Alternate Constructions of Damage: Frictional Design and Disaster Impact Assessment in Post-Earthquake Nepal

Robert Soden

University of Colorado, Boulder
Boulder, Colorado 80302, US
robert.soden@colorado.edu

Nama Budhathoki

Kathmandu Living Labs
Kathmandu, Nepal
nama.budhathoki@gmail.com

Abstract

Following every disaster, governments and other formal emergency responders conduct disaster impact assessments to guide relief and recovery efforts. The data gathered during such assessments is used to construct shared understandings of the disaster and the damage caused to affected areas. Yet such assessments are often reductive and disabling, in that they prioritize information needs of formal, bureaucratic response over informal, community responses and they constrain portrayals of impact only to what is measurable during a typically short window of time following a disaster event. Drawing upon the concept of friction, our research seeks to develop new techniques for assessing impact in post-earthquake Nepal.

Author Keywords

Crisis Informatics; Disasters; GIS; Infrastructure; Mapping, Maps;

ACM Classification Keywords

H.5.3. Groups & Organization Interfaces—collaborative computing, computer-supported cooperative work; K.4.2. Social Issues

Introduction

On April 25, 2015, a major earthquake struck central Nepal, devastating many rural villages and triggering landslides around the country. During the earthquake and ensuing aftershocks, over 9,000 people were killed and over 1 million rendered homeless. The disaster triggered major humanitarian response from the Government of Nepal, international organizations and, importantly, local civil society groups, both established and emergent. Following the immediate search and rescue activities, response and relief agencies worked hard to provide relief shelter, quickly re-establish schools and/or temporary learning centers, and deliver medical services to affected areas. Alongside, informal organizations and voluntary groups played a crucial role in creating, analyzing and provisioning information to both victims as well as response and relief agencies.

Problematic Discourses of Damage and Risk

The official response and recovery efforts happening in Nepal are guided by a series of damage assessments conducted by the Nepali government and various international organizations. These assessments seek to quantify the impact of the earthquake on the population and built environment of the affected areas and identify at-risk locations. Trained assessors from the outside the community record detailed engineering data on the condition and level of damage faced by private houses and public buildings along with comprehensive demographic data of the residents. The data collected is used to determine eligibility for government reconstruction assistance, guide overall rebuilding strategies, and channel relief funding and materials.

Disaster impact assessments are imbricated within a wider societal discourse about damage and risk. This discourse has been called into question on a number of fronts relevant to our research. William Boyd has documented how analytical and technical advances led to a predominance of risk thinking in environmental planning and management. He writes:

> It is hard not to follow Max Weber and embrace a deep ambivalence about these developments. In the seemingly relentless march of disenchantment, in the never-ending quest for calculability, it is clear that something important *was* lost as the strong precautionary impulse of earlier years was subsumed by more formal approaches to risk and embedded within increasingly elaborate bureaucratic routines and expert systems. [5:905]

Other critiques of this approach to understanding disasters attack the underlying premise that disaster risk itself is an objective and scientifically knowable phenomena[3,4,9]. This stance argues that the determination of what phenomena are considered risky as well as the socially acceptable costs of mitigating these risks is ultimately a political, rather than a scientific decision. In the words of Stephen Bocking, "When societal problems are defined as technical, the view of science as objective and free of particular political values rules out political change as an option, thereby disallowing alternative political visions. Alternative ideas about the relations between humans and other species, or about economic systems, or democracy, are excluded. [4]."

Activist research conducted by members of the Occupy movement following Hurricane Sandy looked at the

ways in which both the kinds of data collected as well as the manner in which organizations gathered it produced markedly different representations of the disaster. In particular, "Data collection and representational practices that emphasize sensational or epsiodic moments of destruction rather than the structural conditions that facilitate particular patterns of devastation [7]." Such processes are designed to support the needs of wider bureaucratic processes around recovery and reconstruction, which may have different priorities or come into conflict with community-driven progress towards disaster recovery.

Frictional Design

One of the problems of damage assessments in regards to their relationship to participatory decision-making is that they represent a kind of closure in the knowledge politics surrounding the ways in which we understand the impacts of disaster. In constructivist approaches to Science and Technology Studies, closure occurs "when a consensus emerges that the "truth" has been winnowed from the various interpretations [2:11]." Prior to closure, scientific and technical debate can be characterized by wide-ranging discussion that allows for competing approaches and novel ideas. In the case of disaster impact assessments, these discussions could provide the opportunity for a plurality of voices and deliberation between members of the community and other stakeholders to develop richer narratives of disaster risk and disaster, and more inclusive approaches to recovery and reconstruction.

To help think through alternatives to this problematic closure, we point towards Korn and Voida's use of the concept of *frictional design*. In their work on technologies for civic engagement, they offer a critique of e-government and other strategies aimed at producing smoother, more efficient relations between citizens and their governments. Instead, they argue that challenges and inefficiencies in this relationship can create important sites of struggle and conflict that help raise issues that might otherwise be invisible. They write:

> In the infrastructuring of civic engagement, we believe that frictional design can help to expose diverging values embedded in infrastructure or values that have been left aside during its design. We also contend that frictional design can help to provoke people not only to take up more active roles in their communities but to question conventional norms and values about what it means to be a citizen, as well. [6:2]

Here we can see friction as one potential antidote to closure, and that through introduction of frictional design into the design of information infrastructure that supports the creation and flows of flood knowledge, we might help highlight the non-identity of risk science and support more community engagement with damage assessment. Korn and Voida provide four guidelines for designers seeking to encourage friction:

1. Designs for friction take a position or a stance. They are not neutral;
2. Designs for friction want to cause trouble. They do not want to help you; rather, they place little obstacles in your way;
3. Designs for friction are naive and inferior. They are not intelligent; designs for friction are not absolute.
4. They acknowledge that although change is

desirable, it still lies in the hands of individuals with agency [6:10]."

New Strategies for Damage Assessment

Friction here can be seen as the antidote to problematic closure. A disaster impact assessment designed for friction would be designed to involve new actors, expose uncertainties and assumptions in ways that spark deliberation and debate. Citizen science projects, public design charrettes, community mapping, and collaborative artworks that invite participants to explore and ask questions could all be part of the a community-based impact assessment designed with friction in mind. Such assessments may be used to counter or supplement traditional approaches but will emphasize community participation over the production of usable data. The most important product of the process may not in fact be the assessment itself but the deliberation and inter-subjectivity that takes place between active and engaged publics involved [7].

Our research builds upon a multi-year collaboration between the University of Colorado and a non-profit technology organization in Nepal called Kathmandu Living Labs [8] to explore opportunities in post-earthquake Nepal for new approaches to conducting disaster impact assessment that enable new understandings of the relationships between natural hazards and longer views of both disaster vulnerability and impact. Through this work we expect to further highlight the limitations of current disaster impact assessment practices, explore the linkages between data and representations of disaster damage and risk, and contribute to the body of literature on frictional design and public engagement with science and technology. We welcome collaboration from those working on related issues in Nepal or elsewhere around the world. We are particularly interested in learning from colleagues with expertise in participatory design, citizen science, and connecting art and science.

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