

Risk Management and Town Planning in Small Cities

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Abstract:

More than 40 cities in east Japan were attacked by earthquake and huge tsunami on March 11, 2011. Dr. Furuta and I presented “Capability Assessment for Readiness in Case of Urban Disasters” in EAROPH conference 2005 held in Jogjakarta. We reported the importance of the recognition of the risk in four steps such as risk declaration to public, making up of official action and prevention plan, inauguration of basic ordinance and enacting the risk management ordinance. This time, some cities managed very well and saved many lives but the other cities failed to do that and the lives of 70% of pupils of Ohkawa primary school were lost. This paper shows the rough introduction of the disaster this time and the basic direction of risk management and planning of those cities. The biggest reason why we had so many victims as about 20 thousand was of course the unpredictable size of the Tsunami Wave. But it can be said that there were big difference in the proportion of victims among the disaster areas. This was probably caused by the difference of the understanding level of risk recognition through daily life or the way of acceptance of the emergency announcement.

Keywords: risk management, city planning, tsunami, earthquake

1. Unpredictable scale of earthquake and tsunami

The Pacific Ocean plate slips into the northern American plate in the east coast area of Japanese Main Island. The movement and compression of northern American plate is said to be about 3cm per year and about 5m of that was released this time and caused M9 big earthquake and tsunami. Fig. 1 shows seismic centers of March 9, 10 and 11. We detected earthquakes on 9 and 10, but couldn't predict those of 11 that were huge and spreading wide up to about 600km north to south.

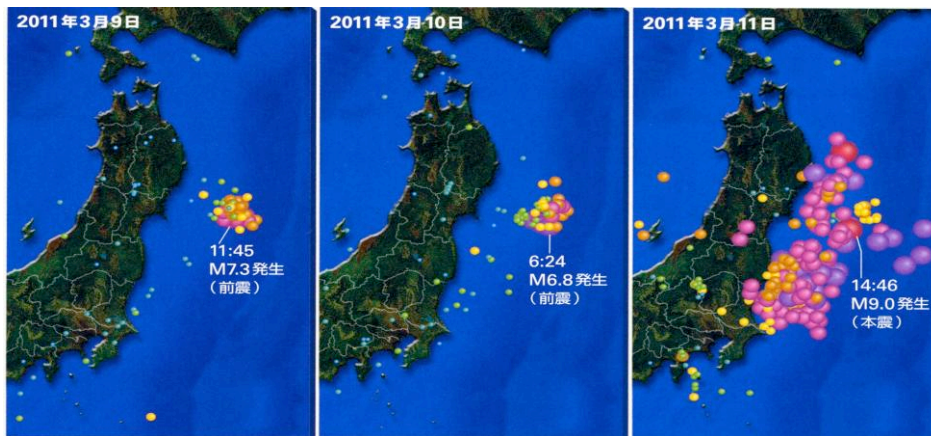


Fig.1 Seismic Centers on March 9, 10 and 11, 2011
("Newton" special edition, 2011. 7. 15)

Earthquake itself was strong enough as Richter scale up to 7 and caused many disasters on transportation system, power plant and electricity network, water supply and sewage system and land liquefaction. Almost all of those were recovered except land liquefaction within a month. The number of victims caused by the earthquake was not so big and less than one hundred. Fig.2 and 3 show the desperate scenery after tsunami and Fig.4 shows the height of tsunami waves.



Fig. 2 Tsunami attacked Kesen-numa City (Tatakau Nihon, Sankei Shimbunsha, 2011)



Fig. 3 Ship floated to the top of house (Tatakau Nihon, Sankei Shimbunsha, 2011)

The highest height of Tsunami wave was 15.8m in Rikuzenn-takada City and that of Fukushima No.1 Nuclear Power Plant was 14-15m. Total number of victims caused by Tsunami is not yet clear but it is estimated about 20,000. It was estimated nearly 30,000 in March but about 10,000 were found safe.

Another disaster was caused by Fukushima No.1 Nuclear Power Plant. Main power



Fig. 4 Height of Tsunami Wave (Higashi Nihon Daishinsai, Futaba-sha, 2011)

supply from Touhoku Electric Company was stopped after the earthquake and emergency generators were all damaged by tsunami. Therefore, all of the cooling system of atomic fuel didn't work.

As a result, the plant caused serious pollution of radiation within the area of 100 to 200 km. People within 30km radius were evacuated.

2. Damages in urban areas

The cities and towns with the lost and missing equal or over 10 persons are as follows.

