Vulnerability and Capacity

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Abstract

While triggered by natural hazards, disasters are never "natural." The term "natural disaster" is current, universally used, but highly loaded and misleading. Disaster risk is a result of hazard events interacting with people who are prepared or unprepared and who have access to the resources to reduce risk or are deprived of such resources.

Keywords

Vulnerability • Capacity • Risk • Natural hazard

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Definition

Vulnerability can be defined 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" (Wisner et al. 2004, p. 11; Blaikie et al. 2006, p. 30). In its glossary of disaster risk reduction terminology, the UN defines vulnerability as "characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard" (UNISDR 2009). Sasakawa Laureate, Professor Omar Dario Cardona of Colombia, reminds us that "disaster only takes place when the losses exceed the capacity of the population to support or to resist them [and that] vulnerability cannot be defined or measured without reference to the capacity of a population to absorb, respond and recover from the impact of [an] event" (Cardona 2004, p. 43). He goes on to cite a large number of Latin American authors whose writings during the 1980s and 1990s converged on the notion that "vulnerability is socially constructed and is the result of economic, social and political processes" (*ibid*.).

Ordinary people know this. Why else would poor, marginalized Mayans have referred to the 1976 earthquake in Guatemala as a "class quake" (Blaikie et al. 1994, p. 6)? People's lives are understood by them at the experiential scale of "daily life" and the "quotidian." Depending on who one is and where one lives and makes a living, daily life presents numerous risks and opportunities. Seasonal flooding in Bangladesh is both risk and opportunity (Schmuck 2012), and for women in Nigeria the grasshoppers that eat cassava (an important root crop) are an opportunity to provide their children with high-protein snacks, while for men these grasshoppers are perceived as a risk to income (Richards 1985). Here we see the way that women, one of the social groups often regarded as vulnerable to hazards, find opportunity in crisis and why labelling people "vulnerable" without acknowledging their capacity for active response can be disempowering and patronizing.

Vulnerability and capacity are intimately bound up together in theory and in practice. Capacity can be defined as a set of perceptions (awareness, attitudes), varieties of knowledge and skill, and (of critical importance) access to resources that facilitate people's ability to anticipate, cope with, resist, and recover from hazard occurrences. Thus, capacity is determined by much more than standard survey measures such as level of education or, in fact, mere income or what is sometimes called "indigenous technological knowledge" or "tradition." Wisner distinguishes many kinds of local knowledge, including that passed on by elder generations, but go beyond answers to questions such as the When, Where, and How of hazard occurrence (Wisner 2011, p. 325). Besides such *technical knowledge* (the opportunistic mixing of traditional and modern), he discussed *social knowledge* that provides answers to the question, "Who is interested in addressing the hazard challenge?" and *critical knowledge* that is based on the question, "Why are we vulnerable and exposed to the hazard?"

On occasion, a variety of authors, planners, practitioners, and trainers have found it useful to schematize the relationship among risk (R), hazard (H), vulnerability (V), and capacity (C) as follows (Wisner et al. 2012, p. 24):

$$R = H \times (V/C).$$

Caveat

Vulnerability should certainly not be confused with physical exposure to a hazard. It is often the case that highly vulnerable groups live in locations and on sites exposed to hazards such as steep, deforested slopes, or flood plains. However, less vulnerable people (those with more capacity) living in the same site may have the ability to anticipate, cope with, resist, and recover far better. In New Orleans as Hurricane Katrina approached, people with private vehicles escaped, leaving tens of thousands of elderly, low-income African-Americans and Whites behind. There was no public transportation provided for evacuation (Wisner 2006a). Conflating vulnerability and exposure is a variation of an old theme, the "naturalness" of disaster, which has been attacked for the past 35 years as blaming nature or the victims for the result of social, economic, and political processes that put some people more at risk than others (O'Keefe et al. 1976; Westgate and O'Keefe 1976).

Causes

What are those social, economic, and political processes that result in differential vulnerability and capacity? How do those processes interact with environmental processes (ecology, geology, hydrology, climate, etc.)? Within limited space, an overview may be provided in three words: "marginalization" and "political ecology."

