JICA's direction and challenge on Disaster Risk Management

JICA Turkey Office
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Outline of presentation

- JICA's policy on DRM
- Our strength of DRM
- Our consideration On Next generation DRM
- Our challenge on DRM

Chapter 1
JICA's policy on DRM

An Evacuation zone were affected by tsunami, Arahama, Sendai-city

JICA's Approach in Disaster Management

Three concepts as the objectives of disaster management

1. Contributing to the improvement of "Human Security"
2. Contributing to sustainable development in developing countries
3. Contributing to the promotion of international cooperation in the field of DRR as an advanced nation of disaster management

Development Strategy Goal

1. Building disaster-resilient communities and societies (Mitigation/Preparedness)
2. Emergency response that reaches affected people quickly and effectively (Protection of life) (Emergency response)
3. Transition and implementation of accurate recovery and reconstruction (Recovery/Reconstruction)

Disaster Management Cycle

DISASTER

①Preparedness / Mitigation

- Hazard mapping, evacuation drill
- Organization Reinforcement
- Establishment of Disaster Management Plan
- Development of Early Warning System

②Emergency Response/Relief

- Dispatch of Rescue team
- Provision of Rescue supply

③Recovery

- Reconstruction and Rehabilitation of Infrastructure
- Mental Health Care

Hyogo Framework for Action

Overall Goal:

Building the resilience of nations and communities to disasters

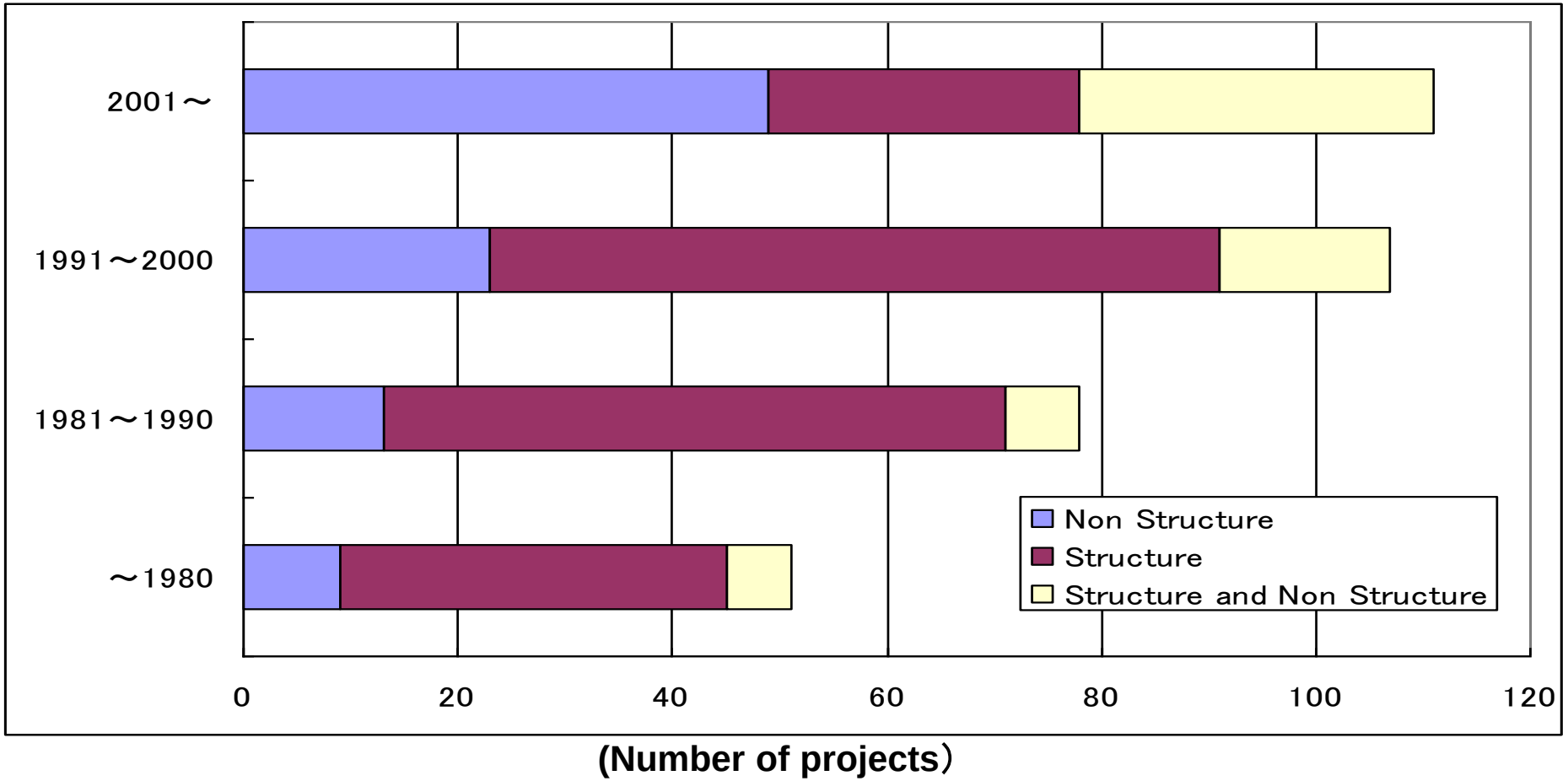
Three Strategic Goals:

- The integration of disaster risk reduction into sustainable development policies and planning
- Development and strengthening of institutions, mechanism and capacities to build resilience to hazards
- The systematic incorporation of risk reduction approaches into the implementation of emergency preparedness, response and recovery

Priorities for Action:

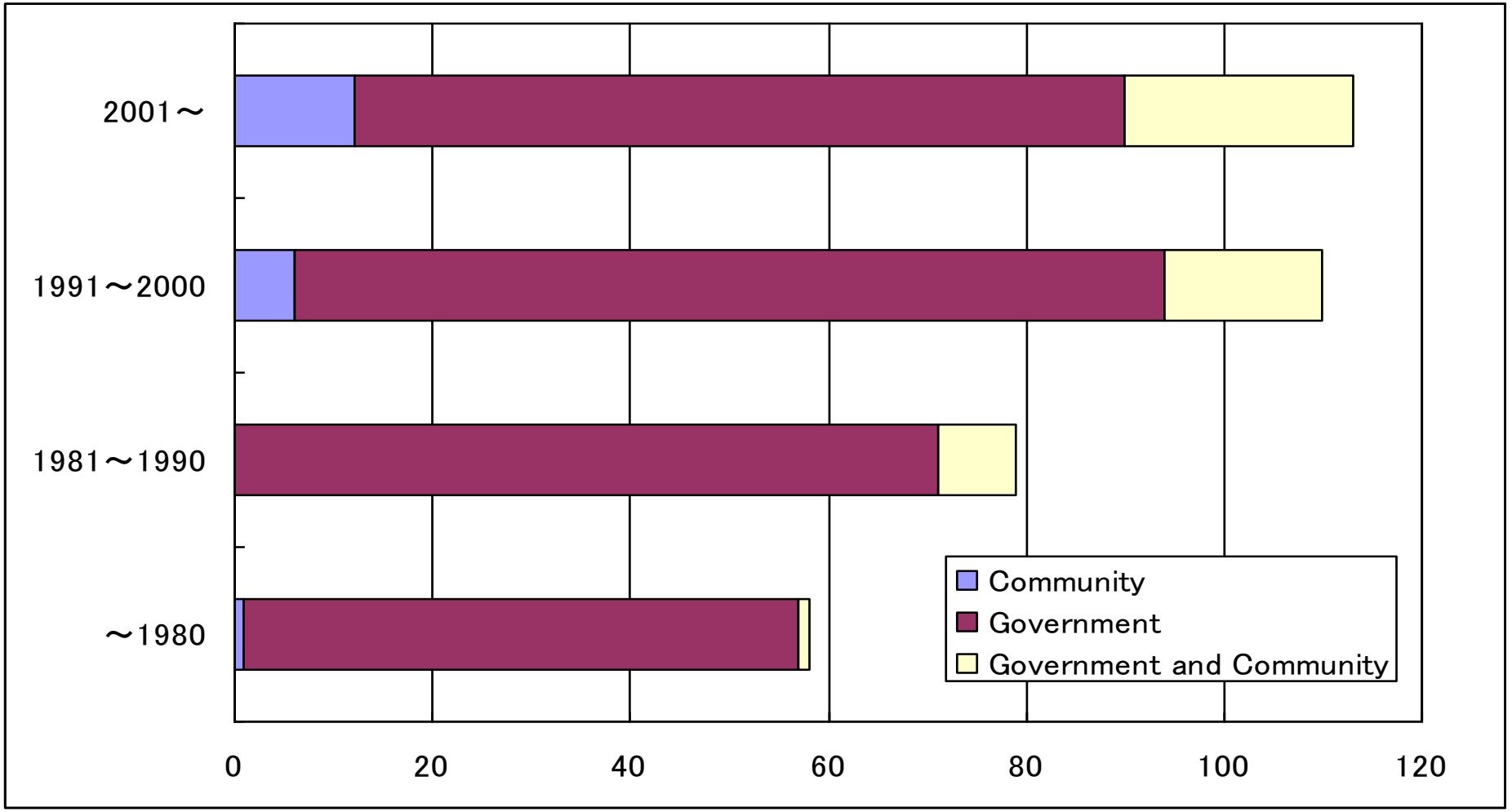
- **HFA1** Make Disaster Risk Reduction a Priority
- **HFA2** Know the Risks and Take Action
- **HFA3** Build Understanding and Awareness
- **HFA4** Reduce Risk
- **HFA5** Be Prepared and Ready to Act

Trend in JICA's Activity



- Majority of JICA Projects up to 90's : Structural measures
  from 2000 : Non structural measures
- Projects by combination of structural and non-structural measures are increasing.

