Disaster Preventive Urban Development

UR’s Support for Restoration in Recovery after the Great East Japan Earthquake

10 October 2016

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Urban Renaissance Agency

街に、ルネッサンス

UR都市機構
一日も早い復興へ 全力で取り組んでいます
Today’s report

1. UR’s profile (outline of our business)

2. Damage by tsunami caused by the Great East Japan Earthquake

3. Outline of UR Disaster Recovery Support Activities (including case examples)

4. Preparation for the future
   ① against urban disaster in Tokyo
   ② against the Nankai Trough Earthquake
1. UR’s profile

■ Overview of organization

<table>
<thead>
<tr>
<th>English Name</th>
<th>Urban Renaissance Agency (Independent Administrative Agency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of Establishment</td>
<td>July 1, 2004</td>
</tr>
<tr>
<td>Head office</td>
<td>Yokohama</td>
</tr>
<tr>
<td>Capital</td>
<td>1.0611 trillion yen (as of March 31, 2015)</td>
</tr>
<tr>
<td>Competent Minister</td>
<td>Minister of Land, Infrastructure, Transport and Tourism</td>
</tr>
<tr>
<td>Full-time personnel</td>
<td>3,196 (as of April 1, 2016)</td>
</tr>
</tbody>
</table>

■ History
1. Outline of UR Business

- **Urban Rejuvenation**
  - UR promotes Urban Renewal in collaboration with Private Business and local authority.
    - To promote Urban Renewal
    - To coordinate Vision, Planning, Conditions
    - To join the project as a partner

- **Disaster Restoration**
  - UR supports the reconstruction of disaster-stricken area and the strengthening of urban disaster prevention function.
    - To promote building disaster resilient urban area

- **Rental Housing**
  - UR properly manages rental housing and provides rich living space.
    - To manage rental housing through cherishing trust relationship with around 748,000 residents (as of the end of March 2014)
    - To promote to live in the urban center, to secure stable rental housing for elderly, to improve child care environment.

- **New Town Development**
  - UR aims at building urban area that provides safe and comfortable life in the suburbs
    - To advance safe, secure, and eco-friendly city building coping with aging population and lower birth rate
    - To realize attractive suburban life or local living
    - To complete promptly new town business
2. All Disaster Types / Disaster Management Plan

**Natural Disasters**
- Earthquake Disaster
- Tsunami Disaster
- Storm and Flood Disaster
- Volcano Disaster
- Snow Disaster

**Accidents Disasters**
- Maritime Disaster
- Aviation Disaster
- Railroad Disaster
- Road Disaster
- Nuclear Disaster
- Hazardous Materials Disaster
- Large-scale Fire Disaster
- Forest Fire Disaster

**Disaster management phases**
- Prevention / Preparedness
- Emergency Response
- Recovery / Reconstruction

**Concrete countermeasures to be taken by each stakeholder**
- National Govt.
- Local Govts. Municipalities
- Residents

Data Source: Cabinet Office
2. Damage by the Great East Japan Earthquake (1)

Seismic intensity map in the Great East Japan Earthquake

Data Source: Japan Meteorological Agency

Comparison with the Sumatra-Andaman Earthquake (2004, resulting in the Indian Ocean tsunami)

<table>
<thead>
<tr>
<th></th>
<th>the Great East Japan Earthquake</th>
<th>the Sumatra-Andaman Earthquake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Mar 11, 2011</td>
<td>Dec 26, 2004</td>
</tr>
<tr>
<td>Magnitude</td>
<td>9.0</td>
<td>9.1</td>
</tr>
<tr>
<td>Dead</td>
<td>15,892 ※3</td>
<td>35,322 ※1 in Sri Lanka</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(126,732 ※2 in total)</td>
</tr>
<tr>
<td>Missing</td>
<td>2,573 ※3</td>
<td>5,637 ※1 in Sri Lanka</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(93,662 ※2 in total)</td>
</tr>
</tbody>
</table>

※1: cited from the Wikipedia
※2: as of Mar 30, 2005, Cabinet Office
※3: as of Aug 10, 2015, National Police Agency
2. Damage by the Great East Japan Earthquake (2)

A range of the damage by Tsunami is widespread from Tohoku to Kanto

Further information of Tsunami height is shown as following HP:

2. Coastal areas attacked by tsunami
3. Outline of UR Disaster Recovery Support Activities

UR has supported town development consisting of restoration, formulation of a reconstruction plan, and urban restoration including urban reconstruction projects and emergency public housing project upon request of the national or local government.

