International Strategy for Disaster Mitigation

Lessons learnt from the Great East Japan Earthquake and the current recovery efforts

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Contents

1. Disasters in Japan and Background of HFA
2. Outline of Hyogo Framework for Action 2005-2015
3. HFA IRIDeS Review Preliminary Report Focusing on 2011 Great East Japan Earthquake
4. HFA Priority for Action 4: Reduce the underlying risk factors

HFA 1

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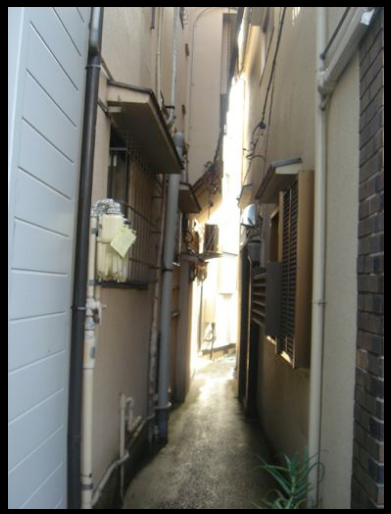
Disasters in Japan and Background of HFA

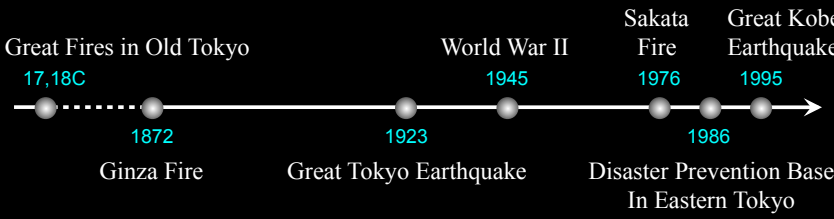
Definition of Urban Risk

Urban Risk = Hazard * Vulnerability * Exposed Value

Vulnerability: Wooden House Congested Districts



Timeline of Critical Disastrous Events



Walls to Prevent Fire Spreading

Block Readjustment to Modernized Area

Great Tokyo Earthquake

1657 1872 1923 1945 1976 1986 1995

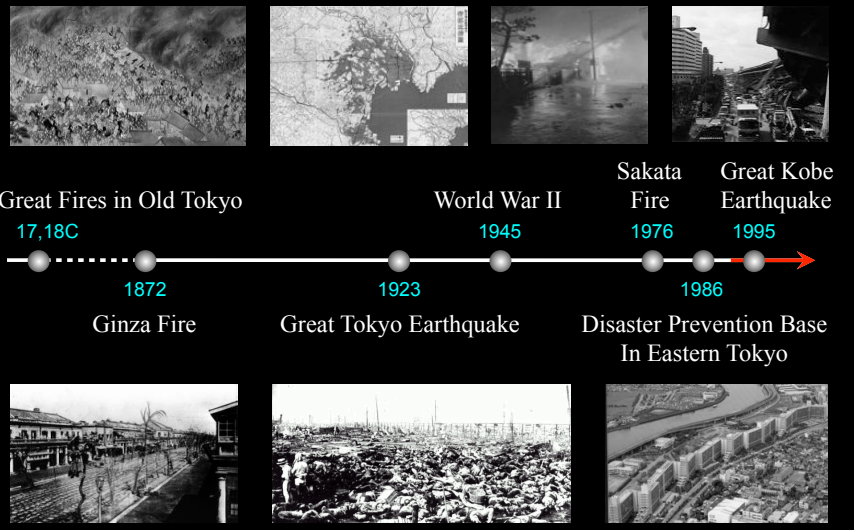
University of Tokyo

1. Urban Structure Readjustment

Recovery Parks

Great Kobe Earthquake (Hyogo)

Timeline of Critical Disastrous Events



International Decade for Natural Disaster Reduction (IDNDR)