Trend in JICA's Counterparts



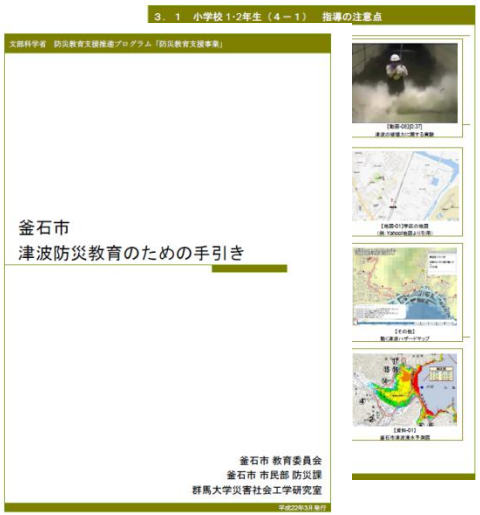
(Number of projects)

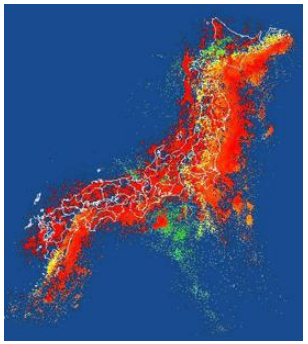
JICA's target is gradually shifting to community from 90's.

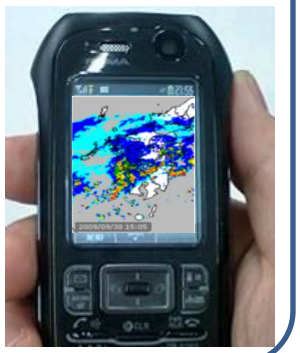
Chapter 2
Our strength of DRM

Well-prepared?

Non-Structure







Structure

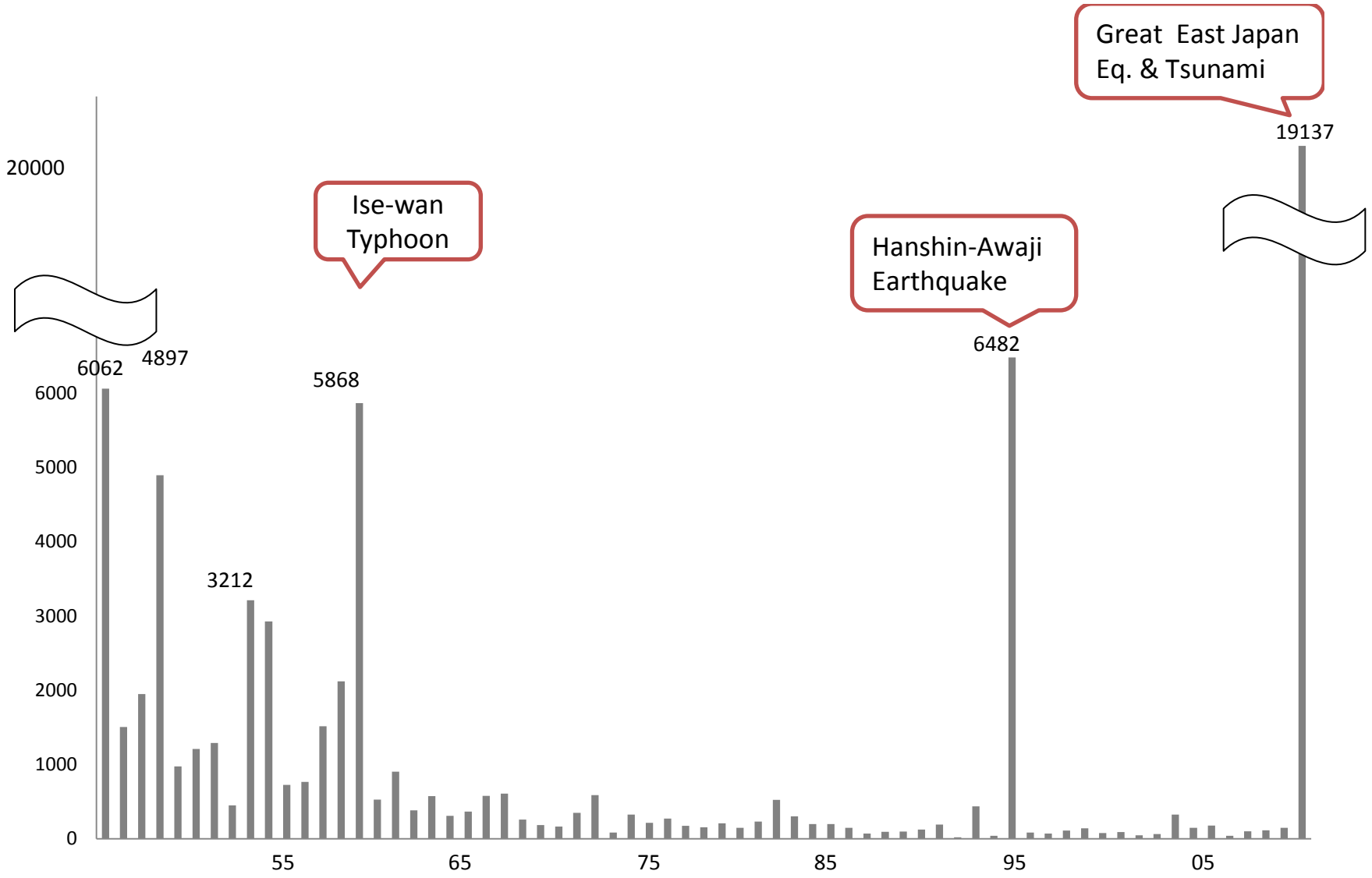
Personal standpoint

One of the best-prepared country

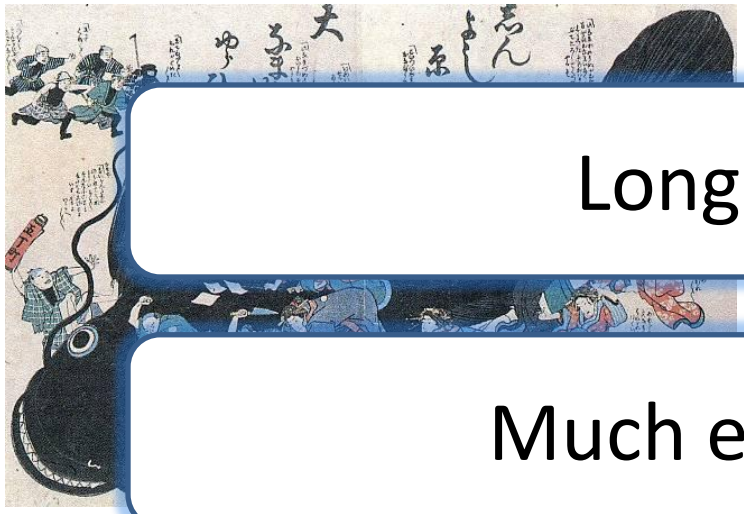
One of the best-invested country

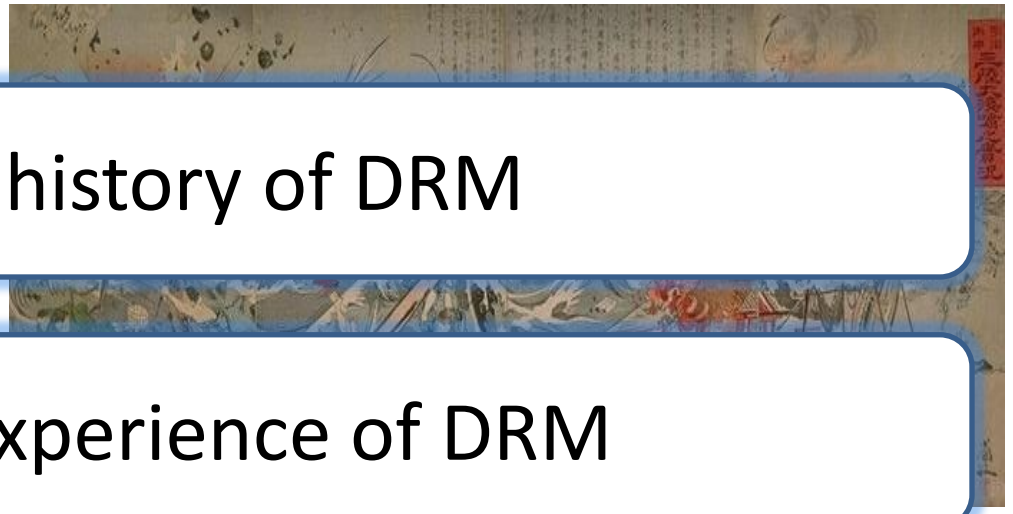
Tremendous damage
by
The Great East Japan Earthquake

