Session I : Disaster Recovery Practices of Economies - Geological Disasters I

Kobe Earthquake, 1995

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Kobe Earthquake (1995.1.17)
1995 Kobe EQ Impacted Area

2004 Mid Niigata Prefecture Earthquake Impacted Area
Japan
World
Kobe
EQ
Impacted Area
2007 Niigataken Chuetsu-oki Earthquake Impacted Area
### Damage caused by 2 EQ in Niigata Prefecture

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Seismic Intensity (JMA)</td>
<td>7 (M7.3)</td>
<td>7 (M6.8)</td>
<td>Upper 6 (M6.8)</td>
</tr>
<tr>
<td>Casualties</td>
<td>6,437</td>
<td>68</td>
<td>14</td>
</tr>
<tr>
<td>Injuries</td>
<td>43,792</td>
<td>4,795</td>
<td>1,984</td>
</tr>
<tr>
<td>Housing Damage</td>
<td>about 650,000</td>
<td>about 120,000</td>
<td>about 40,000</td>
</tr>
<tr>
<td>Emergency Shelters</td>
<td>over 1,200</td>
<td>603</td>
<td>116</td>
</tr>
<tr>
<td>Evacuees</td>
<td>over 300,000</td>
<td>about 103,000</td>
<td>about 12,500</td>
</tr>
<tr>
<td>Temporary Housings</td>
<td>48,300</td>
<td>3,460</td>
<td>1,222</td>
</tr>
<tr>
<td>Public Housings for victims</td>
<td>25,000</td>
<td>493</td>
<td>?</td>
</tr>
</tbody>
</table>
61 areas were isolated by Land Slides (totally 3,800 slides occurred)
2007 Niigataken Chuetsu-oki Earthquake
(2007.7.16)
Major Industries were damaged
The Great Hanshin-Awaji (Kobe) Earthquake in 1995
- Severe damage to physical environment
- Severe damage to social systems
- Recover process took very long time
- Hard to construct the policies on the process of recover because never examined the process before

Disaster in a Densely-populated Urban Area

The Mid Niigata Prefecture Earthquake in 2004
- Wreak havoc on public infrastructure
- Get several villages isolated in the rural areas (Communication, traffic, material flow were disrupted)
- Occur Disaster related Death

Disaster in a Remote and Isolated Area Among Mountains

The Niigataken Chuetsu-oki Earthquake in 2007
- The Niigataken Chuetsu-oki Earthquake in 2007
- Wreak havoc on individual properties
- Get some people doubly victimized by 2 EQ
- Facilities of nuclear power generation were damaged
- spread harmful rumors about the damage of nuclear power plant
- Damage subcontract factory of national-wide enterprises and occur supply-chain disruption

Disaster in local cities area
The Process of Recovery

I. Disorientation
II. Cognition of New Realities
III. Disaster Utopia
IV. Re-entry to Everyday Life
V. Recovery

- 10 hr
- 100 hr 4 days
- 1,000 hr 42 days
- 10,000 hr 1.1 yr
The first phase is "Disorientation" phase, a period in which the victims suffer from severe stress due to the impact of the disaster, and have difficulty objectively understanding what is happening around them.

- Impossible to react as the organization
The second phase is "Cognition of the new realities created by the disaster", a period in which the victims rationally accept the damage caused by the disaster and understand that a new reality of a disaster-stricken society has begun.

- Emergency Response began
- Try to assess the safety and damage
The third phase is "Disaster Utopia" a period in which a primitive communal life is formed based on values different from those of ordinary times due to the paralysis of conventional social functions where the people shared materials and aimed at the same goals of recovery from the disaster for 1,000 hours.

• Volunteers and victims experiences the “disaster high”

• Rebuilding the lifeline systems has begun
The fourth phase is "Reentry to everyday life". A period in which social flow systems are restored and people begin to reconstruct their lives.

- Redeveloping Destructed Cities
- Individual Assistance for Victims
- Revitalizing Local Economies
The fifth phase is “Recovery”, a period in which the most of the victims and organizations believe that the impact of the disaster is reconstructed and the society in the impacted area is recovered.

• Redeveloped Destructed Cities
• Revitalized Local Economies
Changes in the Dwelling Places of the Victims (Kobe)

Disorientation, Cognition of New Realities, Disaster Utopia, Re-entry, Recovery

Private home

S...... Private home
N=381-577

With relatives

Shelter

At friends/neighbors

Rented house

Temporary housing

Time elapsed since the earthquake (hours):

1/17 10 10^2 10^3 10^4

X=log'Time elapsed since the earthquake'

Days:

Changes in the Dwelling Places of the Victims (Niigata)

- Tent/car/garage/parking lot
- Private home
- Shelter
- Temporary housing
- Rented house
- With relatives
- At friends/neighbors
- Company-subsidized house

Graph: X = log 'Time elapsed since the earthquake'

Disorientation, Cognition of New Realities, Disaster Utopia, Re-entry, Recovery
① Work/school resumed.
② Housing problems are finally settled.
③ Personal finances are no longer influenced by EQ.
④ Daily life settled.
⑤ No longer feel like a victim.
⑥ The local economy is no longer influenced by EQ.

