenzel, 2011; Mustafa and Wrathall, 2011; Wisner, 2011; WFP, 2010)

The **instable security situation** and **post civil conflict impacts**, which are still present in Northern Provinces, describe root causes related to the **Political Environment**. The geopolitical situation in KPK, in particular, adds an additional layer to this very complex emergency situation. (Interview No. 20) Military offensives against anti-government elements in Northern Pakistan destroyed key infrastructure and forced people to migrate. Consequently, the National Government focused their efforts on civil conflict recovery activities and neglected measures to increase disaster preparedness. Additionally, the instable security situation brought the National Government to prohibit the access to certain regions leading to insufficient response activities through foreign assistance. (Etter, et al., 2010; Polastro, et al., 2011) Nevertheless, INGO and UN-Agency presence in KPK was very high due to their long-term interventions regarding the IDP situation. Delays in response activities primarily were distinctive in Southern Provinces where INGO attendance was rather low. (Interview No. 23)

The root cause category, **Awareness and Perception**, includes three major factors. The **failed perception of the Na-**



Figure 10: Floods in Pakistan's Sindh Province, Dabu District/Pakistan

**tional Government** with regard to the dimension of the disaster was the reason why they hesitated to call for international assistance causing them to lose valuable time for response activities. (Interview No. 24) Furthermore, the Pakistan Government passed the 18<sup>th</sup> constitutional amendment shortly after the emergency relief phase to modify the national DRM responsibilities. With the aim to decentralize the structure, provinces received more responsibilities in terms of DRM. Thus, the National Disaster Management Agency (NDMA) conferred its operational mandate to the Provincial Disaster Management Agency (PDMA). This change of responsibility was implemented during the emergency relief and recovery phase leading to confusion among international agencies with regard to the coordination of activities. (Interview No. 19, 20, and 23) Additionally, the **traditional way of farming** can be seen as a root cause. Pakistan and its population highly depend on the agricultural sector. *"Farmers traditionally settle in high-exposure areas, such as floodplains in order to benefit from the fertile soils."* (Interview No. 24) **Religious norms** and the gender role in Northern Pakistan highly influenced the susceptibility of women. Due to their poor social integration, women often have a very low level of awareness of how to deal with certain threats. (Etter, et al., 2010) Additionally, rescue activities for unaccompanied women emerged as to be challenging during the emergency relief phase. Male aid assistants did not know how to handle this special situation. (IEG, 2010; Interview No. 24)

**Governance** forms the most important root cause category and includes various factors on the national as well as international scale. Similar to other disaster situations huge amounts of immediate donations were available for emergency relief activities in Pakistan. The lack of recovery and rehabilitation funds led to 'races' among stakeholder for emergency funding. (Interview No. 19) The **inflexible international donor mechanisms** prevented agencies to shift funding according to spatial requirements. Due to the geopolitical situation in Northern Pakistan funds have primarily been provided for activities in KPK leading to insufficient interventions in the South. (Interview No. 20) To some extent it may be said that these spatial inequalities are balanced by **national funding mechanisms**. Southern Provinces receive more political attention and financial support from the federal government. (Interview No. 23) However, it needs to be considered that Punjab and Sindh are characterized by a very high level of **corruption**. Furthermore, the still existing **feudal land ownership and power structures**<sup>15</sup> worsen social inequalities<sup>16</sup> and vulnerability conditions. Approximately 75.5% of all farmers own less than 17% of the total agricultural land. (Mielke, Schetter and Abbas, 2011) This imbalance becomes apparent in terms of access to power and resources, which is creating social as well as economic pressure on the people. Those, who are working for landlords are often also *"deprived from many basic right including access to basic services, such as health and education"*. (Polastro, et al., 2011, p. 21) This increases the marginaliza-

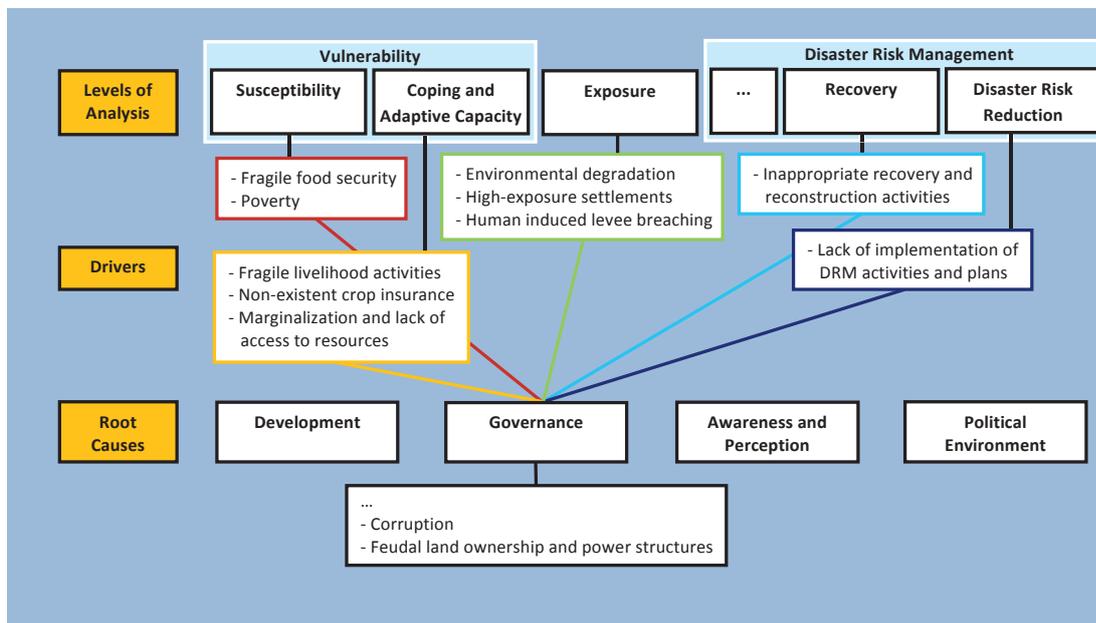


Figure 11: Case study Pakistan, causal linkages between drivers and root causes, own figure

tion process and forces people who do not want to depend on landlords to settle in high-exposure zones for livelihood generation. Deforestation activities and overexploitation of natural resources further increase their exposure.

Apart from these social inequalities, land owner also abused their power and political clout to do illegal levee breaching leading to inundations of regions that are normally not exposed to flood risk. (Interview No. 19, 20, and 22) Furthermore, experts stated that landowners in some regions hindered international agencies to do need assessments and dictated who their beneficiaries are. (Interview No. 23) Thus, many agencies primarily left Punjab due to the difficult operating environment. Often, “politicians rather care about their own political career instead of concentrating on national development and DRM issues.” (Interview No. 22) Although structures and plans for DRM already exist on the paper, implementation policies are insufficient due to the low political priority of DRM. “Pakistan does not have any kind of (natural hazard) insurance system” (Interview No. 19), which covers, for example, agricultural losses.

Nonexistent emergency plans and the modification of DRM responsibilities during the 2010 flood revealed the **inadequate governmental commitment for DRM**. Even during the recovery and reconstruction phase, the government did no more than what was absolutely necessary. Basic liveli-

hood assets in rural areas were not recovered. (Interview No. 21) Due to the **lack of governmental commitment for development**, poverty and malnutrition rates are high and basic infrastructures were and still are insufficiently managed and in bad condition. “This made the disaster many times worst than it otherwise would have been.” (Interview No. 23) This in turn is also linked to the **lack of a legal framework** since operating or monitoring responsibilities are still not clear among government agencies. Furthermore, standing operating procedures for DRM have not yet been set up. (Interview No. 24) In combination with rather **weak DRM coordination**, this led to chaotic and insufficient emergency relief and early recovery activities. Especially the enormous civil society engagement and their participation on UN-Cluster Meetings led to coordination problems at the local level. (Interview No. 20) Additionally, mechanisms did not suffice to coordinate the great amount of international agencies, which came immediately after the flood. Coordination was also influenced by a certain **lack of communication** at the national administrative level leading to limited information exchange among responsible agencies. (Etter, et al., 2010; Kreutzmann and Schütte, 2011; Mielke, Schetter and Abbas, 2011; Polastro, et al., 2011)

Finally, Pakistan had to deal with several **Development** issues, such as **limited resources and capacities** (e.g., financial, technical, and human). The National Government has

15 A land reform has not yet been adopted in Pakistan. (Interview No. 19)

16 More than 40% of the population is living below poverty level (Interview No. 22). Malnutrition rates in Sindh reach more than 20% and thus, are far beyond the emergency threshold (15%) of the World Health Organization (WHO). (Polastro, et al., 2011)

only limited capacity to address drivers of vulnerability or to guarantee sufficient and comprehensive recovery and reconstruction activities. Rural communities, for example, became more vulnerable after the flood as basic needs (e.g., access to schools, electricity, etc.) could not be recovered at all. (Interview No. 21) Local governments, in particular, have only limited operational autonomy as they do not have their own budget. Thus, DRM structures down to the local level could not be established or strengthened and the implementation of DRM activities and plans, especially at the district level, is still lacking. (Etter, et al., 2010) **Insufficient equipment and low technical capacities** are factors, which highly influenced forecasting and Early Warning (EW) performances. Although, the *“event was predictable the meteorological department could not forecast it”*. (Interview No. 21)