International Decade for Natural Disaster Reduction

I D N D R

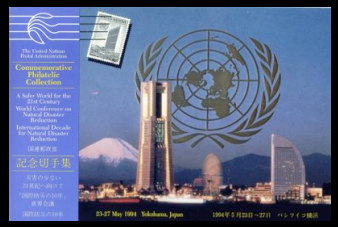
1 9 9 0 – 2 0 0 0

Building a Culture of Prevention

IDNDR

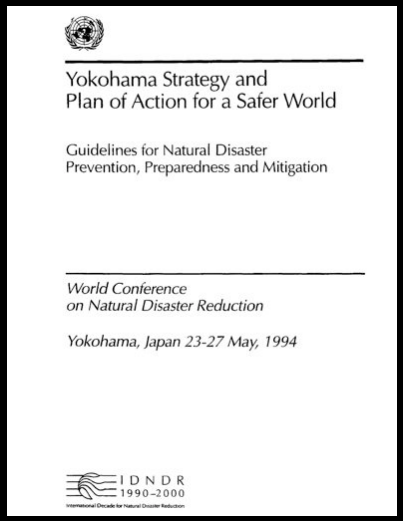
On 11 December 1987 at its 42nd session, the General Assembly of the United Nations designated the 1990's as the International Decade for Natural Disaster Reduction (IDNDR). The basic idea behind this proclamation of the Decade was and still remains to be the unacceptable and rising levels of losses which disasters continue to incur on the one hand, and the existence, on the other hand, of a wealth of scientific and engineering know-how which could be effectively used to reduce losses resulting from disasters.

World Conference on Natural Disaster Reduction 1994 Yokohama, Kanagawa, Japan



The UN World Conference on Natural Disaster Reduction which was part of a mid-term review of Decade activities, was held in Yokohama (Japan), 23-27 May 1994. The UN-FAO/ECE/ILO Team of Specialists used the opportunity to express its views on global fire to the IDNDR.

Yokohama Strategy and Plan of Action for a Safer World (1994)


Yokohama Strategy and
Plan of Action for a Safer World

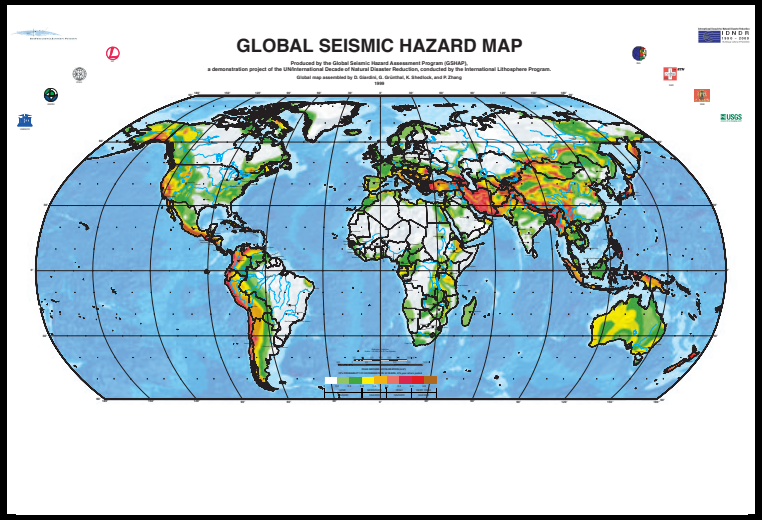
Guidelines for Natural Disaster
Prevention, Preparedness and Mitigation

World Conference
on Natural Disaster Reduction

Yokohama, Japan 23-27 May, 1994

IDNDR
1990–2000

Global Seismic Hazard Map (1999)

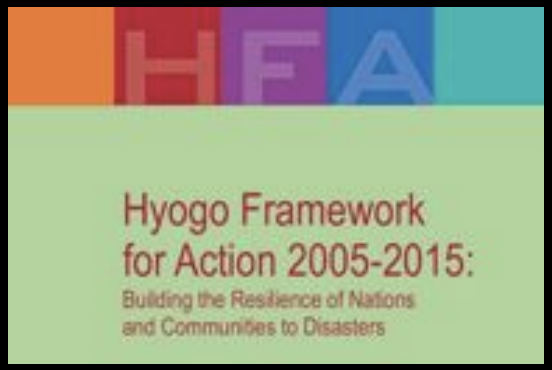


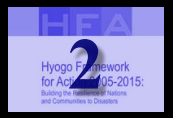
United Nations International Strategy for Disaster Reduction (UN/ISDR)

UNISDR
The United Nations Office for Disaster Risk Reduction

- UNISDR was created in December 1999 as part of the UN Secretariat with the purpose of ensuring the implementation of the International Strategy for Disaster Reduction.
- The International Strategy for Disaster Reduction reflects a major shift from the traditional emphasis on disaster response to disaster reduction, and in effect seeks to promote a "culture of prevention".