Trend of casualty in Japan



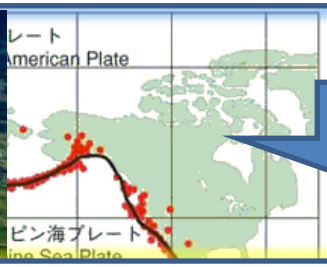
Our experiences on disaster



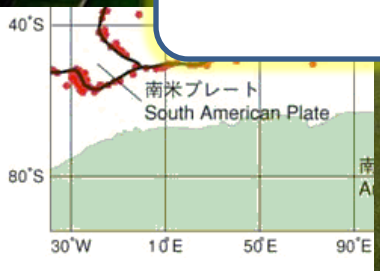


Long history of DRM

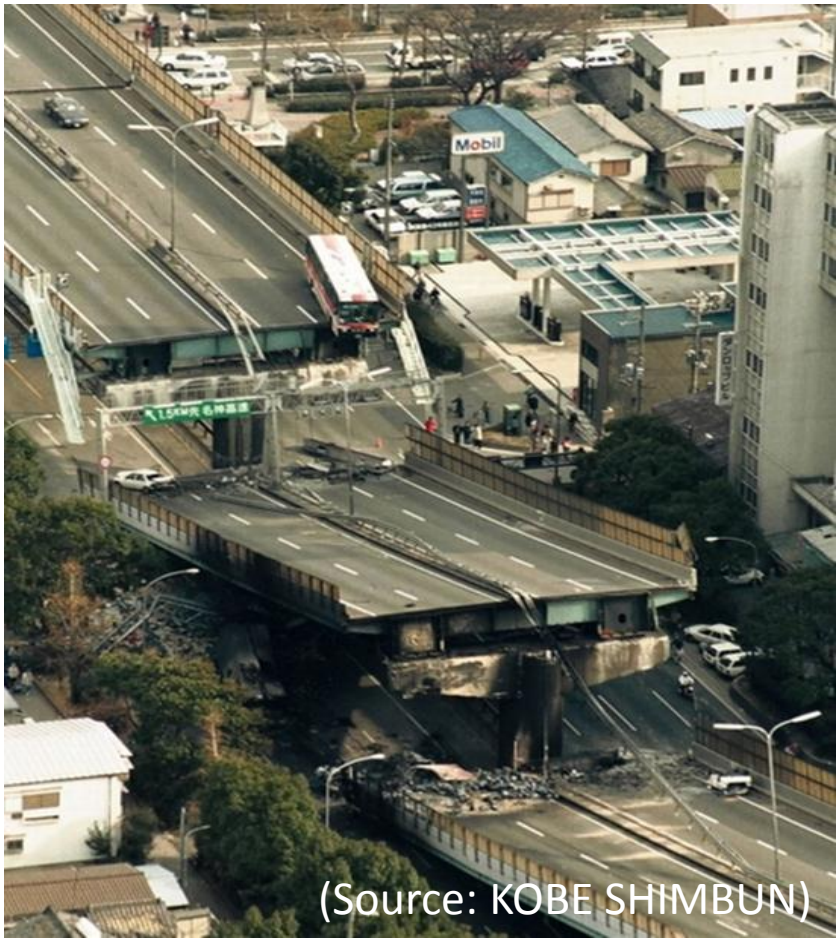
Much experience of DRM



Combination of Analog and Digital



Prominent example (Hanshin-Awaji Big Earthquake)



(Source: KOBE SHIMBUN)

Earthquakes don’t occur In KOBE

We are proud of Japanese civil engineering.

Prominent example (Great East Japan Earthquake)

This region is well-prepared against tsunamis based on the past experience

Personal standpoint

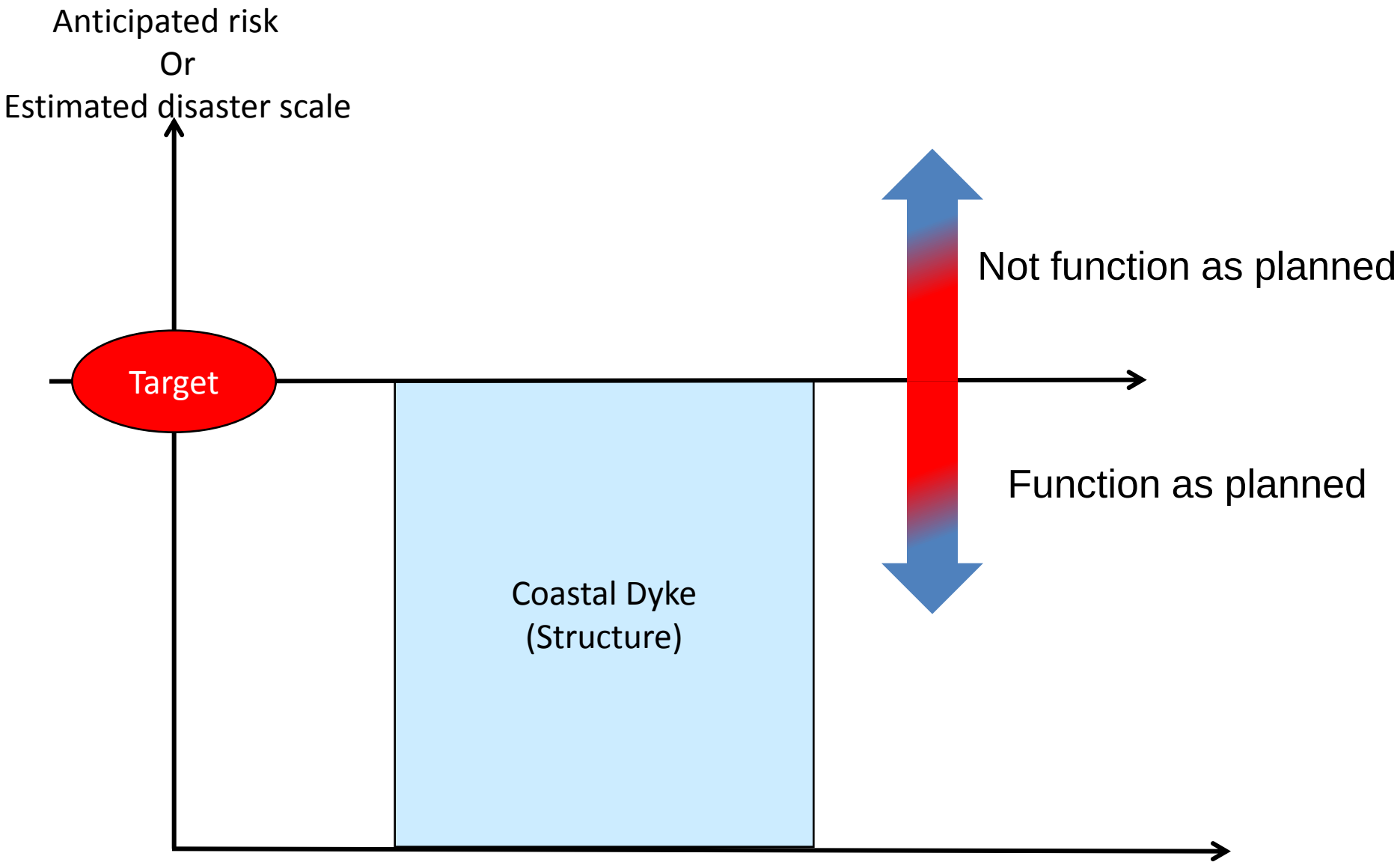
One of the best-prepared country

One of the best-invested country

Tremendous damage
For
Great East Japan Earthquake

DRM should NOT “JUST DO (One-way)”

Existing idea on Disaster Risk Management



Conditions precedent of DRM

DISASTER RISK MANAGEMENT

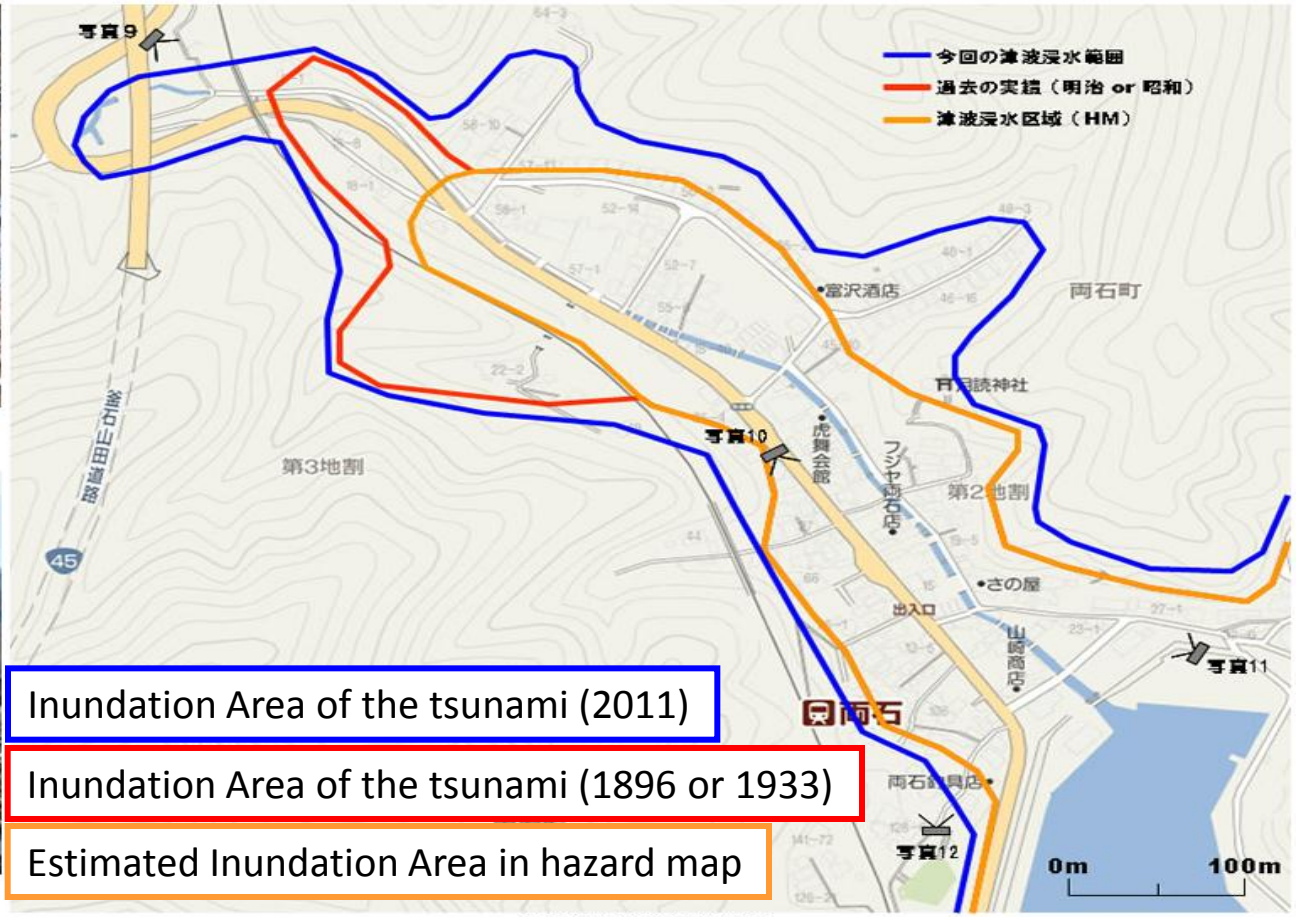
UNCERTAINTY

Human psychology

RISK ASSESSMENT

写真9　津波被災後の両石の様子
（H23.3.18撮影）

写真10　6メートルの防潮堤が津波によって跡形もなくなってしまった
（H23.3.18撮影）



唐丹湾 本郷の津波浸水範囲

(Source: Research Center for Disaster Prevention in the Extended Tokyo Metropolitan Area, Gunma Univ.)