Additionally, responsible agencies were not able to adequately distribute warnings during the flood – especially the Last Mile did not work. (Interview No. 24) This, however, is closely linked to the comparatively low level of **education** among the people who often do not trust, or believe in, EWs. Furthermore, politicians as well as chief executives are still not aware of natural hazards and how to appropriately and effectively respond. (Interview No. 21) **This lack of knowledge and education** is also linked to **missing building codes and inadequate urban and land use planning**. Politicians and respective decision makers still do not consider natural hazards during planning operations. Measures to improve the agricultural productivity and prosperity (e.g., the agricultural infrastructure) have been implemented without considering potential flood events. Irrigation canals were one reason why regions were inundated that normally are not exposed to floods. (Mustafa and Wrathall, 2011) Furthermore, population growth and related population pressure were not sufficiently considered in urban planning processes. In combination with **insufficient law enforcement**, this indirectly increases environmental degradation and settlements in high-exposure zones. (Etter, et al. 2010; Oxley, 2011)

## 4.5 Philippines

The **Physical and Environmental Conditions** in the Philippines are key with regard to extreme events and their impact to the islands. Due to its geographical position, the Philippines belong to the category of the most disaster-prone countries in the world through their exposure to various natural hazards (e.g., earthquakes, flooding, cyclones/typhoons, etc.). (Welle, et al., 2012) The Philippines

are directly located within a typhoon pathway and highly exposed to tropical storms accompanied by heavy rainfall events. Luzon – the northern island – especially has to deal with typhoon impacts each year. (EM-DAT, 2012; Interview No. 27) Therefore, its **topography** needs to be considered in combination with the typhoon pathway. Normally typhoons enter towards the eastern coast of Southern Luzon leading to vast destructions and large inundations around Metro Manila. On their way towards Northern Luzon they fill up water reservoirs and lead to landslides in the mountainous regions in the North. Due to this topography water drains from Northern to Southern Luzon leading to a second flood wave in downstream communities and delta regions (e.g., Metro Manila).

This was the case in 2009 as two heavy typhoons reached the Luzon Islands within only a few weeks. Typhoon Ondoy (Ketsana) came first, and was directly followed by Pepeng (Parma) both entering more or less the same area in Southern Luzon. Ondoy primarily led to flooding in Metro Manila and heavy rainfall in Northern Luzon. However, due to the back-to-back occurrence, Ondoy caused Pepeng to move towards the northern regions. Pepeng brought further long lasting rainfalls, which primarily affected Northern Luzon and brought another flood wave to downstream Metro Manila. (Interview No. 28) Overall both typhoons brought unusual heavy rainfalls causing large scale inundations and landslides, which affected more than 9.3 million people and caused about 1,000 fatalities. (GoP, 2010) It is evident from past experience that rural communities are most likely at risk from tropical storms, whereas urban areas are at risk from floods. (Interview No. 27) Apart from these geological factors, **natural climate variability** and the impacts of **global climate change** are the main reasons why the Philippines recorded an increase in the magnitude and frequency of typhoon activity in recent years. Luzon, in particular, had to deal with increasing damages leading to more complicated evacuation activities. Furthermore, immediate recovery activities are often impossible due to the successive occurrence of typhoons during the rainy season. (GoP, 2010; Nakasu, et al., 2011)

The **Political Environment** in the Philippines has primarily been influenced by political instabilities in the recent past. Independence efforts from the Moro Islamic Liberation Front (MILF) in Mindanao resulted in a 40-year conflict between the National Government and armed forces that is still not resolved and has led to an unstable security situation. Although, primarily Mindanao<sup>17</sup> suffered from the **civil conflict** also Luzon in the North of the Philippines was

<sup>17</sup> Mindanao is the very southern island in the Philippines, which was not affected by the 2009 typhoons.

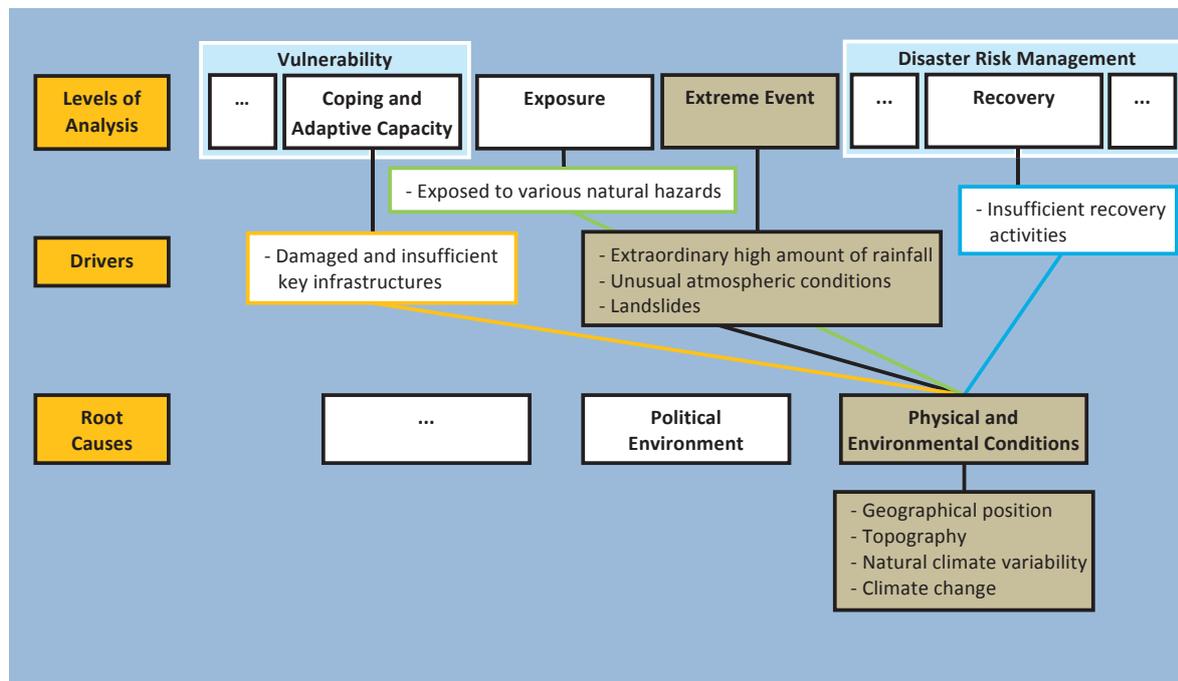


Figure 12: Case study Philippines, causal linkages between drivers and root causes, own figure

indirectly affected. Northern islands had to deal with IDPs that migrated from conflict regions. This increased the susceptibility to natural hazards. Furthermore, the government concentrated their power on resolving the civil conflict in the south instead of deciding on DRM activities. (UNOCHA, 2012b) These linkages reveal the temporal and spatial distance of disaster root causes.

In the Philippines, the reaction to, and the **Awareness** about, natural hazards is often influenced by **culture and religious beliefs**. According to religious beliefs natural hazards are the act of good. Due to this kind of fatalism they try to live with natural hazard impacts and do not prefer response activities. *"It is within the culture of the Filipinos to have the feeling of being saved by agencies in case of emergencies."* (Interview No. 28) Thus, evacuation activities and further response instructions are often not well accepted by the population. (Interview No. 27)

In contrast to the other case studies, donors in this case concentrated more on long-term approaches in the Philippines. However, the **international donor** mechanisms, which prioritized a long-term approach led to a financial gap for humanitarian action, such as early recovery. (UNO-

CHA, 2012b) Additionally, **national funding mechanisms are inadequate** with regard to local governments. LGUs are mandated to set up DRM structures and to implement activities. However, their budget<sup>18</sup> is very limited and does not suffice to initiate activities to improve disaster resilience. (Interview No. 27 and 28) Only during disasters the National Government can provide additional fund for response activities. This calamity fund, however, was immediately finished during the 2009 typhoons. This lack of financial support is often accompanied by a high level of **corruption and lack of leadership at the local level**. *"Those who have close ties with local governments sustain their immediate welfare needs and defend their long-term interests."* (Interview No. 26) Politicians, to some extent, hamper activities to resettle urban slums in order to avoid the loss of potential votes. (Interview No. 28) The lack of access to power and resources as well as the misuse of political power directly influences the vulnerability of local people. Apart from these corrupt conditions, there is often no proper leadership at the town level. Thus, mechanisms to properly respond to emergencies do not exist nor do standing operating procedures, such as where and how to distribute goods and non-food items. (Interview No. 27) This in turn is closely linked to a rather **insufficient legal framework and weak law enforce-**

<sup>18</sup> By law, LGUs should allocate 5% of their internal revenue on DRM work. (Interview No. 29)

**ments.** Furthermore, agencies rarely feel responsible for cleaning up drainage infrastructure and blocked waterways. This weak law enforcement is one reason why illegal logging and settlements in high-exposure zones still exist. (Interview No. 25)

**Governmental commitment** for these issues as well as for development is still very low – especially the willingness and commitment of local chief executives to implement activities and measures to improve DRM at the local level (e.g., through awareness raising campaigns). Often, *“decision makers are not keen in learning new approaches or to adapt to changing conditions. Emergency plans, for example, may exist throughout the country, but they have never been pre-tested.”* (Interview No. 28) The unsustainable governmental efforts with regard to livelihoods, poverty alleviation or access to basic infrastructures also need to be considered within the context of financial limitations. However, this causes lack of options and forces people to migrate into cities leading to high population densities and uncontrolled urbanization. (Interview No. 28)

Apart from the low level of commitment, the government does not adequately **involve the civil society**. Governmental agencies and decision makers do not acknowledge and accept local knowledge, although indigenous knowledge and practices on how to deal with natural hazards exist. Activities and interventions are exclusively based on scientific knowledge. Due to this certain lack of knowledge exchange local people do not understand EW signs. (Interview No. 27 and 29; UNOCHA, 2012b) During the disaster it became evident that **communication across scales** did not adequately work. As water reservoirs in Northern Luzon tend to overflow, dam engineers decided to open the gates without communicating water release activities to downstream communities. Consequently, Metro Manila and further downstream communities were exposed to another flood wave without having time to prepare for, or react to, additional flood impacts. Furthermore, EW communication between the National Government and local NGOs did not work properly. Although the Philippines had well functioning Early Warning Systems (EWS) information and warnings did not reach the local people (Last Mile) due to miscommunication along the warning chain. (Interview No. 28)

Among **Development** issues, **limited resources and capacities** (e.g., financial, technical, and human) were the dominant factors. Although in charge of setting up certain DRM structures (e.g., monitoring agencies) or implement respective activities, LGUs are not able to do so. Due to lack of fi-

nancial capacities an insufficient amount of resources have been provided to address long-term livelihood recovery needs – especially in rural areas. (Interview No. 28) Apart from these financial constraints, DRM agencies were **inadequately equipped and had very low technical capacities**. Although certain forecasting and EW capacities are comparatively high in the Philippines, the Meteorological Department does not have any radar to measure the amount of rainfall – according to international standards this is essential to forecast typhoons. Therefore, the severity of typhoons is determined based on the wind factor. As Ondoy was characterized by little wind but high rainfall intensity, the typhoons were categorized into the lowest typhoon level and the EWS, which is based on the typhoon level, was not activated.