World Conference on Disaster Reduction 2005
Kobe, Hyogo, Japan





Lessons learnt from the Great East Japan Earthquake and the current recovery efforts

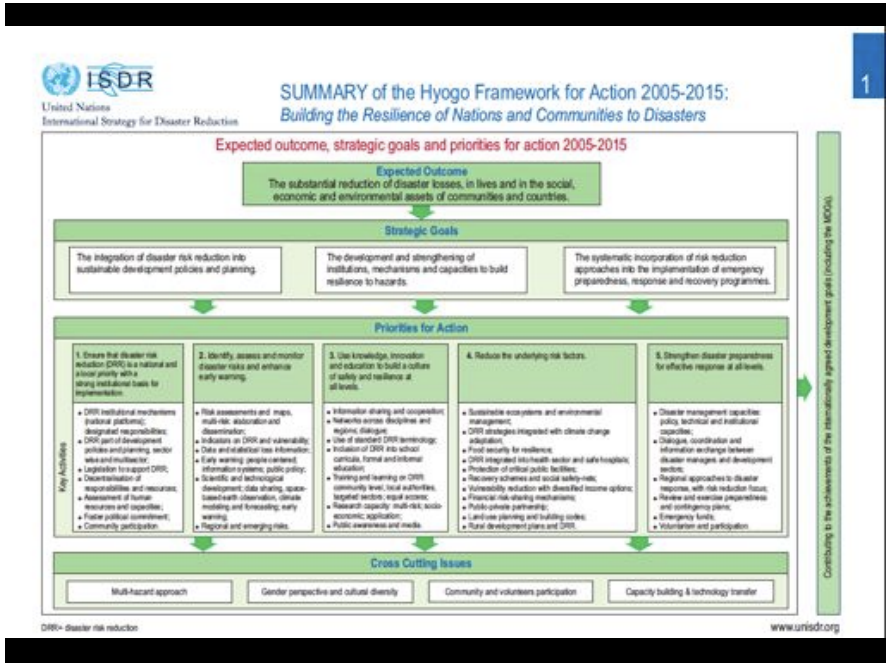
Outline of Hyogo Framework for Action 2005-2015

Five Main Areas for specific gaps and challenges identified after Yokohama Strategy 1994

a. Governance: organizational, legal and policy frameworks;
b. Risk identification, assessment, monitoring and early warning;
c. Knowledge management and education;
d. Reducing underlying risk factors;
e. Preparedness for effective response and recovery.

HFA Priorities

1. Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation
2. Identify, assess and monitor disaster risks and enhance early warning
3. Use knowledge, innovation and education to build a culture of safety and resilience at all levels
4. Reduce the underlying risk factors
5. Strengthen disaster preparedness for effective response at all levels