写真11　津波被災前の両石の様子
（H16.5.29撮影）

写真12　高台にあった避難場所まで津波が到達した
（H16.5.29撮影）

STRUCTURE MEASURE

Giant Coastal Dyke
Taro city, Iwate

Name of disaster	Casualty
Meiji-sanriku Eq.	1867/2248(83%)
Syowa-sanriku Eq.	911/2773(33%)
Great East Japan Eq.	146/2466(5%) (As of 5/15)

INFORMATION DELIVERY

Disaster Center, Minami Sanriku

Source: NHK

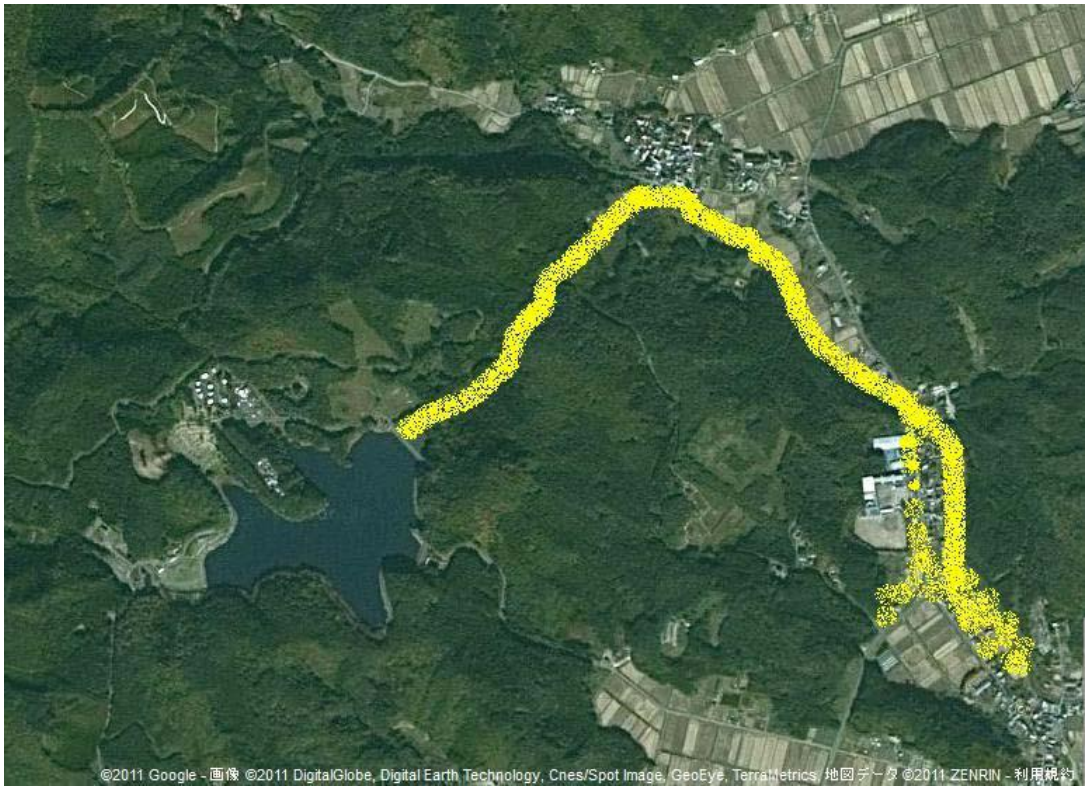
DISASTER EDUCATION

Successful Evacuation by Students in Kamaishi City

The students started evacuation promptly and voluntarily, following their experiences of evacuation drills.

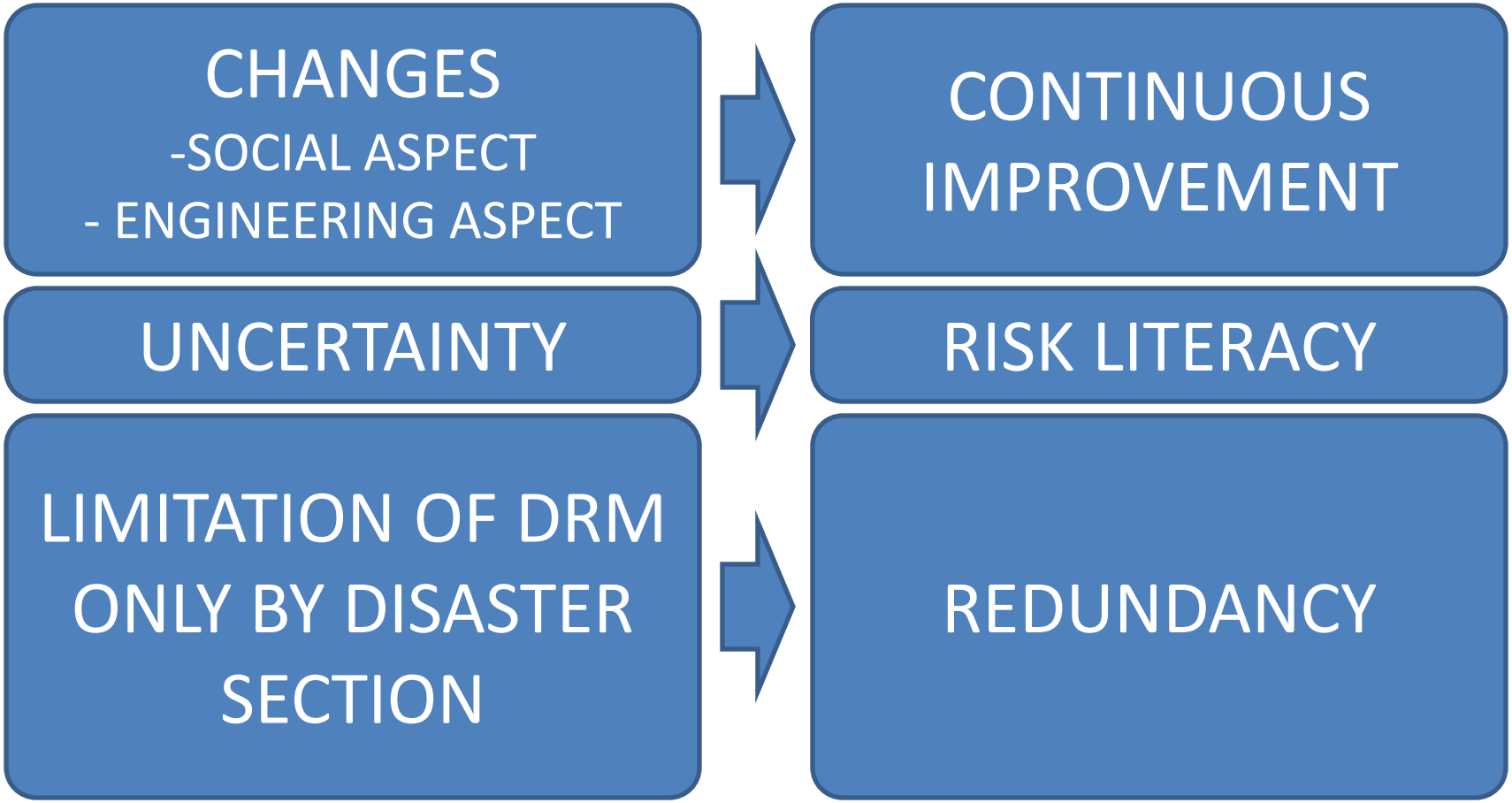
(Source: Research Center for Disaster Prevention in the Extended Tokyo Metropolitan Area, Gunma Univ.)

Tsunami from a mountain



(http://committees.jsce.or.jp/2011quake/)

KEY FACTORS FOR BETTER DRM

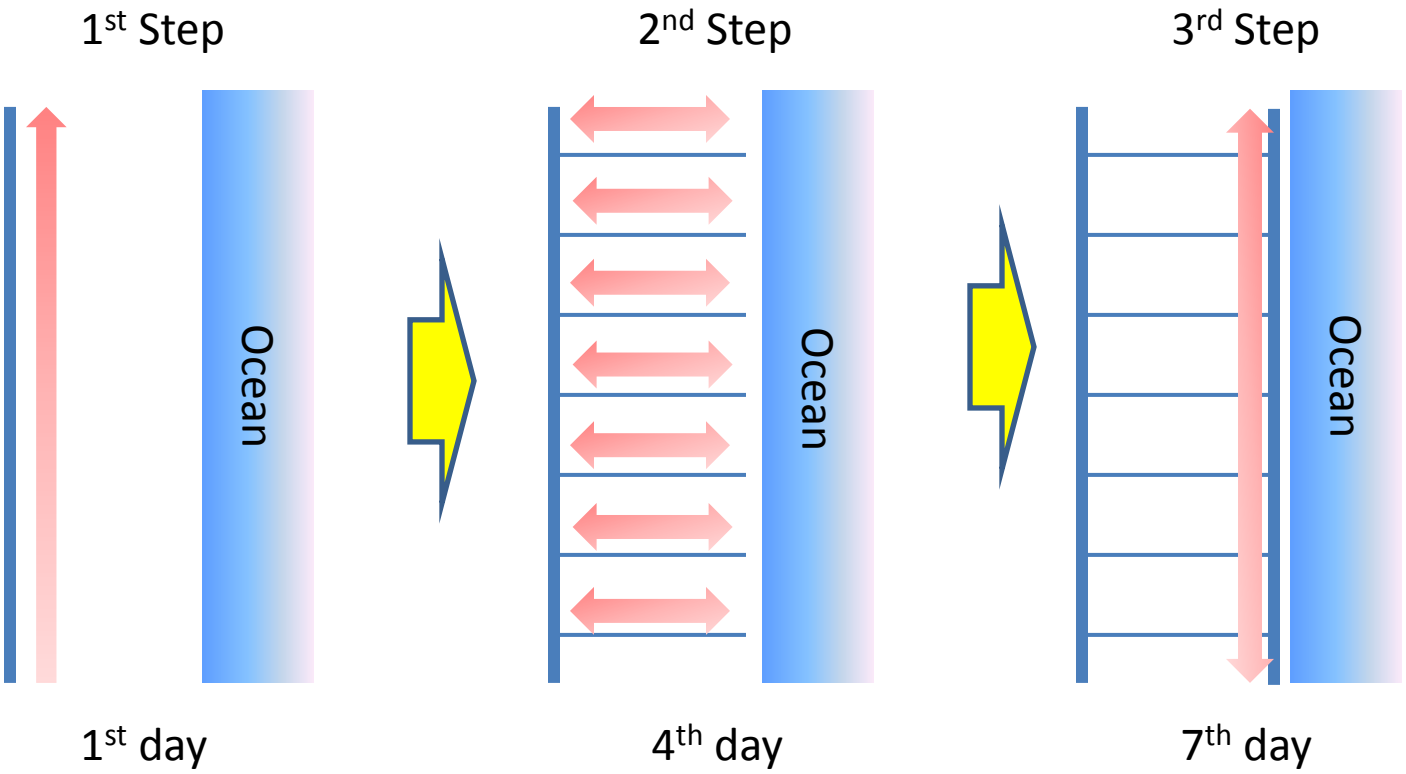


Chapter 3
Our consideration On Next generation DRM

Example of Highway as Settle-back Levee

(Source: KOKUSAI KOGYO)

