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Earthquakes

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Introduction

Earthquakes are among the world's deadliest natural phenomena. As of 2015, some 2.7 billion people worldwide are at risk from seismic catastrophes (Pesaresi et al. 2017: 27); as many as 3 million people are expected to die in earthquakes by the end of this century (Holzer and Savage 2013). On an increasingly crowded Earth, earthquake risk management therefore should be taken seriously as a global policy problem. Thus, this chapter discusses some of the ethical dimensions of earthquakes as a phenomenon of planetary significance in the Anthropocene[2].

As a policy problem, earthquakes raise many ethical issues. For reasons of space, I will not attempt an exhaustive survey, but here I consider one background ethical issue: the kinds of harms that occur when an earthquake impacts human habitation. Here, we may distinguish three categories of human-related harms: personal harms, which accrue to individual humans; social harms, which impact on social relationships between humans; and institutional harms, which compromise the ability of institutions to respond to the quake.[3] Let me discuss each in turn.

1. Personal Harms

Personal harms accrue to individual citizens as a result of earthquake damage. They may be material or psychological. Material harms include those bodily harms such as death, injury and disability. They also include the deprivation of adequate food, water, clothing, supplies and shelter. These undermine citizens' ability to meet their basic human needs, such as subsistence and security (cf. Shue 1980). Furthermore, citizens also experience a loss of income through destroyed businesses and livelihoods, which further undermine their capacity to achieve a minimally decent standard of living.

Psychological harms include those associated with post-disaster trauma. A survey carried out four months after the 2015 Nepal earthquake found that a third of adults had shown symptoms

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[2] Though earthquakes may also occur due to manmade sources, naturally-triggered earthquakes from geological faults will be my primary concern in this chapter.

[3] There will also likely be environmental harms, which are those harms inflicted on the non-human world, but I won't consider those here.

of depression or increased anger and one in ten had experienced suicidal ideation (Kane et al. 2018). Individuals' loss of their sense of place and their consequent rootlessness, as beings with no fixed spatial location in the world, can also bring mental disorientation. Sociological studies of disasters underline the importance of repairing people's sense of place as part of the recovery process (e.g. Carroll et al. 2009; Chamlee-Wright and Storr 2009; Silver and Grek-Martin 2015; Winstanley et al. 2015). In this way, the destruction of an earthquake inflicts not only a physical but mental toll on those affected. Such mental costs also extend to those who have to live with the risk of an earthquake, *even if* the risk does not in fact materialize for them (cf. Nakayachi et al. 2015 on the Tohoku earthquake; cf. Jahn and Barrow 2015).

Moreover, the material and psychological harms inflicted by earthquakes do not affect all citizens equally, as disaster studies has long recognized. Vulnerability is spatially uneven, because of differences in building design, soil conditions, proximity to the fault, quantities of flammable materials, psychological preparedness and so on, which vary geographically (cf. Daniell et al. 2017). It is socially uneven, to the extent that it is affected by race, gender, ethnicity and class (Peacock et al. 1997; Cutter and Finch 2008; Bolin and Kurtz 2018). Certain groups such as children, the elderly and the disabled may be particularly vulnerable (Peek et al. 2018; Ngo 2001; Stough and Kelman 2018) and the poorest are often hardest-hit both materially and psychologically (Bolin and Stanford 1999: 92; Marks 2018: 349). Such an uneven distribution of vulnerability means that individuals in certain groups will suffer disproportionate harm.

2. Social Harms

Social harms accrue to interpersonal social relationships. There are at least three main ways in which such harms arise in earthquakes. First, stricken communities can experience temporary isolation from the rest of the country. Bridges may have collapsed, roads may be impassable and telecommunications lines may be out of action. This may seriously impede flows of supplies and information to the disaster area. Supplies flows are important for restoring basic needs such as food, water and shelter. Information flows are vital for a comprehensive assessment of the destruction and for deciding which groups and locations should be prioritized for assistance. This causes a social harm insofar as a chaotic relief effort can impede a community's ability to recover.

Second, there may be intra-community breakdown when earthquakes disrupt the web of social ties that enable citizens to relate to each other on terms of equal concern and respect. Our sociality as human beings is put under severe strain by disasters, which can lead to weeks or months of social isolation, breakdowns in trust, lawlessness, vandalism, looting and a degradation in community spirit. Many survivors move away permanently, never to return (see Morrow-Jones and Morrow-Jones 1991), which further hampers the ability of the stricken society to restore normality. When intra-community breakdown occurs, the resultant loss of social capital can impede effective disaster recovery (see Aldrich 2012). Earthquakes may also hinder victims' access to interpersonal contact - for example because communication lines are down or because citizens are physically isolated - and lead to some members of the polity being excluded from community membership and identification.