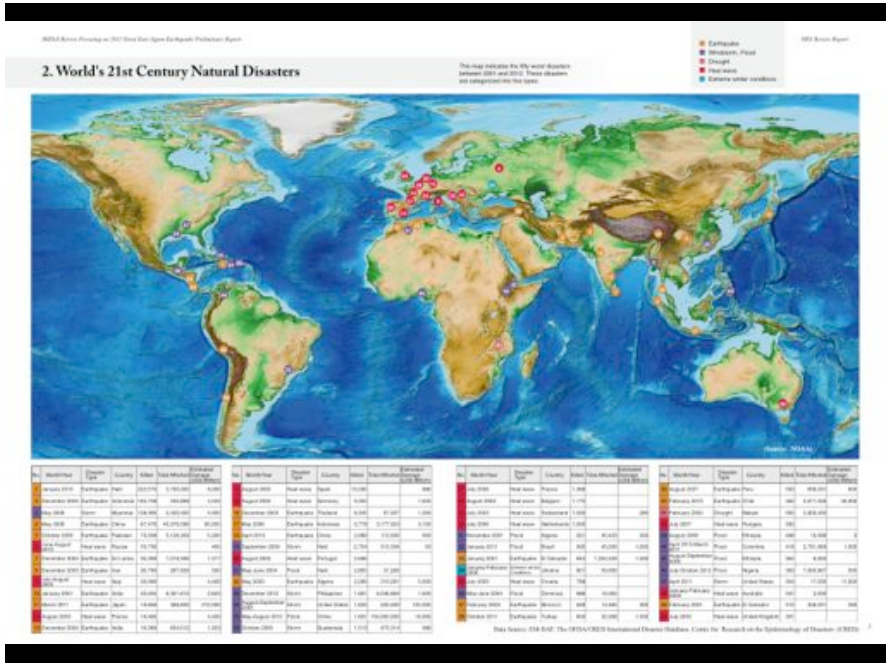


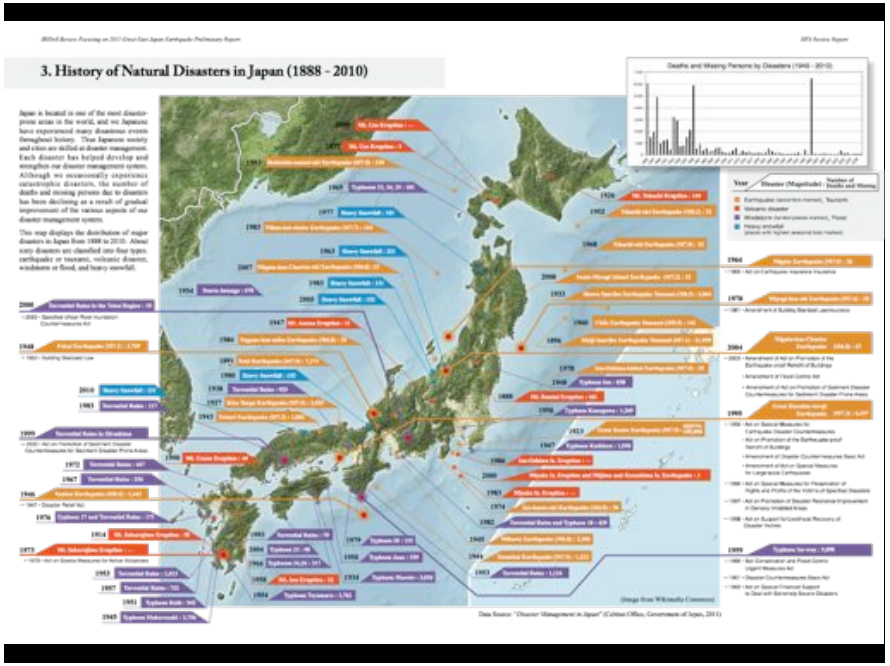
Lessons learnt from the Great East Japan Earthquake and the current recovery efforts

HFA IRIDeS Review Preliminary Report Focusing on 2011 Great East Japan Earthquake

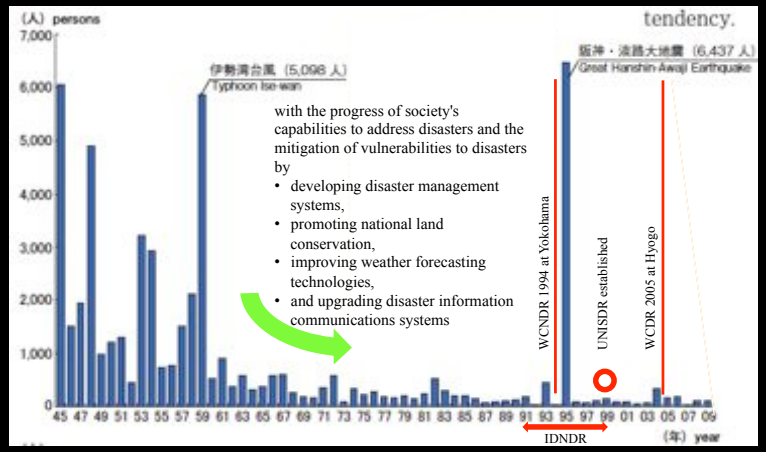
Table of Contents

1. Introduction
2. World's 21st Century Natural Disasters
3. History of Natural Disasters in Japan (1888 - 2010)
4. Damage due to 2011 Great East Japan Earthquake and Tsunami
5. 2011 Great East Japan Earthquake Review

