An Importance of Community Based Revival Process (Lessons from the Niigata Chuetsu EQ)

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## Damage of the Niigata Chuetsu Earthquake

<table>
<thead>
<tr>
<th></th>
<th>Great Hanshin</th>
<th>Niigata Chuetsu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occurrence</td>
<td>1995/01/17 5:46 A.M.</td>
<td>2005/10/23 5:56 P.M.</td>
</tr>
<tr>
<td>Magnitude</td>
<td>M7.4</td>
<td>M6.8</td>
</tr>
<tr>
<td>Max. Seismic Intensity</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Aftershock (Felt)</td>
<td>190</td>
<td>851</td>
</tr>
<tr>
<td>Max. Aftershock</td>
<td>4(1/25)</td>
<td>6-(10/27)</td>
</tr>
</tbody>
</table>
Damage of the Niigata Chuetsu Earthquake

<table>
<thead>
<tr>
<th></th>
<th>Great Hanshin</th>
<th>Niigata Chuetsu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death (related death)</td>
<td>6,443 (941)</td>
<td>68 (52)</td>
</tr>
<tr>
<td>Collapsed House</td>
<td>112,500</td>
<td>3,157</td>
</tr>
<tr>
<td>Building Fire</td>
<td>86</td>
<td>9</td>
</tr>
<tr>
<td>Evacuate People (Max.</td>
<td>316,700 (1/23)</td>
<td>103,178 (10/26)</td>
</tr>
<tr>
<td>of Date)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporary Housing</td>
<td>49,681</td>
<td>3,460</td>
</tr>
</tbody>
</table>

Many People Evacuated due to Heavy Aftershocks
Feature of the Niigata Chuetsu Earthquake

• Many Heavy Aftershocks happened in 30 minutes after the Main Earthquake
  – People evacuate outside their home regardless of damage
  – Evacuation continued long time due to aftershocks

• Heavy Damage concentrate to Mountainous Area
  – Different Situation from the Great Hanshin Earthquake
  – Similarity with the Taiwan 921 Earthquake in 1999

• More Heavily Damaged to the Ground than Buildings
  – Many Cracks in Ground and Landslide
  – Heavy Influence to the building, rice field, and so on
Kogomo District in Yamakoshi
2006/10
7 Years After the Earthquake...

• Disaster Recovery Project → Finished
  – Correspond to the 3 yrs Limitation of Projects
  – Infrastructures Reconstructed of Original Forms

Takezawa in Yamakoshi (2008.12)

Higashi-Takezawa in Yamakoshi (2008.12)
7 Years After the Earthquake...

- Housing Reconstruction → Almost Finished
  - Relocation/Housing Reconstruction also finished
  - Almost Finish of Moving to the Public Apartment

Higashi-Kawaguchi (2006.10)  Higashi-Kawaguchi (2006.10)
The Present Condition of Mountainous Area in Japan
(especially the Affected area of the Niigata Chuetsu Earthquake)

Affected Mountainous Area of the Earthquake
– “House”+”Infrastructure”+”Production Area” were heavy Damaged by Land Slide

Situation of Mountainous Area before Earthquake
– Rapid Progress of Declining Birth Rate and Aging
– Afraid of Village Abolition by Merging Municipalities
Rebuilding Mountainous Villages

- Different Principle for Rebuilding Victim’s Life by Municipalities
  - Yamakoshi Village (A Part of Nagaoka City after 2005/4)
    - 「Be Back To Yamakoshi」
    - Allover Support to the Victim who Want to Go Back
  - Koshiji Town (A Part of Nagaoka City after 2005/4)
    - Support to the victim who want to rebuild the safe area in the same district → Typical rebuilding support in Japan
  - Kawaguchi Town
    - Support to collectively relocate to flat convenient area
  - Ojiya City
    - Support to relocate the urban area
    - Support to the Victim who Leave Their Own Village

Many Different Support regardless of Same Culture, Life Style
Village Rebuilding from the Earthquake

Isolation → Evacuate Affected Area (Grouped by Village) → Temp. Housing Outside Affected Area