Due to the **lack of knowledge and education** people often have a very low level of awareness about natural hazard impacts. Furthermore, they do not understand EW signs. (Interview No. 28) This lack of awareness also applies to national and local preparedness strategies. Using the example of Metro Manila, evacuation scenarios and stock-piling of relief goods have been planned on community basis without considering that the entire Metro Manila region could also be flooded. During the typhoons 2009 stockpiled relief goods as well as evacuation areas were flooded. Furthermore, also dam engineers are not aware of natural hazards and do not have any knowledge on how to deal with disaster situations. They have a clear mandate to control outflow of water for irrigation and power purposes, but issues related to flooding are not within their consciousness. Due to this lack of awareness accompanied by poor communication and networking between dam operators, DRM agencies and downstream communities in Metro Manila had to deal with a second flood wave. (Interview No. 28)

Damaging impacts on this highly urbanized area can partly be ascribed to the lack of **building codes** and **inadequate urban planning**. Still planning does not adequately consider natural hazards, population growth and the related population pressure leading to settlements in high-exposure areas (e.g., slopes, flood plains, etc.). However, it needs to be considered that *“Metro Manila deals with population density and growth rates, which would overwhelm the resources of any LGU.”* (Interview No. 26) Additionally, Metro Manila has a poorly planned drainage infrastructure, which is not able to sufficiently deal with the monsoonal water discharge. (Bankoff, 2003; Gaillard, Liamzon and Maceda, 2005; Interview No. 28; Nakasu, et al., 2011)

## 5. Challenges in detecting disaster root causes

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### PAKISTAN:

A man carries away a bag of rations distributed by the UN World Food Programme (WFP) in Quetta, Balochistan Province, Pakistan, where thousands have been displaced from their homes by massive floods. Since mid-August 2010 WFP has distributed some 7,500 tonnes of food to Balochistan's worst affected districts.

As discussed in the previous chapter, the analysis of disaster root causes has to deal with certain challenges. First of all it is essential to differentiate between drivers and root causes of disasters. Defined in chapter 1.2, drivers are processes and activities that translate the effects of root causes into risks. Root causes, in contrast, involve processes and structures that go beyond an individual crises or event and influence specific drivers of risk, vulnerability and DRM. The following example serves to better understand the differences between drivers and root causes: A certain land ownership structure (root cause) can influence coping capacity and exposure to natural hazards. These ownership structures might manifest themselves in driving factors and conditions, such as lack of access to land or a fragile livelihood leading to a certain lack of coping capacity – i.e., land is not available as a coping resource. Furthermore, marginalization processes and the lack of access to land (landownership structure) is also a key determinant that forces people to settle in high-exposure zones. These ownership structures might be, for example, the result of a national agrarian reform during the colonial era; however, they still influence the coping capacity of the local people. Other root causes, such as political instability or lack of national financial resources often need to be considered within a macro-political or economic context. Therefore, it needs to be defined how many steps are to be considered in order to identify root causes. (Belausteguigoitia, 2004; Stedman-Edwards, 1997)

Apart from the difficulty in determining the spatial or temporal dimension of root causes, it is evident that disaster root causes (e.g., national policies, governance, development status, etc.) are dynamic and continuously changing. This fact alongside the high level of interaction and interdependency among root causes and drivers demonstrate further challenges in systematizing root causes and drivers. Finally, root causes need to be identified and prioritized, which can be tackled or even eliminated through sufficient DRM interventions. This implies that out of a list of various root causes those need to be identified that are particularly key for the region or community and the agencies involved in DRM. The preliminary check list presented in chapter six aims to identify potential intervention options in order to address root causes of disasters.

## 5.1 Scales of root causes

In order to systematize the root causes it is essential to differentiate between generic and place or hazard specific root causes. However, it should be noted that root causes are highly interlinked and the distinction – generic vs. place or hazard specific – differs from case to case. The following example serves to better understand this differentiation.

Without any specification, the lack of communication across scales (governance category see Table 1) can be seen as a generic root cause. With regard to dam management, the level of communication between up and downstream communities becomes a place and hazard specific root cause. Thus, some root causes can either be generic or place or hazard specific depending on the level of abstraction. However, during the case study analyses it became evident that various factors can be transferred to any disaster context. Especially the root cause categories **Development** and **Governance** include rather generic root causes. Conditions with regard to **Awareness and Perception** include generic as well as place specific aspects, whereas factors of **Political Environment** and **Physical and Environmental Conditions** can be seen as rather place or hazard specific. Based on the case study results, the following chapter and Table 1 exemplify the distinction between generic (colored in blue) and place or hazard specific (colored in green) root causes.

### 5.1.1 Disaster root causes

During the research it became evident that more or less all case studies had to deal with similar aspects with regard to their level of **Development**. Although development statuses significantly differ among the case studies, all five root causes listed in Table 1 have been identified as to be generic. This also applies to some root causes with regard to **Governance**. Especially factors, such as inflexible international donor mechanisms as well as inadequate national funding mechanisms emerged. Often local governments do not get any financial support from the central government and highly depend on local revenues. Legal frameworks and improper law enforcement, the governmental commitment for DRM and development, as well as missing DRM coordination mechanisms were further factors, which can be described as to be generic.

According to experts, the vast amount of national and international relief organizations often exacerbates the coordination of emergency relief activities. Although factors, such as failed perception and the ignorance of humanitarian standards have not been mentioned in all case studies, experts stated that these are general constraints during emergency relief phases. Still lots of INGOs do not consider, for example, context conditions during their operations leading to misunderstandings between affected people and emergency assistants.

Corruption accompanied by the feudal power and land ownership structures in Pakistan or the lack of leadership in Haiti, for example, are place specific root causes. Whereas, the lack of communication across scales in Mozambique and the Philippines can be seen as a hazard specific root cause.

Due to missing communication across regional or national borders, downstream communities were not able to prepare for, and react to, the flood. Aspects, such as culture, traditional as well as religious norms and beliefs are very place specific factors. Using the example of Pakistan, traditional and religious norms exacerbated emergency relief activities for women. As well, due to traditions and religious norms there is no provision for external health care for women.

The root cause category **Political Environment** includes very place specific factors, such as post civil war impacts, political instability or centralized government structures. Due to political instabilities and the instable security situation in Pakistan certain regions were not accessible for

international agencies and exacerbated their emergency relief activities. **Physical and Environmental Conditions**, in contrast, are hazard specific. Natural climate variability and global climate change exclusively influence weather-related hazards (e.g., floods). Additionally, geophysical conditions, such as topography, geological faults or proximity to the earthquake epicenter are further hazard specific root causes. In case studies dealing with earthquakes (Haiti and Indonesia), the geological fault and the proximity to the epicenter were key factors that determined the extent of damage from the disaster. While in Pakistan and Mozambique, the topography, for example, was a major reason for the large scale inundations.

Table 1: Disaster root causes – identified through case study analysis

Development	Governance	Awareness and Perception	Political Environment	Physical and Environmental Conditions
Lack of resources and capacities (human, financial, technical)	Inflexible donor and funding mechanisms	Failed perception	Post civil war/ conflict impacts	Natural climate variability
Inadequate equipment	Corruption and lack of leadership	Ignorance of humanitarian standards	Political instability	Climate change
Lack of knowledge and education	Lack of legal framework and law enforcement	Culture, tradition and religious norms and beliefs	Centralized government structures	Geophysical conditions
Missing building codes	Lack of governmental commitment for DRM and development			
Inadequate urban and land use planning	Lack of DRM coordination mechanisms			
	Lack of communication across scales			
	Land ownership structures			
	Missing consideration of basic needs / Missing involvement of civil society			

## 6. Check list to define core areas for DRM

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### **SUDAN**

A man checks voter lists at a polling center in Al Barka IDP camp, in Bahri, Khartoum.

The following chapter introduces the second major objective of the study. As already outlined this study aims to develop an analytic tool to identify root causes and determine areas for DRM intervention. Therefore, a preliminary check list has been formulated based on the case study results, expert interviews and discussion that took place during the international workshop. It follows a practical approach that supports agencies involved in humanitarian assistance and development cooperation to assess root causes of disasters and to identify their linkages to drivers that influence vulnerability, exposure and risk management capacities. Furthermore, it enables respective agencies to prioritize efforts and measures to address these issues. This includes two different approaches: an ex-ante focus and an ex-post evaluation that means an analysis of root causes based on real disaster outcomes. Finally, applicability and transferability is discussed.

## 6.1 Core components

Depending on the application period the check list can be divided into two major components. The first segment of questions refers to pre-disaster conditions and aims to address root causes when dealing with unrevealed risks following a monitoring task. The second segment deals with revealed disasters and provides information about the reasons why and how certain processes and structures influenced disaster outcomes. It focuses on an ex-post perspective and thus, can be seen as a type of event analysis.