Road rehabilitation toward resilient society

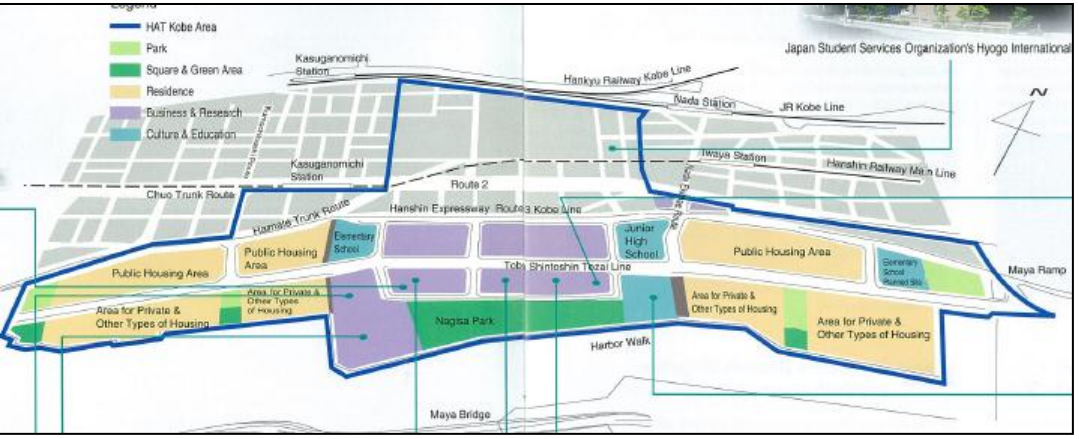


SMOOTH IMPLEMENTATION OF EMERGENCY RESPONSE
EFFECTIVE RECONSTRUCTION WORK

DISASTER BASE HOSPITAL

ROBUST ROAD	EMBANKMENT	FACILITY ARRANGEMENT
ROAD CONNECTION	REDUNDANT INFRASTRUCTURE	BCP

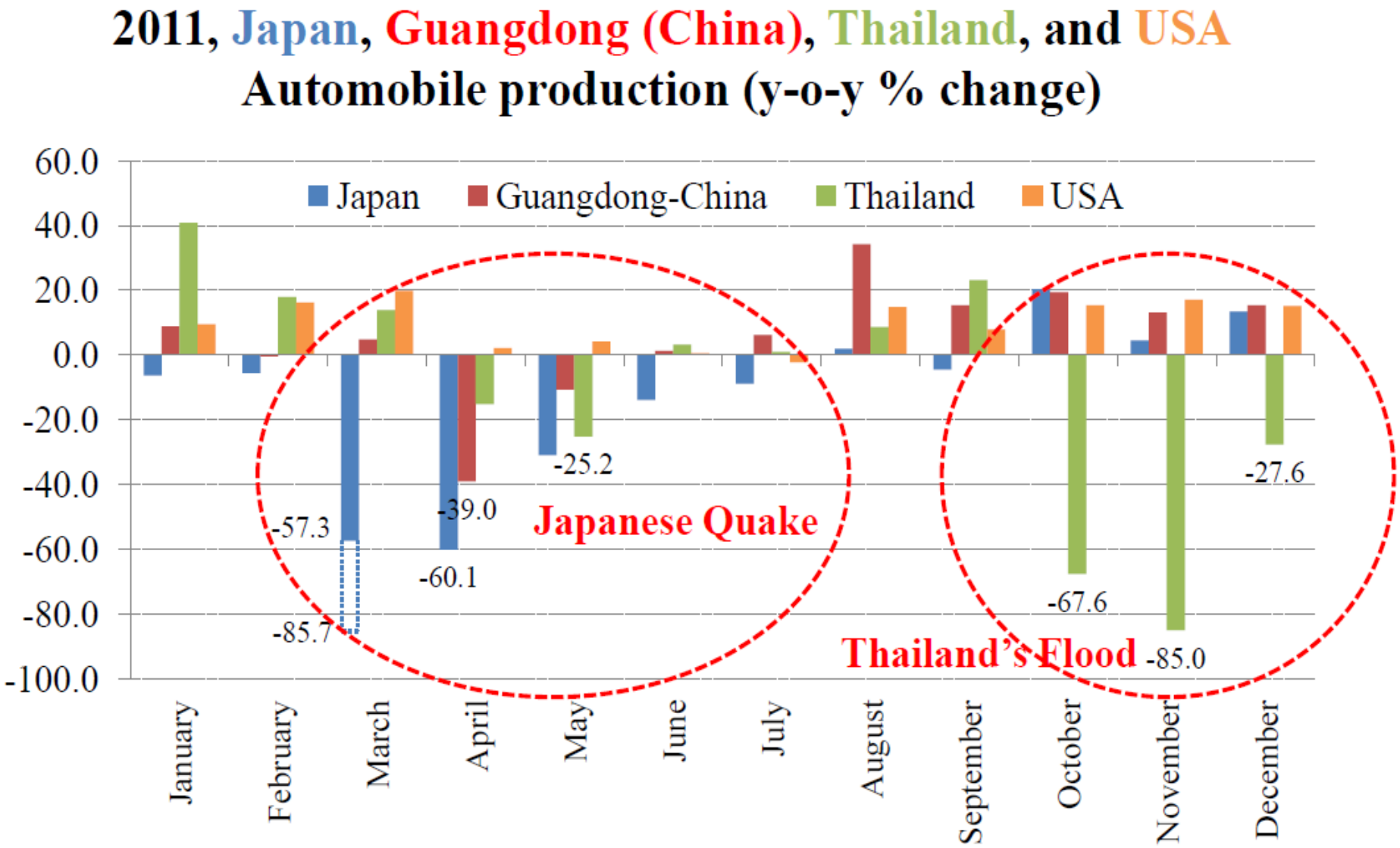
HAT KOBE



Urban Planning taking account for DRM

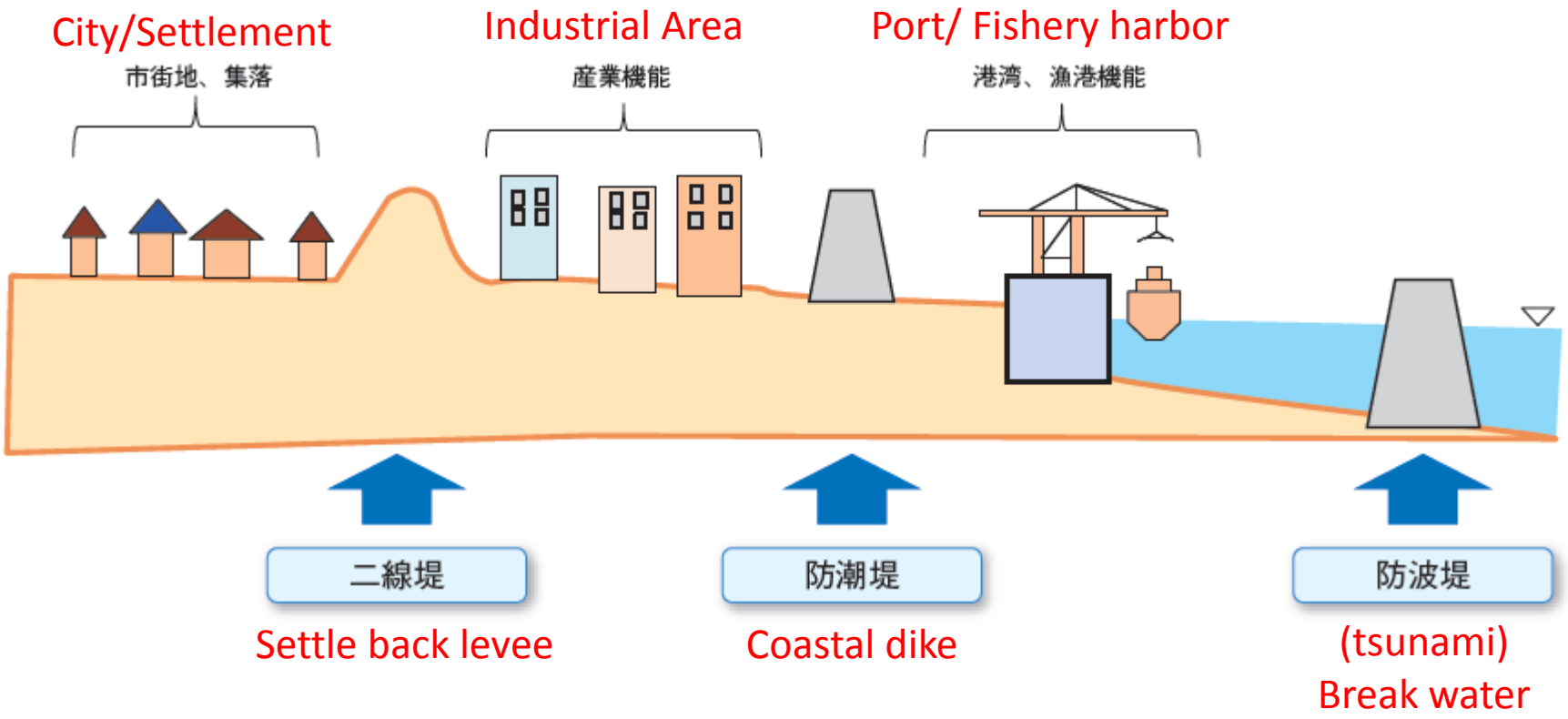
- Wide Road Network
- Emergency Hospital
- School as shelter