(as of August 1, 2016)

<table>
<thead>
<tr>
<th></th>
<th>Restoration support (from March 2011)</th>
</tr>
</thead>
</table>
| 1 | (1) A total of 970 UR rental housing provided  
(2) Around 8 hectares of UR land provided for the construction of emergency temporary housing  
(3) A total of 181 technical personnel dispatched to construct emergency temporary housing  
(4) A total of 3 technical personnel to check safety of the building land |

<table>
<thead>
<tr>
<th></th>
<th>Support to laying down restoration plans (from April 2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>A total of 62 personnel dispatched to 1 prefecture and 18 villages, towns and cities in Iwate, Miyagi and Fukushima prefectures.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Support in restoration work (from Jan. 2012)</th>
</tr>
</thead>
</table>
| 3 | • Conclusion of memorandums and agreements with 22 municipalities in disaster-stricken areas to promote restoration through urban development  
• UR supports ①22 urban reconstruction projects and ②85 public housing projects, according to the request from municipalities in disaster-stricken areas. |
Based on relevant laws, UR carries out the following projects by consignment and request by disaster-stricken municipalities.

1) Land Readjustment Project  
Land development on higher ground for relocation, land elevation of disaster-stricken areas, development of roads, residential land development

2) Collective Relocation Promotion Project for Disaster Prevention  
Purchase of affected residential land, and group relocation to higher ground

3) Development of Business Revitalization Bases

4) Disaster Resilience Enhancement Project of Fishing Communities  
Land elevation in fishing communities and improvement of roads, drainage, etc.

5) Building / Transfer of Public Housing for Displaced People  
Rental housing for people who lost their houses in the disaster

< Project costs > (1) – (4) are fully borne by the central government. (5) is covered by the central government (7/8) and by the local authorities (1/8).
3. UR’s main support menu for urban restoration

1. Urban reconstruction projects
(a total of 22 districts, 1,300 hectares in 12 municipalities)

○ UR implements land readjustment projects and collective relocation promoting projects committed by the disaster-stricken municipalities

Onagawa town

2. Public housing projects
(a total of 5,880 housing units in 51 districts in 16 municipalities)

○ UR constructs public housing and transfers to the municipalities according to their requests

Otsuchi town
### 3. Proportion of UR supporting projects in the whole

<table>
<thead>
<tr>
<th>Urban reconstruction project</th>
<th>Public housing project</th>
</tr>
</thead>
<tbody>
<tr>
<td>22 districts are implemented by UR</td>
<td>About 5,900 units are constructed by UR</td>
</tr>
<tr>
<td>Over 60% of land readjustment projects are supported by UR</td>
<td>(20% of about 29,500 units in total)</td>
</tr>
</tbody>
</table>

I Urban reconstruction project

1. Land readjustment projects

- **Municipalities**: 700ha (38%) (36 projects)
- **UR**: 1,121ha (62%) (25 projects)

   - Total: 1,821ha (61 projects) in total

2. Collective Relocation Promoting Projects

   - **Municipalities**: about 10,000 units (77%)
   - **UR**: about 3,000 units (23%)

   - About 13,000 units in total

3. Business Revitalization Bases Development

   - **Municipalities**: 180ha (62%) (14 projects)
   - **UR**: 109ha (38%) (10 projects)

   - Total: 289ha (24 projects) in total

4. Fishery village disaster prevention functional enhancement projects: 198 projects in total

   - **Municipalities**: 181 projects (91%)
   - **UR**: 17 projects (9%)

II Public housing project

1. Iwate prefecture: about 5,900 units in total

   - **Prefecture**: about 2,800 units
   - **Municipalities**: about 3,100 units
   - **UR**: about 1,100 units

2. Miyagi prefecture: about 15,900 units in total

   - **Prefecture**: About 2,300 units
   - **Sendai City**: About 3,200 units
   - **Municipalities**: about 10,400 units
   - **UR**: about 3,900 units

3. Fukushima prefecture: about 7,700 units in total

   - **Prefecture, etc.**: about 4,890 units (for nuclear power generation refugee)
   - **Municipalities**: about 2,800 units (For earthquake and tsunami refugees)
   - **UR**: about 800 units

   - **UR**: 52units

Data source: 2nd emergency public housing construction plan

Prospect by publicly disclosed information as of April 1, 2016

- Number of projects and units by UR are accumulated ones under construction or under discussion to construct.
### 3. UR’s Reconstruction Projects

