Risk Management in Japan

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Profile of OYORMS

Japan's leading geotechnical engineering firm※1

World's leading risk management company※2

OYORMS

- Joint venture company established in May 1998.
- Co-development of Japan models integrating local expertise.
- Risk management service to the **corporate markets**
- Risk analysis service to the **real estate markets**.
- **Advance application of RiskLink™** for site level risk analysis.
- Develops and markets risk management products in Japan.

※1: OYO Corporation started its business from the investigation of ground structures for public authorities. Now, it has sprung out to four major business domains, namely, Construction, Environment, Disaster Management, and, Future Energy/Natural Resources. OYO has three methods to work on these domains, namely, Engineering, Consultation, and very uniquely, Manufacturing of Measurement Instruments.

※2: Risk Management Solutions (RMS) is the world's leading provider of products, services and expertise for the quantification and management of catastrophe risk. For 20 years RMS has applied models, analytics, data and multi-disciplinary knowledge to the management of insurance risk associated with perils such as earthquakes, hurricanes, windstorms and terrorist attacks. More than 400 leading insurers, reinsurers, trading companies and other financial institutions worldwide rely on RMS models' analytics to make better risk management decisions.

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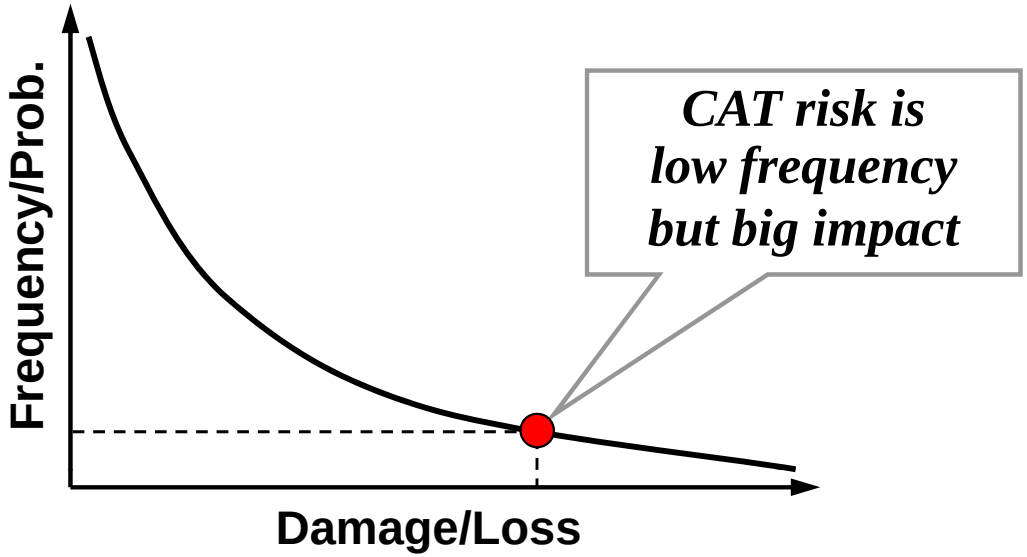
What is Risk?

