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Vulnerability to Natural Hazards: A Gender Perspective in Disasters

BACHELOR THESIS 1

In partial fulfillment of the requirements for the degree

“Bachelor of Arts (BA)”

Bachelor Program:
“Nonprofit, Social & Health Care Management”
Management Center Innsbruck

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Amicus certus in re incerta cernitur.

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Finis coronat opus.

Declaration in Lieu of Oath

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Abbreviations

ADPC	Asian Disaster Preparedness Center
DRR	Disaster Risk Reduction
EM-DAT	International Disaster Database
IATF/DR	Inter-Agency Task Force on Disaster Reduction
IDNDR	International Decade for Natural Disaster Reduction
IFRC	International Federation of Red Cross and Red Crescent Societies
IRP	International Recovery Platform
PAR	Pressure and Release
RCC	Regional Consultative Committee on Disaster Management
UN	United Nations
UNDP	United Nations Development Programme
UNDRO	Office of the United Nations Disaster Relief Co-ordinator
UNEP	United Nations Environment Programme
UNHCR	United Nations High Commissioner for Refugees
UNISDR	United Nations Office for Disaster Risk Reduction
WHO	World Health Organization

1 Introduction

Between 2004 and 2014 more than 4,000 natural disasters occurred worldwide with almost one million people reported killed and 1.7 billion people affected (EM-DAT 2014). The first half of 2015 has not passed yet, but already millions of people have been affected by natural hazards, such as the devastating earthquake in Nepal in April 2015, the volcanic eruption in Chile, the tropical cyclone Pam in the South Pacific in March 2015, avalanches in Afghanistan and several severe flooding and landslides across South America. The International Disaster Database (EM-DAT) reports that the number of natural disasters and people affected is increasing over the last few decades due to climate change, degradation of the environment, massive urbanization, social disparity and globalization. These are factors that are generated by human interaction with the natural environment pre disaster but shape vulnerability at the time a natural hazard affects society.

Historically disaster research primarily explored the geophysical events that caused natural hazards, however in the 1990s, the International Decade for Natural Disaster Reduction (IDNDR) lead to a major shift away from hazard to vulnerability analysis. Disaster researchers and sociologists increasingly focused on social, economic, political and cultural factors that determine different levels of vulnerability to natural hazards between nations, societies and individuals (Blaikie *et al.* 1994; Bradshaw 2013; Cutter 1996; Enarson and Morrow 1998). Even within a single village people can be affected differently due to a variety of factors including socio-economic status, income, level of education, ethnicity, age or gender (Swain 2007, p. 3; Wisner *et al.* 2004, p. 11). These factors shape vulnerability and determine who is most at risk from natural hazards within society.

Vulnerability is essential in exploring disasters within the broader patterns of society, because natural hazards only result in disasters when they cause catastrophic impacts on society (Shaluf 2007, p. 687; Wisner *et al.* 2004, p. 45). Thus natural disasters have to be seen as a complex mix of both natural forces and human actions. McEntire (2001, p. 190) emphasizes the importance of vulnerability in the disaster context by arguing that natural hazards cannot always be eliminated or controlled, but people “determine to a great extent the level of vulnerability to disaster.” Alexander (2006, p. 2) sums it up by stating that “vulnerability is a greater determinant of disaster risk than hazards themselves.”

1.1 Problem Statement and State of Research

When it comes to natural disasters politicians, public actors, policy makers and media usually assume that natural hazards affect people in disaster-hit areas equally. It is hardly emphasized that political and socio-economic processes in the pre-disaster context determine different levels of vulnerability within communities and nations, i.e. the probability of being adversely affected by a natural hazard's impact on society (Swain 2007, p. 3; Wisner *et al.* 2004, p. 6). Adverse social and economic situations in many parts of the world oblige some groups of people to inhabit less safe areas to assure their livelihoods. Due to the proximity to economic opportunities in urban areas some people inhabit slum settlements around cities with low levels of hazard protection. Additionally many less obvious factors such as the allocation of assets and welfare, working conditions, availability of public transport, social infrastructure, access to health care, social protection, access to education, knowledge and information about hazards and various forms of inequality play a significant role in the degree of vulnerability (McEntire 2001, pp. 191–192; Neumayer and Plümper 2007, p. 551; Wisner *et al.* 2004, p. 5). Key variables that determine who is most vulnerable to natural hazards further include class, caste, race, age, disability, ethnicity and gender (Swain 2007, p. 3; Wisner and Luce 1993, pp. 131–133). These variables are shaped over a long period of time by social systems, cultural norms and power relations as well as political and economic systems that operate on national and even international scales (Wisner *et al.* 2004, p. 7).

In the 1990s, during the IDNDR, academics and disaster researcher (Blaikie *et al.* 1994; Comfort *et al.* 1999; Cutter 1996; Varley 1994) had been increasingly discussing determinants that shape vulnerability to natural hazards. The following groups of people were found to be most vulnerable: the poor (subject to class), women (subject to gender), children and the elderly (subject to age), the disabled and ethnic minorities (Cardona 2004, p. 38; Wisner and Luce 1993, p. 133). Gender and gender relations before, during and in the aftermath of disasters as well as varying impacts on women, men, girls and boys gained academic attention in the late 1990s (Begum 1993; Enarson 1998; Enarson and Morrow 1998; Fothergill 1996; Ikeda 1995; Morrow and Phillips 1999; Mulilis 1999).

It is difficult to measure the gendered impact of natural disasters as available large-scale quantitative data only focuses on total numbers of mortality, injury, people

affected and total damage (see EM-DAT). Bradshaw and Fordham (2013, p. 7) point out that there is a lack of gender disaggregated quantitative data available and large-scale qualitative studies by which to better understand gendered experiences of natural disasters. But the absence of data does not mean the absence of a problem. So far, evidence tends to be small scale qualitative studies, but where it exists, researchers (Ariyabandu and Wickramasinghe 2003; Bradshaw 2014; Enarson 1998, 2004; Fordham 2004; Ginige *et al.* 2014; Neumayer and Plümper 2007; WHO 2002) agree that disasters affect women and men differently “because of the distinct roles they occupy and the different responsibilities given to them in life and because of the differences in their capacities, needs and vulnerabilities” (Ariyabandu and Wickramasinghe 2003, p. 51).