**Planning** | **Project** | **Ground-breaking** | **Partially completion**
---|---|---|---

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Project name</th>
<th>Project procedure</th>
<th>Planned Area</th>
<th>Period (FY)</th>
<th>FY2012</th>
<th>FY2013</th>
<th>FY2014</th>
<th>FY2015</th>
<th>FY2016</th>
<th>FY2017-</th>
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<tbody>
<tr>
<td>Miyako</td>
<td>Taro</td>
<td>LR, CR</td>
<td>45ha</td>
<td>2012-2016</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>Kuwagasaki/ Kooanii</td>
<td>LR</td>
<td>24ha</td>
<td>2013-2017</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yamada</td>
<td>Osawa</td>
<td>LR, FS</td>
<td>19ha</td>
<td>2012-2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Orikasa</td>
<td>LR, CR</td>
<td>13ha</td>
<td>2012-2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Yamada</td>
<td>LR, BR, CR</td>
<td>56ha</td>
<td>2012-2018</td>
<td></td>
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<tr>
<td>Iwate</td>
<td>Otsuchi</td>
<td>Machikata</td>
<td>LR, BR, CR</td>
<td>40ha</td>
<td>2012-2017</td>
<td></td>
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<tr>
<td></td>
<td>Kaase</td>
<td>LR</td>
<td>23ha</td>
<td>2012-2018</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>Unosumai</td>
<td>LR, BR</td>
<td>60ha</td>
<td>2012-2018</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Kerobe</td>
<td>CR, FS</td>
<td>2ha</td>
<td>2012-2019</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Ofunato</td>
<td>Ofunatoeki</td>
<td>LR, BR</td>
<td>36ha</td>
<td>2013-2019</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Rikuzentakata</td>
<td>Imaizumi</td>
<td>LR</td>
<td>112ha</td>
<td>2012-2018</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Takata</td>
<td>LR, BR</td>
<td>186ha</td>
<td>2012-2018</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Kesennnuma</td>
<td>shishiori</td>
<td>LR</td>
<td>42ha</td>
<td>2012-2017</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Minami Kesennnuma</td>
<td>LR</td>
<td>33ha</td>
<td>2012-2017</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Miyagi</td>
<td>Minami-Sannriku</td>
<td>Shizugawa</td>
<td>LR, BR</td>
<td>111ha</td>
<td>2012-2018</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Onagawa</td>
<td>Town center</td>
<td>LR, BR, FS</td>
<td>218ha</td>
<td>2012-2018</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remote area</td>
<td>LR, FS</td>
<td>54ha</td>
<td>2012-2017</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ishinomaki</td>
<td>Shinkadowaki</td>
<td>LR</td>
<td>24ha</td>
<td>2013-2017</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Higashi-Matsushima</td>
<td>Nobiruohkubu hill</td>
<td>LR, BR</td>
<td>92ha</td>
<td>2012-2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Higashiyamatoeki Kita</td>
<td>LR, BR</td>
<td>28ha</td>
<td>2012-2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Iwaki</td>
<td>Usuiso</td>
<td>LR</td>
<td>37ha</td>
<td>2012-2017</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toyoma</td>
<td>LR</td>
<td>56ha</td>
<td>2012-2018</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total** | 22 projects | 約1,300ha | Start constructing: 6 | Start constructing: 16 | Transfer building lots: 1 | Transfer building lots: 6 | Transfer building lots: 11 | Transfer building lots: 4 | Complete: 1 | Complete: 5 | Complete: 16 |
3. Illustration of Reconstruction (1)
1. Status at time of disaster

In Minami-Sanriku town, the tsunami waters rose to as high as 16.25 m above sea level.
2. Collective relocation promoting project and Land readjustment projects (Under construction)

Projects promoting group relocation for disaster mitigation

- Areas that cannot be used for residential purposes because risk of flooding remains even after completion of seawall

Land readjustment projects

- Areas that are used for residential purpose after completion of seawall

Projects promoting group relocation for disaster mitigation (residential areas)

- Municipality buys land at high elevations and develops residential areas (planned relocation destination)

Rebuilt seawall

- Municipality buys up land (in area where relocation is encouraged)

Embankment above inundation level (land readjustment project)
3. Illustration of Reconstruction (4)

3. Collective relocation promoting project, and Land readjustment projects (After the construction)

- Disaster hazard area
- Group relocation
- Land readjustment project

New houses are built on residential areas developed by the municipality. The land is either purchased by or leased to the residents.

After municipality builds up embankment and develops residential areas and roads, etc., houses are built in land readjustment project area.

OK for other than residential use.

