Recovery Planning Process & Related Case Studies of the Great East Japan Earthquake

2011.12.16
Yasuo Kawawaki
International Recovery Platform
1. Casualties and Damages

As of 12 December 2011

- 15,841 people confirmed dead and 3,490 people missing
- 126,315 buildings completely destroyed, approx. 228 thousand buildings half destroyed
- 561 square kilometers inundated
- Damages to stock in 7 prefectures estimated: 17 trillion JPY (211 billion US$)

C.f. Hurricane Katrina 125 billion US$
    Kobe earthquake 100 billion US$
Flooded population/Municipal population

- Damaged level differs among municipalities
- Some municipalities are completely destroyed

Source: Population in inundated area - Statistics Bureau, Ministry of Internal Affairs and Communications (25. April 2011)
Total population - Population Census(2010)
Population fluctuation by municipality

**Before**
- Decreasing and aging population
- Centralization to capital city, Sendai

**After**
- Rapid decrease in severely damaged town
- Increase in inland area

Source: [http://www2.ttcn.ne.jp/honkawa/4364.html](http://www2.ttcn.ne.jp/honkawa/4364.html) Data: Mainichi Shinbun Statistics Bureau, MIC
## Number of City Office workers dead or missing

Many city leaders or managers of disaster response lost their lives, making disaster response impossible in their towns.

<table>
<thead>
<tr>
<th>Disaster area municipalities</th>
<th>Dead/ Missing workers</th>
<th>Workers total</th>
<th>Disaster area municipalities</th>
<th>Dead/ Missing workers</th>
<th>Workers total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Iwate Prefecture</strong></td>
<td></td>
<td></td>
<td><strong>Miyagi Prefecture (cont.)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rikuzentakata-C</td>
<td>68</td>
<td>261</td>
<td>Osaki-C</td>
<td>2</td>
<td>700</td>
</tr>
<tr>
<td>Ofunato-C</td>
<td>1</td>
<td>357</td>
<td>Watari-T</td>
<td>1</td>
<td>161</td>
</tr>
<tr>
<td>Kamaishi-C</td>
<td>4</td>
<td>362</td>
<td>Yamamoto-T</td>
<td>4</td>
<td>97</td>
</tr>
<tr>
<td>Otsuchi-T</td>
<td>32</td>
<td>136</td>
<td>Shichigahama-T</td>
<td>1</td>
<td>110</td>
</tr>
<tr>
<td>Yamada-T</td>
<td>2</td>
<td>184</td>
<td>Onagawa-T</td>
<td>1</td>
<td>105</td>
</tr>
<tr>
<td><strong>Miyagi Prefecture</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sendai-C</td>
<td>5</td>
<td>9,446</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ishinomaki-C</td>
<td>48</td>
<td>848</td>
<td>Soma-C</td>
<td>2</td>
<td>214</td>
</tr>
<tr>
<td>Kesennuma-C</td>
<td>2</td>
<td>529</td>
<td>Mnamisoma-C</td>
<td>4</td>
<td>427</td>
</tr>
<tr>
<td>Natori-C</td>
<td>5</td>
<td>316</td>
<td>Namie-T</td>
<td>1</td>
<td>128</td>
</tr>
<tr>
<td>Iwanuma-C</td>
<td>4</td>
<td>193</td>
<td>Total of 19 cities</td>
<td>226</td>
<td>14,732</td>
</tr>
</tbody>
</table>

### Municipal office building damaged by the earthquake and tsunami

<table>
<thead>
<tr>
<th></th>
<th>Total number of municipalities</th>
<th>Main building damaged</th>
<th>Relocated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iwate Prefecture</td>
<td>34</td>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td>Miyagi Prefecture</td>
<td>35</td>
<td>32</td>
<td>3</td>
</tr>
<tr>
<td>Fukushima Prefecture</td>
<td>59</td>
<td>36</td>
<td>9</td>
</tr>
</tbody>
</table>

(For reference) Municipal officers who died or were not found after Hanshin-Awaji Earthquake was 24 in the total 16,550 workers of the most severely damaged cities.

Note: Numbers of dead/missing workers include temporary staff in some cities. Numbers are based on hearings on 1 Aug 2011, not finalized.