This process was essentially the same among all municipalities

Support measures differed from municipality to municipality

Return to Village
- Repairs
- Public Housing
- Rebuilding w/o support

Relocate
- Rebuilding w/o support
- Public Housing
- Collective Relocation
Supporting Measure by Municipality/Government

• Support for Rebuilding or Relocate
  – Small-scale Residential District Improvement Plan (Yamakoshi / Kawaguchi)
  – Collective Relocation Promotion Program for Disaster Prevention (Ojiya)

• Support for the Victims Who Cannot Rebuild Their House
  – Build Public House for Victims in/out the Affected Area

• Revival Support System
  – Foundation for Rebuilding of the Affected Area
  – Mid-Layer Support Organization (NPO/NGO)
Trend of Reconstruction and Revival Process  
(in Case of Yamakoshi Village)  

Decision of the Evacuation All People to the Other Place  
– Disrupted All Accesses to Districts  
– Fear of Expand the Damage due to Heavy Snow  
– Keep the Consensus about returning to the village  

Temporary Housing Planning  
– Planning the Building Sites Consider about Damage Situation  
– Establishment a Medical center, Volunteer Center, and Some Shops in the Area  
– Establishment a Field near by Yokodai Area (Where lives heavy damaged area people)
Temporary Housing
(for Yamakoshi people)
• 3 housing area
• Fields Established near the Housing Area
• They Lived for 2 or 3 years in this house
## Damage Situation of Mountainous Area in the Niigata Chuetsu Earthquake

### Damage Situation of Yamakoshi Village in Chuetsu Earthquake

<table>
<thead>
<tr>
<th>District</th>
<th>House Damage</th>
<th>Land Slide</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Collapsed House (household)</td>
<td>Proportion</td>
</tr>
<tr>
<td>Tanesuhara</td>
<td>206</td>
<td>5%</td>
</tr>
<tr>
<td>Mushigame</td>
<td>160</td>
<td>20%</td>
</tr>
<tr>
<td>Takezawa</td>
<td>217</td>
<td>45%</td>
</tr>
<tr>
<td>Higashi-Takezawa</td>
<td>94</td>
<td>85%</td>
</tr>
<tr>
<td>Sanga</td>
<td>96</td>
<td>95%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>773</strong></td>
<td><strong>40%</strong></td>
</tr>
</tbody>
</table>

The Extent of Damage in the Yamakoshi Village Varied from Village to Village
Mushigame District
- Slight Housing Damage
- Some Landslides
- Heavy Damage of KOI (Carp) Farming Pond
- But They must Evacuate for a Long Time
Damaged due to Landslide (Yubu District Yamakoshi Village 2004/10/25)
油夫集落現況絵図

By Nagaoka City Reconstruction Division
Masahiro SAWADA

5/18/15  20
Location of the Relocation Area and Promotion for Relocate Areas

Relocate Areas

Relocate Promotion Areas
# Damage Situation of Higashiyama District of Ojiya City in Chuetsu Earthquake

<table>
<thead>
<tr>
<th>Name of Vil.</th>
<th>Completely Destroyed</th>
<th>Heavily Destroyed</th>
<th>Half Destroyed</th>
<th>Some Damaged</th>
<th>No Damage</th>
<th>Total</th>
<th>Ratio of Destroyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shiodani</td>
<td>31</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>0</td>
<td>49</td>
<td>73%</td>
</tr>
<tr>
<td>Junidaira</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>100%</td>
</tr>
<tr>
<td>Nigoro</td>
<td>19</td>
<td>7</td>
<td>12</td>
<td>2</td>
<td>0</td>
<td>40</td>
<td>65%</td>
</tr>
<tr>
<td>Utogi</td>
<td>16</td>
<td>2</td>
<td>10</td>
<td>6</td>
<td>0</td>
<td>34</td>
<td>52%</td>
</tr>
<tr>
<td>Iwamaki</td>
<td>10</td>
<td>10</td>
<td>5</td>
<td>10</td>
<td>0</td>
<td>35</td>
<td>57%</td>
</tr>
<tr>
<td>Tsumurisawa</td>
<td>7</td>
<td>2</td>
<td>6</td>
<td>2</td>
<td>0</td>
<td>17</td>
<td>52%</td>
</tr>
<tr>
<td>Asahi</td>
<td>11</td>
<td>6</td>
<td>12</td>
<td>11</td>
<td>0</td>
<td>40</td>
<td>43%</td>
</tr>
<tr>
<td>Terasawa</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>12</td>
<td>0</td>
<td>24</td>
<td>25%</td>
</tr>
<tr>
<td>Nakayama</td>
<td>5</td>
<td>1</td>
<td>6</td>
<td>4</td>
<td>0</td>
<td>16</td>
<td>37%</td>
</tr>
<tr>
<td>Koguriyama</td>
<td>11</td>
<td>4</td>
<td>15</td>
<td>5</td>
<td>0</td>
<td>35</td>
<td>43%</td>
</tr>
<tr>
<td>Total</td>
<td>124</td>
<td>34</td>
<td>89</td>
<td>54</td>
<td>0</td>
<td>301</td>
<td>52%</td>
</tr>
</tbody>
</table>
Sample of Planning to Promotion for Relocate

