

Three Principles to improve the strategy for Disaster Risk Management

- Taking two Mega-Disasters in 2011 for instance-

3 April 2012

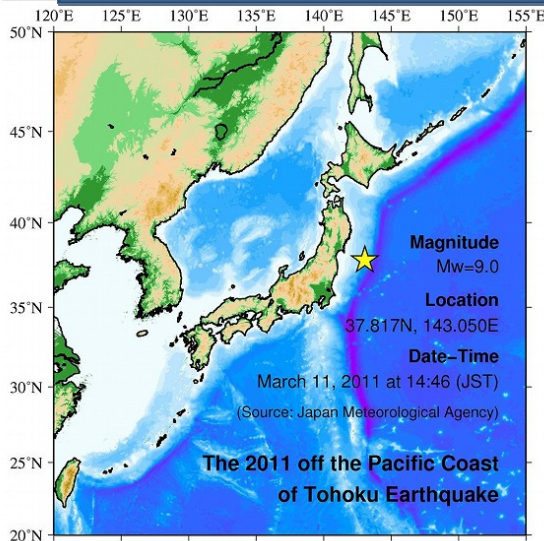
Japan International Cooperation Agency (JICA)

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Outline

- **Disasters strike somewhere in the world every year.**
- **In 2011, the Great East Japan Earthquake and the subsequent Tsunami hit Japan, while the heavy flood occurred in Thailand.**
- **“Trinciples (Tri + principles) Approach”, consists of**
 - (1) Risk Literacy,**
 - (2) Redundancy, and**
 - (3) Kaizen (Continuous Improvement),****are effective to fill the gaps on the foundation of an integrated risk reduction strategy.**

The Great East Japan Earthquake



	Great East Japan Eq.	Hanshin-Awaji Eq.
Date (Magnitude)	2011.3.11 (Mw = 9.0)	1995.1.17 (Mw= 7.3)
Dead/Missing	15,854/3,143	6,434/3
Feature of damage	1) Tsunami damage 2) Damage to Nuclear power plant	1) Collapse of civil structures 2) Fire of wooden houses
Damage cost (bil. USD)	200-313	124

➤ **There was the strategy for disaster risk management, which partially worked, but not so much against the unexpected scale of disaster.**

The heavy Flood in Thailand in 2011

➤ Statistics

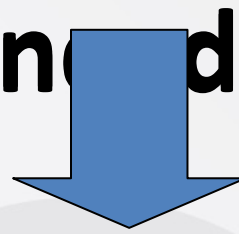
(Source DDPM Jan 23rd: Department of Disaster Prevention and Mitigation)

- Death 815
- Affected House Holds 4,086,138
- Affected People 13,595,192
- 65 Provinces, 684 Districts, 4,920 Sub-Districts, 43,636 Villages
- Area: 18,000 km² (Source: PDNA), 14,241 km² (Source: GISTDA)
- Damages: 20.5 billion USD (Source: PDNA)
- Losses: 26.0 billion USD (Source: PDNA)
- Affected Business (Source: Prime Minister Press Conference, Jan 20th):
7 industrial estates, 28,679 enterprises, 993,944 workers

➤ The strategy for disaster risk management did not seem to exist.

Disaster Risk Management (DRM)