The Global Impact of Japanese Quake and Thailand's Flood



Source: JAMA, Statistic Bureau of Guangdong Province, TAIA, Federal Reserve Board
By courtesy of Professor Nobuaki Hamaguchi

Image of “Area-based” planning



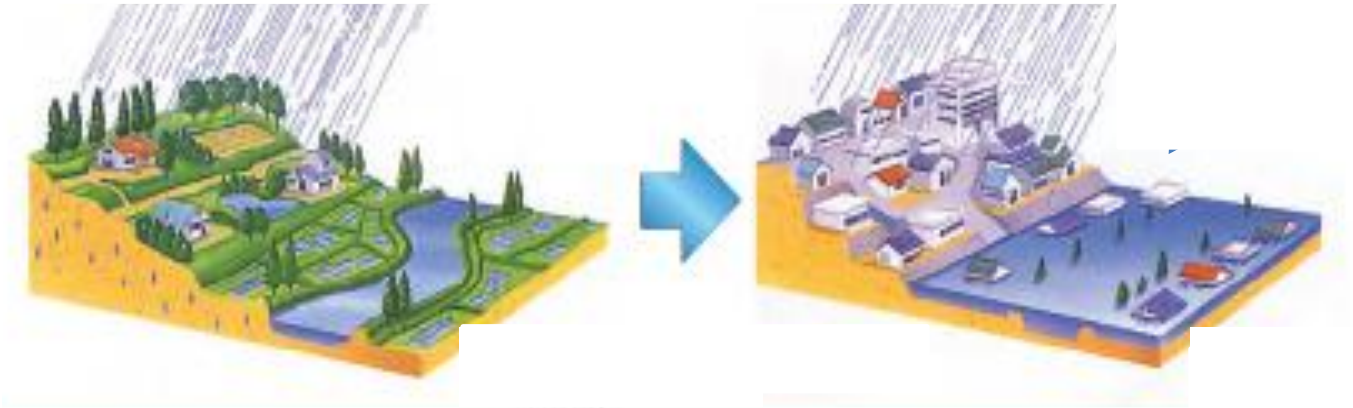
Concept of “Disaster Reduction” , not “Disaster Prevention”

①From Structure measures to People-oriented measures

②From “Linear-base planning” to “Area-based planning”

Source: http//cas.go.jp/jp/fukkou/

Necessity of mainstreaming of DRM

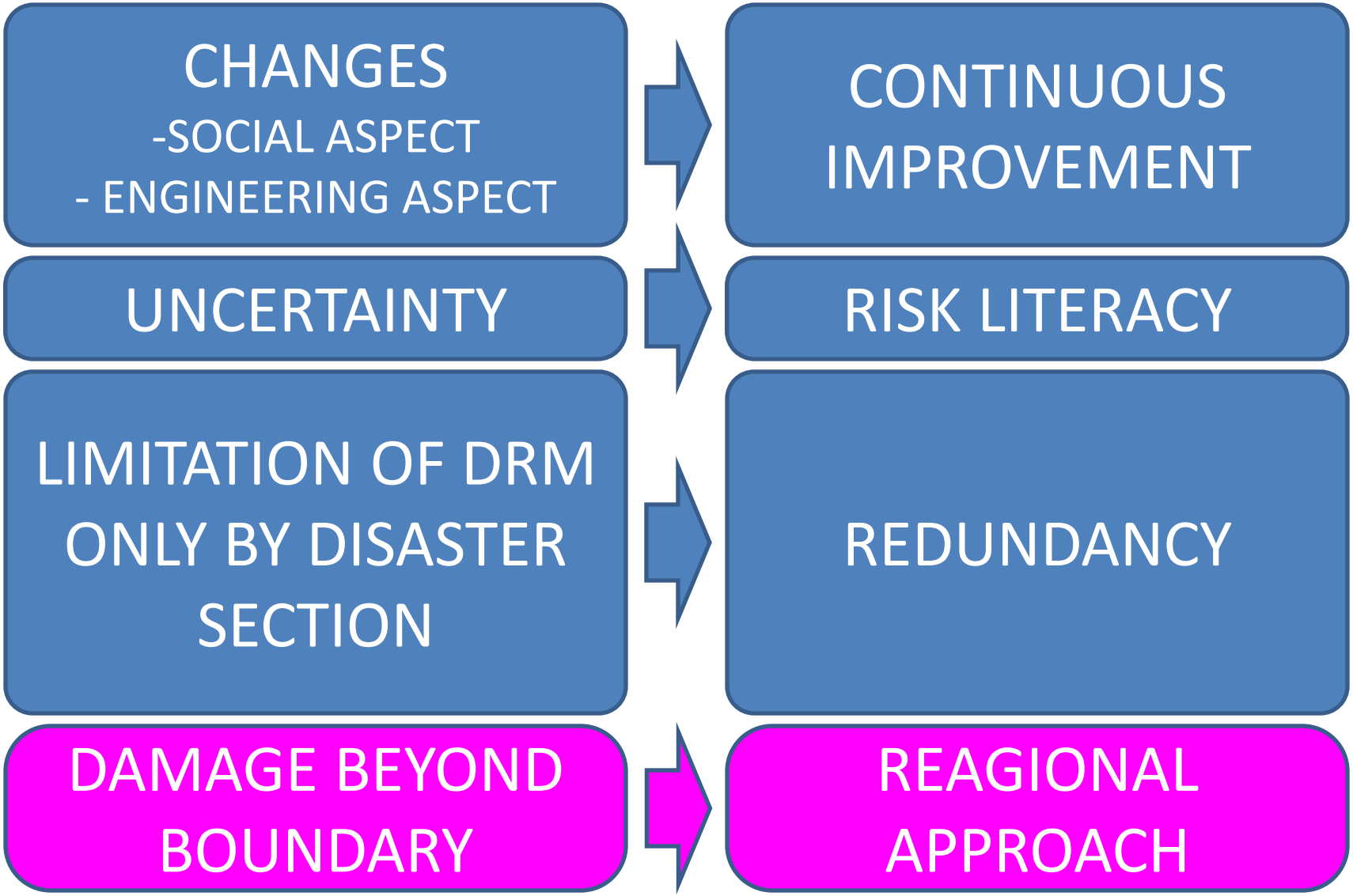


Urbanization may accelerate poverty

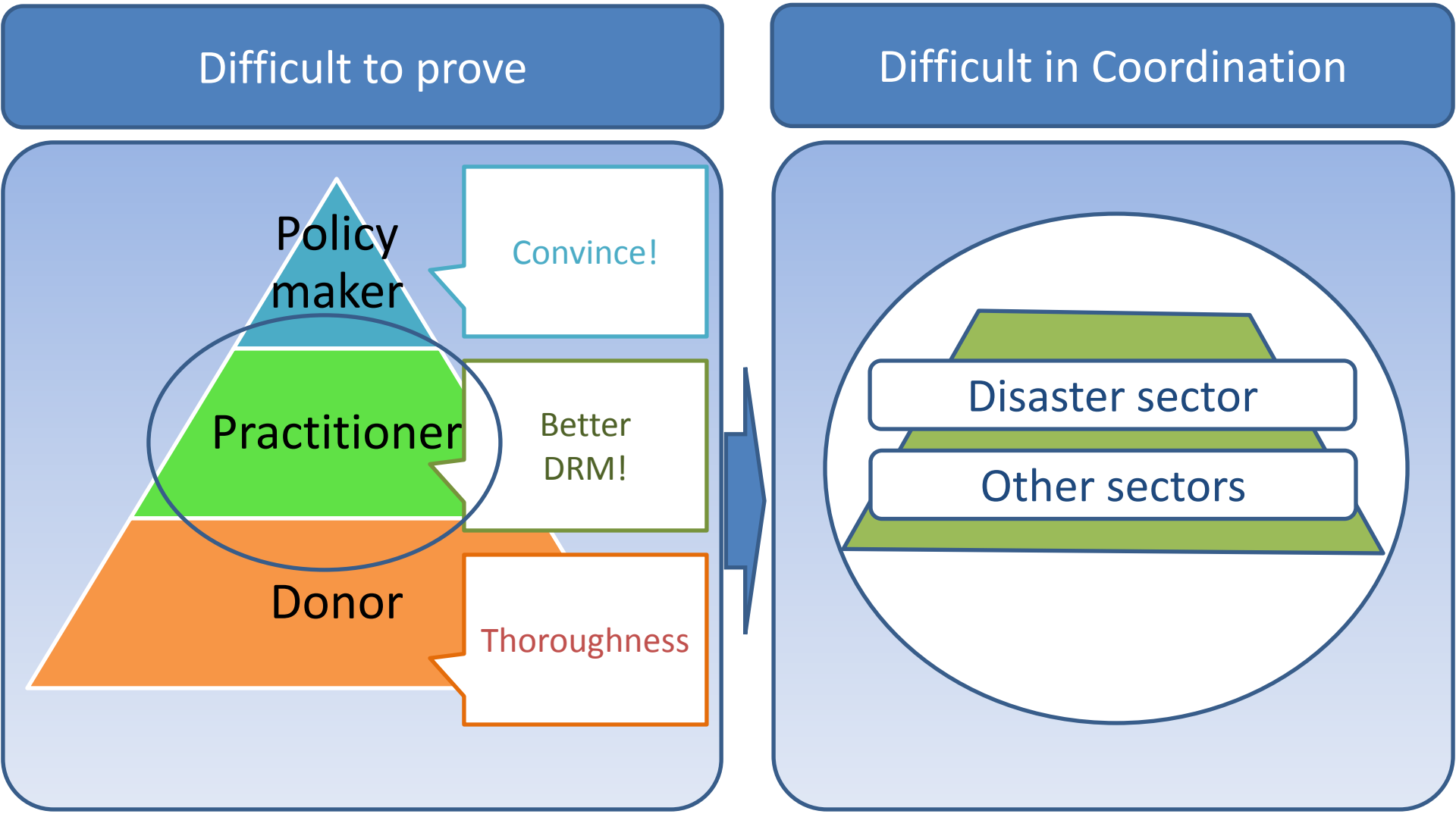
Urbanization may involve various sectors