### 6.1.1 Root causes from a pre-disaster perspective

In order to address root causes with regard to unrevealed risks and disasters, the following questions are key:

Table 2: Segment of questions referring to pre-disaster conditions

<p><b>Which factors describe the socio-economic deficits and insecurities people are facing in the study site?</b> (E.g., nutrition, education, gender role, the built environment, condition of key infrastructures, poverty, etc.)</p> <ul style="list-style-type: none"> <li>• Why are these factors distinctive?</li> </ul>
<p><b>Which factors describe deficits in coping capacities of the respective region?</b> (E.g., insurance mechanisms, health and sanitation situation, livelihood generation, level of awareness, etc.)</p> <ul style="list-style-type: none"> <li>• Why are these factors distinctive?</li> </ul>
<p><b>Are these factors still influenced by (post) civil conflict impacts?</b></p> <ul style="list-style-type: none"> <li>• If yes, how?</li> </ul>
<p><b>Do power and land ownership structures influence people's capacities to cope or adapt?</b></p> <ul style="list-style-type: none"> <li>• If yes, why?</li> </ul>
<p><b>Does traditional and religious behavior influence the awareness of the people?</b></p> <ul style="list-style-type: none"> <li>• If yes, how?</li> </ul>
<p><b>Is the level of knowledge and education a dominant factor leading to vulnerable conditions?</b></p> <ul style="list-style-type: none"> <li>• If yes, why?</li> </ul>
<p><b>What are the key factors determining the exposure of people?</b> (E.g., uncontrolled urbanization, marginalization, settlement in high-exposure zones, environmental degradation, etc.)</p> <ul style="list-style-type: none"> <li>• Why are these factors distinctive?</li> </ul>

<p><b>Is urban planning a dominant factor that influences the exposure to natural hazards?</b></p> <ul style="list-style-type: none"> <li>• If yes, why?</li> </ul>
<p><b>Are missing legal frameworks and the level of law enforcement dominant factors that influence the societies' exposure to natural hazards?</b></p> <ul style="list-style-type: none"> <li>• If yes, how?</li> </ul>
<p><b>Does corruption and lack of leadership influence levels of vulnerability and exposure of people or institutions?</b></p> <ul style="list-style-type: none"> <li>• If yes, how?</li> </ul>
<p><b>Is the lack of governmental commitment a dominant factor leading to the current level of vulnerability and exposure?</b></p> <ul style="list-style-type: none"> <li>• If yes, why?</li> </ul>
<p><b>Describe the current level of preparedness (E.g., EWSs, emergency plans, level of awareness, etc.)</b></p> <ul style="list-style-type: none"> <li>• What are key reasons for potential limitations or failures in preparedness strategies?</li> <li>• To what extent are preparedness activities influenced by available technical resources and capacities?</li> </ul>
<p><b>Describe the level of implementation of current plans and strategies on preparedness</b></p> <ul style="list-style-type: none"> <li>• What are key reasons for potential limitations?</li> </ul>
<p><b>Is communication and information exchange between up- and downstream communities guaranteed?</b> (This question refers to events, such as floods and heavy rainfalls)</p> <ul style="list-style-type: none"> <li>• If not, why?</li> </ul>

### 6.1.2 Root causes from a post-disaster perspective

Using an ex-post perspective, the following questions aim to address root causes of disasters:

Table 3: Segment of questions referring to post-disaster conditions

<p><b>Was the event predictable?</b></p> <ul style="list-style-type: none"> <li>• What were potential reasons for failed forecasting?</li> </ul>
<p><b>Describe the efficiency of response activities and the performance of actors involved</b></p> <ul style="list-style-type: none"> <li>• Describe the level of communication across scales (between lead agencies or across boundaries)</li> <li>• What were key reasons for potential limitations?</li> </ul>
<p><b>Did traditional and religious behavior/norms influence emergency response activities?</b> (E.g., refusal to evacuate, constraints in emergency relief due to religious gender role, etc.)</p> <ul style="list-style-type: none"> <li>• If yes, how?</li> </ul>

**Describe the efficiency of recovery, reconstruction and resettlement activities and the performance of actors involved**

- What were key reasons for potential limitations?

**To what extent were response or recovery activities influenced by available technical resources and capacities?**

**Describe the level of civil society involvement in terms of response, recovery and reconstruction needs**

- What were key reasons for potential limitations?

**How was the coordination of international and national DRM actors organized during response and recovery phases?**

- What were key reasons for potential limitations?

**Describe the current DRM structures and capacities from the national to the local level**

- What were key reasons for potential limitations?

**Describe the governmental commitment for DRM (E.g., Are natural hazards and disaster risk cross-sectoral issues? What kinds of activities are implemented regarding DRM?, etc.)**

- What were key reasons for potential limitations?

**To what extent does the government currently follow the LRRD approach?**

- What are key reasons for potential limitations?

**Were capacities and resources (human, technical, financial) sufficient for adequate disaster risk management activities?**

- What were key reasons for potential limitations?

**Describe the level of implementation of post-disaster recommendations**

- What were key reasons for potential limitations?

**To what extent did national and international funding mechanisms influence response, recovery and DRR activities?**

## 6.2 Application and transferability

Respective actors – emergency response, DRM, or development agencies – can apply the check list in different contexts. Both before and after disasters, the check list serves to provide overview information on current context conditions or post-disaster progresses. It can easily be transferred to any region and context dealing with hazard types, such as floods, cyclones/typhoons, or earthquakes.

The ex-ante monitoring approach, for example, can give useful information on vulnerability, risk and preparedness conditions and indicates potential reasons for certain limitations. If identified, root causes can, to some extent, be addressed leading to more resilient conditions in terms of

disaster risk. The ex-post event analysis approach, in contrast, aims to determine constraints, which became apparent during response and recovery phases. This also includes the evaluation of DRM structures and capacities from the national to the local level. Similar to pre-disaster conditions, these conditions are influenced by underlying root causes, which can be revealed through the application of this check list. Thus, DRM limitations can be addressed to be better prepared for upcoming natural hazards.

The information gained through this check list can serve as a tool to define areas for DRM activities. These findings can be used for internal program planning procedures or to strengthen arguments to convince partners of specific measures that are required within project proposals.

## 7. Addressing root causes and drivers

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### **BANGLADESH**

A man plants rice near Dacca, Bangladesh. In the face of the devastating impacts of the civil war in the early 1970s several members of the UN system contributed assistance in planning, organizing, and conducting humanitarian relief activities.

The identification of drivers and root causes of disasters serves as interim step towards enhancing DRM. Development agencies have, to some extent, the possibility to address certain driving factors and root causes of disasters. However, they often do not have a clear mandate explaining the scope of intervention, which causes constraints in dealing with context specific conditions. The following chapter introduces results of the international workshop on challenges and constraints humanitarian and development agencies are facing in terms of addressing drivers and root causes of disasters. Furthermore, group discussions revealed certain suggestions how root causes could be addressed by different actors.

## 7.1 Challenges and constraints

Addressing root causes goes far beyond the traditional scope of humanitarian organizations as it includes aspects and factors, which are distant from the disaster in terms of time and space. LRRD approaches support to reduce the former and strict separation of mandates<sup>19</sup>. More and more humanitarian organizations now pursue the goal of planning and implementing programs over the long-term, which has led to a certain overlap of mandates. This overlap is a major challenge for the future, as funding mechanisms are still very inflexible. Donors dictate duration and scope of respective measures preventing organizations to shift funds according to perceived demand. Especially agencies with a small amount of private donations have to deal with this dependency. Using the example of German organizations, it became evident that *“funding from the Federal Ministry for Economic Cooperation and Development is highly competitive”*. (Interview No. 6) Thus, it needs to be considered that these *“funds are limited to a certain time period – primarily encompassing the first months after a disaster (emergency relief phase) – leading to a lack of financial resources”* (Interview No. 19) until development cooperation starts. As long as this financial gap between relief and development activities is not bridged and organizations are not able to flexibly use external funds, the *“window of opportunity”* (Birkmann, et al., 2010) after disasters cannot sufficiently be used to address respective issues and initiate change.

Additionally, it needs to be recognized that implementation of certain measures and activities are either totally or partly transferred to local partner organizations. Consequently, chances of success highly depend on the extent to which partner organizations are willing to pursue a certain goal (e.g., addressing identified root causes). Finally, disaster root

causes partly concern the political environment of respective countries, which is determined by very sensitive issues, such as corruption, lack of leadership or political instability. As these aspects are not included in the mandates of large development organizations and humanitarian agencies, they stated not to be able to address them. (Interviews No. 2, 18, and 20)

## 7.2 Intervention options

During the international workshop in Bonn, intervention options for different agencies, such as the Federal Foreign Office, IFRC, GRC, SPHERE, GIZ or international relief agencies have been discussed. Due to their different mandates, agencies and their activities cannot be compared. The Federal Foreign Office, for example, is a donor with coordinative mandates. IFRC and GRC are organizations that primarily provide long-term humanitarian assistance. SPHERE, in contrast, is a voluntary initiative of humanitarian agencies that is aiming to improve the quality of humanitarian assistance. In the context of potential intervention options it needs to be considered that SPHERE does not operate as a relief organization, but rather try to implement changes in procedure. And GIZ is commissioned by the German Federal Ministry for Economic Cooperation and Development and primarily focuses on various development issues. However, all these different agencies have, to some extent, the capacity to address drivers and root causes of disasters.