Gendered vulnerability and thus different impacts of disasters on women and men derive from pre-existing social, economic and political inequalities in everyday life. Historically evolved patriarchal structures still dominate many societies around the world creating male dominants in economic and political systems (Yumarni *et al.* 2014, p. 765). These conditions enhance gender inequalities leaving women and girls more vulnerable to impacts of natural hazards mainly due to inequalities in access to resources, opportunities and control over power, such as lower levels of ownership of land and other productive assets, unequal representation in decision making processes and restricted access to educational opportunities (Sabat and Das 2007, p. 18; WHO 2002, p. 3).

A more holistic perspective of disasters considers the natural processes on the one hand and human activities, i.e. political, cultural, economic and social processes in the pre-disaster context, on the other hand. Because these processes structure the lives of people, determine gender identities and relations, create inequalities and shape vulnerability to natural hazards.

1.2 Purpose and Aim of the Thesis

The focus of Bachelor Thesis 1 is on disasters triggered by natural hazards, but instead of analyzing the geophysics of these events, it will examine the social construction of disasters attempting to express the complexity and breadth of the topic. It explains why some groups of people within society are more at risk from natural hazards than others, i.e. what shapes their vulnerability to natural hazards.

Gender as a determining factor of social life has long been undermined in this context, thus this thesis will explicitly explore gendered vulnerability and highlight the gendered impacts of natural disasters.

In so doing this thesis endeavors to stress the need for a more holistic approach to disaster research and analysis as well as the demand in disaster risk reduction (DRR) and disaster management for a more thorough understanding of the deeply rooted social, economic and cultural conditions that contribute to vulnerability and especially gendered vulnerability to natural hazards. Acknowledging that disasters affect women, men, girls and boys differently is essential for efficient programming.

The research area is predominantly limited to the time pre disaster, i.e. factors that shape vulnerability. In regard to gender a look on immediate impacts post disaster is implemented to underline different gendered experiences of natural disasters. Nevertheless the thesis purposely does not include issues such as posttraumatic stress disorder, long term economic and social impacts on those affected or bad emergency response time.

1.3 Structure of the Thesis

Bachelor Thesis 1 discusses these issues by examining the abundance of academic literature on the subject, especially papers and studies from key journals in disaster research, such as the International Journal of Mass Emergencies and Disasters as well as the International Journal of Disaster Prevention and Management.

The thesis begins with a short overview on the difference between hazards and disasters as well as different types of disasters. In the next chapter the focus shifts from hazard analysis to assessment of vulnerabilities. This chapter examines the progression of vulnerability, i.e. the social causation of disasters, and assesses the social as well as physical determinants of disasters. The chapter will conclude with a brief case study on the recent earthquake in Nepal in April 2015 and some critiques on the vulnerability theory. Then, the next main chapter discusses the nature of gendered vulnerabilities, the progression of gendered vulnerability and additionally a disaster's impact on women and men. It finishes with a case study on the Indian Ocean Tsunami 2004 and some critiques. Finally, Bachelor Thesis 1 concludes with a summary and discusses the main findings from the reviewed literature.

2 The Nature of Hazards and Disasters

Defining the term disaster has already raised questions in the late 1980s and early 1990s (see Drabek 1991; Quarantelli 1987) and it still troubles disaster researchers such as Alexander, Cutter, Perry, Quarantelli and Smith who were discussing the issue in the 2005 published book entitled 'What is a disaster?' (Perry and Quarantelli 2005). Although there is no universally accepted definition yet (Shaluf *et al.* 2003, p. 25) it is commonly accepted to differentiate between three types of disasters (Shaluf 2007, p. 687). Firstly, natural disasters that are catastrophic events resulting from natural hazards, such as earthquakes, tsunamis, volcanic eruptions or landslides. Secondly, man-made disasters that result from human decisions, including conflict, war or production failures, and lastly, hybrid disasters that are a compound of natural forces and human decisions (Shaluf 2007, pp. 687–688). Although it would be interesting to analyze man-made and hybrid disasters as well, the scope of this thesis is restricted to natural disasters mainly to demonstrate the socio-economic processes that determine to a great extent a natural hazard's impacts on society.

In many cultures around the world, natural disasters were often termed as acts of God where humans had little or no control over the events (Shaluf 2007, p. 687; Waugh 2000, p. 26). With increased scientific understanding of the earth's physical system natural disasters were later equated with the geophysical phenomena that caused them, such as floods, windstorms, earthquakes and the like, but this perspective ignored the role of humans in the disaster context (Cardona 2004, p. 41; McEntire 2001, p. 189). As a result a vulnerability approach to disasters has emerged as a key concept. This shift from hazard to vulnerability analysis began in the early 1980s and slowly gained academic attention in the 1990s, the IDNDR (Hewitt 1983; Pelanda 1981; UNDRO 1980; Wisner and Luce 1993). It is now generally recognized that natural hazards do not automatically result in natural disasters. Natural disasters are the catastrophic impact on society resulting from natural hazards (Shaluf 2007, p. 687). According to the United Nations Office for Disaster Risk Reduction (UNISDR 2007) a disaster is defined as:

“A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.”

This definition considers that in contrast to a hazard, which has the potential to bring about loss and disruption, a disaster is defined by the loss occurring and the impact on society which depends on the degree of vulnerability (Bradshaw 2013, p. 3). Wisner *et al.* (2004, p. 45) explains that “there cannot be a disaster if there are hazards but vulnerability is (theoretically) nil, or if there is a vulnerable population but no hazard event.” Therefore natural disasters have to be seen as an interaction of both natural forces and human action.

All types of disasters can trigger subsequent disasters depending on their location and scale (Shaluf 2007, p. 688). For example, earthquakes out at sea can trigger tsunamis and tsunamis can destroy livelihoods in coastal regions. This can cause enormous social and economic losses and displaced people, which can further lead to negative impacts on psychosocial health. The earthquake in Nepal in April 2015 flattened several villages close to the epicenter, destroyed a vast amount of houses and triggered avalanches in the Himalayas and landslides across the country (Burke *et al.* 2015). Thus disasters most often are not single, discrete events, but “multiple, mutually reinforcing, and sometimes simultaneous shocks to (...) families, (...) settlements and (...) livelihoods” (Wisner *et al.* 2004, p. 5). Especially in countries with high poverty rates, inequality, less economic security and none or ineffective disaster prevention and mitigation programs these repeated shocks create hazardous conditions and annihilate whatever efforts have been made to improve social, economic and safety conditions. Konishi (2014) states, that disasters push an increased number of people into poverty, while already poor are even pushed deeper into destitution

As an example, Asia was the continent most frequently hit by natural disasters in the last decade reporting more than half of the deaths and more than 80 percent of the people affected by natural disasters (EM-DAT 2014). The typhoons in the Philippines in the past years show that recurrent physical and economic damages from natural hazards hinder the capacity to effective recovery. In November 2013 Typhoon Haiyan led to widespread destruction and casualties. “When Typhoon Rammasun landed in July 2014, it brought additional death and devastation to areas still recovering from Haiyan.” (Barbier 2014, p. 1250) In consequence, the poverty rates in some areas increased by 35 percent (Konishi 2014). People’s vulnerability, disasters and their social construction are thus not only important in disaster management, but a pressing issue in the development field as well.