Marginalization

Access to resources for development and maintenance of capacity to cope with hazards is critical, as mentioned above. Many processes in society allocate access to resources among different groups and individuals: by caste, gender, or age; by socioeconomic class or inherited and presumptive "rights" to land, water, and pasture; and by the degree of participation in politics, voice, and the ability to enlist use of political power. As a result of these deeply rooted processes, the result is that some people are marginalized: they are caught in what Chambers (1983) once called the "deprivation trap." They inhabit lands of marginal productivity and dangerous locations (because they have no alternatives and not because they do not perceive the risk), live on economically marginal income (relative to prices), and have little political power or access to those who do (Blaikie and Brookfield 1987; Wisner et al. 2004; 2012). The combination of drought and conflict in Somalia resulted in suffering not

generically different from mass mortality and lifelong injury from the explosion of the Union Carbide factory in Bhopal, India, in 1984 (Hanna et al. 2005; Jasanoff 1994). In both cases, people sought locations and conducted livelihoods within the constraints of land prices and their access to other resources. They balanced safety and daily bread. Hardscrabble, working-class people lack locational and livelihood options, which keep them in harm's way – suffering the consequences of mountaintop removal by coal companies in Appalachia (http://mountainjustice.org/facts/steps.php) or unable to flee towns on the Ohio River or in the city of Chester (near Philadelphia) that are chronically polluted by airborne effluents from waste incinerators. They lack the political voice to get regulators to do something about the pollution (http://www.ejnet.org/chester/kurtz_article.html). Nizamabad district in eastern India has suffered many serious droughts. These have forced some women from poor farming households into the sex trade in the city of Hyderabad, an example of the complex spiral of negative impacts on the lives of women and other marginal groups in disasters (Paul 2012).

Political Ecology

The field of political ecology provides a way of framing the interactions of society, nature, and location at a range of scales, from the micro to the macro, within the context of the use and abuse of social, economic, and political power. Political ecology is the grandchild of an approach called human ecology which, from the 1920s onwards, sought to study how human civilization and activities shape the landscape and vice versa. The latter, however, was devoid of an interest in power relations and generally focused on localities (the micro scale) without taking into account what today is called globalization and then should have entered the analysis as the influence of distant decision-makers in colonial metropoles. For example, the Sahel famine in West Africa (1968–1973) was conventionally attributed to drought and population pressure on scarce resources in a naturally semiarid zone. However, the roots of this crisis go back to the introduction of groundnuts (peanuts) by the French colonial powers to have a cheap source of cooking oil for the working class back in France. Groundnut growing spread into zones once occupied by livestock herders. The herders were pushed further into drier areas. The result was catastrophic hunger for both small farmers and herders when the rains repeatedly failed (Franke and Chasin 1980). In the industrial country context, distant bankers and investors, commissars, and Soviet planners made decisions that resulted in twin dust bowls in their respective hinterlands: in the United States in the 1930s (Worster 2004) and in the USSR in the 1950s (Goudie and Middleton 2006, pp. 181–184).

Assessment

Many methods for assessment and measurement of disaster risk have been put forward during the 2000s, and that set of operational planning tools continues to

grow (Birkmann 2006). These range from regional-scale mapping at the global level (Dilley 2006) to a variety of top-down economic and engineering-based measures at the national scale (Cardona 2006) to local scale, participatory assessment in which the affected people themselves organize, map, discuss, plan, and act (Wisner 2006b) – often with facilitation by civil society organizations (Thompson 2012; McCall and Peters-Guarin 2012). The Global Disaster Alert and Coordination System (GDACS) lists 25 sets of tools that are currently being used for disaster risk assessment, including remote sensing, historical analysis, modelling, fault tree analysis, participatory mapping, and a variety of interview methods (GDACS 2012).

For example, in the Pacific, volcanologists have worked with local leaders and elders to map eruption and lahar hazards and to overlay these maps onto the mental maps provided by communities showing the time geography of daily life – where people are at different times of day, on different days of the week, and seasonally. Both top-down and bottom-up maps were then used by the residents to design a warning and evacuation plan (Jenkins and Haynes 2012, pp. 342–343).

The epistemological elephant in the room is whether one can "measure the un-measurable" (Birkmann and Wisner 2006). Some believe that vulnerability and capacity are sufficiently dynamic and situational that it is impossible to measure them accurately, at least in any meaning of the term "measurement" that would satisfy an engineer or social scientist oriented toward positivism (i.e., the framework that challenges social inquiry to be fully "scientific" on the model of the physical sciences). Others respond from a pragmatic point of view that planners and policy makers and, indeed, local communities themselves need at least surrogates or indices that provide comparable assessments over time and across space (comparing localities and regions). That compromise might, indeed, be the way forward (GNDR 2011).

Conclusion

Disasters are never "natural." There are always root causes to be found by using the tools of political ecology – crudely, "following the money," or less crudely, analyzing power relations at a variety of scales, from local to global. Vulnerability to hazards – both natural and technological (such as pollution) – is a function of the interaction of hazards, location (exposure), and capacity to anticipate and act to prevent, cope, and recover. Powerful, affluent elites in all societies would prefer to "blame nature" for events that cause great suffering among the poor and marginal with whom they share a territory. Despite having heard a crescendo of scholarly voices contesting the "naturalness" of disaster since the 1970s, it is possible that the discourse of climate change will provide elites with another opportunity to blame nature for disasters. Vigilance is needed to ensure that this does not happen.

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