Table 1 Cities, Towns and Villages by the number of victims

| Number of Lost and Missing | Name of Cities and Towns |
|------------------------------|--|
| 10—99 4 C., 6 T. and 2 V. | Noda V., Tanohata V., Shichigahama T., Shiogama C., Futaba T., Ohkuma T., Tomioka T., Tomioka T., Naraha T., Sukagawa C., Shirakawa C., Asahi C. |
| 100—999 8 C. and 6 T. | Miyako C., Yamada T., Ohfunado C., Onagawa T., Sendai C., Tagajo C., Iwanuma C., Watari T., Yamamoto T., Shinchi T., Souma C., Minami Souma C., Namie T., Iwaki C. |
| 1000— 5 C and 2 T. | Ohzuchi T., Kamaishi C., Rikuzen Takada C., Kesen-numa C., Minami Sanriku T., Ishinomaki C., Higashi Matsushia C. |

In case of Rikuzen Takada City, about 2,000 among the 24,000 total population were lost and missing, and in Minami Sanriku Town over 1,000 are lost and missing among 18,000 population. 3-storied town hall was completely flowed over by Tsunami and the mayor and a young lady staff announcing the emergency died. Many patients in the hospital were also died because of the tsunami attacked up to the forth floor. In Kesen-numa City, not only tsunami but also big fire destroyed the city. Tsunami broke many oil tanks in the harbor and the spilled out oil burnt most of the downtown. Ohkawa primary school in Ishinomaki City lost 74 pupils

among 108 and 10 teachers among 13. This was caused by the delay of evacuation. Tsunami attacked while teachers were searching the schoolrooms one by one.

Total amount of damage, such as house, building, lifeline, infrastructure, agricultural field and functions, and others, was estimated as about 200 billion US Dollars. Almost same amount of national budget would be required to reconstruct these damaged areas. This is about 5 % of GDP and 20 % of annual national budget.

3. Risk management of cities and towns

Kamaishi City is said to be one of the best cities of risk management. While about 1,200 were died among 40,000 population, 3,000 pupils and students of 14 primary and secondary schools located coastal area were all safe. They were educated three points: (1) don't believe the prediction (2) do your best (3) to be the first runaway. This fact suggests that the first prediction of Meteorological Office of National Government, the height of Tsunami would be 6 m, influenced the delay of runaway like Ohkawa primary school in Ishinomaki City and the staff of Minami Sanriku Town. The prediction was changed to over 10m Tsunami about 30 minutes later but the people already didn't have time enough to run away. Students of Kamaishi City were trained to run away in previous classes and the students of secondary schools helped the runaway of the pupils of primary schools nearby.

Then it is necessary to add another step of risk management to that of mentioned in the beginning part of this paper. It will be like this;

- (1) To identify the risks and declare them to public,
- (2) To make up the plan for prevention and evacuation,
- (3) To inaugurate the basic ordinance,
- (4) To enact the risk management ordinance, and

(5) To educate and train people in daily life.

Especially, it is important to prepare automatic announce system through loudspeakers with battery to notice the emergency to public. In Minami-sanriku Town, a young lady staff continued to announce the emergency before the microphone in the town hall and died by the tsunami.

4. Planning for small cities and towns

The biggest problem of small cities and towns would be the lack of experienced staff. After this disaster, a lot of staff exchange has been carried out. Capable staffs are kept in big cities and Urban Renaissance Agency (former National Housing and Urban Development Corporation). For example, Sapporo City sent her staffs to Sendai City, Ishinomaki City, Shirakawa City, Kesenuma City, Aizu-misato Town, Ohfunado City, Kuji City, Ohkuma Town and Yamamoto Town. URA has sent the staffs to more than 30 cities and towns, and supporting the reconstruction planning and works.

Before the devolution and renovation of administration in national and local governments started about 10 years ago, private consultant companies could be the home consultants of cities and towns. But the negotiated contract was forbidden since then and every contract became severe competitive contract. Then private consultant companies cannot stay steadily in house and cities and towns have lost their pearls of wisdom.

Japan introduced NPO (Non Profit Organization) system in 1998. There are more than 40 thousand organizations and almost half of them are related to city planning. Some of these organizations are capable to replace high cost consultants but most of those are non-experienced groups. They usually discuss about daily life issues and not long term planning. Even though governments intend to develop NPO groups because they are mainly volunteer base and cheap.

The central organization named NPO Japan Society of Urban Regional Planning opened the consultant window for such cities and towns but the actual number of approach is quite limited. Most of mayors are not interested in city planning for the long future.