3 Vulnerability to Natural Hazards

While disasters are a complex mix of natural hazards and vulnerability, vulnerability in turn arises from physical (including technological and environmental) as well as social (including economic, political and cultural) characteristics of individuals, communities and nations (Bradshaw 2013, p. 7; McEntire 2001, p. 190). Wisner et al. (2004, p. 11) argue that “by vulnerability we mean *the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard*”. This definition is primarily based in the social sphere of vulnerability and mainly refers to susceptibility and resilience. Susceptibility adversely affects individuals’ or communities’ likelihood to suffer harm whereas resilience refers to the capability to efficiently cope and recover (UNISDR 2007; Zakour and Gillespie 2013, p. 20). For a broader approach McEntire (2001, 2005, 2012) suggests that a dual concept that addresses both capabilities and liabilities from the social as well as the physical sphere should be considered in vulnerability analysis. Liabilities increase the probability of disasters and the potential for losses, for example due to geographical proximity to exposure, and magnify adverse social and economic effects whereas capabilities refer to physical and social resources as well as abilities that enhance resilience and resistance to disasters (McEntire 2012, p. 207; Zakour and Gillespie 2013, p. 21).

Thus “a vulnerability approach to disasters would suggest that inequalities in exposure and sensitivity to risk as well as inequalities in access to resources, capabilities and opportunities systematically disadvantage certain groups of people, rendering them more vulnerable to the impact of natural disasters” (Neumayer and Plümper 2007, p. 551). Factors that lead to an increase or decrease in liabilities and capabilities will be discussed in the following chapters.

3.1 The Progression of Vulnerability

The natural environment on earth offers spatially varied opportunities, such as different places to live and work as well as resources, including water, agricultural land or minerals, and at the same time a range of potential hazards (Wisner et al. 2004, p. 6). “But crucially, humans are not equally able to access the resources and opportunities; nor are they equally exposed to the hazards.” (Wisner et al. 2004, p. 6) Each nation and area has its unique vulnerability due to its geographic location

(McEntire 2012, p. 210). Within these nations social structures determine inequality that lead to varying degrees of vulnerability of different groups of people. The social causation of disasters and the progression of vulnerability is perhaps best illustrated by Blaikie *et al.*'s (1994) Pressure and Release (PAR) model, which was further developed and refined by Wisner *et al.* (2004; 2012). The idea of the PAR model is to schematically illustrate that disasters are composed of natural hazards on the one hand and processes that generate vulnerability on the other hand. Disaster risk increases with higher pressure on people and societies from either side – will it be the severity of a hazard event or factors that lead to an increase in vulnerability. Blaikie *et al.* (1994) suggest that vulnerability is a product of 'dynamic pressures' that arise from 'root causes' within society, and in turn lead to 'unsafe conditions' for some groups of people (see Figure 1). These three factors will be briefly explained in turn but discussed in depth in the following chapter.

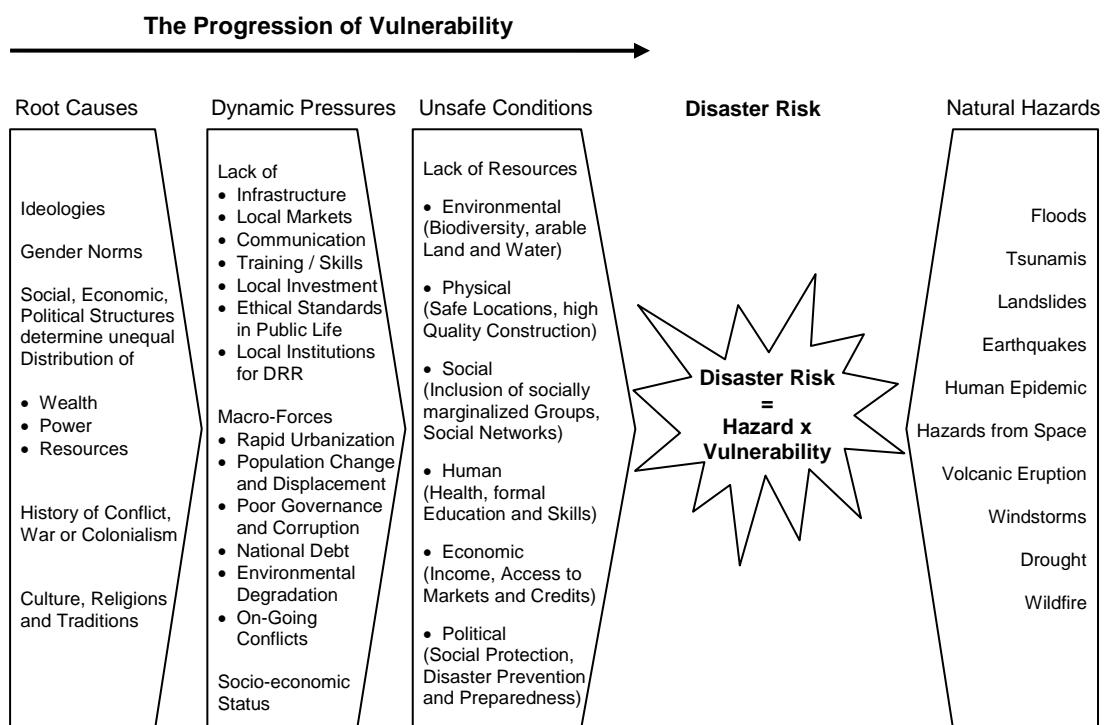


Figure 1: The Disaster Pressure and Release Model

(Source: author adapted from Wisner *et al.* 2004, p. 8; Wisner *et al.* 2012, p. 23)

Root causes are embedded in social, economic and political structures that affect the allocation and distribution of resources, political power and wealth between different groups of people. Root causes include effects of past wars and colonialism

as well as legal definition, gender norms, prejudices toward some groups of people or other ideological elements (Wisner *et al.* 2004, pp. 47–48; Wisner *et al.* 2012, p. 22; Zakour and Gillespie 2013, p. 44). Cultural and religious perceptions enhance marginalization of some groups of people in this process. Dynamic pressure, which channel root causes into unsafe conditions, are more contemporary manifestations of the underlying and historically evolved structures that shape vulnerability. That includes all processes and activities mainly on a national or macro level, for example rapid urbanization or poor governance, which channel root causes over time into unsafe conditions. Unsafe conditions express, in a strong temporal and spacial element, the vulnerability of a population in conjunction with a certain hazard (Wisner *et al.* 2004, p. 49). Unsafe conditions are in a constant state of flux and vary between regions, households and individuals. They “represent the surface manifestation of vulnerability” (Zakour and Gillespie 2013, p. 48).