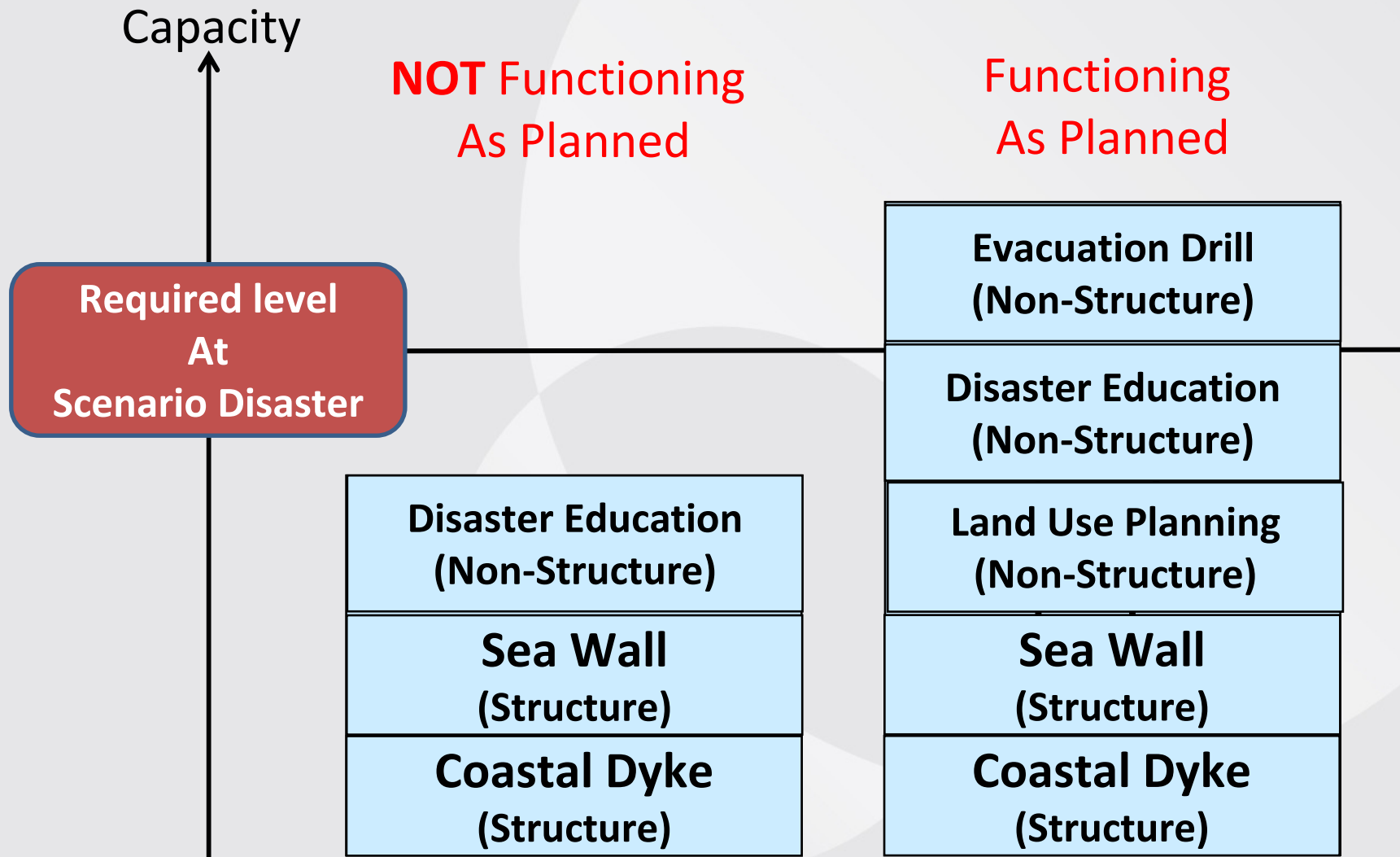
To minimize the damage by disasters, the strategy is definitely needed.



- **How can the strategy be improved?**
- **What are the gaps?**

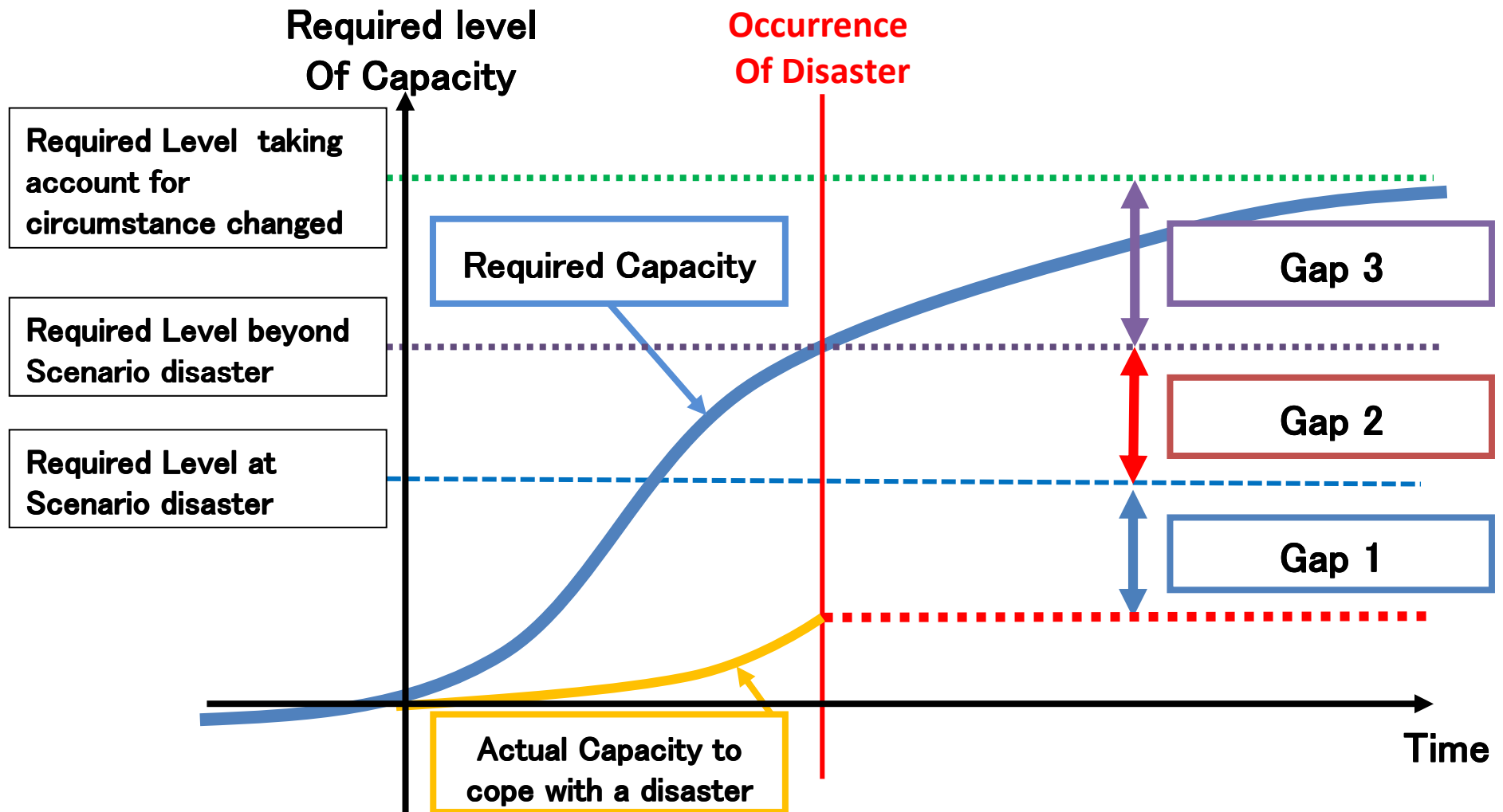
Disaster Risk Management (DRM)

