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Disasterizing Fukushima's Nuclear Disaster: Pedagogical Reflection on Anthropology of Disaster

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Introduction

I never thought I would teach a course on "Anthropology of Disaster" until I was forced by necessity to do so several years ago. It turned out to be a great pedagogical venue to introduce students to concepts and styles of thinking in cultural anthropology in general, and environmental and medical anthropology in particular. Diverse topics covered in anthropology of disaster (earthquakes (Oliver-Smith 1999b), tsunami (Klein 2007, Slater 2015), hurricane (Stonich 2008), chemical and nuclear contamination (Hay 2009, Shkilnyk 1985, Dahlberg 2012, Ishiyama 2008), pandemic (Lakoff 2017), oil spillage (Button 1999), etc.) offered enough variety for each student to find something they are interested. But above all, the accessible nature of many of the academic articles in this field was especially helpful in teaching Global Discovery Program (GDP) students which consist of a mixture of international and Japanese students with varying level of English. I provided the students with reading guide questions prior to the class, and the students were able to do the reading, write reading summaries, and discuss their contents in class.

Conceptually, students typically responded well to the discussions about Arnold van Gennep's notion (later adapted by Victor Turner (1969)) of *liminality* and *communitas* applied to the analysis of post-disaster period (Oliver-Smith 1999b). The readings on the "state of emergency" and technocratic management of post-disaster reconstruction (in particular, through the notion of "disaster capitalism") have led to heated discussions about the pros-and-cons of disaster aid. Coupled with the discussion on *media framing,* this set of readings (e.g. Button 1999, Klein 2007, Stonich 2008) allowed me to introduce the idea of *constructed* nature of "disaster" and its consequences. Meanwhile, texts taking political economic approach to disaster *vulnerability* (Oliver-Smith 1999a) and the notion of *environmental justice* (Ishiyama 2008) were able to draw students' attention to how historically constructed inequality affects the distribution of damages in the context of natural disasters. The case studies of toxic disasters in which toxic spillage expose the population to toxic substances without drawing much attention until it suddenly comes under media spotlight became an occasion to discuss the continuity between disaster and everyday. By shifting our gaze back and forth between continuity and discontinuity of disaster with everyday reality, my aim in teaching this course was to sensitize the students to the potential of "disasters" for social changes and its possible appropriation by those in power, as well as to the presence of everyday sufferings that tend to be regarded as mundane, unfortunate but inevitable, sources of human suffering.

What was missing in this discussion was the role of scientific knowledge in mediating the process through which a calamitous phenomenon is recognized as a disaster. While there are many anthropological and sociological studies that focus on the topic of toxic disasters and their relation to scientific knowledge (e.g. Brown and McCormic 2006, Wynne 1989, Petryna 2002), they tend to be too difficult to be assigned in an introductory level course because of their reliance on the theories developed in science and technology studies. Present essay is my attempt to provide a teaching resource to help students think about the role of scientific knowledge and its production and concealment in the making and unmaking of disasters. For this purpose, I have selected a familiar example of the nuclear disaster in Fukushima in 2011.

TEPCO Nuclear Disaster in Fukushima

"Tokyo Olympic/Paralympic of this summer will be an opportunity to broadcast to the world the proof of humanity's victory over COVID-19 and our recovery from the Tohoku Disaster."[1] This was the statement prime minister Yoshihide Suga made in January 18, 2021. The Olympic game started on July 23, 2021 certainly before humanity's victory over COVID-19 pandemic, and whether Tohoku has recovered from the disaster in 2011 is still up to debate even now.

Tohoku's "triple disaster" (so called due to the tsunami and the nuclear disaster that followed the initial earthquake) has been a highly divisive issue in Japan. Nuclear disaster, in particular, seemed to have created a division among its populous between those who emphasized the "back to the ordinary" and those who refused to forget the invisible presence of radioactive contamination from the now defunct nuclear power plant of Tokyo Electric Power Company (TEPCO) in Fukushima.[2]

The divergent views on the radiation risk have given rise to many issues. For example, anthropologist Yoko Ikeda (2013) and sociologist Rika Morioka (2013) report on family breakdowns and social conflicts due to different perceptions of risk of radiation contamination of food and living locations. Such bifurcation in worldview—between those who believe in the menace posed by radioactive materials and those who accept them as benign matter of fact—has led to a division in the view on disaster itself (*whether* it is over or not, or *when* one can say that the disaster is over).