It is important to note that a single aspect that shapes vulnerability may be analyzed in isolation, but essential and most important in understanding vulnerability is the interaction of various factors that are simultaneously at play when hazards strike. Even hazards and the conditions that create vulnerability are not distinct from each other, but interact in time of disasters and so can hazard events alter the set of resources available and the ability to recover (Wisner *et al.* 2004, p. 46). The PAR model is by no means comprehensive and it does not imply that single causes give rise to single effects (Wisner *et al.* 2004, p. 51). The concept of vulnerability has to be understood in a relative and dynamic way as economic and social conditions change over time and so does vulnerability differ in every single disaster context. “Nevertheless, with knowledge of the prevailing hazards and the patterns of population and socio-economic development, disaster risks can be assessed and mapped, in broad terms at least.” (UNISDR 2007)

3.2 Determinants of Vulnerability

In general, factors that shape vulnerability are inherent in root causes, dynamic pressures and unsafe conditions. They can be segregated into hazardous physical (including technological and environmental) and discriminatory social (including economic, political and cultural) causes that “influence how hazards affect people in varying ways and with differing intensities” (Wisner *et al.* 2004, p. 7). Each of the key variables leading to vulnerability from the physical and social sphere will be briefly

discussed in turn, but the range and diversity of risk factors are almost endless (Cutter 2005, p. 41).

3.2.1 Physical Causes of Vulnerability

Some of the factors shaping vulnerability arise from human activity intersecting with the natural environment. According to Blaikie et al. (1994) and Wisner et al. (2004; 2012) dynamic pressures in this sphere include negative environmental factors such as erosion of biodiversity, deforestation or decline in soil productivity. Diminished biodiversity and land degradation threaten the ecosystem's productivity, which can lead to water scarcity or food insecurity and force communities to inhabit marginal lands or migrate to urban areas (IATF/DR 2006, p. 11; UNEP and UNISDR 2007, pp. 11–13). Population expansion and rapid urbanization especially in earthquake or flood prone coastal regions degrade coastal ecosystems and natural barriers that decrease the severity of natural hazards (Barbier 2014, p. 1250). Further ecological variables that increase communities' vulnerability may include contaminated air or inadequate sanitation facilities that lead to water pollution (IATF/DR 2006, p. 11). This in addition adversely affects human's health and consequently their resilience to natural hazards.

Besides the geographical location of a nation and the degree of environmental degradation, the choice of location for human settlements within a nation, i.e. the proximity of property and people to disaster-prone areas, marks a factor of physical liability (McEntire 2001, p. 191). Adverse socio-economic situations coerce some groups of people to inhabit less safe areas to assure their livelihoods, for example slum settlements around cities with low levels of hazard protection and low quality of housing construction, due to the proximity to economic opportunities in urban areas. Essential for physical vulnerability are social factors as well, including education to achieve professional technical knowledge and practices about the construction of disaster resilient settlements. "Physical vulnerability [mostly] refers to susceptibilities of the built environment." (IATF/DR 2006, p. 11)

In this context technological causes of vulnerability are addressed as well, which arise from ineffective early warning systems, the lack of communication or technical ability to get out warnings, lack of structural mitigation devices, carelessness in industrial production (that in turn influence the environment and environmental vulnerability) or lack of foresight regarding computer equipment (Bradshaw 2013, p.

7; McEntire 2001, p. 192). “The Indian Ocean tsunami illustrated that an event may be predicted, but if it is not communicated to those who may be affected, or not communicated in time, they will not be able to respond.” (Bradshaw 2013, p. 62)

3.2.2 Social Causes of Vulnerability

The growing divergence in the distribution of wealth, i.e. inequalities in allocation of assets and welfare, is an essential factor of differing degrees of socio-economic vulnerability within society (McEntire 2001, p. 192; Wisner et al. 2004, p. 5). It is increased by dynamic pressures, such as sparse governmental investments in disasters prevention and response, as well as education or other human capital, which lead to a lack of skills and knowledge about hazards. Social causes further include levels of literacy and education, initial well-being, access to health care, access to basic human rights as well as cultural and religious factors including traditional values, customs and ideological beliefs (IATF/DR 2006, p. 11; McEntire 2001, p. 191; Wisner et al. 2004, p. 5). A key variable that determines who is most at risk from natural hazards is the exclusion or marginalization of specific groups and individuals due to class, caste, race, health and immigration status, age, disability, ethnicity and gender (Swain 2007, p. 3; Wisner et al. 2004, p. 11). In the Kobe earthquake in Japan in 1995 and the Gujarat earthquake in India in 2001 one could track that the exclusion of people along caste and ethnicity leads to their greater vulnerability in disasters as discriminatory factors determine unequal access to resources and opportunities. The Burakumin, Japan’s outcast for more than a century and victim to severe discrimination, were segregated in the most unsafe geographic areas where they experienced greater losses from the earthquake (Karan 2005, p. 37; Sterngold 1995; Zakour and Gillespie 2013, p. 42). In the case of the Gujarat earthquake in India, Muslims and Dalits, also known as the “untouchables” and considered less than human, had little to no access to relief aid and rehabilitation services due to caste discrimination and political corruption (Human Rights Watch 2001, pp. 5–6). This is also particularly true in the case of the recent earthquake in Nepal (see chapter 3.3).

Poor people, i.e. those whose income fails to meet basic needs, and especially the very young and old, single-headed households with many dependants and people from ethnic minorities who live in poverty suffer proportionally larger economic losses in disasters due to their limited access to resources, political power and their limited capacity to recover and sustain future disasters (IATF/DR 2006, p. 11).

