EERI-NSF Workshop on Haiti Earthquake Research Needs
Breakout Session Report

Breakout Session Title: Risk management, complexity, and complex events.
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Session Overview: The Haiti earthquake took place in the context of a dynamic urban environment that had already experienced multiple recent disasters from which it arguably had not yet recovered (e.g., Hurricanes of 2008, environmental degradation). Fully understanding the factors that led to the devastation experienced in the January 12, 2010 earthquake and the best way to recover from it and manage the risk for the future requires acknowledging and examining the complexity of the context. In this session, we discussed research needs in three general areas: (1) risk assessment (i.e. characterizing the risk), (2) risk management (i.e., reducing or spreading the risk), and (3) complexity.

Risk Assessment

Develop and validate better risk assessment models, particularly as they apply in regions that like Haiti are characterized as:

- Developing regions
- Regions with limited resources and a degrading natural environment
- Regions with very limited information (e.g., building inventory data)
- Regions with multiple hazards (e.g., earthquakes, hurricanes, climate change)
- Cities characterized by primacy (i.e., 3 to 5 times larger than the next largest city in the country)

Risk Management

- Develop methods to support resource allocation for disaster risk reduction at the international, national, and local levels.
- Develop and validate better tools to support risk management, particularly as they apply in regions that like Haiti are characterized as:
    - Developing regions
    - Regions with limited resources and a degrading natural environment
    - Regions with very limited information (e.g., building inventory data)
    - Regions with multiple hazards (e.g., earthquakes, hurricanes, climate change)
    - Cities characterized by primacy (i.e., 3 to 5 times larger than the next largest city in the country)
- Determine how to incentivize earthquake risk reduction for various stakeholders, particularly in areas with infrequent earthquakes.
- Better articulate the costs and benefits of earthquake risk reduction so that it can be more directly compared to other societal demands (e.g., health care, education).
- Improve understanding of risk management for critical infrastructure, especially cascading effects and infrastructure interdependencies.

- Develop methods to effectively develop, implement, and coordinate risk management strategies across organizational levels, especially in the presence of numerous independent organizations.

Complexity and Complex Events

Since Haiti is a developing country, the earthquake provides an excellent opportunity to examine the relationship between the disaster cycle and international development. Specifically, research needs include:

- Development of better conceptual frameworks and quantitative models to capture the complex interactions and feedback loops among the various sectors (e.g., housing, education, health care) and issues (e.g., construction of a vulnerable infrastructure, influx of international funding, corruption, environmental degradation).
- Development of better tools to support disaster risk management decisions and development decisions in an integrated fashion. In the best case, disaster risk management strategies can support development and development strategies can support disaster risk management. At the least, efforts in one area should not exacerbate problems in the other.