Furthermore, although these agencies have to deal with certain constraints and challenges, as mentioned above there are intervention options that are possible in order to address drivers and root causes of disasters. As a first step, this requires determining which of the causes are still operating and thus, are subject to intervention, and which are historical factors that can no longer be changed. These considerations and the analysis results (see chapter four) on disaster root causes need to be included in the annual planning process of agencies. Here, strategic realignment in terms of content are decided based on experiences, feasibility as well as analysis results. Potential intervention options can be classified as:

- **Structural measures**  
(e.g., technical preparedness and construction)
- **Non-structural measures**  
(e.g., awareness and perception)
- **Paradigm shifts**  
(e.g., from disaster response to disaster preparedness)

**Structural measures** include *“any physical constructions to reduce or avoid possible impacts of natural hazards and equipment to achieve resilience in structures or systems”*.

<sup>19</sup> In times of disasters humanitarian assistance ensures emergency relief, whereas development agencies rather deal with long-term aspects such as reconstruction, resettlement or DRR activities.

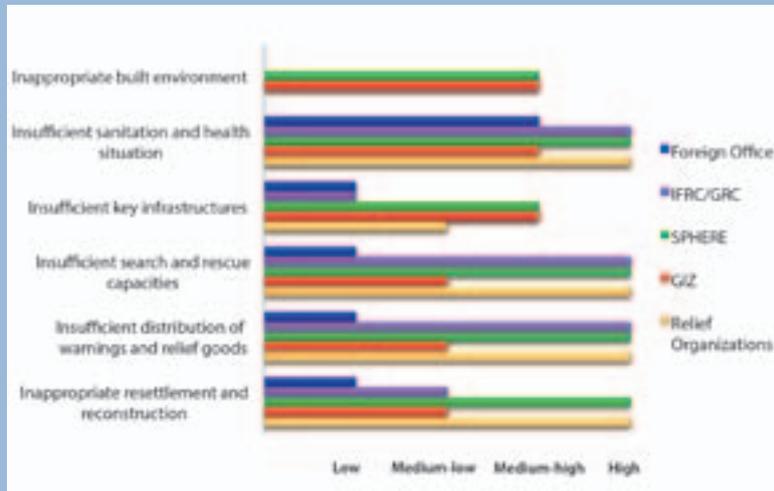


Figure 13: Actors' capacity to address drivers through structural measures, own figure based on workshop results

(adopted from UN/ISDR, 2009) Technical preparedness in terms of EWSs or key infrastructure set up and maintenance, for example, describe structural measures, which can be implemented by certain stakeholders. Agencies can provide assistance in terms of equipment and technical capacities to strengthen respective EWS capacities. Furthermore, they can help countries or communities to improve their key infrastructures or technically implement building codes to upgrade the built environment. Apart from assistance in terms of equipment and technical capacities, the analysis results revealed that drivers can primarily be addressed through structural measures. Figure 13 shows that relief organizations, in particular, IFRC/GRC and, to some extent, the GIZ have high or medium-high capacities to address the listed drivers through structural measures. The Federal Foreign Office, with a coordinative mandate, cannot address most of these drivers, however, they are important for modifying potential funding mechanisms for DRR that are discussed in the context of disaster root causes.

**Non-structural measures**, in contrast, are “*measures not involving physical constructions that use knowledge, practice or agreement to reduce risks and impacts, in particular through policies and laws, public awareness raising, training and education*”. (UN/ISDR, 2009) Awareness and perception at the national as well as at the local and community level play a major role for successful measures. Using the example of Pakistan, traditionally there is no provision for external health care for women in Northern Provinces. Considering this gender issue, GRC raised awareness among lo-

cal people around health care for women and emphasized that external health care is urgently needed to improve the health situation of women. Today, skilled women from other parts of the country conduct home visits to increase adequate health care for women in Northern Provinces. Thus, GRC succeed to address insufficient health care conditions, particularly those rooted in traditional values and religious norms and beliefs, through non-structural measures. GIZ, as a development agency, and IFRC/GRC – they have a humanitarian mandate, but more and more implement long-term projects – stated that they could address certain root causes (see Figure 14).

The third category addresses root causes, which can only be addressed through **paradigm shifts**. This is a very long-lasting process, which primarily addresses sensitive issues on governance (see Figure 15). This requires sensitivity and awareness from the actor's side accompanied by a high level of confidence. In particular, long-term projects and engagements require a close relationship between agencies and national or provincial governments and through this relationship a certain level of confidence can be developed over time. This enables agencies to raise awareness among decision makers and chief executives about certain root causes and their influence on, and contribution to, drivers. However, this highly depends on the willingness of all actors to pursue the intervention option. GRC, for example, uses this contact to chief executives in order to influence DRM legislations or the set up of legal frameworks. Thus, succeeding to address insufficient EWS capacities, which

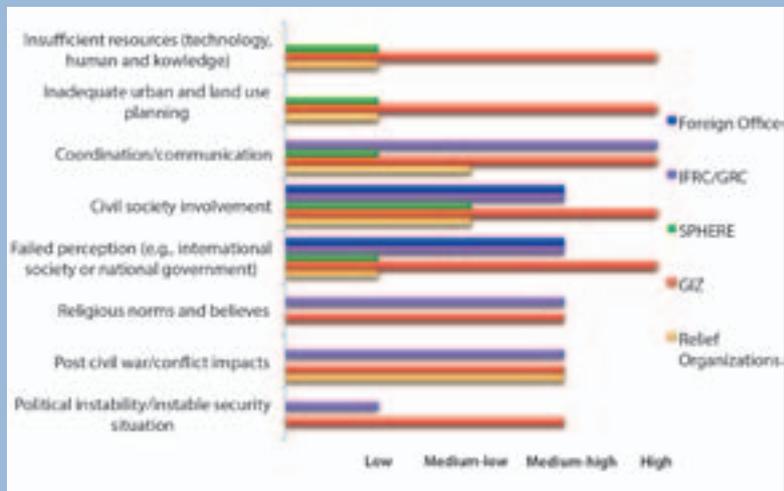


Figure 14: Actors' capacity to address root causes through non-structural measures, own figure based on workshop results

are, to some extent, rooted in the lack of legal frameworks. Research results revealed that GIZ and relief organizations, in particular, can address root causes at the national level, such as corruption, lack of leadership, land ownership struc-

tures or the governmental commitment for DRM and development. The Federal Foreign Office and IFRC/GRC stated to have high capacities to modify international donor mechanisms.

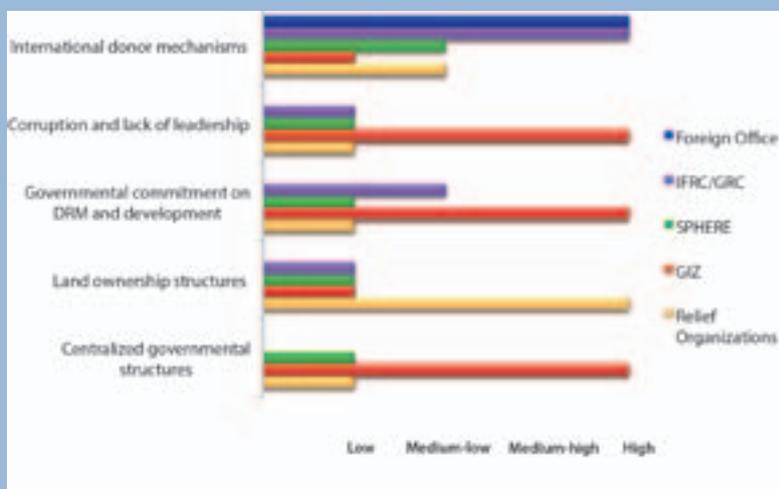


Figure 15: Actors' capacity to address root causes through paradigm shifts, own figure based on workshop results

## 8. Recommendations

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**CÔTE D'IVOIRE**

Legislative elections in Abidjan.

A woman reads a list of candidates.

The case study analyses revealed that root causes can either be described as generic, place or hazard specific. While governance or development issues as well as factors dealing with awareness and perception are primarily generic root causes that have to be addressed in various countries, the political environment as well as physical and environmental conditions are identified as being more local or place specific root causes that might need to be addressed in one case, but not in other cases.

Two major recommendations have emerged with regard to addressing internal as well as external root causes. Internal failures in pre- as well as post-disaster situations primarily occurred due to a lack of knowledge and education. Therefore, the first step towards preparedness and increasing resilience is an adequate knowledge base leading to an increase in awareness about crucial issues, such as DRM. This is essential as intensity and frequency of some key extreme weather events (e.g., heat stress, flooding, etc.) are going to increase due to predicted global climate change. Thus, countries will have to deal with increasing challenges in terms of future disaster risk. Consequently, awareness among decision makers and chief executives at the national as well as at the local level needs to be increased. In addition, this needs to be followed by a stronger governmental commitment for DRM and development, which would reduce the level of vulnerability and disaster risk. Especially the low level of governmental awareness and commitment is a major reason for insufficiencies in terms of DRM activities and long-term planning perspectives. (Ingram, et al., 2006) Thus, adequate and effective governmental policies on DRM are required as a priority. Legal frameworks have to be established in order to guarantee the consideration of natural hazards and the vulnerability of different population groups, economic sectors or environmental services.

Furthermore, the lack of resources and capacities (financial, human, or technical) emerged in all case studies as a major internal root cause for several drivers of disaster risk. Especially capacities and resources of agencies at the local level need to be strengthened in order to improve their performance. Therefore, in order to ensure effective implementation of DRM

at the local level, competent staff is required. Consequently, DRM staff training needs to be improved and standing operating procedures on how to act in emergency situations need to be set up. Additionally, national funding mechanisms need to be modified to facilitate the financial capacities at the local level and strengthen the implementation capacities in terms of DRM.