Following the 1923 Kanto earthquake in Japan for instance, false rumours of Korean subterfuge led to mass atrocities against the Korean minority (e.g. Allen 1996; Aldrich 2012: 14).

Finally, communities may suffer from ongoing uncertainty regarding the possibility of recovery. Standard models of community resilience portray disasters such as earthquakes as sudden 'ruptures' with well-defined exit paths (Wilson 2013: 213). This is evident for example in the *Oregon Resilience Plan* for major earthquakes, which depicts high resilience as a period of rapid readjustment and recovery and lower resilience as a slower, lengthier time taken to restore functioning (OSSPAC 2013: xv). Yet as the 2010-11 Christchurch experience shows, resilience may instead be "an *on-going* process of adjustment," with no clear indication as to whether the community may rapidly improve its standing, recover more slowly or simply wither away (Wilson 2013: 213-214; author's emphasis).

3. Institutional Harms

Another kind of harm from earthquakes is *institutional*. Major disasters often overload the capacities of local, regional and national institutions to respond effectively. Earthquakes therefore may be particularly harmful for the ways in which they expose the weaknesses embedded within the institutional system. These institutional failings undermine both the ability of communities to return to normal and citizens' trust in their leaders. If citizens and communities are not reassured that something is being done to help them, they may lose confidence in their institutions. Worse, they may end up taking matters into their own hands: for example, through mass looting, if institutions do not act quickly enough to restore norms of private property. Earthquakes, then, can under certain conditions lead to a crisis of political legitimacy.

Earthquakes damage institutions in three main ways. First, institutional capacity may be overwhelmed in the immediate and long-term aftermath, which compromises the institution's ability to respond successfully to the catastrophe. One way to think about disasters in this respect is as a time-compressed version of the normal process of capital depletion and replacement (Olshansky et al. 2012); thus, institutional damage occurs when this new reality engulfs the institution and devastates its responsive capacities. Furthermore, the institutional setup can itself pose a barrier to effective disaster response. A lack of timely coordination from an institutional standpoint is frequently a key failing in disaster response (Christensen et al. 2016).

Second, institutional functioning can be impeded when disasters allow authorities to circumvent democratic norms, as some have argued (e.g. Honig 2009). Because emergency powers can give the executive wider latitude than is normally permissible, the fear is then that such powers will be entrenched and eventually normalized; this is known as the *ratchet effect* (Kreuder-Sonnen 2019: 1). The COVID-19 pandemic may be a vivid illustration of this phenomenon, due to the sheer scale of the powers invoked to control the virus (Kavanagh and Singh 2020: 1007).

Finally, institutions can be harmed when they fail to learn the right lessons either in advance of an impending disaster or in the aftermath of one. There are two reasons for this. The first is *information failure*: for example, the significance of critical factors may not be fully recognized or the authorities may attempt to minimize the risk of a tragedy even in the face of explicit warning signs (Pidgeon and O'Leary 2000: 19-20; cf. Perrow 1999; cf. Vaughan 1986). The second is *depoliticization*: institutional regimes seek to shift blame in an attempt to reassert legitimacy. For instance, in the aftermath of the 2011 Bangkok floods, Thai leaders deflected responsibility by placing blame on external factors allegedly beyond their control, such as climate change. As a result, subsequent flood policy in Thailand focused on blocking and draining floodwater, which simply redistributed the risk rather than reducing the likelihood of future floods (Marks and Elinoff 2020). The failure to build the right lessons into the institutional culture, then, damages the institution's ability to function properly and so constitutes a harm.

Conclusion

Earthquakes are well-known for their deleterious effects on human societies. Consequently, they merit attention as an understudied policy problem of ethical concern. This chapter overviewed three kinds of harms that earthquakes inflict on human habitation: personal, social and institutional. This analysis will help us better appreciate the moral salience of earthquakes as a global policy imperative in the Anthropocene.

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Biography

Gah-Kai Leung is a PhD candidate in the Department of Politics and International Studies at the University of Warwick, UK. His research considers the ethical and political issues in earthquake/tsunami risk management, with an applied case study focusing on the Pacific Northwest USA and Canada. Gah-Kai has general interests in social and political philosophy, science and public policy, applied ethics and disaster risk reduction.