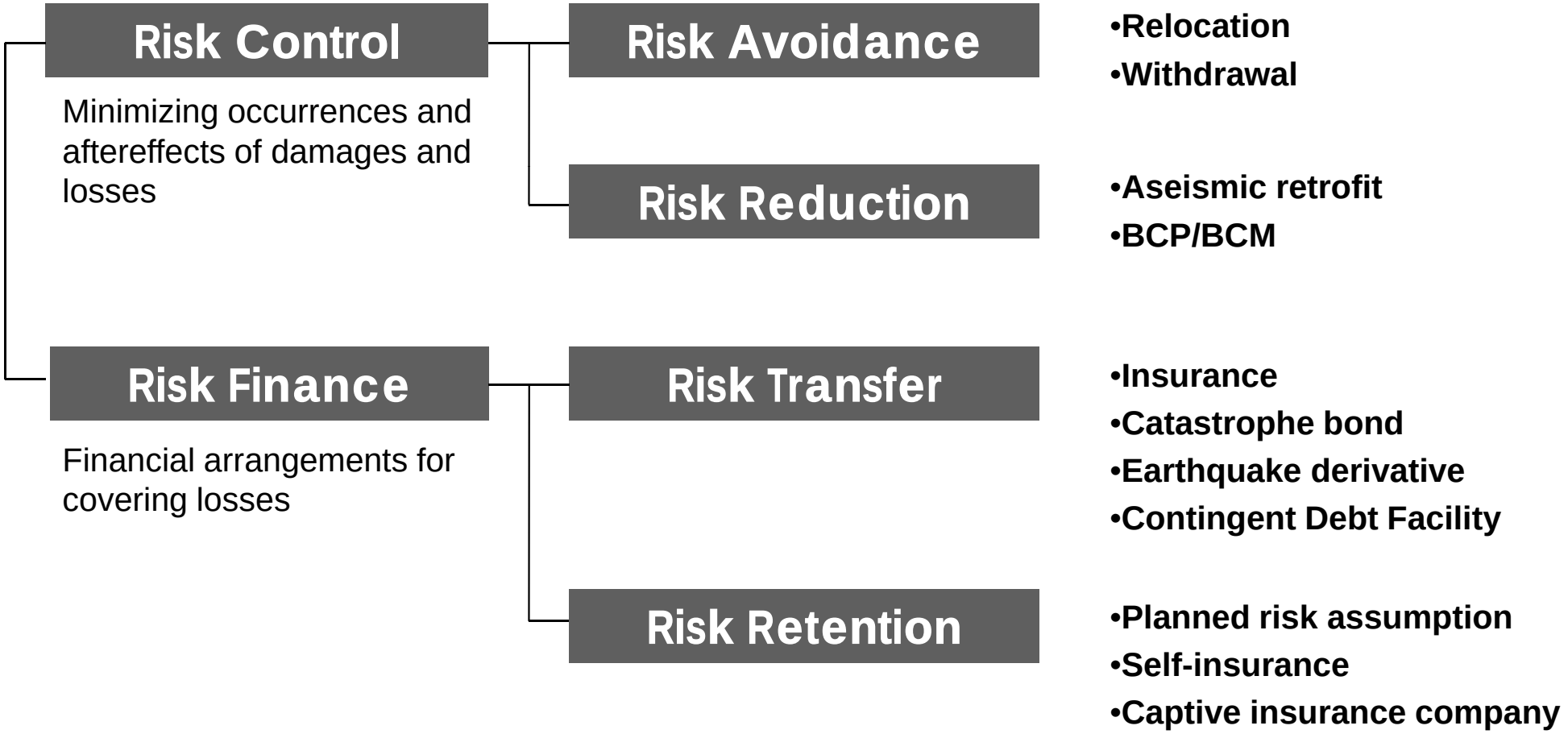
- Risk includes the following concepts.
  - Amount of negative impact: *Damage, Loss, ….*
    - *"Pure risk" ⇔ "Speculative risk" (negative & positive impact)*
  - Occurrence probability
  - Uncertainty: Variance

- In the following discussion, we focus on:
  - Catastrophe (CAT) Risk caused by natural hazard
  - Especially, Earthquake



What is Risk Management ?

Risk management is the process of protecting assets, earning, debt, and human resources of the company with maximum effects and minimum costs.