The *reality* of nuclear disaster has been shrouded in uncertainty from the beginning. When and how the meltdown of the reactor occurred, radioactive particles released, to where and to what extent they have spread, posing what threats, causing what damage, and so on have all been contested as the catastrophe unraveled (*Tokyo Shinbun* 2012). All these questions involved, to some extent, what Stefan Boschen and his colleagues (2010) have called "nonknowledge," or lack

[1] https://www.tokyo-np.co.jp/article/80572 accessed July 26, 2021.

[2] https://www.sankei.com/article/20210505-L2SWGF4EOZM6VORPYTHR7LWSRA/ accessed July 26, 2021.

of knowledge which is willfully or inadvertently generated, acknowledged and communicated. In this paper, I discuss some of the sources of nonknowledge that have led to the blurring of the reality of the nuclear disaster on the one hand, and the works of citizen-scientists to fill this gap of knowledge and "disasterize" (or invoke the sense of urgency to mitigate the situation) the precarity in which they feel they live.

Why "disaster"?

Anthropologists of disasters have noted that disasters can bring out the worst and the best of people (Hoffman 1999). Anthony Oliver-Smith (1999b), for example, reported on the inordinate sense of camaraderie and the acts of self-sacrifice observed in the immediate aftermath of the Peruvian earthquake of 1970. But the same kind of disasters can also lead to self-centered actions for personal survival or even hysteric xenophobia and violence as seen in the Japanese violence against resident Koreans in 1923 Kanto earthquake. Disasters lift us out of ordinary life, creating a kind of "vacuum" in ordinary social norms (or "liminality" in anthropologists' language (Turner 1969)). Sometimes, the existential challenge posed by the enormity of the catastrophe and the shared experience of such liminality occasion self-reflection and generate new self-awareness, which can lead to permanent transformation of the social structures and social norms (e.g. Hay 2003). Meanwhile, the "vacuum" produced by the destructive forces of natural disasters like hurricanes and tsunamis can also be "capitalized" by corporate interests and Republican politicians for radical neoliberal policy reform and economic development (Journalist Naomi Klein (2007) has called such practice "disaster capitalism"). What this literature suggests is that once a "disaster" is recognized as such, it *produces* many *effects* at individual level, collective level, as well as at policy, institutional, and infrastructural level.

It was precisely this potentiality of "disaster-effects" that made the 2011 triple disaster in Japan a highly politically charged subject. For many Japanese, the nuclear disaster at TEPCO's Fukushima Daiichi Nuclear Power Plant (hereafter "TEPCO nuclear disaster"), in particular, was an existential moment. People spoke of the "collapse of *anzen shinwa* (safety myth)" of the nuclear industry and the loss of trust in the government. It also occasioned an emergence of new forms of civic activism in Japan. Anti-nuclear movement, which had been largely limited to left-wing social movements until then, was now joined by people of many different political inclinations.[3] Thousands took to the streets to demonstrate against nuclear industry and the government. All these disaster-effects went against the national policy and the interests of economic elites. How such "disaster-effects" are cultivated, resisted, or tamed are subject to political struggles, and depend on the *knowledge* that characterizes the disaster itself.

[3] I also participated in several demonstrations in 2012-13 and encountered various types of leftist groups as well as people professed no particular political inclination.

Nuclear industry in general are often shrouded in misinformation and secrecies. Because the technologies and the secondary products of nuclear power generation are translatable to nuclear weapons development, throughout its history, the information on nuclear power, including its health effects, have been tightly guarded (Kimura and Takahashi 2016). This long history of secrecy has contributed to the culture of secrecy surrounding nuclear disasters as well.