Urbanization may trigger secondary disaster

KEY FACTORS FOR BETTER DRM



Difficulties to realize mainstreaming DRM into sustainable development

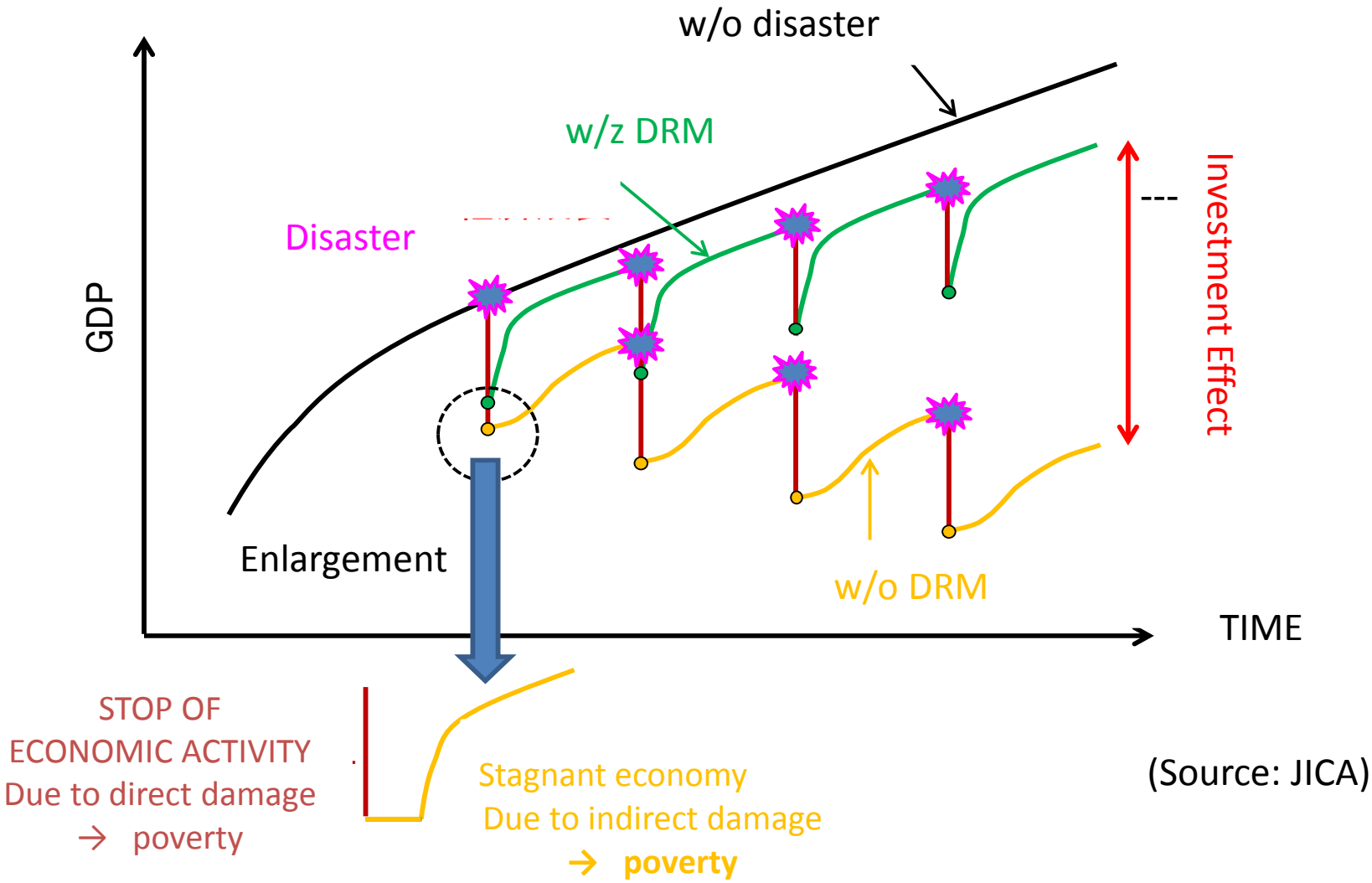


Chapter 4
Our challenge on DRM

The 3rd GPDRR (Global Platform for Disaster Risk Reduction organized by UN/ISDR (Geneva, Switzerland)

Investment effect

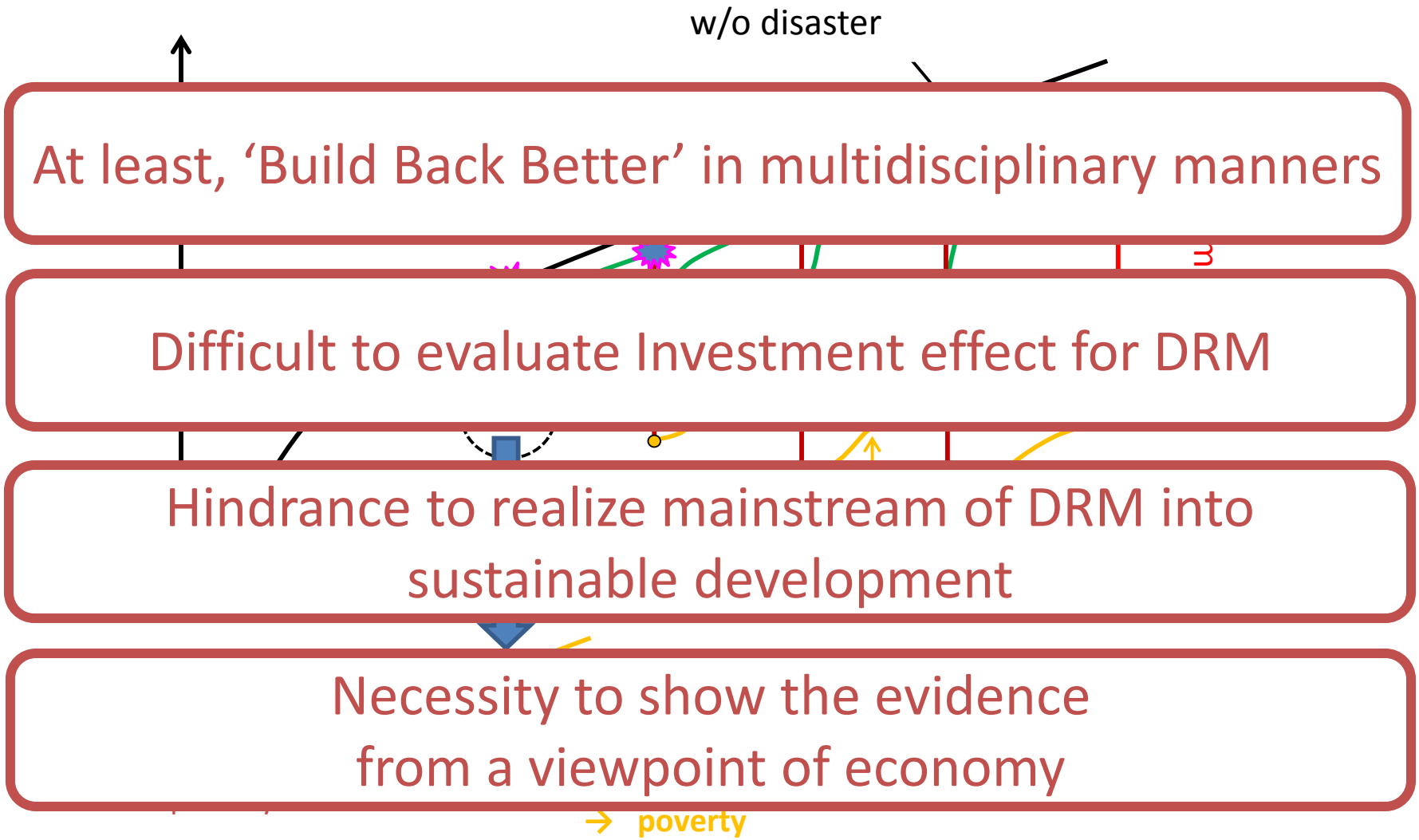
Investment of 1USD worth effect of 7USD



(Source: JICA)

Investment effect

Investment of 1USD worth effect of 7USD



At least, ‘Build Back Better’ in multidisciplinary manners

Difficult to evaluate Investment effect for DRM

Hindrance to realize mainstream of DRM into sustainable development

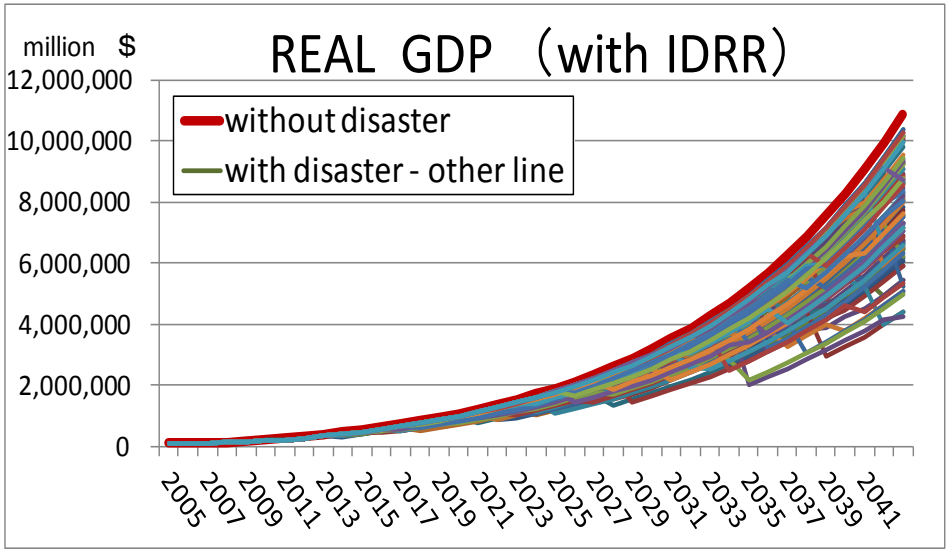
Necessity to show the evidence from a viewpoint of economy

