Character of the Great East Japan disaster

- 14:46, 11 Mar 2011
- M9.0
- Multiple disaster; earthquake, tsunami, fire, land slide and nuclear power plant accident
- Huge area; 500km length From Aomori to Tokyo
- These characteristics make it different from the Hanshin-Awaji earthquake in 1995 in Kobe.
Damage by the Great East Japan Earthquake
(as of 14 Dec 2012)

- Death 15,878
- Missing 2,713
- Secondary death 2,303
- Evacuee 321,843

Total 18,591 person

House damage
- Totally damaged 129,714 units
- Half damaged 267,603
- Partially damaged 731,534

Major 3 types of damaged area

1. Ria-coastal area
   Iwate, Miyagi prefecture
2. Coastal plain
   Miyagi prefecture
3. Nuclear accident area
   Fukushima prefecture
Damage in ria-coastal area

Ofunato city

港内の重油タンクが破損し、燃え上がって火災を広げた。

Kesen-numa city

消防艇も黒こげ
Onagawa town, Miyagi prefecture

One of the most heavily damaged areas. Almost 10% of the population was killed.

Building that fell down (tipped over) by tsunami

Hospital on the hill 15m high from sea level. Tsunami attacked the first floor.

Sendai plane

Rice field

Sendai airport
Arahama district, Sendai plane

Elementary school, nearest to sea shore

Nuclear radiation contamination

- Nuclear contamination and tsunami damage
- Many local government offices moved to other city, town and prefecture.

They can not know when they can return to their home town. It is difficult to discuss about reconstruction plan.
Damage by tsunami in nuclear radiation contaminated area

Current scene of contaminated town
Class room and Grave yard

Framework for transitional shelter

Disaster

Evacuation Shelter
- Usually municipal buildings, schools, gymnasiums

Transitional Shelter
- Funded by Central government, organized by prefectural government.

Permanent Housing
- Survivors build their own houses or live in public housing at discount rent

Disaster Relief Act 1947
Public Housing Act
Victims Life Support Act 1998
Three types of temporary housing

As of 14 Dec 2012

A) Temporary housing 48,447 units
   (1) Prefabricated house
   (2) Wooden house
B) Private apartment as temporary housing 61,442 units
C) Existing public housing & government-owned accommodations 10,824 units

Typical temporary housing

Prefabricated house

Prefabricated house
Low quality; biggest problem in prefab temporary housing

- Heat control, noise protection
- Small space <29㎡
- Poor facility
- High cost
  - 6 mill. yen/unit
  - + additional work

Additional work to attach heat insulation panel.

We have had many experiences of low quality problem since Hanshin-Awaji earthquake 1995 in Kobe.
Wooden temporary housing

- 30㎡, 2.6 mill. yen/unit
- Good quality
- Permanent use
- Local material
- Local carpenter
- Good for local economy

Sumitacho town, Iwate pref.

Variation of wooden temporary house

Fukushima Pref.; 6000 units
Iwate pref.; 2500 units
Miyagi pref.; 250 units

60 m², 4.4 mill yen

仮設住宅はいいけれど、（大熊町の住民）
Location & facilities

- Lottery system for allocation
- Far from town
- Difficult to go to shop, medical center and living facilities
- Losing community

These problems are well known as important lessons from Kobe experience.

Temporary housing, Hanshin-Awaji case

- 山上 (西宮市)
- Building cost: 3 mill. Yen/unit
- Demolishing cost: 1 mill. Yen/unit
- 埋立地 (芦屋市)
Location of temporary housing, 
Hanshin-Awaji case

Total number of temporary housing; 48,300 units

We can say that temporary housing in GEJE is not products well learned from Hanshin-Awaji earthquake.

The reason must be clear why the same errors has been brought.
Private apartments as temporary housing

- National government money for rent
- 60,000 yen/month for two years
- This system fit for victims needs because they can chose their living location.
- There are many problems.
  1. Moving of victims to urban areas
  2. Lack of support for victims in private apartments
  3. Complicate system to provide rent through national, prefectural and municipal governments.
- The system should be improved before next major disaster in the near future.

Permanent house

- Next stage after temporary housing is getting permanent house.
- There are two options for victims to get the permanent house.
  1. Public housing; important option for low income victims
     Iwate pref.: 4,000～5,000 units
     Miyagi pref.: 15,000 units
     Fukushima pref.: 2130+1000 units
  2. Self reconstruction
Public housing after Hanshin-Awaji earthquake

- Total number; 38,600 units
- Far from home town
- Lottery system for allocation
- Losing community

Solitary death

Important lesson from Hanshin-Awaji earthquake is that public housing without community brings social isolation for residents and sometimes it occurs solitary death.

During 18 years since 1995 there has been 1011 persons solitary death because of losing community.

- In temporary housing: 233
- In public housing: 778
- Total number: 1011 persons
Community oriented planning and design for public housing

- Based on community
- Close to original villages
- Small scale, wooden house

Disadvantage of Public housing

- Public housing system is important as safety net for victims, particularly for low income peoples.
- However it is not necessarily best solution.
- Small space, fixed plan, high rise tower block (sometimes), no garden, no farm
- Many victims in Tohoku area had big house with garden and farm where they made flower and vegetable and they could keep health and enjoyed the life.
- Public housing can not afford them these conditions.
- In terms of management of public housing, in future local government should be suffer from heavy work under many number of new public housing.
Self reconstruction

- It is best way for victims to reconstruct their house as before earthquake on their own land, if it is possible.
- In this sense main measure to get permanent house should be support for victims to construct their own housing.
- So it is better way to decrease the number of public housing, and promote the victims to make self reconstruction by financial support.

Finance support for self reconstruction

- Finance support is very important, but it is quite limited.
- National government support is ¥3 million in maximum case depend on damage level.
- This system has been created after Hanshin-Awaji earthquake, Victims Life support Act 1998.
- National government scheme must be improved.
- Local government should provide additional support.
- In Noto earthquake 2007, central and local government support money was up to ¥7.7 million and in Niigata Chuetsuoki case 2007 was ¥6.5 million.
Land use and urban planning issues

- Wide area is covered by sea water.
- Wide area has future risk attacked by tsunami.
- In those areas victims can not reconstruct on their own land.
- Relocation program from coastal area to inland or highland area is strongly suggested.

Ofunato city, Iwate pref.

Tsunami risk assessment

Tsunami simulation

Ofunato city, Iwate pref.
Land use plan

Tsunami protection by three guards.

In the area in front of third guard people should not live and have to move to high land.

Relocation from low land to high land

Ofunato city, Iwate pref.
Many problems

- Consensus making
- Merit and demerit for relocation?
- Job in new area?
- Money to build new housing in new area

- Relocation project needs long time, three or five years.
- During those time how can they earn the money to live?
- Each local government lacks the man power to promote making consensus.

Relocation experience in Banda Aceh, Indonesia

Far from home town, No job, vacant house It seems to provide many lessons to Japanese current situation.
Temporary shopping center

- Local people have to struggle to make a micro business and to find out better reconstruction way.

Ofunato city, Iwate pref.  Kesen numa city, Miyagi pref.

FINE

Thank you for your attention