Adriana Petryna (2002: 39), who conducted research in post-Chernobyl Ukraine, argued that the production of "non-knowledge" was crucial in managing the exposed populations and taming the situation in the aftermath of the nuclear disaster in Chernobyl. Non-knowledge is not just the absence of knowledge, but an absence of knowledge that is expected to be there in a given context (Boschen et al. 2010). Some types of nonknowledge are produced inadvertently due for example to the malfunctioning of infrastructure to monitor contamination levels. Some nonknowledge is created by willful concealment of information, willful dissemination of scientific discourse that emphasizes the uncertainty of scientific knowledge (e.g. David Michael's (2004) "manufactured uncertainty"), and willful neglect of gathering critical information such as the chemical or radioactive dosage in exposed population (Petryna 2002, Hino 2013). In the context of a nuclear disaster, such production of nonknowledge played a large role in casting doubt on the *reality of the disaster* itself, throwing into question the legitimacy of the disaster-effects in the process.

Disaster and Non-knowledge

Journalistic reconstruction of the events at TEPCO's Fukushima Daiichi Nuclear Power Plant by *Tokyo Shinbun* (2012) offers an insight into the construction of *nonknowledge*. Some of these are produced inadvertently by the circumstance of the disaster. At the nuclear power plant itself, the loss of electricity (including all the backups) due to the tsunami and the high level of radiation within the facility made it impossible to grasp what was happening in the reactors in real-time. The destruction of communication infrastructure by the tsunami and the earthquake also hindered the transmission of information. There were also willfully produced nonknowledge. Government spokespersons and TEPCO representatives delayed public announcement of already known information and downplayed the severity of the situation in the name of avoiding panic among the populous (Kaido et al. 2015). The lack of coordination between government agencies and Ministries also prevented crucial information like the spread of the radioactive fallouts (e.g. SPEEDI incident) from reaching the decision-makers as well as the public in timely manner (Morita, Blok, and Kimura 2013). All these delays exacerbated the uncertainty of the situation and contributed to the suspicions of the information issuing from the authority.

One of the most contentious issues was the characterization of the radioactive contamination and its health effects. The radioactive particles released in the explosion spread throughout eastern Japan, even reaching as far as Gunma, Saitama, Tokyo and Chiba prefectures. Extremely high level of radiation (3 million becquerel of radioactive Cesium) was measured in areas

northwest of the nuclear power plant up to 40 kilometers (*Tokyo Shinbun* 2012: 151). While this level was high even in comparison to Chernobyl nuclear disaster, the so called *goyogakusha* (scientists patronized by the government) continued to claim that the level of the exposure outside the emergency evacuation zones do not pose immediate health hazards. Epidemiologist Toshihide Tsuda (2017) argues that much of this view was based on studies that were taken out of context.[4]

Another source of nonknowledge was the willful neglect of gathering crucial information like radiation exposure data and contamination of food. For example, the suggestion to collect fallen baby teeth, which could later be used as an exposure data for Strontium 90, was resisted by the public servant involved in Fukushima's prefectural health survey (Kimura and Takahashi 2015: 140-143). Such manufactured ignorance would eventually lead to uncertainty of epidemiological findings, making it difficult to know the true extent of this nuclear disaster.

What emerged within this context of official production of nonknowledge was a form of civic activism that focused on technical measurements of radioactive contamination. Anthropologist Aya Kimura (2015) calls such practice "citizens science."

Citizen-Scientists

For several decades, science studies scholars have been documenting regular citizens' involvement in the effort to generate knowledge about toxic contaminations and their health effects. Some studies have explored what sociologist Phil Brown (1987) has called "popular epidemiology" wherein citizens gather health information of the exposed population in the effort to identify the effects of toxic contamination (Brown and McCormick 2006). Others have discussed how local citizens challenge scientists' characterization of the contamination (e.g. Wynn 1989, Satterfield 2003, Gill 2015). Government scientists tend to use grids or concentric zoning based on the distance from the source of the contamination to monitor and characterize the pattern of contamination. By drawing attention to more fine-grained topography and their experiential knowledge of the flow of contaminated material, local citizens have intervened in the scientists' work, demanding more complex sampling methods.