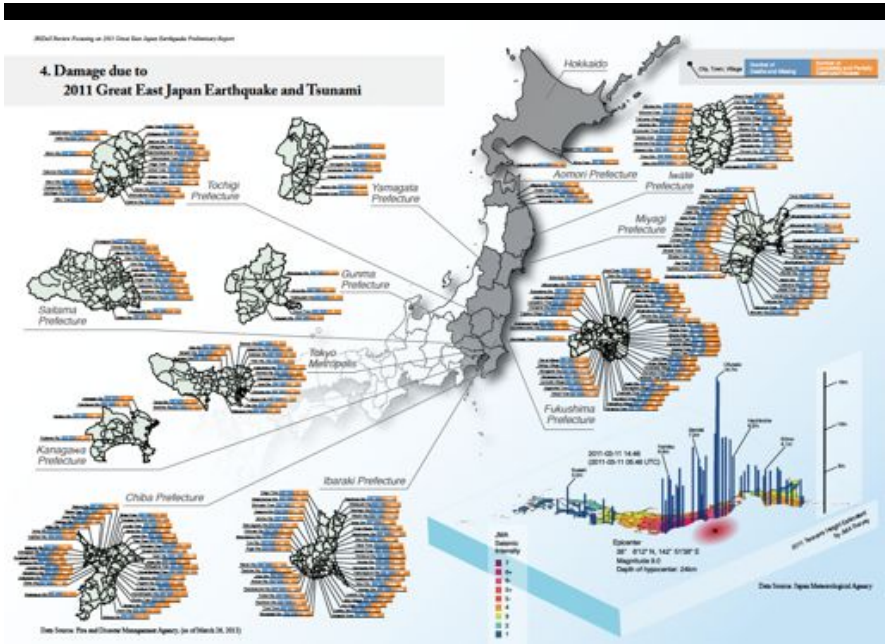




The Number of Deaths and Missing Persons in Disasters



Disaster Management in Japan (CAO, 2011)

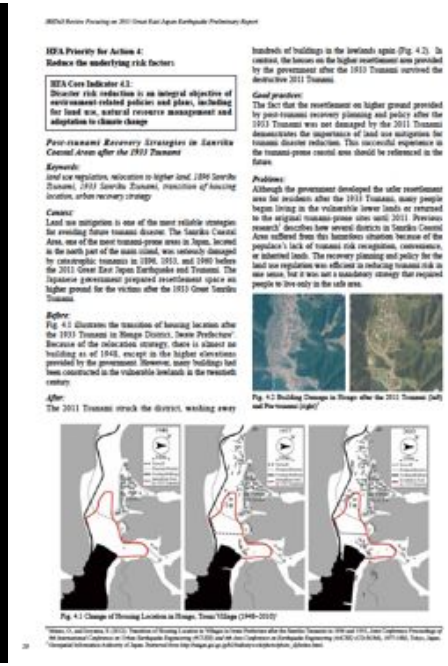


Lessons learnt from the Great East Japan Earthquake and the current recovery efforts

HFA Priority for Action 4: Reduce the underlying risk factors

Contents of a Topic for Each Core Indicator

- Key Words
- Contexts
- Before
- After
- Good practices
- Problems
- Future Recommendations



HFA Priority for Action 4:
Reduce the underlying risk factors

HFA Core Indicator 4.1:
Disaster risk reduction is an integral objective of environment-related policies and plans, including for land use, natural resource management and adaptation to climate change

Post-tsunami Recovery Strategies in Sanriku Coastal Areas after the 1933 Tsunami

Keywords:
land use regulation, relocation to higher land, 1896 Sanriku Tsunami, 1933 Sanriku Tsunami, transition of housing location, urban recovery strategy

Context:
Land use mitigation is one of the most reliable strategies for avoiding future tsunami disaster. The Sanriku Coastal Area, one of the most tsunami-prone areas in Japan, located in the north part of the main island, was seriously damaged by catastrophic tsunamis in 1896, 1933, and 1960 before the 2011 Great East Japan Earthquake and Tsunami. The Japanese government prepared resettlement space on higher ground for the victims after the 1933 Great Sanriku Tsunami.

