World Development 103 (2018) 27–39

Contents lists available at ScienceDirect

World Development

journal homepage: www.elsevier.com/locate/worlddev

Disasters, Deaths, and the Sendai Goal One: Lessons from Odisha, India

Nibedita S. Ray-Bennett

University of Leicester, UK

ARTICLE INFO

Article history:
Accepted 8 October 2017

Key words:
deaths
disaster management
risk
vulnerability
justice
Odisha

SUMMARY

Natural disasters (such as floods, cyclones, heat waves, and lightning) have the potential to cause human loss and injury. Due to climate change, the number of people affected by natural disasters is increasing every year with a marked debilitating effect on developing countries as compared to developed countries. To tackle these challenges, the United Nations "Sendai Framework for Disaster Risk Reduction 2015–30" identified "seven global targets", of which the first target is to "substantially reduce global disaster mortality by 2030". This research contributes to this emerging domain of knowledge by bringing gender disaggregated mortality data from 1999 to 2013 from an Indian state called Odisha. In doing so, this research brings three questions to the fore: first, why do deaths occur in disasters? This is answered by going beyond the traditional perspectives on risk and vulnerability to include a "complex perspective" developed from the theories of organization, violence, and justice. Second, who is responsible to reduce deaths and third, how deaths get recorded and reported? Based on a review of annual death reports, census data, and seven expert interviews, findings suggest that the current disaster management system in Odisha is not accountable and the death reporting and recording system merits change in order to be consistent with the Sendai's Goal to reduce deaths. This study posits that complex perspective has the potential to improve disaster management system by shifting the attention from "at risk" community to the actors and organizations' and to the necessary resources and measures that will be required to reduce deaths in resource poor contexts.

1. Introduction

Natural disasters (such as floods, cyclones, typhoons, heat waves, and lightning) have the potential to cause human loss and injury. The number of people affected by natural disasters is increasing every year, with a marked debilitating effect on developing countries as compared to developed countries (Coppola, 2011; DFID, 2013). During 1980–2000, 53% of the deaths due to disasters occurred in poor countries, although these countries accounted for only 11% of the world's "at-risk" population (Coppola, 2011). During 2000–04, "on an average annual basis one in 19 people living in the developing world was affected by a climate disaster" in comparison to "one in 1,500 affected" in the Organisation for Economic Co-operation and Development (OECD) countries—"a risk differential of 79" (UNDP, 2007, p. 76). It is estimated that by 2080 the number of additional people at risk of hunger due to disasters could reach up to 600 million (Hansen, 2007)—twice the number of people living in poverty in the Sub-Saharan Africa today. By 2050, "natural disasters could have a global cost of over $300 billion a year" (HPN, 2007) because global warming and climate change is likely to increase the frequency of abnormal weather events and disasters (Flatø, Muttarak, & Pelser, 2017). To tackle *these current and forthcoming challenges*, The United Nations' Sendai Framework for Disaster Risk Reduction 2015–30 (successor of the "Hyogo Framework for Action 2005–15") identified seven global targets, of which the first target is to: "Substantially reduce global disaster mortality by 2030" (UN, 2015, p. 12). This is welcome news because it will lead to new actions, funding, and research. It will also lead to systematic collection of mortality data at national and international levels, which is currently lacking. This research contributes to this emerging domain of knowledge by bringing mortality data from an Indian state called Odisha. Based on the collection and analysis of this data, this research identifies novel theoretical perspectives and practical measures that will be required to reduce deaths in resource-poor contexts.

2. Deaths and disaster perspectives

This section engages with one of the pertinent questions: why deaths occur in disasters. Although research that scrutinizes the causes for men and women's deaths in disasters is rather limited, it usually relies on one of two perspectives: traditional

https://doi.org/10.1016/j.worlddev.2017.10.003
0305-750X/

(or risk-based) and vulnerability (Kapur, 2010). Both perspectives are analytically different but in practice they are related. An additional "complex perspective" is also suggested to explain why deaths continue to occur. This complex perspective is built from the tenets of Sen's "theory of justice", violence and organizational theories. This additional perspective adds new layers of understanding to risk and vulnerability perspectives to understand the reasons for deaths, as well as identify measures to reduce them in resource-poor contexts.

(a). Traditional perspective

The traditional perspective is the most dominant and mainstream perspective. According to this perspective, natural hazards originate from natural systems and they can cause harm and loss. One way of mitigating the effect of nature is through technology or a "technical fix" (Ariyabandu & Wicramasinghe, 2003; Bryant, 2005; Ray-Bennett, 2009a; Wisner, Blaikie, Cannon, & Davis, 2004). This line of thinking was dominant in the UN's General Assembly Resolution 44/236, adopted on 22 December, 1989. Four out of five of its goals underlined the importance of the dissemination of technical information and the transfer of scientific and engineering knowledge for the mitigation of disasters in developing countries (Bankoff, 2001; de Senarclens, 1997). As a result, structural mitigation measures, such as building concrete houses, flood levies, ocean wave barriers, cyclone shelters, embankments, and dams, attained primary importance over non-structural mitigation measures, such as policies, laws, training, raising public awareness, and aid—among many *(Davis & Gupta, 1991; Haque & Zaman, 1994; Kaiser, Spiegel, Henderson, & Gerber, 2003; Thomson & Penning-Rowsell, 1994; Zaman, 1999)*. This technical perspective has evolved due to the mid-term evaluation of the International Decade for Natural Disaster Reduction (IDNDR) (1990–2000) in 1994 (known as Yokohama Strategy) followed by the Hyogo Framework for Action (2005–15) and most recently the Sendai Framework for Disaster Risk Reduction (2015–30) (UN, 2005; UN, 2015). Now there is widespread acknowledgment that hazards can include "latent conditions that may represent future threats and can have different origins: natural (geological, hydrometeorological and biological) or induced by human processes (environmental degradation and technological hazards)" (UNISDR, 2015a, p. 3/25).