In the aftermath of the TEPCO nuclear disaster, citizen-scientists focused on the measurement of ambient radiation (Morita, Blok, and Kimura 2013, Kera et al 2013) and radioactive material in food (Kimura 2016). The irregular pattern of nuclear fallouts from the radioactive plumes occasionally led to the creation "hotspots" where extremely high level of contamination was found in unexpected locations (*Tokyo Shinbun* 2012: 153). This meant that

[4] This claim is usually backed by the argument that "radiation dosage below 100 mSv does not pose risk of cancer, or if it does, it will not be detectable" (Tsuda 2017). According to historian Hiroko Takahashi, this 100 mSv threshold theory originally came from the study conducted by Atomic Bomb Casualty Commissions (ABCC) on Hiroshima and Nagasaki in the context in which exposure data was not available and the effects of nuclear fallout was outright rejected (Kimura and Takahashi 2015). Epidemiologist Toshihide Tsuda (2017: 19) also argues that this 100 mSv threshold theory has been refuted by many studies on low dosage exposure studies.

spot checks of radiation level may not be accurate enough to protect the people. Changes in the government standards of tolerable dosage from environmental exposure and in food also led to suspicions. Some of these citizens purchased pocket Geiger counters and even uploaded the result online to collectively create radiation distribution maps (Morita, Block, and Kimura 2013). Others organized what Kimura (2016) calls "citizen radiation-measuring organizations" (CRMOs) where people can bring in food items to be measured. Many of these individuals had no previous experience with science or political activism, but became involved through their concerns for the safety of their family. There was a momentary hope that the spread of these citizen science practices would rejuvenate political activism in Japan, and challenge the power of the political and economic elites. The reality, however, turned out differently. Many of these citizen scientists failed to become a significant force in antinuclear movement, and in fact "diverted the momentum away from radical politics" (Ibid.: 2).

In the aftermath of the triple disaster in Tohoku, Japanese media emphasized pervasive sense of sympathy and solidarity with the survivors. Ironically, this atmosphere of solidarity (reminiscent of what Oliver-Smith (1999b) called "brotherhood of pain") was later exploited by the government-led "Eat to Support" campaign. Dubbed *fuhyo-higai*, or "harmful rumor," prefectures surrounding Fukushima were described as suffering from a false risk perception, which tainted their image. One of the ways Japanese citizens can support the people in Tohoku, it was said, was to eat agricultural and fishery products from Tohoku—as if to say that people of Tohoku were suffering, not from the radiation, but from false beliefs. This idea of *fuhyo-higai* moralized individual citizens' risk perception and created a dichotomy among the citizens between those who feel that they are at risk of radiation poisoning, and those who do not perceive that risk. According to Kimura (2015), especially women, who were seen to be particularly worried about the risk of radiation were called "radiation brain" (放射脳) and attacked as irrational and unscientific women. In such a context, women involved in CRMOs emphasized science and distanced themselves from politics (ibid.: 24-5).

However, one may also see these citizen-scientists as engaging in a politics "by other means" (cf. Latour 1983, Mol 1999). A disaster is never a single event, but involves a cascade of events and consequences that produce human suffering. While initial event such as the earthquake, tsunami, or an explosion maybe obvious to all, in a toxic disaster such as the TEPCO nuclear disaster, the reality of the radioactive materials and the harm caused by them are not directly perceptible by our sensory organs. Science and technology in this context are crucial in rendering the presence of the potential threat of radiation real, and thus the matter of political concern. By individually providing services that measure radiation in the environment and in food, these CRMOs constitute an infrastructure that can turn invisible radioactive contamination into tangible data, thereby making their presence real and remain in the social realm of the problems to be addressed.

Conclusion

In teaching anthropology of disaster, one of the first myths that needed to be debunked has been the common perception that what we call a "disaster" is obvious. A short initial exercise getting students to raise the examples of what they think to be a disaster has been sufficient to disturb this assumption. However, students tended to think that this variation comes from different definitions of what "disaster" means. The discussion of media representations of calamitous events (as a disaster or not) helped students understand the constructed nature of disaster representation. The political consequences of disaster declaration got students incensed about mixing politics in the matter of humanitarian concern such as disaster aid and post-disaster reconstruction. The present essay, I hope, offers an example in which the recognition of a "disaster" is political at a more fundamental level.

Especially in a "disaster" involving toxic contamination, the political struggle over accountability and mitigation often occurs at the level of its *reality* (*Is there really a toxic contamination to be concerned about? How severe is the contamination? When can we say that the contamination level is low enough to be no longer a matter of concern?*). The attention to the struggles over the production of knowledge and nonknowledge regarding such reality, I hope, will help the students in thinking about how the science and technology is involved in the process through which a disaster *becomes* recognized and compels a response.

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