“Although vulnerability cannot be read directly from poverty, the two are often very highly correlated.” (Wisner *et al.* 2004, p. 12) Firstly, living in disaster-prone areas is not a choice made by the poor (see slum settlements around cities), but some of the rich, who may live in less safe areas due to a panoramic view but can afford insurance and engineering that minimize a hazard’s impact and secondly, the consequences of natural hazards are far more severe for the poor, who frequently lose their entire capital, including their homes, clothing, tools for daily work and the like, which substantially decreases their ability to recover and leaves them more vulnerable to subsequent disasters and future hazards (Wisner *et al.* 2004, p. 12).

Dynamic pressures creating vulnerability in the political sphere are poor governance and corruption that lead to a lack of ethical standards in public life, such as integrity, honesty or accountability. Sparse resources and minimal support from government for disaster programs, a lack of or weak institutions charged with responding to hazards, by evacuating the population for example, the lack of laws and inability to enforce steps for evacuation and mitigation, the lack of policing to ensure people feel it is safe to leave their property, a lack of social protection or a mistrust of the government increase a nation’s and its communities’ vulnerability to natural hazards (Bradshaw 2013, p. 7; McEntire 2001, p. 191). For example, warnings of Hurricane Katrina were not sufficient to ensure a response because people lacked access to public or private transport (Bradshaw 2013, p. 62).

3.3 Vulnerability in the Case of the Nepal Earthquake in 2015

Especially in the case of the recent earthquake in Nepal it became evident that unsafe physical conditions, i.e. high seismic activities and poor building standards, paired with poverty, social disparity, haphazard urbanization and weak disaster management can lead to devastating consequences. More than 8,500 people lost their lives in the 7.8-magnitude earthquake on 25th April 2015 and its aftershocks (Nepal Disaster Risk Reduction Portal 2015; National Seismological Centre 2015). The earthquake triggered landslides across the country that cut off whole villages and avalanches in the Himalayas leading to further destruction. Economic difficulties and political instability over years made it difficult to decrease Nepal’s vulnerability and effectively prepare for disasters, even if an event may be predicted (Robins-Early 2015). Just in March 2015 at the 3rd UN World Conference on Disaster Risk Reduction Nepal’s Minister of Foreign Affairs voiced his concern over the impact of a major earthquake (Pandey 2015):

"We are seriously concerned that Nepal continues to remain one of the most vulnerable countries in the world to disasters such as earthquakes, flooding, landslides (...) It is also estimated that the human loss in the Kathmandu Valley alone should there be a major seismic event will be catastrophic."

Already a few years ago Bhattacharai and Conway (2010, p. 66) as well as Muzzini and Aparicio (2013, p. 64) pointed out that massive unplanned urban migration, weak institutional arrangements, substandard and irregular housing patterns, rapid changes in the socio-cultural diversity and polluted environment are common features of the Kathmandu Valley leading to increased vulnerability. Additionally Nepal lacks safe transportation systems and adequate public health infrastructure, which is struggling with the daily demand and one can imagine that there is a huge lack of medical and surgical care after a major earthquake, especially in remote areas where access is aggravated by landslides or destroyed roads (Fitzgerald 2015). Furthermore half of Nepal's 28 million population lives in poverty in unsafe buildings (Chughtai 2015). The ability of many poor people to efficiently cope and recover is negatively affected by the lack of social protection as well as economic and social infrastructure (Chughtai 2015).

While poverty and political instability were central factors in the disaster in April 2015, structural inequality was equally important. The houses that crumbled were mainly those made of mud mortar, bricks and timber where the rural poor and recent rural-to-urban migrants lived who could not afford the rent in safer buildings made of concrete cement and steel pillars (Amos 2015). Nelson (2015) therefore argues that the earthquake was more of a 'classquake' that will exacerbate inequalities and lead to increased vulnerability among the poor and marginalized. For example the Dalit, on which was touched upon in chapter 3.2.2, constitute up to 20% of Nepal's population (UNDP 2008, p. 22). They are often denied basic resources due to their social standing and thus faced difficulties in registering for relief and receiving financial aid from the government after the recent earthquake (Singh 2015). A Dalit man once said that "caste has such strong foundation in Asia that no tsunami can wash it, no earthquake can shake it and no flood can carry away the filth of it" (Dr. B.R. Ambedkar's Caravan 2015).

3.4 Critiques

Vulnerability in disaster contexts has received a great deal of attention throughout the last two decades, but it also needs to be critized. Hewitt (1997, p. 167) argues that the term ‘vulnerability’ emphasizes a sense of societies and people as passive, pathetic and weak. Bradshaw (2013, p. 12) confirms this statement and points out that in the disaster literature there tends to be a focus on liabilities, i.e. what people lack, what they cannot do and what enhances their vulnerability whereas the development literature in contrast rather focuses on capabilities, i.e. the ability to use assets and resources to respond and recover from disasters. In fairness, quite an amount of literature in the disaster field meanwhile focuses on the concept of resilience (Enarson 2012; Masys 2015; McEntire 2012; UNDP 2014).

McEntire (2005, p. 212) further argues that “the social vulnerability school may run the risk of over-simplifying the disaster problem.” Vulnerability may be associated with some social circumstances, such as poverty, but poverty itself is certainly not vulnerability (Cardona 2004, p. 48). Disasters cannot be prevented if poverty is eliminated. It is important to view vulnerability as the complex issue it is; diverse in every single disaster situation. For DRR it is necessary to closely study the historical, demographic, political, cultural and socio-economic factors of society in relation to a natural hazard. “Hazard and vulnerability are concomitant and lead to risk.” (Cardona 2004, p. 38)

Furthermore vulnerability is rather seen to be an issue in poorer and developing countries whereby people from developed nations initiate global strategies for vulnerability reduction or disaster response. But such strategies in turn can generate vulnerability and undermine people’s capabilities and indigenous coping strategies. Using existing assets and local knowledge in the aftermath of disasters hand in hand with international emergency relief organizations is essential for efficient response and sustainable recovery. For more information on emergency response and current challenges for Austrian Red Cross relief workers please refer to Bachelor Thesis 2 on Sensitive Disaster Management at the Austrian Red Cross: Challenges in WASH Programs.

