Hazard Resilience Index (HRI)

Earthquakes, Tsunamis, and Volcanoes

Earthquakes
Tsunamis
Volcano-Ash Falls, Projectiles and Lateral Blasts, Pyroclastic Flows and Lava Flows

Earthquakes, Tsunamis and Volcanoes

Please refer to the *Hazard Resilience Index Instructions (HRI)* document for more information on using this document.

In order to avoid repetition, resiliency factors which only apply to human-caused hazards are in italics.

Since many of the specific earthquake hazards have similar mitigation strategies, they have also been combined.

Earthquakes – General, ground failure, surface faulting, tectonic deformation – Natural and Human-Caused

Hazard Resilience Rating	High Resilience ☐	Low Resilience ☐	Need More Info ☐	Not Applicable ☐

Yes	No	Need More Info	Not Applicable	FACTORS	This is important to my community
☐	☐	☐	☐	Community-based earthquake exercises have taken place in the community-at-large (e.g., table-top or full-scale exercises)	☐
☐	☐	☐	☐	*Dam operators carefully monitor water levels in large dams.*	☐
☐	☐	☐	☐	*Quarry operators carefully monitor large scale excavations.*	☐
☐	☐	☐	☐	*Legislation regulates and monitors deep fluid injection (fracking) in oil and gas drilling sites and the storage and disposal of nuclear wastes*	☐

☐	☐	☐	☐	Businesses have secured to the wall all office furniture that might fall onto individuals and have established earthquake evacuation and preparedness plans.	☐
☐	☐	☐	☐	Most residences in the community are typical stick-frame buildings with vertical shear walls and are anchored to a proper foundation.	☐
☐	☐	☐	☐	Most residents have placed large or heavy objects on lower shelves and store breakable items in low or closed cupboards with latches.	☐
☐	☐	☐	☐	Residents have secured to the wall all furniture that might fall onto individuals and have established home-based earthquake evacuation and preparedness plans.	☐
☐	☐	☐	☐	The community actively promotes businesses, residents and school children to take part annually in “The Shake-Out Earthquake Exercise” or other similar exercise.	☐
☐	☐	☐	☐	The community has a retrofit regulation that requires all buildings that are being significantly retrofitted to be seismically upgraded if they do not meet current earthquake standards.	☐
☐	☐	☐	☐	The community has access to municipal and regional earthquake hazard (including fault lines) and soil zonation maps	☐
☐	☐	☐	☐	The community has an inventory of public structures and buildings that do not meet current seismic codes that is regularly updated.	☐
☐	☐	☐	☐	The community has designated seismically safe buildings with access to resources like potable water and back-up electricity, and large enough to act as emergency shelters.	☐
☐	☐	☐	☐	The community has educated residents and school children regarding earthquake risks in the community through public awareness campaigns.	☐
☐	☐	☐	☐	The community has regulations in place to prevent construction across known fault lines (areas of earthquake vulnerability).	☐
☐	☐	☐	☐	The community has regulations in place to prevent building on soils subject to loss of soil strength and stiffness (e.g., reclaimed land and old river beds) without having adequate engineering plans in place to address the deficiency.	☐
☐	☐	☐	☐	The community has seismically upgraded all schools and other public buildings that do not meet current earthquake standards.	☐
☐	☐	☐	☐	There is an earthquake response plan in place that directs emergency response personnel, as well as Search and Rescue (SAR) volunteers, to those areas most likely to suffer major structural damage post-earthquake.	☐
☐	☐	☐	☐	The community has in place a means to discuss earthquakes with Traditional Knowledge holders about warning systems and effective responses.	☐

Tsunamis

Hazard Resilience Rating	High Resilience ☐	Low Resilience ☐	Need More Info ☐	Not Applicable ☐

Yes	No	Need More Info	Not Applicable	FACTORS	This is important to my community
☐	☐	☐	☐	Community-based tsunami exercises have taken place in the community-at-large (e.g., table-top or full-scale exercises)	☐
☐	☐	☐	☐	Plans are in place to develop and preserve coastal forests which act as protection against tsunamis.	☐
☐	☐	☐	☐	The community has access to tsunami hazard zonation maps and shared them with the community.	☐
☐	☐	☐	☐	The community has clearly marked tsunami risk areas and evacuation routes with visible signage.	☐
☐	☐	☐	☐	The community has designated tsunami safe buildings as temporary evacuation facilities and plans/partnerships to enable the evacuation to more shelters when appropriate after the tsunami.	☐
☐	☐	☐	☐	The community has educated residents and school children regarding tsunamis risks and evacuation routes in the community through public awareness campaigns.	☐
☐	☐	☐	☐	The community has regulations in place to prohibit new construction or rebuilding in tsunami hazard areas.	☐
☐	☐	☐	☐	The community has coastal tsunami defenses, such as dykes, built and regularly maintained.	☐
☐	☐	☐	☐	There is a warning system in place to notify emergency response personnel of a potential tsunami.	☐
☐	☐	☐	☐	There is a warning system in place to notify residents of a potential tsunami, including a zoned alarm system to notify people on the streets.	☐
☐	☐	☐	☐	There is a warning system in place to notify transient, migrant, homeless and visiting people of a potential tsunami.	☐
☐	☐	☐	☐	The community has in place a means to discuss earthquakes with Traditional Knowledge holders about warning systems and effective responses	☐

Volcanoes – Ash falls, lava flows, mud flows, projectiles and lateral blasts, and pyroclastic blasts

Hazard Resilience Rating	High Resilience ☐	Low Resilience ☐	Need More Info ☐	Not Applicable ☐

Yes	No	Need More Info	Not Applicable	FACTORS	This is important to my community
☐	☐	☐	☐	Community-based volcano exercises have taken place in the community-at-large (e.g., table-top or full-scale exercises).	☐
☐	☐	☐	☐	The community has access to volcanic hazard zonation maps and shared them with the community.	☐
☐	☐	☐	☐	The community has built engineering measure such as dykes, catch basins and dams to control flows and/or divert flows away from the community.	☐
☐	☐	☐	☐	The community has clearly marked volcanic evacuation routes with visible signage.	☐
☐	☐	☐	☐	The community has designated seismically safe buildings with access to resources like potable water and back-up electricity, and large enough to act as emergency shelters.	☐
☐	☐	☐	☐	The community has educated residents and school children regarding volcanic risks and appropriate responses in the community through public awareness campaigns.	☐
☐	☐	☐	☐	The community has in place or has access to a volcanic monitoring system in place with rain gauges (it's easier to predict debris flow if you have information about rainfall and storm build-up), trip wires (set off by debris flow) and flow sensors (to record the nature of lava flows) to detect volcanic flows.	☐
☐	☐	☐	☐	The community regularly performs activities to divert lava flow (i.e. channel deepening, widening, dredging and removal of silt) to help direct volcanic materials to safe, uninhabited areas and/or to control movement of sediment.	☐
☐	☐	☐	☐	The community has plans to have people at watchtowers in safe locations during times of high volcanic eruption risk.	☐
☐	☐	☐	☐	The community has land use and zoning regulations in place to prohibit new construction or rebuilding in hazard areas.	☐
☐	☐	☐	☐	There is a warning system in place to notify emergency response personnel of a potential volcano.	☐
☐	☐	☐	☐	There is a warning system in place to notify residents of a potential volcano.	☐
☐	☐	☐	☐	There is a warning system in place to notify transient, migrant, homeless and visiting people of a potential volcano.	☐
☐	☐	☐	☐	The community has in place a means to consult Traditional Knowledge holders about volcanic eruptions, effective responses and warning systems.	☐

References

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