Not All of Area Assignment for Relocate,

Only the Area who Want To Relocate Assignment the Promotion Area
Chiya District, Ojiya City (2006/12)
Chiya District, Ojiya City (2006/12)
Chiya District, Ojiya City (2006/12)
## Revival Situation of Yamakoshi Area (Especially heavily Damaged 6 Village)

<table>
<thead>
<tr>
<th>Name of Village</th>
<th>Yubu</th>
<th>Kajigane</th>
<th>Kogomo</th>
<th>Okubo</th>
<th>Ikedani</th>
<th>Naranoki</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households Before EarthQuake</td>
<td>20</td>
<td>29</td>
<td>25</td>
<td>21</td>
<td>34</td>
<td>29</td>
<td>158</td>
</tr>
<tr>
<td>Intention of Return Village (2006.2)</td>
<td>10</td>
<td>25</td>
<td>19</td>
<td>13</td>
<td>23</td>
<td>13</td>
<td>103</td>
</tr>
<tr>
<td>Intention of Return Village (2007.2)</td>
<td>9</td>
<td>20</td>
<td>16</td>
<td>12</td>
<td>13</td>
<td>12</td>
<td>82</td>
</tr>
<tr>
<td>Return by Themselves</td>
<td>7</td>
<td>18</td>
<td>10</td>
<td>9</td>
<td>12</td>
<td>10</td>
<td>66</td>
</tr>
<tr>
<td>Build Home at New Site</td>
<td>1</td>
<td>4</td>
<td>7</td>
<td>6</td>
<td>4</td>
<td>10</td>
<td>32</td>
</tr>
<tr>
<td>Build Home at Previous Site</td>
<td>6</td>
<td>14</td>
<td>3</td>
<td>3</td>
<td>8</td>
<td>0</td>
<td>34</td>
</tr>
<tr>
<td>Enter the Public Apartment</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td>Final Return Late</td>
<td>45%</td>
<td>69%</td>
<td>64%</td>
<td>57%</td>
<td>38%</td>
<td>41%</td>
<td>52%</td>
</tr>
</tbody>
</table>