- Scenario disaster and anticipated risk -



Three (3) types of Gaps emerged from Mega-Disasters' experiences

Gap = "Required Level" and "Actual Capacity"



The Great East Japan Earthquake

Giant Dykes TARO, Iwate Prefecture



Gap 3 Circum- stance Changed

- New development for residence and tourism after the completion.
- Rapid aging in the area

Gap 2 Beyond Scenario

- Malfunction of dykes
- Limited evacuation route and Evacuation centers

Gap 1 Scenario Disaster

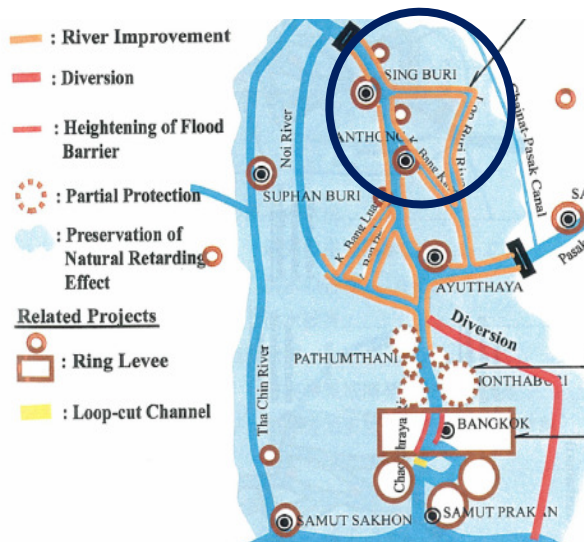
- Lack of understanding in limits on functions of measures designed by scenario disaster