Before:
Fig. 4.1 illustrates the transition of housing location after the 1933 Tsunami in Rikuzentakata City, Iwate Prefecture. Because of the relocation strategy, there is almost no building as of 1948, except in the higher elevations provided by the government. However, many buildings had been constructed in the vulnerable lowlands in the twentieth century.

After:
The 2011 Tsunami struck the district, washing away hundreds of buildings in the lowlands again (Fig. 4.2). In contrast, the houses on the higher resettlement area provided by the government after the 1933 Tsunami survived the destructive 2011 Tsunami.

Good practices:
The fact that the resettlement on higher ground provided by post-tsunami recovery planning and policy after the 1933 Tsunami was not damaged by the 2011 Tsunami demonstrates the importance of land use mitigation for tsunami disaster reduction. This successful experience in the tsunami-prone coastal area should be referenced in the future.

Problems:
Although the government developed the safer resettlement area for residents after the 1933 Tsunami, many people began living in the vulnerable lower lands or returned to the original tsunami-prone sites until 2011. Previous research[1] describes how several districts in Sanriku Coastal Area suffered from this homeless situation because of the populace's lack of tsunami risk recognition, convenience, or inherited lands. The recovery planning and policy for the land use regulation was efficient in reducing tsunami risk in one sense, but it was not a mandatory strategy that required people to live only in the safe area.

Fig. 4.2 Building Damage in Hirota after the 2011 Tsunami (left) and Pre-tsunami (right)

Fig. 4.1 Change of Housing Location in Hirota, Iwate Village (1948–2010)

HFA Core Indicator 4.1:

- Disaster risk reduction is an integral objective of environment-related policies and plans, including for land use, natural resource management and climate change adaptation.

Post-tsunami recovery strategies in Sanriku Coastal Areas after the 1933 tsunami

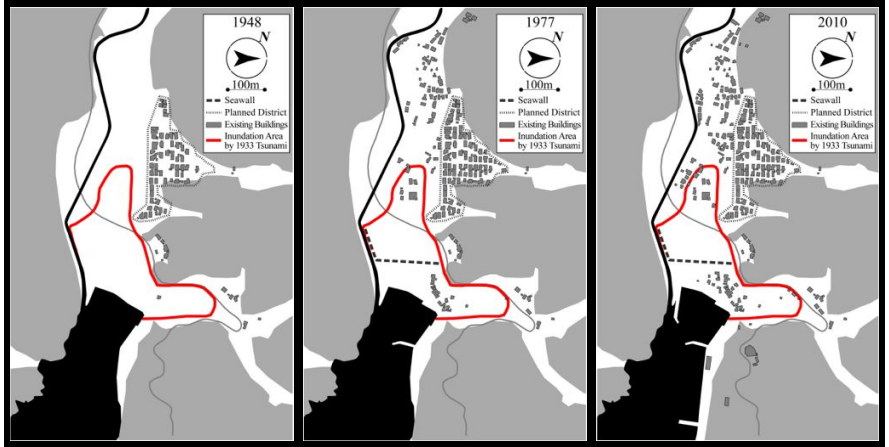
Keywords:

land use regulation, relocation to higher land, 1896 Sanriku Tsunami, 1933 Sanriku Tsunami, transition of housing location, urban recovery strategy

Contexts:

Land use mitigation is one of the most reliable strategies for avoiding future tsunami disaster. The Sanriku Coastal Area, one of the most tsunami-prone areas in Japan, located in the north part of the main island, was seriously damaged by catastrophic tsunamis in 1896, 1933, and 1960 before the 2011 Great East Japan Earthquake and Tsunami. The Japanese government prepared resettlement space on higher ground for the victims after the 1933 Great Sanriku Tsunami.

Change of Housing Location in Hongo, Touni Village (1948-2010) (Murao and Isoyama, 2012)



Before:

Fig. 4.1 illustrates the transition of housing location after the 1933 Tsunami in Hongo District, Iwate Prefecture1. Because of the relocation strategy, there is almost no building as of 1948, except in the higher elevations provided by the government. However, many buildings had been constructed in the vulnerable lowlands in the twentieth century.

After:

The 2011 tsunami attacked the district and washed away hundreds of construction in the lower lands again as shown in Fig.4.2. On the other hand, the houses on the higher resettlement provided by the government after the 1933 tsunami survived the destructive tsunami.