## Revival Situation of Higashima (Ojiya City) Area

<table>
<thead>
<tr>
<th>Name of Village</th>
<th>Shiodan</th>
<th>Juni-daira</th>
<th>Nigoro</th>
<th>Utogi</th>
<th>Iwamaki</th>
<th>Tsumurisawa</th>
<th>Asahi</th>
<th>Terasawa</th>
<th>Nakayama</th>
<th>Koguriyama</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households Before EQ</td>
<td>49</td>
<td>11</td>
<td>39</td>
<td>34</td>
<td>33</td>
<td>16</td>
<td>40</td>
<td>23</td>
<td>16</td>
<td>33</td>
<td>294</td>
</tr>
<tr>
<td>Return to Villages</td>
<td>20</td>
<td>0</td>
<td>11</td>
<td>14</td>
<td>19</td>
<td>5</td>
<td>27</td>
<td>20</td>
<td>16</td>
<td>21</td>
<td>152</td>
</tr>
<tr>
<td>Relocate</td>
<td>29</td>
<td>11</td>
<td>18</td>
<td>20</td>
<td>14</td>
<td>11</td>
<td>13</td>
<td>3</td>
<td>0</td>
<td>12</td>
<td>131</td>
</tr>
<tr>
<td>Movement Promotion</td>
<td>15</td>
<td>10</td>
<td>9</td>
<td>11</td>
<td>0</td>
<td>7</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>56</td>
</tr>
<tr>
<td>Relocate by each</td>
<td>14</td>
<td>1</td>
<td>9</td>
<td>9</td>
<td>14</td>
<td>4</td>
<td>9</td>
<td>3</td>
<td>0</td>
<td>12</td>
<td>75</td>
</tr>
<tr>
<td>Final Return Late</td>
<td>41%</td>
<td>0%</td>
<td>28%</td>
<td>41%</td>
<td>57%</td>
<td>31%</td>
<td>67%</td>
<td>87%</td>
<td>100%</td>
<td>64%</td>
<td>52%</td>
</tr>
<tr>
<td>Reconstruction Site</td>
<td>Small-scale Residential District Improvement Plan</td>
<td>Collective Relocation Promotion Program for Disaster Prevention</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------------------------------------</td>
<td>-------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same or Relocate</td>
<td>Relocate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Available</td>
<td>Not Available(as Danger Zone)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| For the Victim Who can’t Reconstruction | Public Housing (Rural Area Type) | Public Housing (Another Site) |

| Land Rights | Leasehold(from Municipality) | Sale (include infrastructure) |

| Functionality | Upgrade (esp. Snow) | Upgrade(Relocation site) Down(Previous site) |

| No. of Households | Decrease | Decrease |

| Community Strength | Strong Bond (Resolution) | Down(Relocation site) Mottle(Previous site) |

| Financial Issue | Big(Initial) Small(Running) | Middle(Initial) Big(Running) |

| Spatial | Intensification | Tessellation |
Effect for the Revival the Mountainous Area

• Yamakoshi
  – Great Care for the Victims who Want to Return
  – They Must live outside of Village for a Long Time
  – They Cannot Consider the Sustainable Way for Life in Mountainous Area yet.

• Ojiya / Kawaguchi
  – Care for the Victims who Want to Relocate
  – Remain Residents must Rebuild Themselves
  – But They Consider the Way for Sustainable Village, and Get the Network with NPO/NGO, Urban Areas
Current Situation of Stricken Area in Chuetsu (2014)

“Colleagues from outside of Stricken area”

Stricken Area (Rural Area) Accelerated Depopulation (decreased to less than half of the number prior to the earthquake in Yamakoshi, Higashiyama) “Become a Marginal Village”

Neighborhod City Area
People who have no commitment before EQ
Relocate within same region

Relocation Resettlement Etc.

Commit With the Area as a Supporter of Rural Life (Mobility within a region)

Some Support of Government
Strong-willed people live

revival situation becomes a mental support
Purification of the class of resident

The person who gave up living in a mountain lives

Support for Relocated Person

※Rate of Relocate within same City 96.2% (By Their own Home 84.6%)
Way of thinking of a Damage and a Loss, restoration and the revival

Projects based on the revival fund menu depending on the on-site situation

Project based on the Revival Plan of Pref. Gov.

Restoration
- Restoration Social Infra.

Creative Restoration
- Self Restoration Rice Field
- Restoration of Community Facilities

Revival
- Event by Themselves
- Planning for the Future

Correspondence to Loss

Correspondence to Damage

Volunteer
- Flexible administrative correspondence

Share with the outside talented person

Revival Vision as a Story

Framework of multifaceted multiple support by the tripolar structure

Human Resources

Funding

Cooperate with Public-Privete
Conclusion

• Supporting Measure by Municipality/Government are Different due to Their Policy for Mountainous Area Management

• Area without Much More Support, They Consider the More Better Way for Revival Themselves

• Study about the Influence that Continuity the Instruction of Evacuation to the Consciousness for Return to Village