4 Gender in Natural Disasters

Whereas the sex of a person refers to the biological differences between men and women, gender refers to dynamic social processes deeply rooted within society that lead to socially constructed gender roles, identity, gender norms, learned behavior and attributes considered appropriate for men and women (WHO 2015). A few countries, including Germany, Australia or Nepal, have recognized a third gender, i.e. a persons who considers their gender identity as neither male nor female (often denoted as 'others') (Carpenter 2013; Knight and Bochenek 2012; Nandi 2013). Gender shapes the relationships between women, men and others, their personality, life chances and opportunities and thus is, like race and class, a social relationship of difference and inequality (Alway et al. 1998, p. 178; Enarson 2012, p. 23).

Both natural disasters and gender relations are socially constructed under different cultural, political and socio-economic conditions that vary within and between societies across the globe and have complex consequences for women, men and others (Enarson 2000b, p. 1). To support a more complete understanding of the social construction of disasters a growing volume of published articles encompasses study of gender related issues in disasters that explore gendered vulnerability and varying impacts on women and men in this context. So far, studies that focus on 'others' in the context of disasters barely exist. That is why this thesis predominantly focuses on differences between women and men in disaster situations.

Although there is a lack of large-scale quantitative evidence, many authors (Ariyabandu 2009; Enarson and Dhar Chakrabarti 2009; Ginige et al. 2014; Neumayer and Plümper 2007; Swain et al. 2007) address the disparity of women's and men's vulnerability to natural hazards and subsequently the gendered impact of these events. The social world, within which natural disasters occur, is shaped by gender (Enarson 2000a, p. 4). Gender ideologies often reduce women's access to resources, opportunities and power (Yumarni et al. 2014, p. 765). This increases their vulnerability and consequently intensifies adverse impacts of natural disasters on women. Although women are not a homogenous group and it would be fallacious to assume that all women experience the same hazard event in the same way (Bradshaw 2013, p. 9), one can say that generally speaking "women as a group have fewer opportunities than men as a group." (McDowell 1999, p. 25) Due to women's higher vulnerability to natural hazards in many societies around the world,

disaster researchers in the field of gender most often focus on women in disasters and thus practitioners quickly tend to read ‘gender’ as ‘women’ (Enarson 2012, p. 23). But “it is not female gender itself that marks vulnerability, but gender *in a specific situation*” (Wisner *et al.* 2004, pp. 14–15). Gender stereotypes also lead to challenges for men in disasters, which are less researched and can therefore easily be overlooked by both sexes. These commonalities afford gender, i.e. women, men as well as others, a unique angle of vision in disasters (Enarson and Fordham 2001, p. 43).

4.1 The Progression of Gendered Vulnerability

Root causes of vulnerability, as discussed in chapter 3.1, are mainly based on the lack of access to resources and opportunities that allow people to cope with natural hazards. This access may be gendered due to historically and culturally evolved patterns of patriarchic structures creating male dominance in economic and political response roles leading to a social construction of gender that relegates women to a subordinate status in society (Fothergill 1998, p. 13; Yumarni *et al.* 2014, p. 765). Consequently women tend to have less access to resources and opportunities, control over assets and decision-making power (Bradshaw and Fordham 2013, p. 9; UN Women 2014, p. 111). Root causes of ideological, cultural, social, economic or political order that enhance gender inequalities lead to gendered dynamic pressures and unsafe conditions, such as unequal educational and training opportunities due to gender stereotypes, thus lower levels of literacy among women and girls, unequal representation of women in decision making processes, lack of local institutions for disaster management addressing gender needs and capacities or unequal levels of ownership of land and other productive assets (Sabat and Das 2007, p. 18; WHO 2002, p. 3). Moreover the gendered division of labor leads to an overrepresentation of women with domestic responsibilities as well as in underpaid jobs in the agricultural sector, self-employment or the informal economy leading to women’s higher economic insecurity (Sabat and Das 2007, p. 18; Noel 1998, p. 214).

Gender as a factor of vulnerability is most often co-determined by the intersection with social class, income, age, sexuality, disability, violence or ethnic status that additionally shapes liabilities and capabilities (Bradshaw and Fordham 2013, p. 9; Enarson 2012, p. 49; Padhi 2007, p. 28). Poor women and men or single-headed households with many dependents or those from ethnic minorities, such as Dalits in

many Asian countries, increasingly lack access to basic resources, including secure housing, employment and transportation. Regarding gender in correlation with age, women in different life stages (puberty, pregnancy and lactating periods) need specific care that is usually provided by family and social networks, but these structures are often disrupted in natural disasters (Ariyabandu 2009, p. 9). Gender norms and relations paired with inequalities inherent in social life creates hazardous social conditions placing women and men differently at risk when natural disasters strike human society and thus create different gendered impacts and experiences of these events.

4.2 Gendered Impacts of Natural Disasters

Immediate consequences of natural disasters and thus international statistics are generally focusing on physical impacts measured in terms of mortality, injury rate and material loss (EM-DAT 2014; Fothergill 1998, p. 17). The most obvious evidence of women's higher vulnerability to natural hazards would thus be if more women than men die during disasters. Although reliable data disaggregated by sex is still largely missing (Mazurana *et al.* 2011), various authors (including Ikeda 1995 and Pincha 2008) address this issue based on case studies.

In the 1991 Bangladesh Cyclone, Ikeda (1995, pp. 176–177) found that women 20 years of age or older were four to five times more likely to die than men. Reasons explaining these differences, were firstly related to gender norms that restrict women to their homesteads thus not allowing them to leave without male permission. Additionally their child caring role and traditional long *sari* clothing hindered fast movement and slowed down their escape especially in water. Higher malnutrition and ill health among females is also a key factor affecting this (Ikeda 1995, pp. 179–180). The case study on the 2004 Indian Ocean Tsunami (see chapter 4.3) also provides a prolific example in this context.

In some situations men may be more likely to die in natural disasters. In this context reference is made to Klinenberg's (2015) study on the 1995 Chicago heat wave where age-adjusted death rates show that men were twice as likely to die than women, although experts assumed higher female mortality rates. Reasons detected by Klinenberg were in complex correlation with race, class, ethnicity, neighborhoods, social relationships, violence and poverty. This affirms that gendered vulnerability cannot be referred to a single cause but is embedded in complex social

constructions and shaped by many additional variables that vary between cultures, societies, locations and even within neighborhoods. Thus reasons for varying impacts on women and men have to be analyzed based on profound historical and contemporary knowledge of a certain community considering gender concurrently with class, race, ethnicity and age (Fulu 2007, p. 844). Care needs to be taken to avoid erroneous assumptions.