Source: Commemorative speech of the opening of Disaster Education Center, University of Hyogo
Temporary Onagawa Town Office 20 Sep

Temporary houses in athletic park 21 Sep

Recovery market (once a month) in Minami-sanriku town

Fish store, restaurant in Minami-sanriku town

Kesennuma Port
2. Recovery Planning Process

Disaster Counter Measures Basic Act

【National level】
Prime Minister
Central Disaster Management Council

【Prefectural level】
Governor
Prefectural Disaster Management Council

【Municipal level】
Mayors of Cities, Towns and Villages
Municipal Disaster Management Council

[Residents level]

- Municipalities are responsible to first respond to disasters
- Prefectural or Central government support if the scale of the disaster is bigger than the capacities of the municipalities

<Recovery Planning>

Basic Act for Reconstruction
Basic Guidelines for Reconstruction  June - July

Supplementary Budget

Iwate, Miyagi, Fukushima Prefectural Recovery Plan  Aug - Sep

Municipal Recovery Plan

- Land use plan (relocation, level of dikes)
- Reconstruction project
- Consensus building among residents
Mapping out municipal recovery plans

Status of recovery planning (as of November)

Fukushima Prefecture
- Namie-Town
- Iwaki-City
- Tomioka-Town
- Okuma-Town
- Shiraishi-Town
- Minamisoma-City

Miyagi Prefecture
- Sendai-City
- Shiogama-City
- Shioya-Town
- Higashimatsushima-City
- Rifu-Town
- Shida-Town
- Iwamizawa-Town
- Ishinomaki-City
- Osaki-City
- Oshika-Town
- Tomioka-City
- Noda-Village
- Futaba-Village

Iwate Prefecture
- Iwaki-City
- Chuo-Town
- Kamaishi-City
- Ofunato-City
- Kesennuma-City
- Rikuzentakata-City
- Minami-Sanriku-City
- Kesennuma-City
- Williams-Town
- Ishinomaki-Town

Recovery plan completely mapped out (as of Sep)
Recovery plan completely mapped out (as of Nov)
Goals decided; Basic/Guideline Plan complete
Nothing (no online announcement) at all

Source: Documents on Web pages of municipalities
Minami-Sanriku Town Recovery Plan

Town Overview
- Pop. 17,431 (2010 National Census) (Approx. 30% over 65 years old)
- Area 164km²
- Shizugawa Town and Utatsu Town were incorporated into Minami Sanriku Town
- 19% of people work related to fishing (2005 census)
- Economic strength index 0.31 (within Miyagi Pref, ranking 34 out of 35)

Planning Process
- 4 town hall meetings,
- 4 committee proposals,
- 30 residents explanation meetings,
- End of September decision to adopt the plan

Organizational Structure for Planning
- operate in temporary city office
- 7 people in recovery section (support by 3 people from municipalities in Hyogo, Nagasaki Pref, 1 from Miyagi Pref)

Source: Home page of Minami Sanriku Town
Issue 1: Relocation to higher area
- land use plan

Less damage on higher ground

Minami Sanriku Town Shizugawa Area
Minami-sanriku town relocation plan to higher ground

Counter measures against Maximum level tsunami

- Evacuation
- Houses and Public Facilities on high ground
  (considering night time evacuation, personnel who needs support, ••)

Counter measures against Frequently occurring tsunami

- Sea walls constructed based on the predictions of future tsunami

Before

Mountain

Residence, Industry, Tourist facilities

Sea

Future Mountain

Residence, Public facilities

Green belt

Industry, Tourist facilities

Sea

Evacuate to heights

A: Maximum level tsunami More than 10m
B: Frequently occurring tsunami 8.7m

※case of Shizugawa area
Yuriage district in Natori city Land Use Vision

Western residential area elevated

Inundation of flatland area

Piled up rubbles which will be used for embankment   20 Sep
Hongo district in Kamaishi city - changes of land use

After 1933 Showa-sanriku tsunami villagers relocated to higher places

After completion of a sea wall villagers came back to lower places

Source: Map of Hongo district (Nikkei Architecture)
Issue 2: Recovery projects

Minami-Sanriku town recovery projects

**Main Projects**
- Land readjustment project for recovery
- Group relocation project for disaster risk reduction
  → residential areas relocated to safer ground

**Total project cost**
- 160 billion yen

**Budget scale of the town**
- 8 billion yen /year

Source: Home page of Minami Sanriku Town
Onagawa town Recovery Projects

Main Projects
- Land readjustment project for recovery
- Group relocation project for disaster risk reduction
- Fishery community environmental improvement project
  → residential area relocated to safer ground

Total project cost
- ~150 billion yen

Budget scale of the town
- 6 billion yen/ year

Diagram showing residential areas, public facilities, commercial & tourism area, memorial parks, and fishery processing industry area.
## Minami-sanriku fishing villages recovery project

<table>
<thead>
<tr>
<th>A. Separate Relocation Plan</th>
<th>B. Collective Relocation Plan</th>
<th>C. Combination Relocation Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="A. Separate Relocation Plan Diagram" /></td>
<td><img src="image2.png" alt="B. Collective Relocation Plan Diagram" /></td>
<td><img src="image3.png" alt="C. Combination Relocation Plan Diagram" /></td>
</tr>
</tbody>
</table>

### 【Features and challenges】

**(Viewpoint of Life)**

- Live with the people who are familiar
- Close to the place where victims were living for a long time
- Close to the fishing port, and easy to go out fishing

