The Tohoku Disaster: Responding to Japan’s 3/11 Earthquake, Tsunami, and Nuclear Accident

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Mr. Yohei Oka, Harvard College
Presentation Outline

• The Great East Japan Earthquake as an example of “landscape-scale” disasters
• Japan’s disaster management system
• Relief to earthquake and tsunami victims
• Response to the nuclear accident
• Enhancing Japan’s emergency system
• Q/A and discussion
Framing Argument

• Japan's experience with the Tohoku disaster reinforces the proposition that major disasters are fundamentally decentralized phenomena.

• That means that trying to centralize disaster response to improve its effectiveness is likely to fail.

• More appropriately, two questions need to be faced:
  
  • How do we make a necessarily decentralized response system work better -- i.e., to foster intelligent, decentralized adaptation?
  
  • What is the role of the center in such a system?
Japan’s Disaster as an Exemplar of “Landscape-Scale” Disasters

Catastrophes that severely affect large geographic areas in many inter-locking societal dimensions – including life safety, community, economy, environment, politics, governance, and culture
Increasing Disaster Danger

- In the 21st century, landscape-scale disasters are becoming more frequent and a greater threat to humanity.
  - Larger, more concentrated populations are located in areas of substantial exposure to risk
  - Increasingly complex and interconnected human systems are highly vulnerable to disruption
  - Technology vulnerability magnifies the danger of natural disasters
  - Climate change threatens to increase the number of natural disasters – and intensify their impact
Recent Examples of Landscape-Scale Disasters

• The Great East Japan Earthquake, tsunami, and nuclear accident (2011)
• BP fire and oil spill in the US (2010)
• Pakistan floods (2010)
• Haiti’s Earthquake (2010)
• South China blizzards (2008)
• China’s Wenchuan earthquake (2008)
• Hurricane Katrina in the US (2005)
• Indian Ocean tsunami (2004)
The Great East Japan Earthquake –
March 11, 2011

Source: The Economist,
March 11, 2011
Earthquakes from March 10-16, 2011

Number of Quakes:
M≥7: 4; 7>M≥6: 43

From Jun KURIHARA, Senior Fellow, Ash Center for Democratic Governance and Innovation, Presentation at Harvard Kennedy School, March 22, 2011.
The Tsunami Hits 650 km of Coastline

http://www.guardian.co.uk/world/video/2011/mar/14/japan-tsunami-amateur-footage-video
Takata Matsubara (Pinetree Beach)

Source: Kiyoshi MURAKAMI
The Tsunami Approaches Rikuzentakata

Source: Kiyoshi MURAKAMI
Rikuzentakata Before the Earthquake and Tsunami

Source: Kiyoshi MURAKAMI
Only one pine tree among 70,000 survived

Source: Kiyoshi MURAKAMI
The Municipal Gymnasium in Rikuzentakata
A Failed Tsunami Shelter

Photos: Arn Howitt
The Nuclear Accident at Fukushima Daiichi
## Impacts

### Great East Japan Earthquake/Tsunami

<table>
<thead>
<tr>
<th>Damage along 650 km of coastline</th>
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<tbody>
<tr>
<td>Casualties:</td>
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<tr>
<td>Dead and missing</td>
</tr>
<tr>
<td>Injured</td>
</tr>
<tr>
<td>Building Damage (8/8/12)</td>
</tr>
<tr>
<td>Total collapse</td>
</tr>
<tr>
<td>Half collapse</td>
</tr>
<tr>
<td>Partial damage</td>
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<tr>
<td>Evacuees (maximum on 3/14/11)</td>
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<tr>
<td>Economic Damage</td>
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Japan’s Disaster Management System
Disaster Management Before the Hanshin-Awaji Earthquake in 1995

- Responsibility for disaster planning and response rested primarily with local governments, which had the main body of response personnel – firefighters – and substantial practical influence over the police.

- Prefectures were supposed to plan for, support, and coordinate regional events; but many did little in advance, and most had few personnel to dispatch in response to dire happenings.

Disaster Management Before the Hanshin-Awaji Earthquake in 1995 (2)

• National ministries were “stove-piped” and resisted cooperation.
• There was a national ministerial disaster council but no ongoing coordinating institution except what was organized ad hoc to deal with a specific event.
• The prime minister could direct the Self-Defense Force to aid disaster-struck areas, but local governments had to formally request assistance and then pay the costs of maintaining this force in the field – a strong disincentive for requesting aid.

Post-Disaster Reform in 1995

• Slow and inadequate response following the Hanshin-Awaji Earthquake led to widespread criticism of the national government.

Post-Disaster Reform in 1995 (2)

• Post-disaster reform legislation provided for:
  – Improved information gathering on post-disaster conditions
  – Provision for speedy briefing of the prime minister
  – Infrastructure for information sharing among ministries
  – Convening of emergency meetings of key officials in PM’s office
  – Establishment of position of Deputy Chief Cabinet Secretary for Crisis Management, with a small staff in the Cabinet Secretariat
  – Strengthening of planning requirements for sub-national governments
  – Provision for the Self-Defense Force to perform relief work

• The general thrust: centralization of response