The following two chapters endeavor to give an overview of gendered experiences of natural hazards based on varying case studies from different researchers; however, reliable data is largely missing. The following studies largely focus on South-East Asian countries, so their findings have to be associated with the gender norms and relations predominant in these societies. It is difficult to say whether the findings can be translated to other societies, but it is certain that social norms and gender roles determine vulnerability, risk and thus gendered impacts of natural disasters.

4.2.1 Implications of Gender Factors for Men

Gender identities are historical and cultural constructs inherent in society that lead to concepts of masculinity and femininity, through which men most often are seen as brave, physically and emotionally strong and in control of the situation (Ariyabandu 2009, p. 8; Bradshaw 2013, p. 66). Disasters challenge the traditional male identity as the provider especially in cases of displacement or loss of livelihood opportunities (Ariyabandu 2009, p. 8). For many men with traditional gender role norms the loss of ability to take care of their family causes adjustment difficulties and emotional stress (WHO 2002, p. 3; IRP *et al.* 2010, p. 7). Traditional gender role norms are also reasons why men and boys often do not “develop the skills of domestic chores and care giving” (Ariyabandu 2009, p. 8). This is especially challenging for widowers with small children as they may never have had to care for them before. Field notes from an Ethiopian refugee camp noted that despite prompt food aid men continued to starve because they had never learned how to cook (WHO 2002, p. 2).

The gender based social expectations commonly attributed to men as strong and capable may hinder the development of coping capacities pre-disaster and often leave them to deal in isolation with their own loss and grief afterwards leading to negative impacts on psychosocial health (Ariyabandu 2009, p. 8). Both men and women suffer from loss of family members and friends in disasters but mainly

pictures from crying women tend to be reflected in mainstream media reinforcing the stereotype (Mishra 2009, p. 31). These stressful circumstances following natural disasters can lead to increased alcohol consumption, aggression and violence, where women as well as young girls and boys easily become victims of domestic violence, assault or rape (Ariyabandu 2009, p. 9). It is also observed that insensitive distribution of family relief packages and financial aid resulted in men spending the money on alcohol (Dhar Chakrabarti and Walia 2009, p. 345; Fisher 2009, p. 239).

In the aftermath of disasters the gendered division of labour places men in riskier response roles, such as search and rescue or reconstruction (Deare 2004, p. 9). This can have severe negative effects on physical health as shown by the following example from the Philippines. Typhoon Haiyan, who struck the Philippines in November 2013, destroyed the house of a Filipino called Domingo and his 14-person family. During clean-up he injured his leg that soon got infected seriously and had to be amputated. Domingo had been a taxi driver and without his leg he could not go back to work. He said, "if I can't work, I can't feed my grandchildren. Without my leg I'm dead." (Handicap International 2015) Many men not being able to work in their original environment often migrate for economic reasons leaving family members behind, thus increasing their economic and social burden.

4.2.2 Implications of Gender Factors for Women

Women and men both may suffer injury, direct damages on property and assets, loss of livelihood or productive employment resulting in stress, grief and emotional trauma, but women may suffer additional disadvantages in natural disasters for different reasons. Due to biological differences women may be physiologically less strong than men and thus may be more easily swept away by wind or water (Neumayer and Plümper 2007, p. 553). The ability to self rescue is even more aggravated for women in late stages of pregnancy. These biological factors leading to increased vulnerability are enhanced by gendered dress codes that can restrict women's movement or gender norms that consider it inappropriate for women and girls being taught to swim or climb trees (Neumayer and Plümper 2007, p. 554). In many societies women are the major providers of healthcare, childcare, care of elderly and education due to their gender role socialization (Morrow and Phillips 1999, p. 7; Noel 1998, p. 214). These tasks are often unpaid and thus minimize women's economic security. Due to this division of labor women rather than men are accompanied by or in the same place with children or elderly people at the time of

natural hazards. In quick-onset disasters this slows down their escape as they lose precious minutes trying to save children and elderly (Pincha 2008, p. 21). In the aftermath of disasters healthcare and childcare are increasingly demanded placing an additional burden on women and young girls. Loss of employment opportunities and male migration post disaster often leave women as sole earners at the verge of destitution (Bradshaw and Fordham 2013, p. 21).

It is observed that women suffer increased negative health consequences following natural disasters, such as malnourishment and emotional disorder. Care giving roles expand dramatically and many women put family needs ahead of their own leading to overall declines in their well-being (WHO 2002, p. 3). Sexuality and reproductive health are taboos and a private matter in many countries, but contribute to health problems if not met. Moreover, women's bodies are intrinsically more exposed to waterborne contaminants especially when tampons or pads are being used in a place where they cannot be washed out or dried due to limited privacy or access to clean water (Enarson 2012, p. 63). Due to these circumstances adolescent girls reported perineal rashes and urinary tract infections during the 1998 floods in Bangladesh (WHO 2002, p. 2). Studies also report adverse reproductive outcomes, such as premature delivery, early pregnancy loss or delivery-related complications post disaster (WHO 2002, p. 2).

Gender issues as well as matters of privacy and safety are often overlooked in the immediate aftermath of disasters where relief programs try to cover basic human needs, but this can expose women and girls to increased violence and sexual abuse given the breakdown of protective social networks and families (Fulu 2007, p. 850). The threat of violence may constrain women's mobility, decrease their access to critical resources, employment opportunities and recovery assistance (IRP *et al.* 2010, p. 8). Violence is not only a cause of disasters, most often it is prevalent in society pre disaster but becomes more visible afterwards (Bradshaw and Fordham 2013, p. 16). Nevertheless, it is observed that violence increases after disasters given the challenges to patriarchal power, poverty and male frustration (Bradshaw 2013, p. 123). Results of all sorts of violence may be physical injury, psychosocial impact, stigmatization, sexually transmitted diseases, unwanted pregnancies, social exclusion or family disruption (IRP *et al.* 2010, p. 8). The World Disaster Report published by the International Federation of Red Cross and Red Crescent Societies (IFRC 2012) and a 2013 report by Plan address that women and girls may be

coerced or practice transactional sex in exchange for basic needs, such as food, shelter or relief items. One of the most dramatic examples was probably the Haiti earthquake in 2010 where extremely high rates of violence, abuse and transactional sex were reported (Gómez *et al.* 2009; UNHCR 2011). Young women and girls post disaster may also be at increased risk of early and forced marriage or trafficking (Bradshaw and Fordham 2013, pp. 19–20).

