Mega Cities, Mega Disasters, & Disaster Mitigation Nonlinear dynamic events, without models

Mega Disaster – Mega event @ Mega city

Mega event = a high intensity earthquake, typhoon, hurricane or Tsunami, or accidental or intentional human-induced large-scale events

Multiple events -- fires, floods, breakout of diseases, and release of toxins to the environment start a chain reaction of failure of services, communication and transportation and other similar life lines of a mega-city. Together with such physical failures, loss of human life and human suffering, long-term disruption of life, in general, lead to a mega-disaster

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Disaster Mitigation Viewpoints

• From the viewpoint of preparation for disaster mitigation, mega-disasters may be considered in three parts:

- Before, during, and after

a mega event becomes a mega-disaster.

- From a technical viewpoint stages of a mega event:
 - energy build-up,
 - energy transport, and
 - energy dissipation.

Preparation before an event

- Training, education, and preparedness *in advance* can help mitigate the scope of the disaster
- Close collaboration of technical, social, and legislative components of a civil society is essential.
- Focusing only on the engineering, vulnerabilities of infrastructure need to be identified and strengthened to reduce the possibility of a chain reaction of events.
- Strengthening the widespread vulnerabilities that exist in many of the well established mega cities require resource that may not be readily available and, thus, requires mega political will supported by sound risk assessment methodologies.

Early Detection & Warning

- Mega events have different time scales during which energy is built up and transported, they need different considerations.
- Distributed sensors to detect incipient micro- events that are precursors of a mega event.
- Early detection, different than forecasting.