

App tracks risks, ranks hazards of nearby earthquake faults

David Perlman, San Francisco Chronicle, 11-25-15

After tracking earthquake hazards around the world for 30 years, geophysicist Ross Stein and his wife volunteered to help build a school in a remote Kenyan village last year that would also serve as the community's town hall, bazaar and grain storehouse.

"The 700 people there had nothing — no shoes, no roads, scarce livestock, almost no water, and too little food," Stein recalled, "but to my surprise, most of them had cell phones with solar rechargers because all financial transactions there took place through their phone apps — you buy or sell a cow with a phone, not cash. It's safe and certain."

Stein had just retired from the U.S. Geological Survey in Menlo Park, and he saw to his horror that the school was being constructed in the traditional Kenyan way — "with heavy volcanic blocks and a smear of concrete," he recalled, "and it was located right next to an active fault which would harm or even kill children in a quake."

No one in the village knew the fault was there, nor did the nonprofit agency that sponsored the school.

"So I decided to move fast," Stein said. He created a mobile app that the villagers could use, and that could also work in California and around the world.

His mobile app is called Temblor. It's free, and it's up and running. It is designed to help people who are unaware about the precise seismic environment where they live, Stein said.

Public unaware

Even in America, Stein said, neither his colleagues in earthquake research nor the varied state and federal agencies that deal with quake hazards have adequately communicated seismic risks to the public.

Masses of that seismic information are available in America in government data, in fault maps, land-use maps and quake records, he said, and it's all free. But putting those maps and records together, and applying them to a local homesite is almost impossible, Stein said.

"We haven't explained to people in terms they can understand where the seismic risks are high so they can see that they have decisions to make to preserve themselves and their families," he said. "Most people don't know whether active earthquake faults are anywhere near where they live or where they're planning to live.

"They don't know whether low-lying property could be subject to liquefaction in an earthquake, or if shaking from a strong quake could trigger a landslide in area around a hillside homesite."

Stein had already begun designing his high-tech tool with a former colleague at the Geological Survey, a Turkish-born specialist in seismic stress named Volkan Sevilgen.

The Temblor system links layers of the existing government earthquake data directly to a user and ranks the "seismic hazard" of any precise location compared with areas nearby. It estimates the risk of quake damage to a specific structure based on nearby faults, past quakes in the area, and even the soil type at a building's location.

Specific information

With input from a user, Temblor can estimate the risk of quake damage to an individual building, and, in developed nations like the U.S. compare the typical costs of repairing or retrofitting with current costs of available quake insurance.

“People living in high seismic hazard areas are most often unaware of those hazards, but now they can know it, and they can do something about it,” Stein said.