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Risk Control

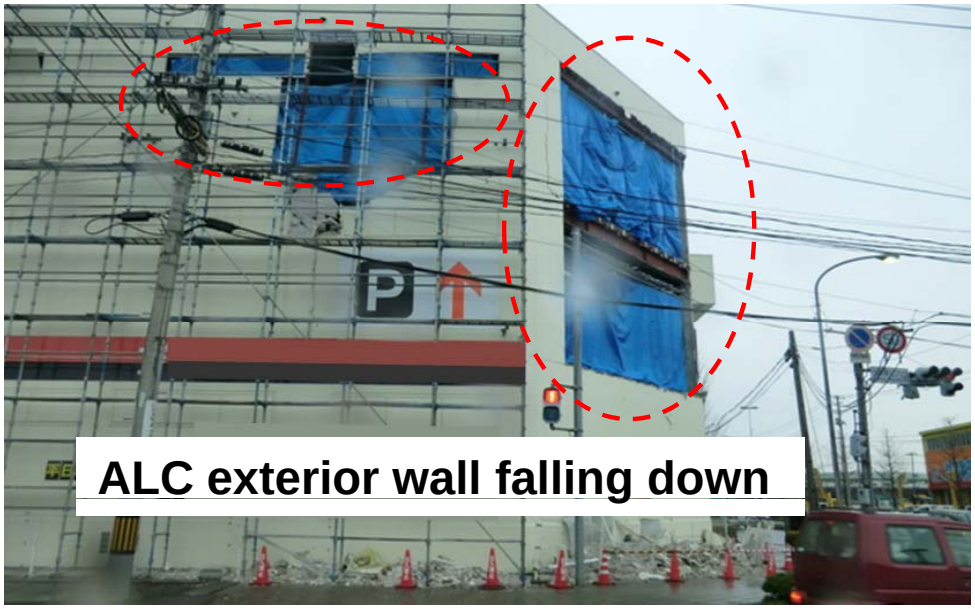
History of Building Code in Japan

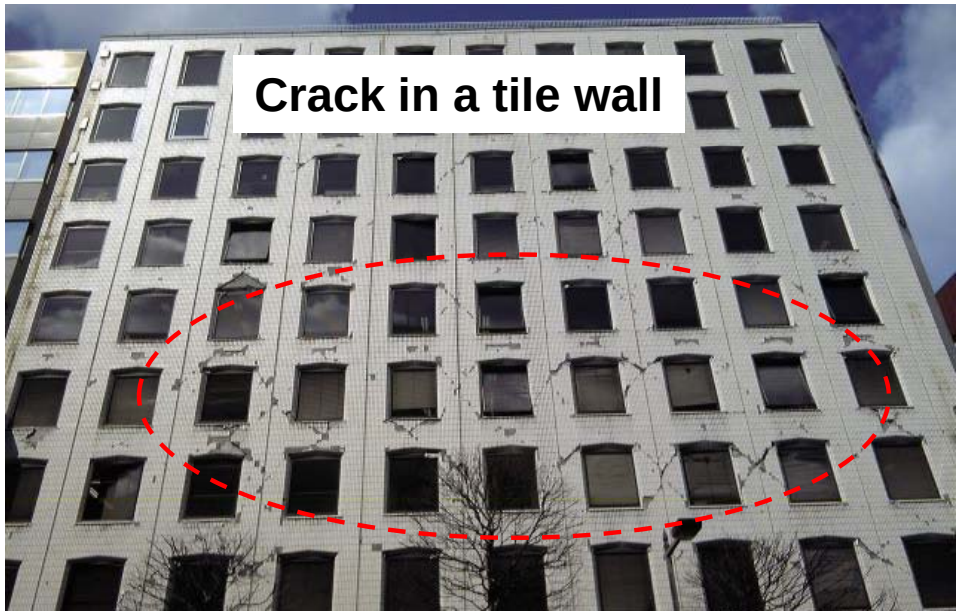
Year	Damaging Earthquake	Building Codes and Others
1923	The Great Kanto Earthquake	
1924		Urban Area Building Act (Revision)
1948	Fukui Earthquake	
1950		Building Standards Act
1968	Tokachi Offshore Earthquake	
1971		Building Standards Act (Revision)
1978	Miyagi Offshore Earthquake	
1981		Building Standards Act (Revision) New Seismic Design Standard
1995	The Great Hanshin-Awaji Earthquake	Act for Promotion of Renovation for Earthquake-Resistant Structures
2000		Building Standards Act (Revision)
2006		Act for Promotion (Revision)
2007	Niigata Offshore Earthquake	Building Standards Act (Revision)
2011	The Great East Japan Earthquake	

Seismic Countermeasures for Buildings

- Buildings designed by "New Seismic Design Standard" showed higher aseismic performance than older building at the Hanshin Earthquake .
- "Act for Promotion of Renovation for Earthquake-Resistant Structures" were established after the Hanshin Earthquake.
    - *The purpose of this act is upgrading old buildings' aseismic performance up to the level of new seismic design.*
    - *A seismic renovation has been completed 73% for public schools and 62% for hub hospitals as of 2010.*
- At the Great East Japan Earthquake, there were relatively few structural damage but a lot of nonstructural damage.
    - *Nonstructural components are ceilings, lights, windows, partitions , file cabinets, computers, air conditioning facilities etc.*
- Building Code is intended to protect a human life in a building. Keeping the building code is insufficient for maintaining building function and business continuity.
    - *Securing production equipments is essential for business continuity of factories.*
- Base isolation structure becomes common for hospitals, IDCs, and other important facilities. There are 2,600 base isolated buildings as of 2009.