(housing block for group relocation)
3. 【Case 1】Nobiru Hokubu Project, Higashimatsushima city

- UR developed a new urban area on the hill and relocated JR Senseki Line in May 2015 in land readjustment project, at a time. (448 building lots for housing, 1 childcare supporting facility, etc. were completed and transferred in FY 2015)
- UR reduced construction time by carrying 3,000,000 m³ surplus soil by temporary conveyor belt, proposed by private contractor.
3. 【Case 1】Nobiru Hokubu Project, Higashimatsushima city

- UR transferred construction site for JR Senseki Line by July 2014, reducing time by utilizing conveyor belt to carry lots of surplus soil.
- It could make possible that JR Senseki Line, the most important local railway, was opened in May 2015, on schedule.
- UR will transfer all building lots for housing in FY 2016 and emergency public housing in 2017.
3. 【Case 2】Takata & Imaizumi District, Rikuzentakata city

Before the Disaster

![Before Disaster Image]

After the Disaster

![After Disaster Image]
• Old city center in Tsunami stricken area is planned to relocate closer to hilly area and constructed on the embankment over Tsunami level.
• New city center is planned to be compact.
• Relocation of city center is implemented through land readjustment project.

3. 【Case 2】Takata & Imaizumi District, Rikuzentakata city

- Takata district about 190ha in total
- Imaizumi District about 113ha in total

Carrying surplus soil by conveyor belt

Upland urban area
(Residential, public facilities)

Embankment
(Residential, commercial, and public facilities)

Low land
(Park, agriculture, etc.)

New city center

Old city center

*: Emergency public housing

Collective Relocation Promoting Projects
3.【Case 2】Takata & Imaizumi District, Rikuzentakata city

View from the Hill in Imaizumi district (as of July 2014)
※The crusher and conveyor belt was removed from Sep. 2015 to Feb. 2016
※The suspension bridge to convey sands was removed from April to Sep. 2016

View of Takata district, raising the level of embankments (as of Oct. 2015)
3. Construction schedule of Public housing by UR

- UR has a plan to construct 5,880 units of public housing in 85 project sites. Peak of construction is in FY 2015 and 2016.
  - Iwate: 1,124 housing units in 37 project sites
  - Miyagi and Fukushima: 4,756 housing units in 48 project sites
    (4,003 units in 43 project sites outside Iwaki, 753 units and 5 project sites in Iwaki)
- UR has got all requests of building public housing from municipalities by March 2016 and a plan to complete by March 2018.
  - Completion ratio: 40% in March 2016 → 78% in March 2017 → 100% in March 2018

※ at making a contract with contractor
3.【Case】Sakuragi district, Tagajo city

- Place residential floor, community traffic line and space over 2nd floor against Tsunami
- Place community deck on the 2nd floor, using emergency traffic line
- Place elderly person life counselor’s office and childcare supporting facilities
- Place meeting room for all residents facing to community deck

- Roof playing space
- Meeting room (2F)
  (1 room for each block)
- Community deck
- Solar power generator
- Housing with pet
  (western part of Block 4)
- Park
- Elderly person life counselor’s office
  (2F)
- Childcare supporting facilities
  (1・2F)
- Emergency stairs from Tsunami
  (East & west side of whole blocks)
- Childcare supporting facilities (1・2F)
- Meeting room (1F)
- Community deck
- Community deck

23
Urban development with bolstered functions for disaster-resistance
【Mitaka civic center project, Tokyo】

- Civic center and related facilities should be renovated or rebuilt because they became old and not enough earthquake-resistant.
- Construction of integrated disaster-readiness hub with disaster-readiness park, multi-function building and civic center in the project site
Building a fire-resistant, safe town
【Kyojima 3-chome District, Tokyo】
・Densely built-up area with many wooden houses and tenement houses
・In terms of improving the disaster-resistance of this area, UR worked in collaboration with municipality to establish a disaster-prevention block.
・Old wooden buildings were rebuilt to be more fire-resistant, and main roads in this community were widened.
4. Preparation for the future (against the Nankai Trough Earthquake)

- Formulation of the “Guidelines for Disaster-resistant Town Development”
- Consideration of “a disaster-resistant town development plan” for each regional model
- Developing a tsunami evacuation tower, evacuation routes and other facilities

The central part of Naka-Tosa town, Kochi, and the tsunami evacuation tower (November 2015)
Activities for disaster-resistant town development

Regions where tsunami damage is predicted are proceeding with study on disaster-resistant town development and other projects. UR is providing information on the Preliminary Urban Restoration Plan and other projects based on its experience in the reconstruction from the Great East Japan Earthquake.

For example,

● Reconstruction direction policy

A direction policy is important to ensure speedy decisions on reconstruction projects (whether reconstruction at the original place or relocation to upland/inland or other area) that need to combine speed and quality

● Securing of necessary land

Preparation (consideration of a disaster prevention park, understanding of the land situation and so on) for accessible flat land in upland or inland areas which will become necessary for emergency disaster countermeasures, emergency temporary housing, emergency public housing and other measures at an early stage

● Systems to promote reconstruction

Local interested organizations and municipalities that concluded “mutual aid” or other agreement are expected to deepen understanding among staff members, social welfare councils and others
Thank you for your attention.