Despite these changes, governmental organizations often use natural causes or the geophysics of a hazard to explain deaths in disasters. This is noted by Kapur (2010) while reviewing the effects of 16 natural hazards[1] on human deaths from 1977 to 2002 in India. Geophysics of a hazard can be understood in three ways: first, higher the intensity of a hazard, the more likely it is to kill people. Intensity is classified as moderate or severe for 11 hazards out of 16. Of the 11 hazards, cyclones had killed more people in India. Second, hazards are seasonal and so are human deaths. In India, the month of November is cyclone-prone, May is prone to gale and dust storms, April for hailstorms, June for lightning, and January and February for cold snaps. It was noted that 32% of cyclones occurred in the month of November and 36% of all deaths due to disasters were in this month. Third, the effect of hazard is spatially determined and so are the deaths due to disasters are spatially varied. India is diverse and different regions are exposed to different types of hazards. For instance, the coast of Bay of Bengal is exposed to severe cyclonic storms, whereas the north-west is exposed to droughts. Almost one half of all deaths in the Bay of Bengal were due to cyclones compared to the west coast of India (Kapur, 2010).

[1] The 16 natural hazards are: cloudburst, cold wave, drought, dust storm, earthquake, flash flood, gale, hailstorm, heat wave, lightning, snowfall, squall, thunderstorm (Kapur, 2010).

This perspective provides an excellent insight into the dynamics of geohazards and their effect on humans. As a result, national and international organizations are investing heavily to build the capacity of the experts and practitioners by embracing state-of-the-art technologies, such as space technology and multi-hazard early warning systems in order to promote effective disaster management system to reduce deaths (UNISDR, 2015b; WMO, 2017a). However, in the context of this research, this perspective explains little as to why more women die in disasters than men or vice versa.

(b). Vulnerability perspective

The vulnerability perspective, on the other hand, aims to explain why some people are more vulnerable to disasters than others. Vulnerability is often used in different ways (Bacon, Sundstrom, Stewart, & Beezer, 2017) but in this instance, it is understood as "*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* (an extreme natural event or process)" (original emphasis by Wisner *et al.*, 2004, p. 11). According to this perspective, the impacts of natural disasters are not entirely "natural", rather they are determined by people's unequal exposure to risks which are a consequence of the socio-economic systems (Cannon, 1994; Neumayer & Plümper, 2007). The significance of natural hazards as trigger-events is not denied by this perspective, but emphasis is placed on the various ways in which social and economic systems can render people more vulnerable to disasters (Cannon, 1994; IPCC, 2012; Varley, 1994; Winchester, 2000; Wisner *et al.*, 2004). In this perspective, the normal daily lives of some vulnerable groups are often difficult to distinguish from disaster conditions. Disasters only act as an interface between an extreme physical environment and a vulnerable group of the population, due to a "combination of hazards, conditions of vulnerability and insufficient capacity or measures to reduce the potential negative consequences of risk" (Sivakumar 2005, p. 2). According to this perspective, differences in mortality to natural disasters are explained due to biological vulnerability, social and cultural vulnerabilities (caste, race, gender, and age), economic vulnerability (class) and physical vulnerability (housing structures). These vulnerabilities are not distinct; they often are conjoined and reinforce each other during the time of disasters. This is evident in the discussion below.

Biological and physiological differences between men and women put women at higher risk during disasters (Neumayer & Plümper, 2007). Men in general are physically stronger than women and therefore they are likely to withstand the impact of a disaster better than women. For instance, a physically robust man has a better chance to swim or climb up a tree in order to survive against an emerging storm surge. However, biological and physiological differences may also be socially determined. Social and cultural norms related to role behavior put women more than men at a greater risk when it comes to rescue efforts (Neumayer & Plümper, 2007). Dress codes such as *saree* or *burqa* were found inhibiting women's mobility during the 1991 cyclone in Bangladesh. Learning to climb a tree or swimming are something that are socially not permissible in some societies. In Sri Lanka, a study conducted by Centre on the Epidemiology of Disaster (CRED) (2006; quoted in Eklund & Tellier, 2012) noted that only 12 to 20% of women were able to swim compared to 75 to 85% of men. In the response phase of a disaster, the lack of lifesaving skills along with the responsibility of looking after young children often put women at a greater risk to disasters (Eklund & Tellier, 2012; Neumayer & Plümper, 2007). A report by the WHO (2002) noted that although the Indian Ocean Tsunami in 2004 claimed 300,000 lives across 13 nations, 80% of this was women and children. The