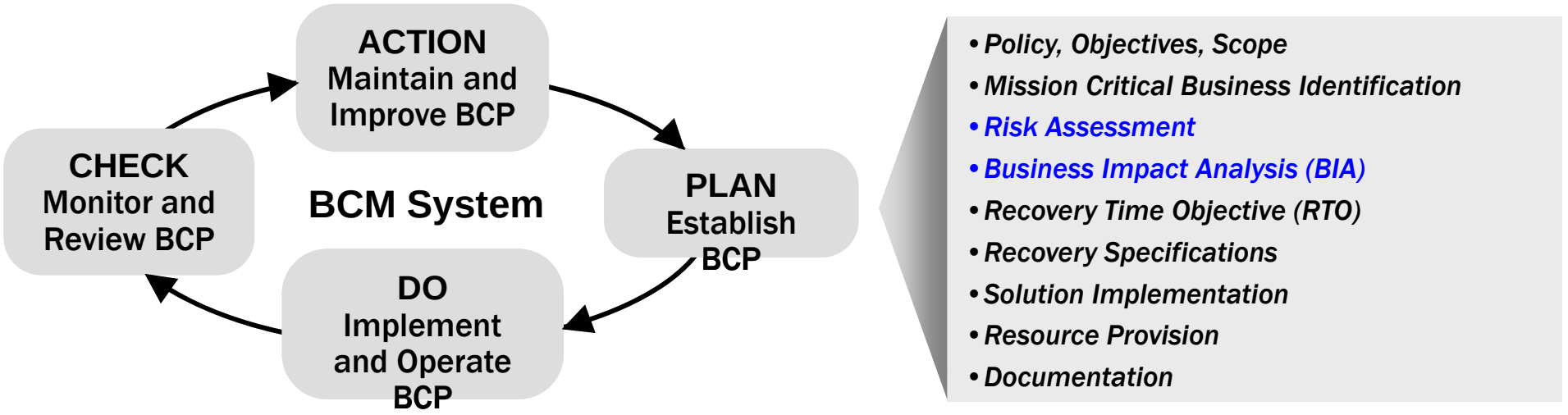
Nonstructural Damage at the Great East Japan Earthquake