Good practices:

The fact that the resettlement on the higher ground provided by the post-tsunami recovery planning and policy after the 1933 tsunami was not damaged by the latest tsunami evidences the importance of land use mitigation for tsunami disaster reduction. This successful experience in the tsunami-prone coastal area should be come down to the future.

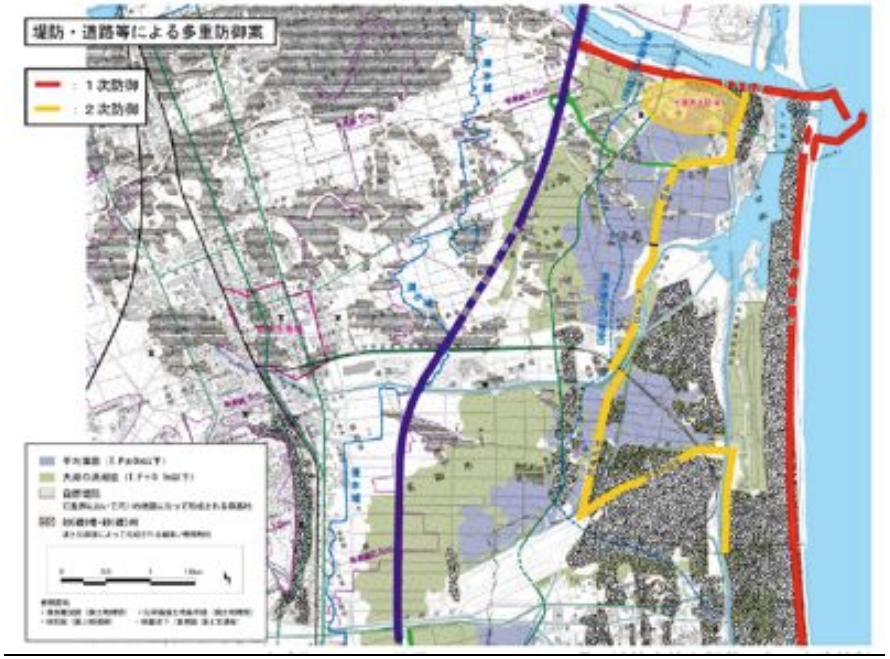
Problems:

Although the government developed the safer resettlement for the residents after the 1933 tsunami, many people started living in the vulnerable lower lands or returned to the original tsunami-prone sites until 2011. According to the previous research1, this unfavorable situation can be seen in several districts in Sanriku Coastal Area. It is because of lack of tsunami risk recognition, convenience, or inherited lands. The recovery planning and policy for the land use regulation was efficient to reduce tsunami risk in a sense, but it was not mandatory strategy to keep people living only in the safe place.

Future recommendations:

Relocation to higher land from waterfront area as a post-tsunami recovery strategy should be carried out with land acquisition by national/local governments' purchase to avoid future private usage of vulnerable waterfront space.

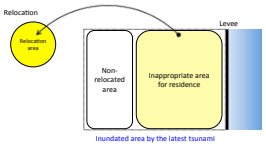
Post-tsunami Urban Recovery Plan



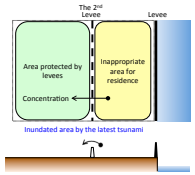
Regional Urban Recovery Types Proposed after the 2011 Great East Japan Earthquake and Tsunami

（MLIT,012）

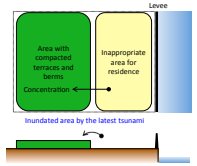
A. Relocation



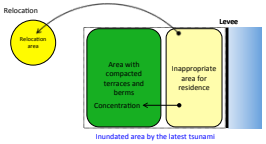
B. Concentration



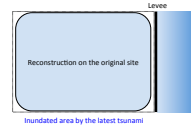
C. Compacted terraces and berms



D. Relocation and compacted terraces and berms



E. Reconstruction on the original site with facility reinforcement



Compacted terrace model in Natori

To be continued!

Thank you for your kind attention!

Hyogo Framework for Action 2005-2015:

Building the Resilience of Nations and Communities to Disasters

HFA IRIDeS Review
Preliminary Report
Focusing on
2011 Great East Japan Earthquake

October 2013

http://irides.tohoku.ac.jp/hfa

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