Understanding the specific needs and concerns of women, men, girls and boys in disasters leads to more accurate and equitable disaster preparedness, response and recovery (Enarson 1998, p. 157).

4.3 Gender in the Case of the Indian Ocean Tsunami in 2004

The Indian Ocean tsunami triggered by an earthquake close to Sumatra on 26th December 2004 is one of the most destructive natural disasters ever recorded in human history killing around 230,000 people in a single day in over a dozen countries and displacing more than 1.7 million people (Athukorala 2012, p. 212). The Indian Ocean tsunami became a well-documented example of gender in natural disasters, because the death tolls revealed a glaring gender gap.

A survey carried out by Oxfam (2005) in Aceh Besar district of Indonesia states that almost four times more men survived than women. In India, women and children accounted for nearly 75 percent of the fatalities (Pincha 2008, p. 1). The underlying reasons for these differences were mainly ascribed to prevalent gender norms that determined women's relative risk.

The earthquake happened on a Sunday morning when many women were waiting with their children on the shoreline for the fishermen to bring in the catch to process and sell them on the local markets (Oxfam 2005, p. 2). When the tsunami hit the coast many women put family needs ahead of their own, stayed behind and lost precious minutes attempting to save children and elderly. Dead bodies of women were often found intertwined with those of children (Pincha 2008, p. 21). Due to socio-cultural norms women moreover tended not to maintain their swimming skills and were less used to climbing trees compared to men (Oxfam 2005, p. 2). Conventional clothing, i.e. long *sari* dresses, hindered fast movement in water. These and women's long hair got easily wedged around parts of palm trees or debris resulting from the tsunami, subsequently pulling women under water. Many

men out at sea survived as the tsunami passed under their boats relatively calmly. When they came back they found whole villages washed away by the tsunami uncertain about whether their family and friends survived.

It was observed that the tsunami was so violent, that women were stripped of their clothes (Pincha 2008, p. 21). Many people were swept miles off the coast. When the surviving fishermen and rescue boats started to save those adrift at sea, some women reported that they refused to climb naked into the boats because of an internalized sense of shame and honor (Pincha 2008, p. 22). While some men offered them their shirts, a study also brought out the fact that in some instances women were asked sexual favors in return (Oxfam and SWASTI 2007).

Although the affected states were prompt in responding to the disaster, women who lost their husbands faced difficulties in the immediate relief phase in registering for relief aid as government relief agencies registered households based on their male heads (IFRC 2010, p. 16). Additionally, some relief measures did not take cultural and gender specific needs into account. Some relief packages did not include inner garments for men and women, nor culturally appropriate clothing for Muslim women or sanitary towels to manage menstrual hygiene (Pincha 2008, pp. 23–24). Such gender blind approaches add on women's discomfort and undermine their dignity.

Even though women and men suffered badly from the impacts of the tsunami, the disaster also presented an opportunity for change. Many women and girls broke the mold and stood up for their needs and rights (Pincha 2008, p. 60). The Indian Ocean tsunami also led to international awareness and urges to integrate gender concern into policies, strategies and guidelines.

4.4 Critiques

While it is important to take into account the different characteristics of women and men when analyzing vulnerability and the gendered nature of natural disasters, care needs to be taken in assuming that women are always the more vulnerable group (Bradshaw 2013, p. 64). The UN *et al.* (2010, p. 8) for example state, that “women always tend to suffer most from the impact of disasters”, but reliable evidence for this is far from clear. Gender disaggregated quantitative data on mortality and large-scale research on social and economic impacts on both women and men is still missing. When women are constructed as the more vulnerable sex in disasters their local knowledge, capabilities in managing and coping with disasters is easily overlooked, although they have vital community roles and frequently take on managerial tasks post disaster (Ariyabandu 2009, p. 7). Furthermore, the focus on women in vulnerability research and disaster response obscures the need to consider men’s experiences in natural disasters, their needs and capabilities as well (Fulu 2007, p. 855). Enarson and Meyreles (2004, pp. 61–62) argue that the majority of work on gender and disaster are snapshot case studies, that lack investigation of root causes and historical perspectives and fail to consider gender concurrently with class, caste, race, ethnicity, age and physical abilities. Slowly but surely there is a shift in the disaster field where researcher as well as practitioners try to balance both liabilities and capabilities of women and men in disasters by taking equally important factors such as class, age or ethnicity simultaneously into account.

5 Conclusion

Natural disasters compound of hazard events on one side and socio-economic, cultural and political factors that create vulnerability on the other side – both together determining varying levels of disaster risk of nations, communities and individuals. Neither the geophysical factors that cause natural hazards alone nor the factors inherent in society that create vulnerability lead to a comprehensive understanding of disasters. They always have to be seen and analyzed in correlation to each other.

Root causes of vulnerability are deeply embedded in political, social, economic and ideological constructs that determine access to opportunities and power as well as control over resources. Vulnerability varies across socio-economic status, class, caste, race, age, ethnicity and other social factors with the gender dimension cutting across all of these. Given that socio-economic systems as well as gender norms and relations shape women's and men's identity, opportunities and life chances differently, women's and men's experiences of natural disasters, response and recovery vary accordingly. Thus disasters happen in a highly gendered context. Although reliable quantitative data is still largely missing, natural disasters such as the Indian Ocean Tsunami highlight women's higher vulnerability to natural hazards. In some areas surviving men outnumbered women by a ratio of 3:1 due to factors as simple as clothing. But gendered vulnerability is not a binary opposition. In contrast, the conclusion to be drawn is that gender is never the primary factor for vulnerability, but derives from complex social processes that are closely intertwined with other factors of life, such as race, class, age or ethnicity.

While the majority of work in the field of disaster vulnerability focuses on women and what they lack or cannot do, a more holistic approach should incorporate both liabilities and capabilities of women and girls as much as men and boys. Many organizations, such as the IFRC, United Nations, Oxfam or CARE, have meanwhile acknowledged that disasters affect women and men differently and adopted gender-sensitive policies and guidelines into their work. Sensitive disaster management takes different needs and concern of those affected into account and leads to more equitable and efficient programming. Nevertheless, actions in this area are slow. In this regard, reference is made to Bachelor Thesis 2 which assesses challenges in Austrian Red Cross disaster response operations and focuses on how workshops can be improved in regard to sensitivity towards gender and vulnerability issues to efficiently prepare future disaster managers in this field.

6 References

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