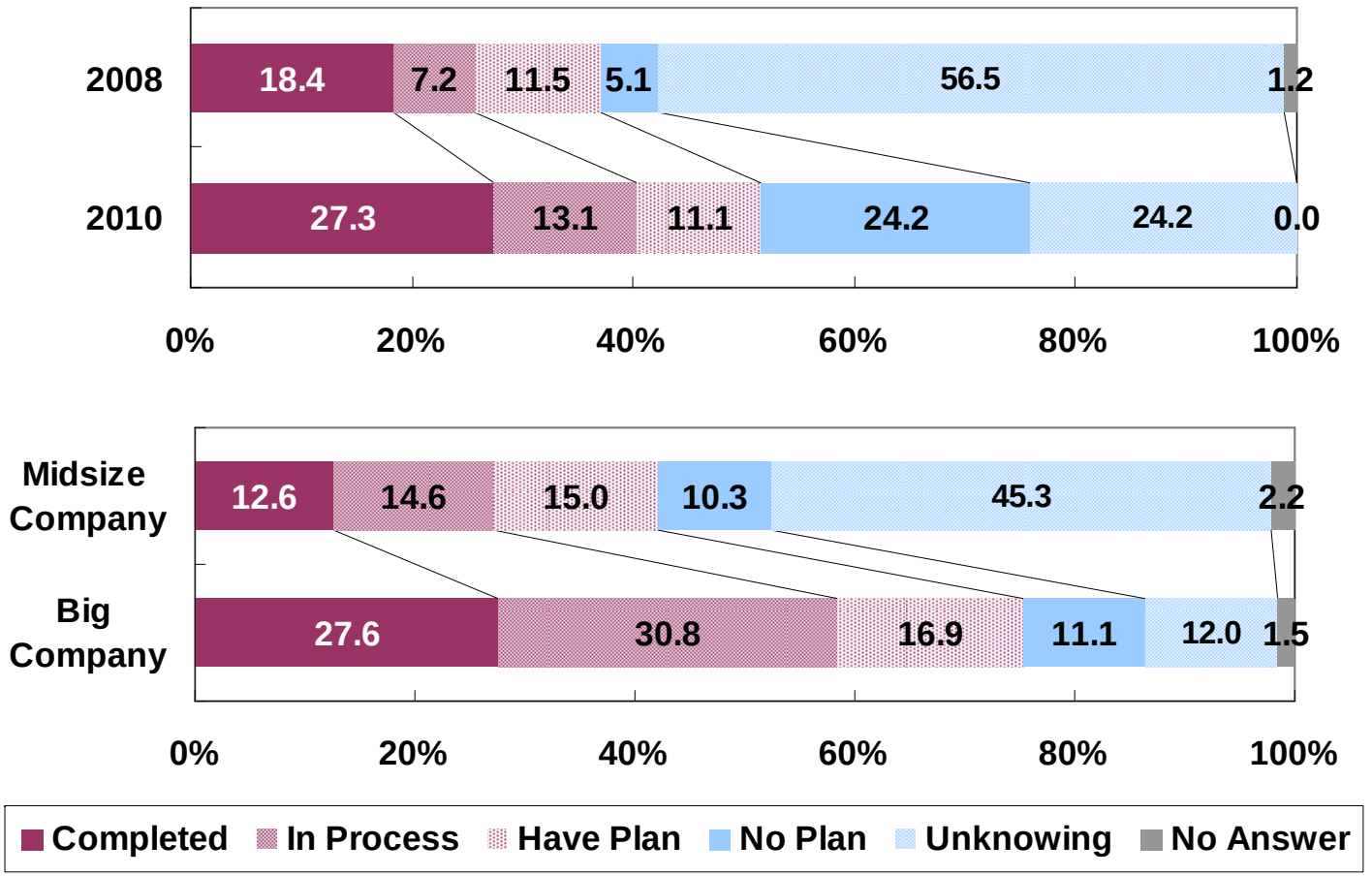


Business Continuity Management (BCM)

- It is recognized that hard and soft measures are essential for disaster mitigation.
- Importance of BCP/BCM is recognized after 9.11 WTC.
- In Japan, around 2004, after Niigata-ken Chuetsu Earthquake, BCP/BCM came to be frequently discussed about.
  - *"BC Guidelines" was published in 2005 by Ministry of Economy, Trade and Industry.*
  - *"BC Guidelines ver.1" was published in 2005 by Central Disaster Prevention Council.*
  - *"Small and Med. Enterprise BCP Guidelines" was published in 2006 by Small and Med. Enterprise Agency.*
  - *Business Continuity Advancement Organization, NPO, was established in 2006.*



Progress of BCP/BCM



Reference: Cabinet Office, Government Of Japan, 2011
note: targeted industries are Communication, Gas, Transportation, and Railway

- BCP/BCM is still developing stage both in penetration and effectiveness in Japan.

Challenges of BCP/BCM

- For the organizations which have already started BCP/BCM
  - It is important to establish a PDCA cycle of BCP as routine practice and improve their BCP continuously.
- For the organizations which cannot progress BCP/BCM
  - It is a start point to share the common image against their own risk.
  - Risk quantification is one effective way for it.