The 2011 Thai Flood

Gap1
scenario disaster

Gap2
beyond scenario

Gap3
Circumstance Changed



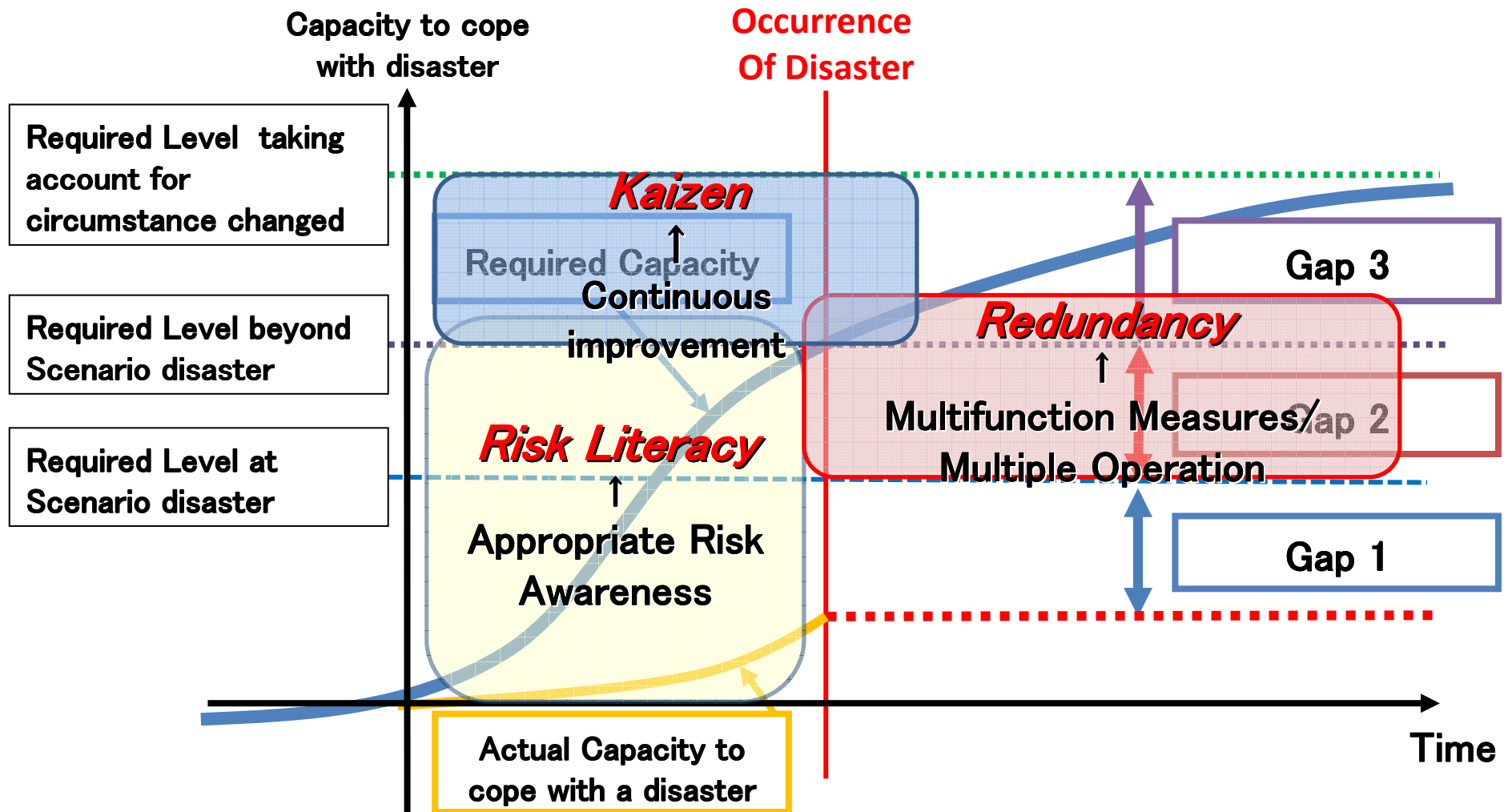
- Miscommunication of disaster potential
- Lack of information and early warning
- Insufficient investment in DRM

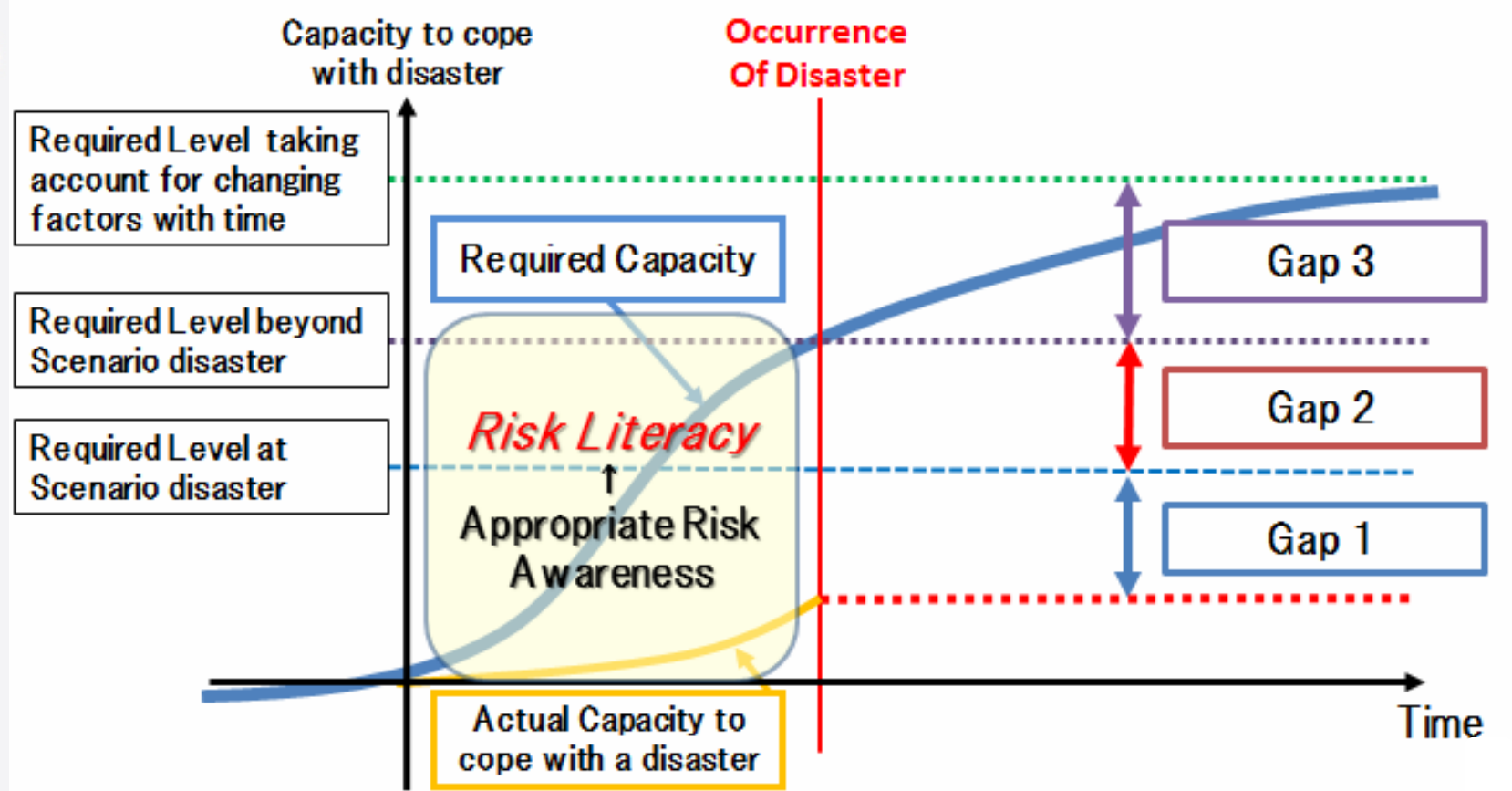
- Inundation beyond estimation (Hazard Map) due to Extraordinary Precipitation