Inflexible international donor mechanisms were a major external reason for insufficient and ineffective DRM activities, particularly if the link between relief, rehabilitation and development was not secured. Due to several restrictions and temporal deadlines dictated by donors, long-term approaches, such as LRRD are difficult to be implemented. Case studies, however, showed that long-term engagement and presence is essential and very helpful for immediate response activities, as well as for the development of sustainable DRM capacities. Thus, mechanisms need to be modified to facilitate the easy shift of funding according to requirements without temporal restrictions. This would facilitate international agencies to follow long-term projects to address drivers and root causes of disasters. Furthermore, funding with rather long-term perspectives might also reduce the amount of international agencies following short-term engagements<sup>20</sup> and increase agencies' sensitivity to consider contextual conditions, such as cultural, traditional or religious aspects and to facilitate civil society involvement. This applies, for example, to awareness campaigns, which need to be related to the risk of people's daily live in order to be sustainable.

Apart from these general suggestions, case study specific recommendations can be formulated. The following table lists place specific root causes identified in the study and introduces potential intervention options.

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<sup>20</sup> However, it needs to be considered that many countries only allow agencies to operate for a very short time frame.

Table 4: Addressing place specific root causes

Root Causes	Potential intervention options/strategies
<b>Corruption and lack of leadership</b>	<ul style="list-style-type: none"> <li>• Support the set-up of functioning governmental structures that provide basic functions to the people (Haiti);</li> <li>• Strengthen institutional sustainability to ensure that programs exist beyond the change of government (Mozambique).</li> </ul>
<b>Lack of communication across scales</b>	<ul style="list-style-type: none"> <li>• Improve communication among community groups and agencies involved in DRM (Haiti, Pakistan and Philippines);</li> <li>• Improve communication between dam managers and DRM agencies (Mozambique and Philippines).</li> </ul>
<b>Land ownership structures</b>	<ul style="list-style-type: none"> <li>• Clarify land ownership structures before disasters to prevent conflicts during post-disaster shelter planning (Haiti);</li> <li>• Modify restrictions for normal residents that have limited access to land (Indonesia);</li> <li>• Re-establish the land tenure to reduce social inequalities (Pakistan).</li> </ul>
<b>Missing consideration of basic needs/ Missing civil society involvement</b>	<ul style="list-style-type: none"> <li>• Recovery and resettlement activities primarily need to consider the population's basic needs (Haiti and Indonesia);</li> <li>• Translate EW signals and signs into the local context and promote the consideration of indigenous knowledge and practices on how to deal with natural hazards (Philippines).</li> </ul>
<b>Culture, tradition and religious norms and beliefs</b>	<ul style="list-style-type: none"> <li>• Consider context conditions, such as language, culture, or religious norms and beliefs during pre- as well as post-disaster interventions (Haiti, Pakistan and Philippines).</li> </ul>
<b>Post civil conflict impacts</b>	<ul style="list-style-type: none"> <li>• Projects and interventions need to follow a conflict-sensitive recovery approach (Pakistan).</li> </ul>
<b>Political instability</b>	<ul style="list-style-type: none"> <li>• Projects and interventions need to follow a comprehensive societal approach, which also considers the political environment (Haiti and Pakistan).</li> </ul>
<b>Centralized governmental structures</b>	<ul style="list-style-type: none"> <li>• Decentralize agencies' responsibilities to improve DRM performance in remote areas (Haiti).</li> </ul>
<b>Additional recommendations</b>	<ul style="list-style-type: none"> <li>• Strengthen EWSs and improve EW dissemination (Indonesia);</li> <li>• Improve the road infrastructure to improve access to all regions during floods (Mozambique);</li> <li>• Establish mechanisms to coordinate the vast amount of civil society engagement during emergencies (Pakistan);</li> <li>• Improve drainage infrastructure for Metro Manila to better cope with future flood events (Philippines).</li> </ul>

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# Annex

## Annex I – Expert interview partners

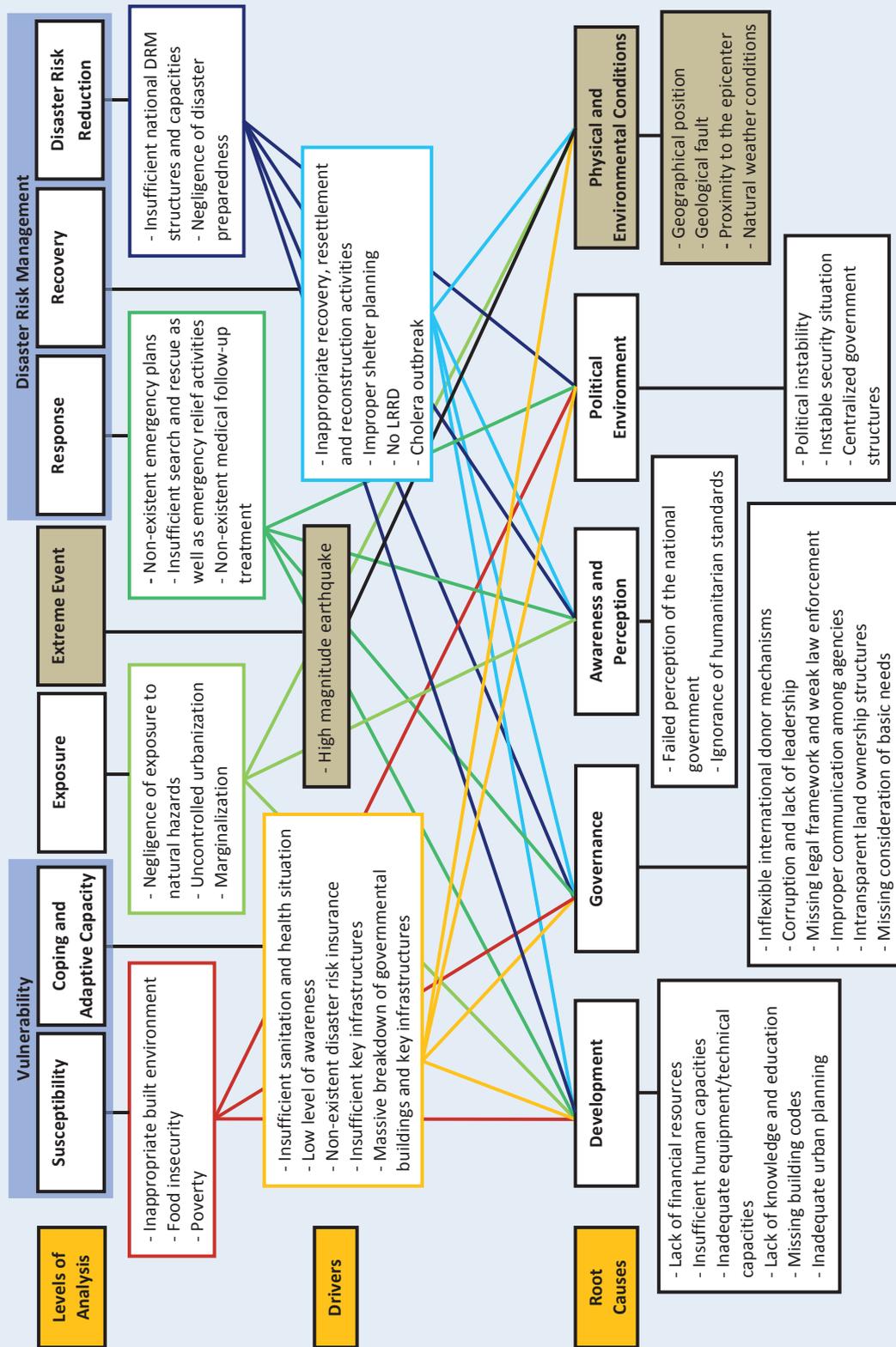
Case Study	Name	Organization
<b>Haiti</b>	Mr. M. Geiger Ms. M. Hild Mr. M. Kühn Ms. M. Paech Ms. N. Bergmann Ms. A. Nissen	German Red Cross (GRC) German Red Cross (GRC) Welthungerhilfe (WHH) Malteser International (MI) Aktion Deutschland Hilft (ADH) Diakonie Katastrophenhilfe (DKH)
<b>Indonesia</b>	Mr. F. Jörres Ms. I. Rafliana Mr. H.Z. Anwar Ms. T. Moektijasih  Ms. P.R. Dewi	German Red Cross (GRC) Indonesian Institute of Science (LIPI) Indonesian Institute of Science (LIPI) United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) KOGAMI (Tsunami Preparedness Society) in Padang/Indonesia (local NGO)
<b>Mozambique</b>	Mr. D. Fischer Mr. N. Lamade Ms. W. Greiner Ms. I. van der Kamp Ms. I. Gerster Mr. D. Krebs	German Red Cross (GRC) Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) Welthungerhilfe (WHH) Welthungerhilfe (WHH) World Food Programme (WFP) Welthungerhilfe (WHH)
<b>Pakistan</b>	Mr. M. Souvignier Mr. J. Clemens Ms. J. Arickal Mr. A.M. Durrani Mr. B. Dubajic Ms. A. Keith Mr. C. Bender	German Red Cross (GRC) Malteser International (MI) Welthungerhilfe (WHH) Pakistan Red Crescent (PRC) Malteser International (MI) Malteser International (MI) Malteser International (MI)
<b>Philippines</b>	Ms. K. Bergmann Ms. C. Saloma-Akpedonu Mr. M. Capistrano Ms. D.M.D. Lagdameo Mr. C. Daep	German Red Cross (GRC) Institute of Philippine Culture (IPC) Malteser International (MI) Independent Consultant (IC) Albay Public Safety and Emergency Management Office (APSEMO)