- Current major concern
  - Tsunami impact
  - Supply Chain Management (SCM)

    Japanese companies are painfully aware of the importance of SCM in the recent disasters.
    - Niigata-ken Chuetsu-oki Earthquake in 2007
    - The Great East Japan Earthquake in 2011
    - Flood in Thailand in 2011

- Standardization of BCM is discussed globally ⇔ ISO
    - BCI/BSI, UK: The BCI Good Practice Guidelines (2010), BS25999-2 (2007), BS25999-1(2006)
    - NFPA/ANSI, USA: NFPA1600 (2010)
    - Japanese Guidelines (see page 10)

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Risk Finance

Insurance Condition in Japan

- Insurance deregulation and liberalization was done in 1998.
- Risk quantification by model was introduced for risk management of insurance company and insurance rating.

- Insurance coverage rate of the East Japan Earthquake is higher than of the Hanshin Earthquake. *(see next page)*
- However, insurance coverage rate in Japan is not so high as the another major overseas catastrophe events. *(see next page)*

Claims Paid for Major Disasters

Category		Event Name (Year)	Total Loss	Claims Paid		Remarks
Japan	EQ	The Great East Japan Earthquake (2011)	¥ 16,900 billion ※1	personal	¥ 1,178 billion ※4 *(insurance)*	720 k claims (Nov. 9th)
					¥ 529 billion ※5 *(mutual aid)*	320 k claims (Jul. 15th)
				corporate	¥ 600 billion	¥ 400 billion covered by reinsurance etc. (May 19th, Nikkei)
		The Great Hanshin-Awaji Earthquake (1995)	¥ 9,600 billion ※2	personal	¥ 78 billion ※4 *(insurance)*	6.5 k claims
					¥ 119 billion ※5 *(mutual aid)*	100 k claims
		Geyo Earthquake (2001)			¥ 17 billion ※4	
	WS&FL	MIREILLE (1991 No.19)			¥ 568 billion ※4	
		SONGDA (2004 No.18)			¥ 387 billion ※4	
Worldwide	EQ	Northridge Earthquake (1994)	$ 30 billion ※3		$ 21 billion ※6	
	WS&FL	Hurricane Katrina (2005)	$ 96 billion ※3		$ 72 billion ※6	
		Hurricane Andrew (1992)	$ 44 billion ※3		$ 25 billion ※6	
	Terror	9.11WTC (2001)	$ 83 billion ※3		$ 23 billion ※6	

※1 Cabinet Office, Government Of Japan, ※2 National Land Agency, ※3 National Research Institute for Earth Science and Disaster Prevention, ※4 The General Insurance Association of Japan, ※5 JA mutual Aid, ※6 SwissRe, Sigma2011, No1

Other Risk Finance

- Advantage and Disadvantage of Insurance
  - Insurance covers actual loss. Basis-risk is low.
  - It takes some time before receiving insurance payment because investigation takes time.
  - It is difficult to buy insurance covering “Business Interruption (BI)” in Japan.
  - It is generally said that insurance capacity is insufficient in Japan.

- Alternative Risk Transfer (ART) can cover the disadvantage of insurance
  - CAT Bond, Earthquake Derivative, etc.
  - “Magnitude trigger” and “Seismic intensity trigger” are common for corporate risk finance.