- Expansion of urban area
- Lowed retention effect due to urbanization

Three Gaps emerged from Mega-Disasters' experiences

Gap = "Required Level" and "Actual Capacity"

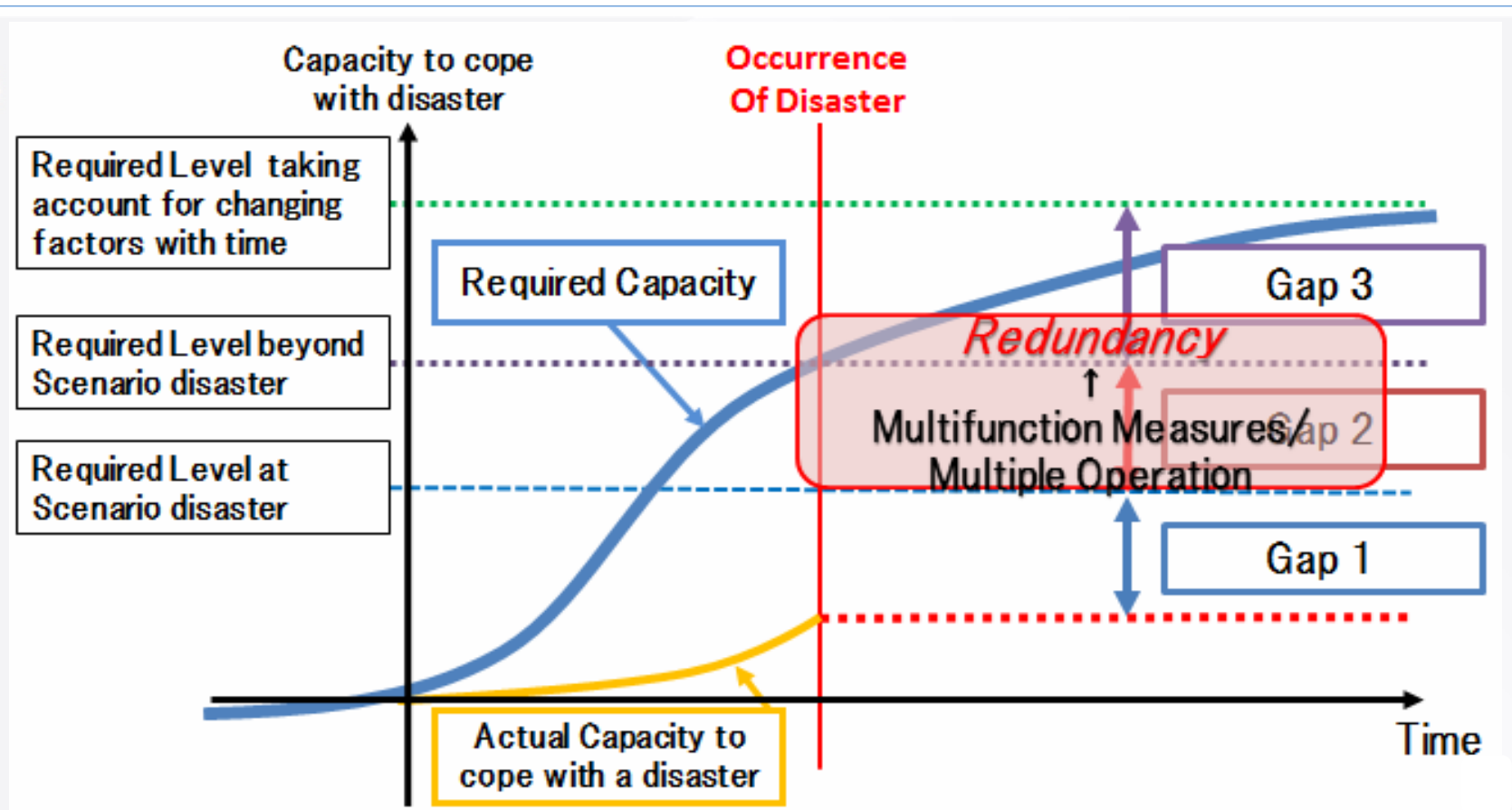




Risk Literacy

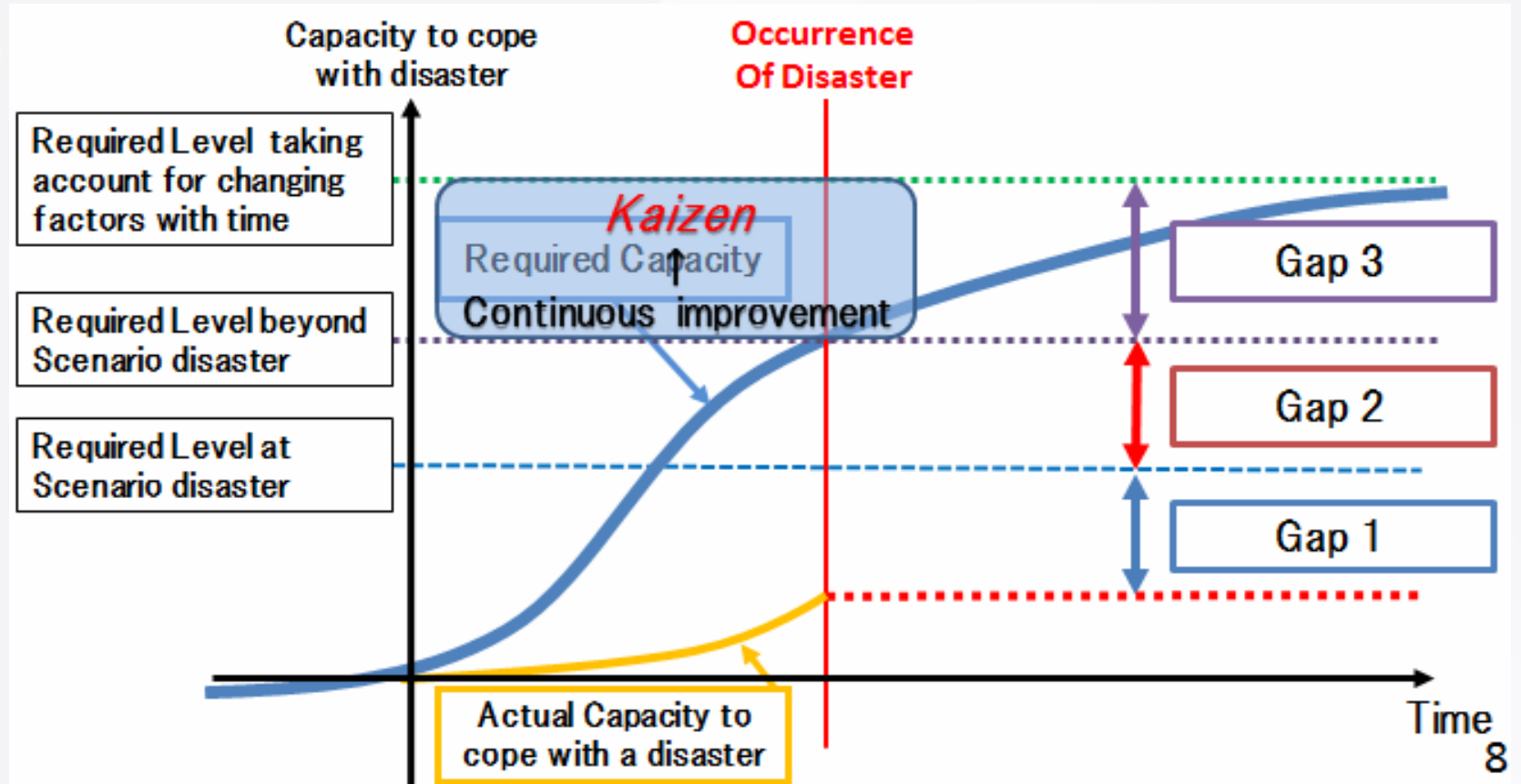
Exchange and/or sharing of risk information

- (1) Limitations of structure and non-structure measures
- (2) Promotion of Communication among various stakeholders



Redun- dancy

- Inclusion of extra components to original functions in preparation for uncertainty**
- (1) Redundant operations and measures
 - (2) DRM into other sectors (Multi-sector)



Kaizen
(Continuous Improvement)