## Annex II – List of different reports used during the disaster root cause analysis

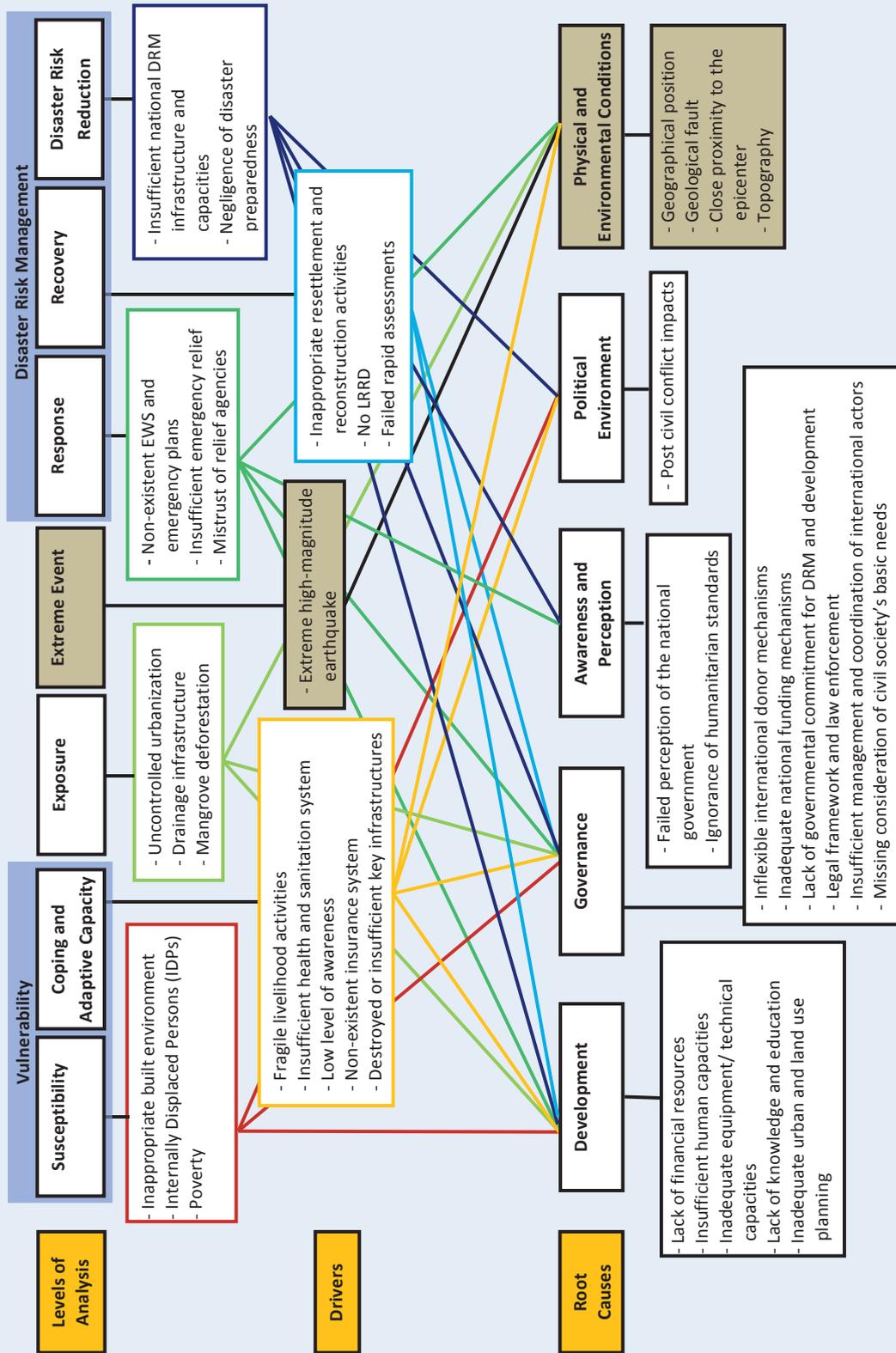
Report type	Description
<b>Disaster Report</b>	<ul style="list-style-type: none"> <li>• Reports the disaster as well as the direct impacts</li> <li>• Describes the spatial and temporal dimension/scale of the disaster</li> </ul>
<b>Early Warning Report</b>	<ul style="list-style-type: none"> <li>• Evaluates and summarizes the early warning and evacuation situation (efficiency, constraints, deficits, etc.)</li> </ul>
<b>Real-time (response) evaluation (RTE)</b>	<ul style="list-style-type: none"> <li>• Evaluation and summary of ongoing activities (emergency relief, response, recovery, etc.) right after disasters</li> <li>• Includes a context analysis, lessons learned and recommendations</li> </ul>
<b>Post-disaster Needs Assessment (PDNA)</b>	<ul style="list-style-type: none"> <li>• DaLA (Damage and Losses Assessment): Quantitative estimation of damage and losses in economic flows and the impact on the overall performance of the economy</li> <li>• HRNA (Human Recovery Needs Assessment): Determine the requirements for the full resilient recovery of human development for affected populations, including the restoration of governance systems</li> </ul>
<b>Response, recovery or rehabilitation report</b>	<ul style="list-style-type: none"> <li>• Similar to the RTE but with temporal distance to the disaster</li> <li>• Recovery and rehabilitation reports in particular provide specific information on speed, efficiency, sustainability, constraints, deficits, etc. of recovery and rehabilitation activities</li> </ul>
<b>Disaster lessons learned report</b>	<ul style="list-style-type: none"> <li>• Summary of experiences and constraints (especially regarding DRM)</li> <li>• Basis for future investigations and improvements</li> <li>• Includes all disaster risk management phases</li> </ul>
<b>Vulnerability and Risk Assessment</b>	<ul style="list-style-type: none"> <li>• Determines the socio-economic factors of vulnerable societies based on indicators</li> <li>• Considers the impacts of natural hazards</li> <li>• Identifies core areas for vulnerability and risk reduction measures</li> </ul>
<b>Vulnerability and Capacity Assessment (VCA)</b>	<ul style="list-style-type: none"> <li>• Participatory tool to understand the vulnerability and capacity of the people</li> <li>• Allows the people to identify their level of risk</li> <li>• Enables the identification of local priorities and the consideration of specific needs</li> </ul>
<b>Institutional Analysis</b>	<ul style="list-style-type: none"> <li>• Analyzes the institutional environment and their capacity with regard to disaster risk management resources</li> </ul>
<b>Root Cause Analysis</b>	<ul style="list-style-type: none"> <li>• Identifies critical factors in the pre-disaster, impact and post-disaster (response and recovery) phases to determine disaster root causes</li> <li>• Identifies the fundamental causes of disasters in a broad, multi-dimensional and comprehensive manner</li> </ul>