- Contingent Debt Facility
  - Commitment line for CAT events

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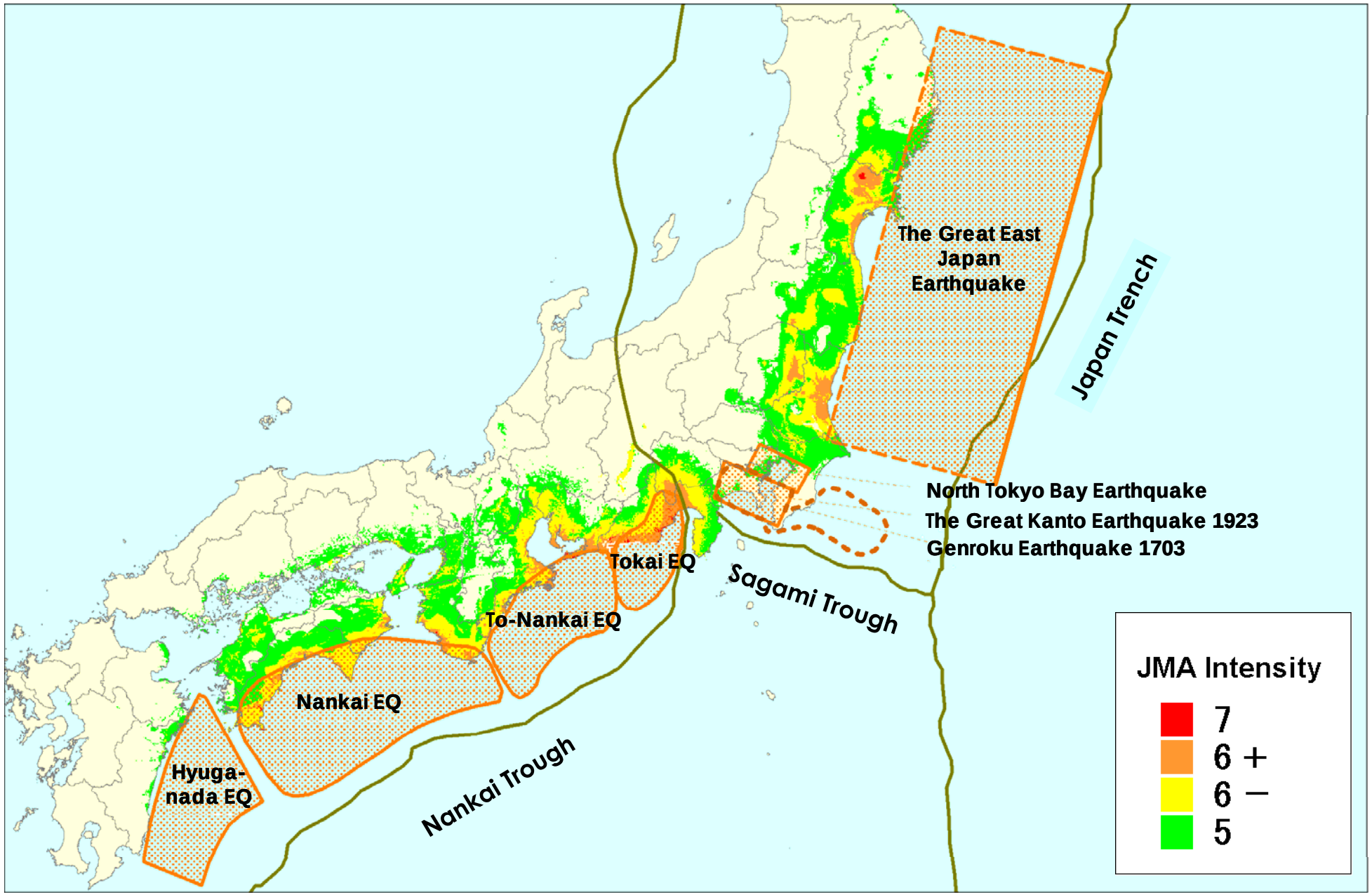
Challenges of risk management for the future

The East Japan Earthquake and Other Major Earthquakes



JMA Seismic Intensity for the 3 Coupled Earthquakes along Nankai-trough were evaluated by Central Disaster Prevention Council