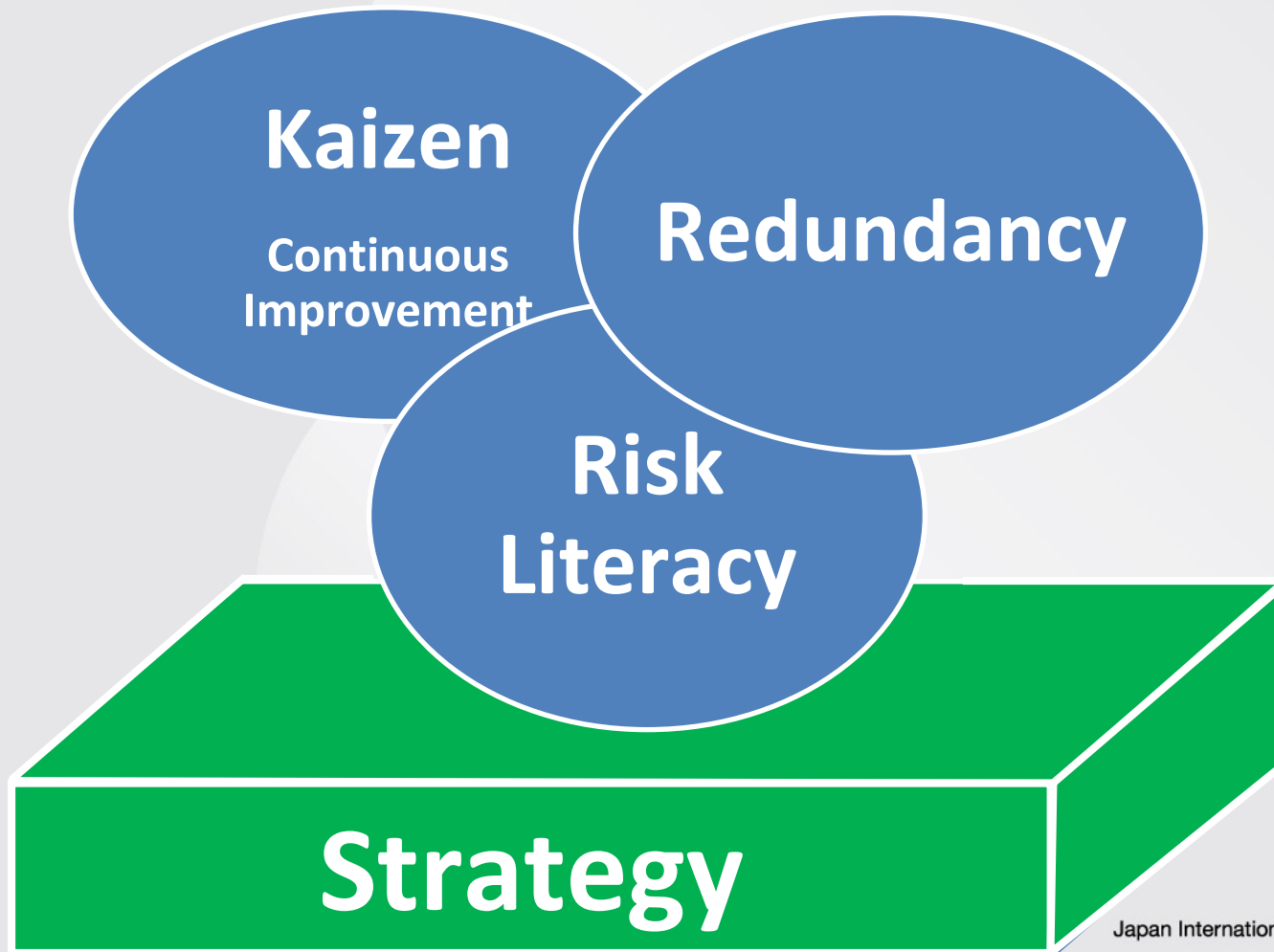
Continuous improvement and review

- (1) Scientific aspects (The latest research results, advancement in technology, etc.)
- (2) Social aspects (population growth, urbanization, aging society, etc.)



JICA's Principles Approach

* Principles : Coined Word created form "Tri (Triple) " and "Principles"



Principles Approach for the Great East Japan Earthquake



Gap 3 Circum- stance Changed

- New development for residential and hotel area after the completion.
 - Rapid aging in the area
- Preparation of disaster management plan taking account for social change
(Kaizen)

Gap 2 Beyond Scenario

- Malfunction of the dyke
 - Limited evacuation route and Evacuation centers
- Increase of evacuation routes
(Redundancy)

Gap 1 Scenario Disaster

- Lack of understanding in limits on functions of measures designed by scenario disaster.
- Advocacy planning such as limitations of various measures
(Risk Literacy)

Principles Approach for the 2011 Thai Flood

Gap1
scenario disaster



Gap2
worst scenario



Gap3
Circumstance Changed



RISK LITERACY

- Discussion on validity of a scenario flood
- Clear indication of limitation of each measures

REDUNDANCY

- Leveling of road connected with industrial estates
- Preparation of MP taking account for agriculture sector

KAIZEN

- Preparation of MP taking account for climate variation, population growth and urbanization etc.