X = log 'Time elapsed since the earthquake'

Disorientation  Cognition of New Realities  Disaster Utopia  Re-entry  Recovery

Mar 2005, Reconstruction Calendar （Niigata:bold line & Kobe）
Integrated Recovery Plan with Three related Goals

Economic Recovery

- Revitalizing Local Economies
  - As a Tool
- Redeveloping Destructed Cities
  - As a Result

Physical Recovery

Life Recovery

Helping Disaster Victims
Lessons to be Shared from Kobe

• Importance of Having Recovery Plan
  – It could be a chance for improvement
  – What we would like your life to be
  – Future Vision : Smart Growth

• Recovery Plan must be a Holistic Plan
  – Not Just Zoning
  – Sustainable Economic Development
  – Improving Quality of Life
  – Physical Recovery as a tool

• Planning Process Should be Participatory
  – Capacity Building
  – Don’t Rush/Take Time
Holistic Recovery Policy Model

Financial Source

Supporting Entity (Gov., Private, NGO)

Operation Agencies

Direct Approach

- Micro-finance
- Providing Fund/Goods
- House Reconstruction
- Physical/Mental Health Care

Direct Approach

- Subsidy
- Loan
- Tax Exemption

Indirect Approach

- Infrastructure
- Public Building
- Regulation/Deregulation
- Technical Support
- New Business Creation

Economic Recovery

Life Recovery
## Life Recovery Scale

<table>
<thead>
<tr>
<th>問</th>
<th>震災前と比べて増えましたか？減りましたか？</th>
<th>かなり増えた</th>
<th>少し増えた</th>
<th>変わらない</th>
<th>少し減った</th>
<th>かなり減った</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>忙しく活動的な生活を送ること</td>
<td>5点</td>
<td>4点</td>
<td>3点</td>
<td>2点</td>
<td>1点</td>
</tr>
<tr>
<td>2</td>
<td>生きがいを感じること</td>
<td>5点</td>
<td>4点</td>
<td>3点</td>
<td>2点</td>
<td>1点</td>
</tr>
<tr>
<td>3</td>
<td>まわりの人々とのつきあい</td>
<td>5点</td>
<td>4点</td>
<td>3点</td>
<td>2点</td>
<td>1点</td>
</tr>
<tr>
<td>4</td>
<td>日常生活を楽しく送ること</td>
<td>5点</td>
<td>4点</td>
<td>3点</td>
<td>2点</td>
<td>1点</td>
</tr>
<tr>
<td>5</td>
<td>将来は明るいと感じること</td>
<td>5点</td>
<td>4点</td>
<td>3点</td>
<td>2点</td>
<td>1点</td>
</tr>
<tr>
<td>6</td>
<td>元気ではつらつとしていること</td>
<td>5点</td>
<td>4点</td>
<td>3点</td>
<td>2点</td>
<td>1点</td>
</tr>
<tr>
<td>8</td>
<td>仕事の量</td>
<td>5点</td>
<td>4点</td>
<td>3点</td>
<td>2点</td>
<td>1点</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>問</th>
<th>あなたの満足度は？</th>
<th>いつもある</th>
<th>たびたびある</th>
<th>たまにある</th>
<th>まれにある</th>
<th>まったくない</th>
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<tbody>
<tr>
<td>1</td>
<td>毎日のくらし</td>
<td>5点</td>
<td>4点</td>
<td>3点</td>
<td>2点</td>
<td>1点</td>
</tr>
<tr>
<td>2</td>
<td>自分の健康</td>
<td>5点</td>
<td>4点</td>
<td>3点</td>
<td>2点</td>
<td>1点</td>
</tr>
<tr>
<td>3</td>
<td>今の人間関係</td>
<td>5点</td>
<td>4点</td>
<td>3点</td>
<td>2点</td>
<td>1点</td>
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<tr>
<td>4</td>
<td>今の家計の状態</td>
<td>5点</td>
<td>4点</td>
<td>3点</td>
<td>2点</td>
<td>1点</td>
</tr>
<tr>
<td>5</td>
<td>今の家庭生活</td>
<td>5点</td>
<td>4点</td>
<td>3点</td>
<td>2点</td>
<td>1点</td>
</tr>
<tr>
<td>6</td>
<td>自分の仕事</td>
<td>5点</td>
<td>4点</td>
<td>3点</td>
<td>2点</td>
<td>1点</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>問</th>
<th>1年後のあなたは？</th>
<th>かなり良くなる</th>
<th>やや良くなる</th>
<th>変わらない</th>
<th>やや悪くなる</th>
<th>かなり悪くなる</th>
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<tbody>
<tr>
<td>今より生活がよくなっていますか？</td>
<td>5点</td>
<td>4点</td>
<td>3点</td>
<td>2点</td>
<td>1点</td>
<td></td>
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</table>
生活復興感の2時点における分布

2006年3月 (N=822) 平均39.8 標準偏差 7.9
2006年10月 (N=887) 平均40.7 標準偏差 7.1
The Degree of Life Recovery (Gender)

Average Score of Scale

- Male
  - 2006 March Survey: 38
  - 2006 October Survey: 40

- Female
  - 2006 March Survey: 38
  - 2006 October Survey: 41

Second survey: statistically insignificant difference

Third survey: significant difference
The Degree of Life Recovery (Generation)

Average Score of Scale

2006 March Survey
2006 October Survey

20s&30s
40s&50s
Over 60s
The Degree of Life Recovery (Housing Damage)

- Pancaked
- Totally
- Half
- Partially
- No damage

Average Score of Scale

2006 March Survey
2006 October Survey
The Degree of Life Recovery (Residence)

- Nagaoka
- Yamakoshi
- Ojiya
- Kawaguchi

Average Score of Scale

- 2006 March Survey
- 2006 October Survey

Second Survey
Statistically meaningful difference not observed

Third Survey
2006 March Survey
2006 October Survey
The Degree of Life Recovery (Occupation)

Average Score of Scale

2006 March Survey
2006 October Survey

Engineers/expertise
executive officer
white-collar
service industry
Blue-collar
self-owned business
Agriculture, Forestry and Fisheries
Housewives
Students
Unemployed under 60 y-old
Unemployed over 60 y-old