Now, the basic city planning problems for small cities and towns would be as follows:

- (1) How to get experienced planning staff,
- (2) How to find and identify any kind of risks and problems such as disasters, shortage of land and food, troubles of lifeline, transportation and communication network, terrorism and so on,
- (3) How to announce the risks and problems to public,
- (4) How to prepare countermeasures and necessary planning and ordinances, and
- (5) How to educate and train people in every occasion.

5. Expected direction of suffered Japanese cities and towns

It is easy to say that those areas attacked by tsunami should be relocated to up-land and lowland should not be used for residential use. But please remember that the attack of huge tsunami was not the first time. Record shows that the big tsunami attacked so frequently as in 869, 1585, 1611, 1616, 1676, 1677, 1696, 1835, 1856, 1894, 1896, 1933, 1960 and 2011. If such solution were easy, people would have been relocated already. Actually it is very hard to establish the safe area because of the lack of convenient highland for fishermen.

Tsunami disaster happened in more than forty municipalities and those situations are quite different one by one. It is said that the policy making of national government was so slow under the Democratic Party administration. Official research work for each municipality started in June and the debris treatment started so late in August. Probably this delay was caused by the basic policy of Democratic Party to eliminate the bureaucratically affection to the national administration and to strengthen the leadership of politicians. Then experienced governmental

officials couldn't work based on their own experience and knowledge but just waited the direction shown by the politicians.

The Reconstruction Team of Ministry of Land, Infrastructure, Transportation and Tourism proposed 7 key policies in late June such as:

(1) As a requiem for the victims, we should operate deep analysis on the fact and leave and publish the result to all of the global coming generations.

(2) National government will support the municipalities through the basic policy and administrations, and each municipality will work for reconstruction understanding the diversion of each area.

(3) These areas should be reconstructed as most advanced areas in both technology and potential.

(4) These areas should be reconstructed like such areas as the safest against disasters, with the highest utilization of clean energy and with the tightly united communities.

(5) Economy renaissance of the country and these areas should be driven in a parallel direction.

(6) The accident of Nuclear Power Plant should be stabilized quickly and the national government should pay the deepest and delicate attention for the solution and recovery.

(7) We all alive should accept this disaster as our own and promote the reconstruction works under the strong ties.

As mentioned already, solution would be quite different from town to town, but it would be sure that the reconstruction work would be the mixture of highland development, lowland reconstruction, purchase of sunk and abandoned land by the national government, construction of tall evacuation buildings or floor in lowland, and the construction of tide embankments.

Rough estimation of mine is that about 5% of former residents were lost or missed, 30% will intend to go out of the region, 30% will return to the former resided areas, and the rest will live

on highland or in tall apartments nearby. The research result of each city and town will come out in the beginning of 2012 and reconstruction works will start vigorously then. The government expects that the economy growth of Japan in coming year will be much higher than ever before.

6. Conclusion

The risk management and planning in small cities and towns depends on the acquisition of good human resources. There are three ways to do that. One is to educate and to train the own staff, the second is to make good connections with good consultants and the third is to install committees or boards organized by experienced experts and professors. There are three big problems in Japan. One is the regular personnel order made every two or three years in governments. This will prevent the growth of experienced government staff in the special fields. The second is the strict control or the contact between governmental organizations and private fields. Because of the strict competition among private organizations and the instability of the long-term contract, private fields such as general construction companies and consultants are losing their capability both in intelligence and finance. The third is the capability of mayors. Mayors are elected by voting and have a tendency to listen to the short-term public opinions. Then well-experienced and trained professionals are sometimes expelled from the committees and boards.

On the other hand, such short foresight sometimes faces political instability. Because the journalism in these days sucks around the public and is changeable. For example, Democratic Party was very much welcomed two years ago but has lost the public support already and Liberal Democratic Party is getting public support again to some extent. Another example is the introduction of the single-seat constituency system in 1996. This was so welcomed in those days but we feel the loss of political stability and discussing to return to the plural seats system again.

Finally, it is vitally important to elect a good mayor and keep well experienced staff. It would be also suggested to give many chances to governmental officials to attend any kinds of meetings such as international, inter-regional, inter-professional conferences. There is a saying in Japan “Don’t be a big fish in a little barrel”.

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Hirohide Konami (Prof. and Ph.D.) was born in Tokyo in 1942. Studied city planning in the University of Tokyo and the Graduate School of Design, Harvard University. While working for Japanese national government in City Planning for 31 years, invited to the University of the Philippines as a visiting professor for one year in 1996. After retirement, worked for Toyo University and Tokyo Jogakkan University in Tokyo for 7 years and 4 years each and came to the present Teikyo Heisei University. EAROPH lifetime and executive committee member.