Toward the mainstreaming of DRM

Understanding of risks
by all stakeholders

Risk Literacy

Multidisciplinary
approach

Redundancy

**Sustainable
Development**

Mainstreaming Of DRM

Circumstance changed

KAIZEN

Capacity of society
To cope with disaster

Leveling of subway entrance (Thailand)



A School with function of shelter (Bangladesh)



Enhancing capacity of DRM with various sectors



Multipurpose agricultural facility (Kenya)

- (1) Ring dyke for Industrial estates
- (2) Preparation of Business continuity plan (BCP) (ex: Port, Medical facility, Educational Facility etc.)
- (3) Disaster education in official curriculum
- (4) Urban development + DRM
- (5) Community/gender development + DRM

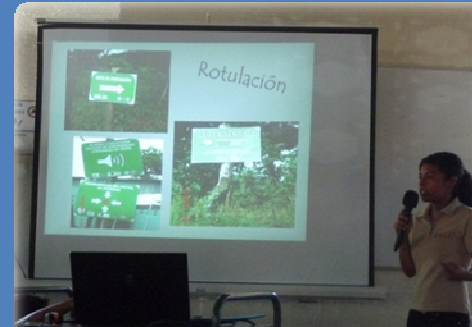
Others



Application to JICA project



Pupils discussing risks in and around their school



Youth of a community discussing risks and countermeasures

Risk Literacy

- ❑ Linkage between communities, municipalities and national agencies
- ❑ Risk mapping by communities

Redundancy

- ❑ Involvement of school education and community development

Continuous improvement (Kaizen)

- ❑ Capacity development for preparing and revising risk maps and disaster management plans

STRATEGY

**Central American Policy
for Integral Disaster Management (PCGIR)**



Input to International DRM Strategy

2012

International conferences on DRM

2013

4th Global Platform for Disaster Risk Reduction (UNISDR)

2014

2015

3rd World Conference on Disaster Reduction (UN/ISDR)

Discussion on new strategy on DRM and new framework after HFA (Hyogo Framework for Action 2005-2015)

Post-HFA



Total amount of Damage

Unit: Billion US \$, 1USD=80JPY

	東日本大震災 Great East Japan Eq. (Cabinet Office)	Great East Japan Eq. (Cabinet Office)		Hanshin-Awaji Eq. (National Land Agency)
		ケース 1	ケース 2	
建築物等 (住宅・宅地、店舗・ 事務所・工場、機械等) Houses/Building	約 10兆4千億円 130	約 11兆円 （被災率の想定） 140 : 2倍程度 非津波被災地域： 阪神と同程度	約 20兆円 （被災率の想定） 250 ケース 2 に大きい 非津波被災地域： 阪神と同程度	約 6兆3千億円 79
ライフライン施設 Lifeline utilities	約 1兆3千億円 16	約 1兆円 13	約 1兆円 13	約 6千億円 7.5
社会基盤施設 Infrastructure	約 2兆2千億円 28	約 2兆円 25	約 2兆円 25	約 2兆2千億円 28
その他 Other	Agri. 約 1兆9千億円 24	約 2兆円 25	約 2兆円 25	約 5千億円 6.3
	Other 約 1兆1千億円 14			
Total Amount	約 16兆9千億円 212	約 16兆円 203	約 25兆円 313	約 9兆6千億円 121

注：ストックの区分は内閣府（防災担当）の推計で用いたものによるものであり、推計により若干異なる。



Government Budget Bill for DRM (FY 2011)

Ministry / Agency	Research	Mitigation	National Land Conservation	Recovery	Total (Mil JPY)
Cabinet Office	7	3,801		609	4,417
National Police Agency		3,484			3,484
Min. of Internal Affairs and communications	495	30			525
Fire and Disaster Management Agency	439	10,439			10,878
Min. of Justice		14,021			14,021
Min. of Foreign Affairs		268			268
Min. of Finance		9,284		78,346	87,630
Min. of Education, Culture, Sport, Science and Technology	4,277	8,606		602	13,485
Agency for Cultural Affairs		89			89
Min. of Health, Labor and welfare		14,821		720	15,541
Min. of Agriculture, Forestry and Fisheries		1,173	95,145	129,147	225,465
Min. of Economy, Trade and Industry		3,388	2,483		5,871
Min. of Land, Infrastructure and Tourism	1,657	44,210	577,208	44,958	668,033
Japan Meteorological Agency	1,048	21,957			23,005
Japan Coast Guard	116	72,002			72,118
Min. of the Environment			14	200	214
Min. of Defense		1,113		118	1,231
	8,039	208,686	674,850	254,700	1,146,275



Thank you very much for your kind attention.

For further information, please visit our website.

http://www.jica.go.jp/english/operations/thematic_issues/water/earthquake/index.html

Just type

JICA english tsunami study



and search!

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