## Annex III – Disaster root cause analysis frameworks

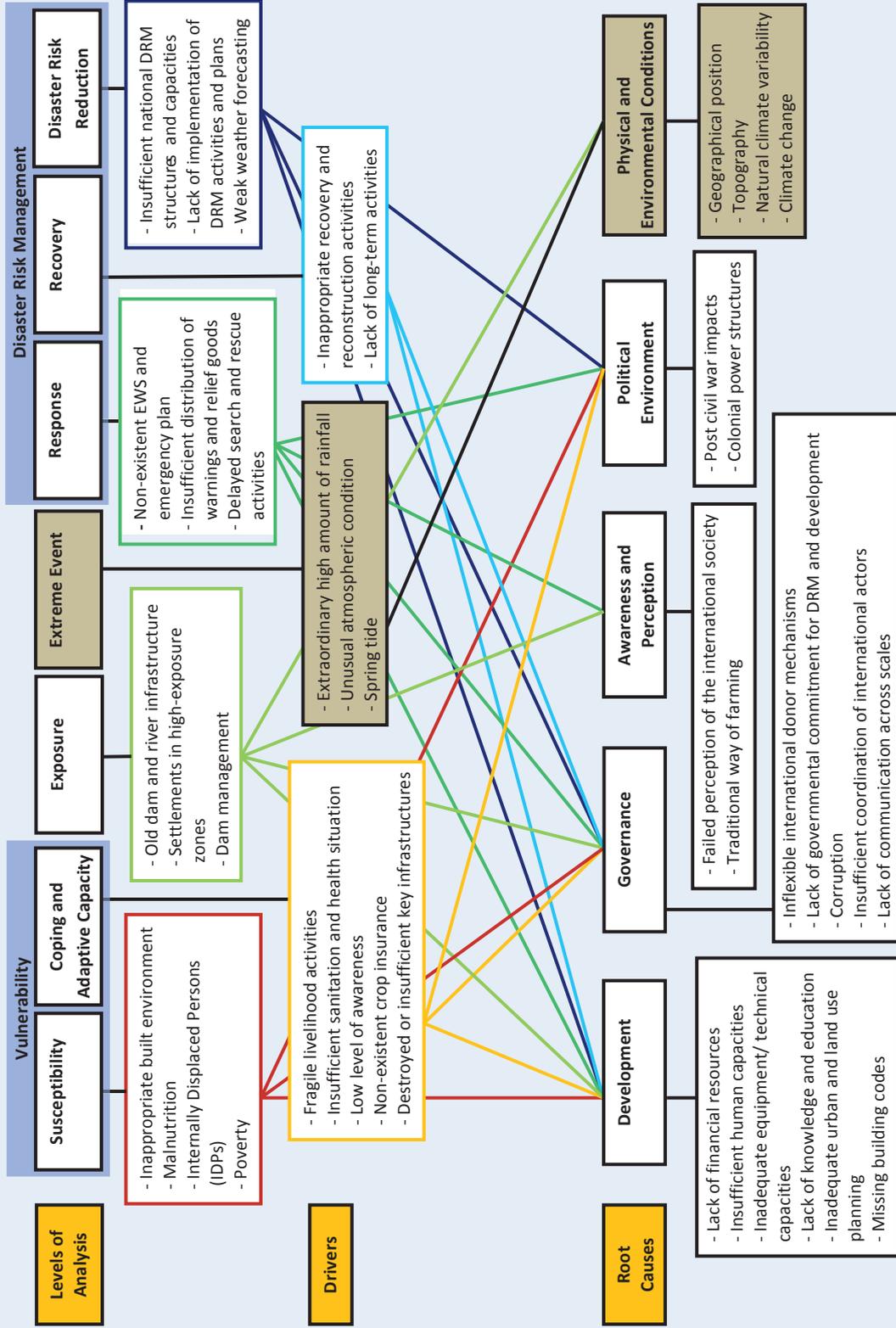
### Haiti



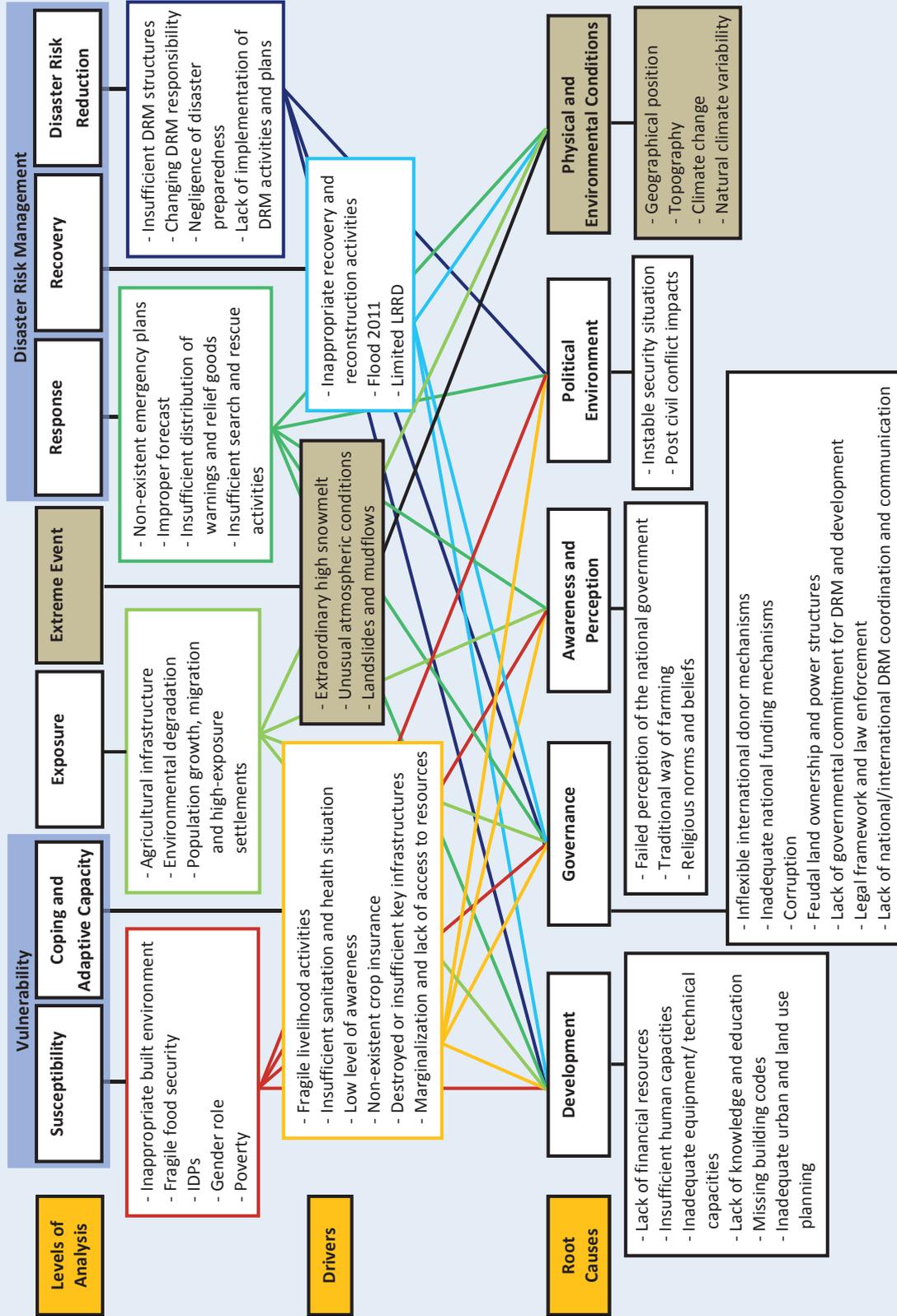
## Indonesia



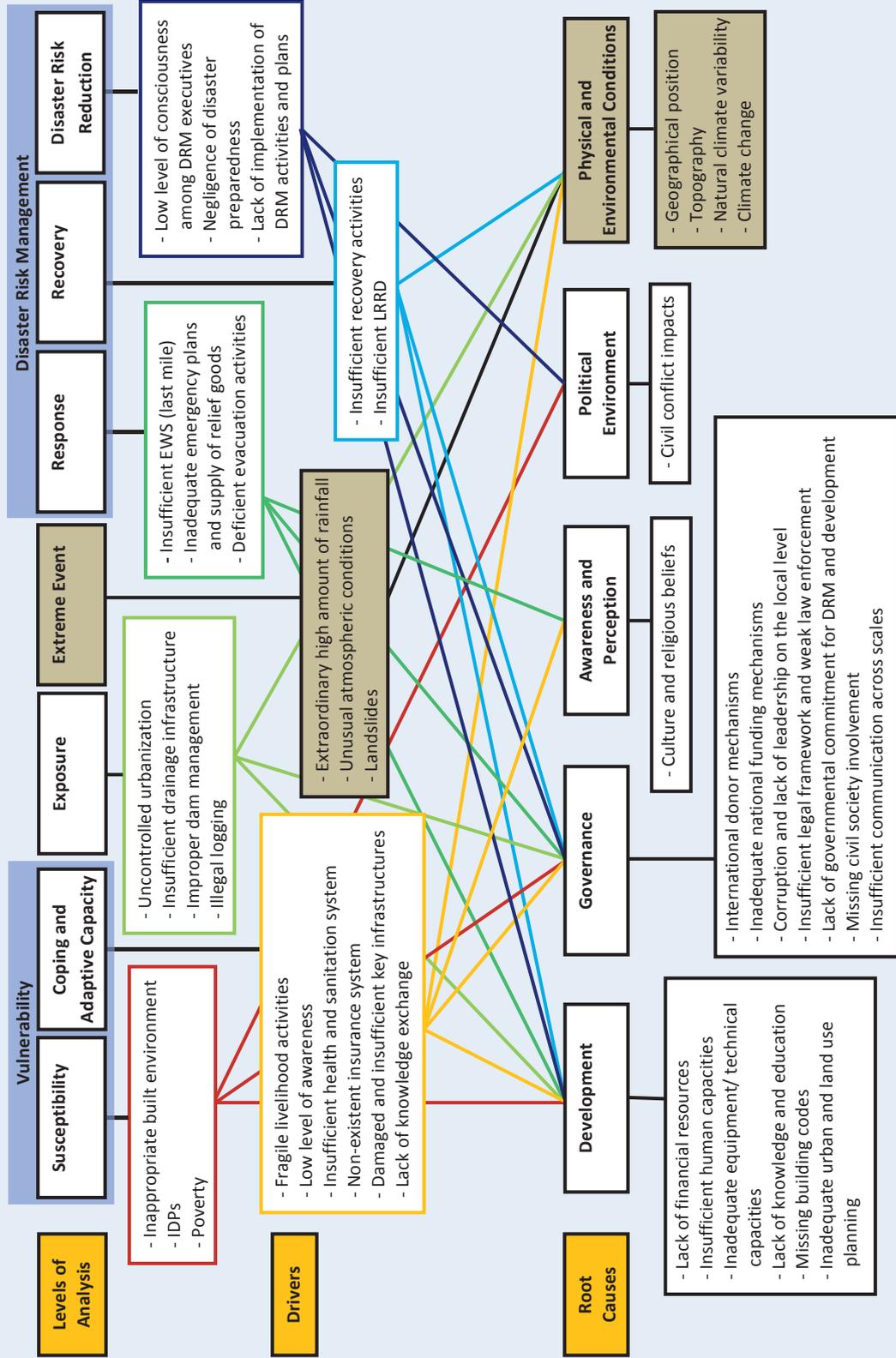
# Mozambique



# Pakistan



# Philippines



# Abbreviations

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<b>CCA</b>	Climate Change Adaptation
<b>CRT</b>	Current Reality Tree
<b>DKKV</b>	German Committee for Disaster Reduction
<b>DRM</b>	Disaster Risk Management
<b>DRR</b>	Disaster Risk Reduction
<b>ENSO</b>	El Niño-Southern Oscillation
<b>EW</b>	Early Warning
<b>EWS</b>	Early Warning System
<b>FAM</b>	Free Aceh Movement – Province of Aceh/Indonesia
<b>GIZ</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit
<b>GRC</b>	German Red Cross
<b>HFA</b>	Hyogo Framework for Action (2005-2015)
<b>IDPs</b>	Internally Displaced Persons
<b>IFRC</b>	International Federation of Red Cross and Red Crescent Societies
<b>INGC</b>	Instituto Nacional de Gestao des Calamidades (National Disaster Management Institute – Mozambique)
<b>INGO</b>	International Non-Governmental Organization
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>KPK</b>	Kyber Pakhtunkhwa Province – Northern Pakistan
<b>LGUs</b>	Local Government Units
<b>LRRD</b>	Linking Relief, Rehabilitation and Development
<b>NGO</b>	Non-Governmental Organization
<b>PDNA</b>	Post-disaster Needs Assessment
<b>RTE</b>	Real-Time Evaluation
<b>SPHERE</b>	Community of Humanitarian Response Practitioners
<b>SREX</b>	IPCC Special Report on „Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation“
<b>UN/ISDR</b>	United Nations International Strategy for Disaster Reduction
<b>UNU-EHS</b>	United Nations University - Institute for Environment and Human Security, Bonn
<b>VCA</b>	Vulnerability and Capacity Assessment



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