**Features and challenges**

- People from two or more villages live together
- Possibly far from a place where victims were living for a long time
- Possibly far from the fishing port
- Public service facilities and stores are expected to be built

**Features and challenges**

- Required to secure new lands close to the original village
- Required to build meeting places, parks, and so on in each district
- New facilities will be used more efficiently
- Development cost will be reduced

### Source: Home page of Minami Sanriku Town
Issue 3: Residents Involvement in the Planning Process

Minami-sanriku town Recovery Plan

Disaster recovery planning committee engages academic experts (inputs into recovery plan)

Survey of all residents

Disaster recovery planning residents’ committee (symbol project selection)

Community gathering (discussions on community level town planning)

Town planning meetings at neighborhoods (detailed discussions on relocation and land compensation)
Symbol Project

- Selected based on the opinions of residents, ideas and suggestions from results of “Disaster Recovery Planning Residents’ committee”

Project scope and main activities

1. Pass on the lessons of tsunami Project
   - Designate “Tsunami disaster preparedness day” (Victim memorial, disaster drills, etc.)
   - Create “Disaster archive”
   - Create “Earthquake memorial park and monument”
   - Promote storytelling

2. Support the disaster victims lives Project
   - Appoint “daily life support consultants”
   - Psychological support
   - Careful monitoring to prevent solitary death

3. Life Protection Road Project
   - Maintain evacuation roads
   - Establish tsunami evacuation guide flags

4. Lively town revival Project
   - Support temporary fish market, temporary shared factory facilities
   - Support local and handmade products
   - Supply local public housing
   - Establish facilities for tourism

5. Strong bonds and tributes Project
   - Support volunteer and exchange activities
   - Cooperation and exchange with supporting municipalities
   - Issue recovery information
Minami-sanriku
- Views on housing relocation areas

Of the people who lost their houses in the tsunami
- 9% want to continue to live in the former location
- 24% in the same neighborhood
- 25% in the same district of Minami Sanriku
- 22% inside Minami Sanriku

In total, about 80% want to stay in Minami Sanriku

Source: Townspeople intention investigation of Minami Sanriku Town
Minami-sanriku
- Hopes for Employment

People who wanted to continue the same work as they had done before the tsunami, based on occupation

- Farming: 77.3%
- Forestry: 81.8%
- Fishing: 84.9%

Source: Townspeople intention investigation of Minami Sanriku Town
Ishinomaki City resident survey results

Way to live from now (houses completely destroyed or abandoned)
N=7580

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Option 1: Want to live in the same place (own house) as before</th>
<th>Option 2: Want to live in the same area as before</th>
<th>Option 3: Want to move to the other area in the city</th>
<th>Option 4: Want to move to other cities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>27.9%</td>
<td>23.3%</td>
<td>41.3%</td>
<td>7.5%</td>
</tr>
<tr>
<td>10's, 20's</td>
<td>21.1%</td>
<td>21.1%</td>
<td>46.9%</td>
<td>11.0%</td>
</tr>
<tr>
<td>30's, 40's</td>
<td>22.9%</td>
<td>23.0%</td>
<td>46.6%</td>
<td>7.4%</td>
</tr>
<tr>
<td>50's</td>
<td>25.9%</td>
<td>22.0%</td>
<td>45.8%</td>
<td>6.3%</td>
</tr>
<tr>
<td>60's</td>
<td>33.7%</td>
<td>23.4%</td>
<td>34.5%</td>
<td>8.4%</td>
</tr>
<tr>
<td>Over 70's</td>
<td>32.8%</td>
<td>26.6%</td>
<td>33.9%</td>
<td>6.7%</td>
</tr>
</tbody>
</table>

Source: The Ishinomaki urban infrastructure recovery public questionnaires (Ishinomaki city homepage) (investigation time 2011.5.1-5.15)
Issue 4: Support among local governments

Alliance of 7 prefectures in Kansai region
- Sent relief goods (rice, drinking water, ...)  
  Dispatched support staff (54,589 persons as of Dec 1)  
  Received victims (4,497 persons as of Dec 1)
- **Counterpart system**  
  to avoid overlapping of support
Support from Hyogo Prefectural Government

Set-up Headquarters in Miyagi PG Office named Team Miyagi

Support for Kesennuma C
Support for Minami-sanriku T
Support for Ishinomaki C

Needs in devastated area
Needs in devastated area
Needs in devastated area

- General Support, Logistics, Public health, Medical care, welfare, Temporary housing, Educational support, Volunteer coordination, Shelter management, Rubble removal
- Support team consists of Prefecture G / City G / Village G

From now on staff with expertise will be dispatched for longer period
Thank you for your attention!

Yasuo Kawawaki
International Recovery Platform (IRP)
kawawaki@recoveryplatform.org