Preemptive design saving cities

March 9 2015, by Laurie Everett

Miho Mazereeuw designs a plan to guard against floods, earthquakes, tsunamis, and typhoons. Credit: Len Rubenstein

Miho Mazereeuw is the founder of the Urban Risk Lab. She designs buildings and cities in anticipation of disasters. "Working in a field that has traditionally been the domain of emergency managers and engineers, we bring preemptive design and community engagement into the risk-reduction equation," she says.

An architect, landscape architect, and assistant professor of architecture

and urbanism, Mazereeuw's lab has a rapidly growing list of projects across the globe. Current projects take her to Haiti, India, Peru, and Japan—all sites vulnerable to earthquakes and floods. In Haiti, she and her research partners developed a framework for hurricane evacuation, working with the Department of Civil Protection and the World Bank. Considering the vast differences in terrain and levels of urbanization, the team developed nine strategies, with prototypes for coastal, valley, and mountainous areas.

In India, she is embarking on a two-year project in Odisha, a state on the east coast that is hit frequently by cyclones and floods. Working with a team that includes material science systems engineers and logistics experts, Mazereeuw is helping plan a large industrial corridor and the housing needs that will come with large-scale development, preemptively building disaster planning into the process.

Her work recently brought her to the White House for a discussion on [disaster response](#) and recovery, which focused on the most effective uses of technology to better prepare communities for a disaster.

Half Japanese and half Dutch, Mazereeuw has roots in two countries that have dealt with floods, earthquakes, and typhoons. "Ever since I was back in Kobe, Japan, volunteering in the aftermath of the [earthquake](#) in 1995, I've been researching how the city can be designed better to prepare for such events. Urban developers focus on livability and economic vitality, but risk factors rarely come into that dialogue."

Initiating a community dialogue, in fact, is the center of Mazereeuw's approach. In San Francisco, a U.S. city most associated with earthquakes and anticipation of "the big one," Mazereeuw works with the Neighborhood Empowerment Network, tapping into one community at a time to engage people in disaster planning. It's a six-step process, and by the end, she says, the community has its own plan to make its social and

physical environment more resilient and is prepared for earthquakes, floods, and heat waves. This model goes beyond an individualistic approach to disaster planning—from "I've got my water, my food, and my batteries"—to community-based awareness, concern, and planning.

And that awareness can be used to recognize existing community assets. A park with a spray pool may not look like part of a disaster plan, until you consider the water tank beneath it. That water may become vital to putting out a fire when other systems are impaired. We need to look at our schools, churches, parks, and everyday public places though that lens. "It is important to recognize the dual purpose of many community features, and better yet, when planning an urban environment, build in dual purposes preemptively," she says.

"We define risk as the hazard times the vulnerability divided by the coping capacity. The hazard is about the probability, location, frequency, and magnitude of an earthquake happening." How vulnerable, she asks, are the people? "How can the community's resilience change the outcome? We have little control over the hazard, but we have great control over the living part—where we live, how we plan, and how we build and structure our cities."

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