Historical Earthquakes and Coming Earthquakes

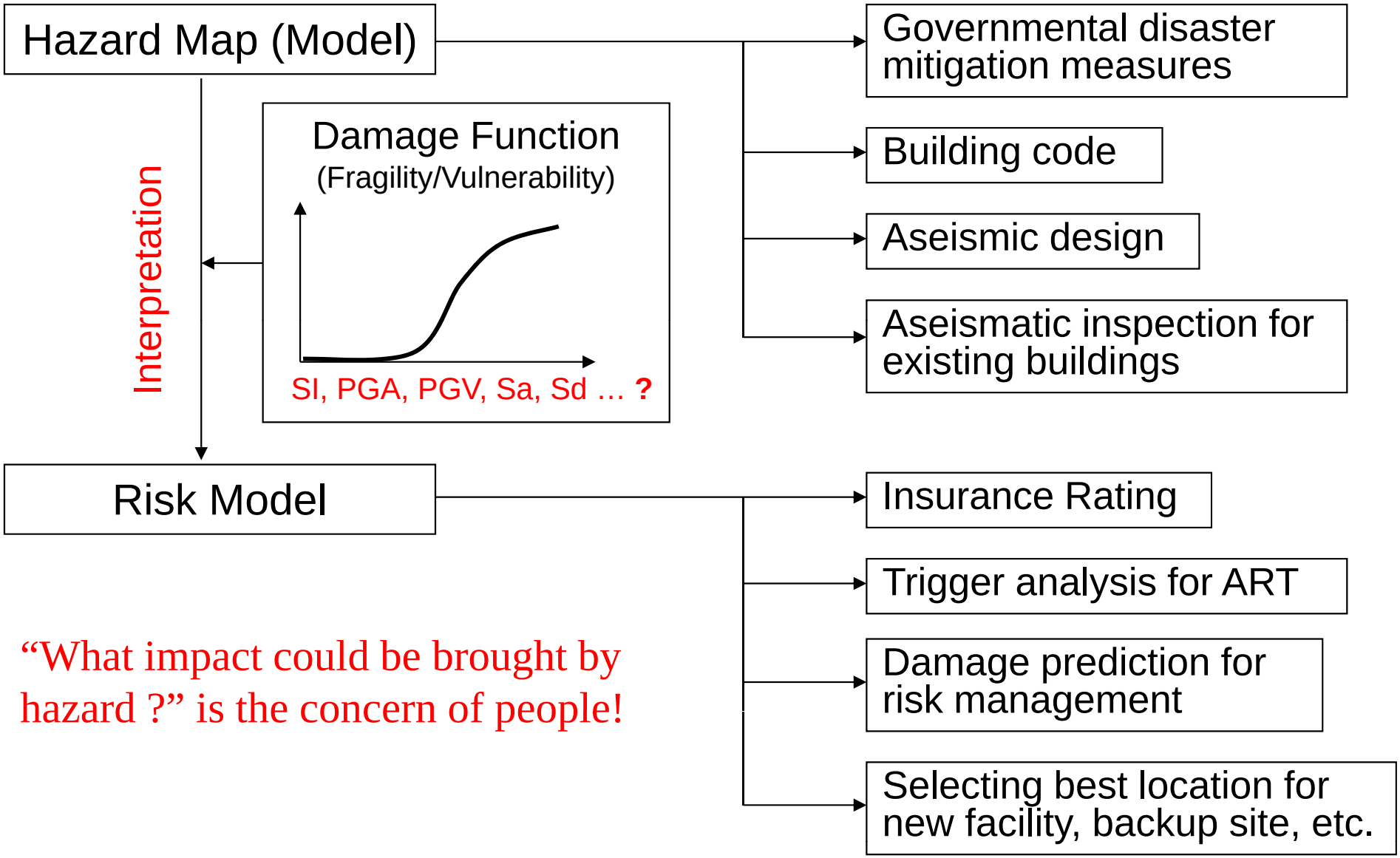
Event Name	Estimated Population in the Area（million）		Property Loss (trillion yen)	Remarks (Estimating Organization)
	5+≦ SI_{JMA}	6-≦ SI_{JMA}		
The Great Hanshin-Awaji Earthquake (1995)	9	4	9.6	National Land Agency
The Great East Japan Earthquake (2011)	27	6	16.9	Cabinet Office, Government Of Japan
3 coupled Earthquakes along Nankai-trough (Tokai, To-Nankai, Nankai EQ)	41	15	40～60	Central Disaster Prevention Council
Tokyo Metropolitan Earthquake (North Tokyo Bay Earthquake)	36	27	66.6	Central Disaster Prevention Council

Challenges of risk management for the future

- Professional risk manager is required for the Japanese company.
  - *Financial department buys insurance, maintenance department plans aseismic retrofit of buildings, administration department manages BCP/BCM, but there no person who can control all of them.*
  - *Persons in charge are frequently changed by personnel rotation.*

- Seismic Hazard Map/Model is used for not only governmental disaster mitigation but also insurance industry and risk management of other private sectors. Further improvement of the reliability and disclosure are requested.

Application and capability of Hazard Map



"What impact could be brought by hazard ?" is the concern of people!

Thank you !

謝謝!

감사합니다!

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