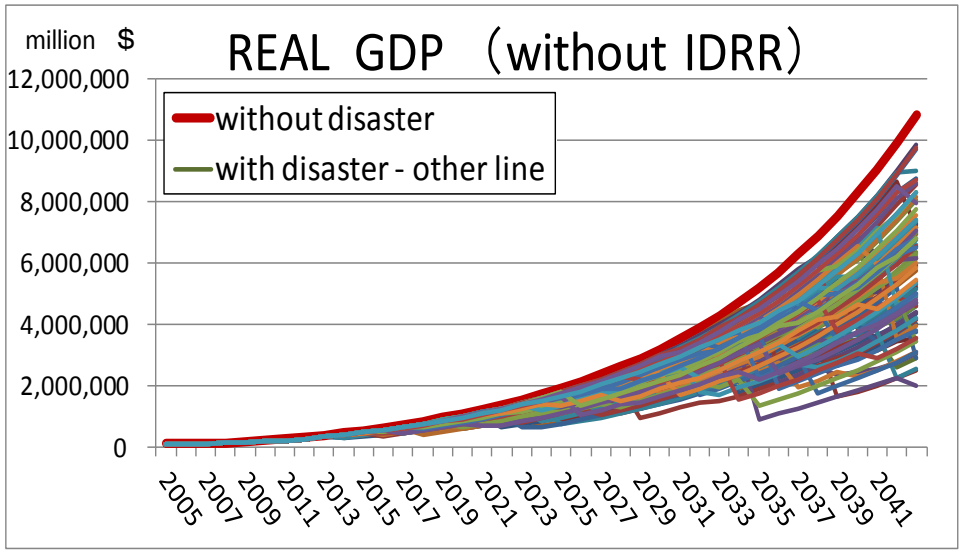
JICA developing Economic Model to show the effectiveness of DRR investment

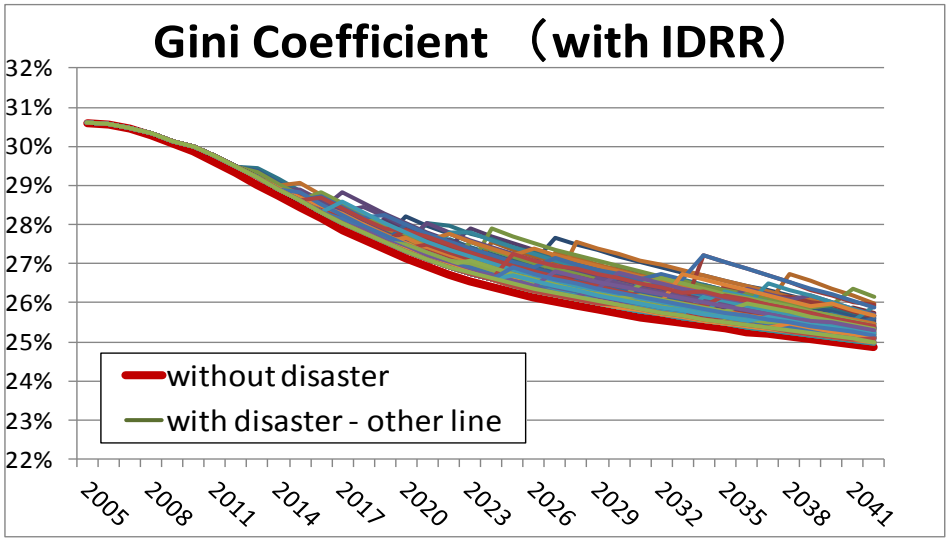
- Economical Model which can measure
  - GDP change
  - income differential and Gini coefficient change in Lorenz curve
- With & Without DRR investment
- Named **DR^2AD Model**

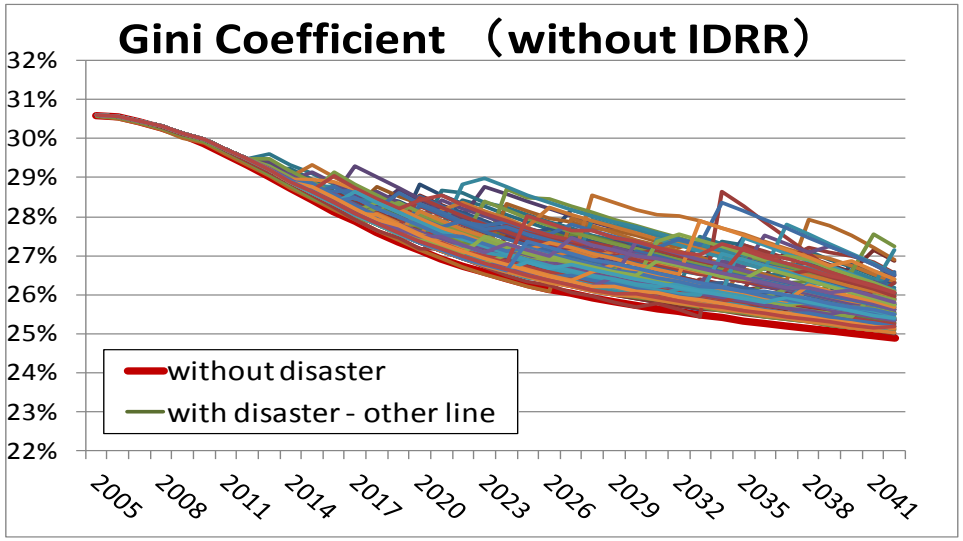
Simulation example

(Source: JICA)

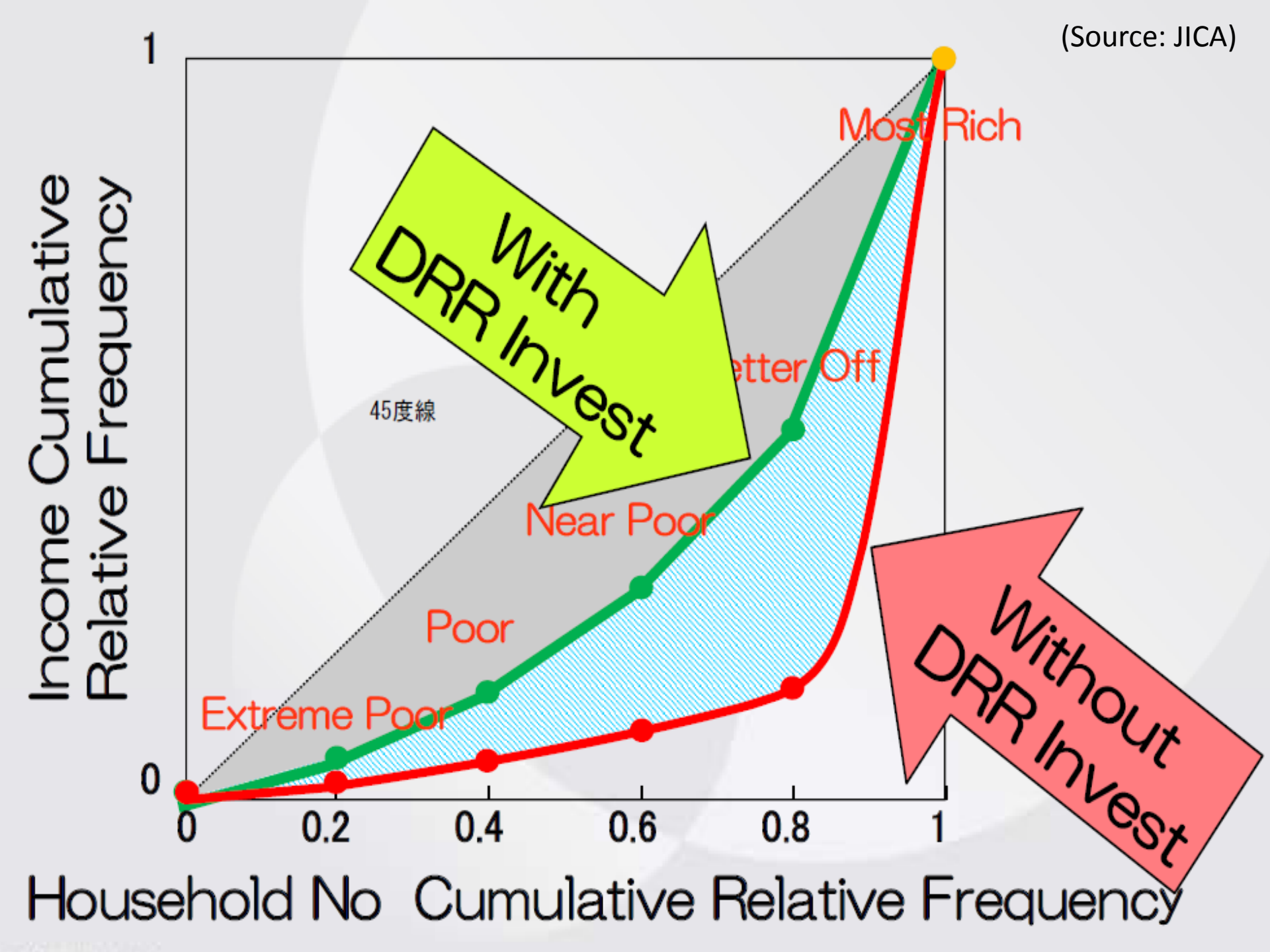








(Source: JICA)


1
0
Income Cumulative Relative Frequency
0
0.2
0.4
0.6
0.8
1
Household No Cumulative Relative Frequency
45度線
Most Rich
With DRR Invest
Near Poor
Poor
Extreme Poor
Without DRR Invest

Conclusion

- Better DRM needs to consider (1) Continuous updating, (2) Risk Literacy and (3) Redundancy.
- There are many projects which don’t take into consideration for DRM in other sectors.
- JICA challenges discussion to convince policy makers and various sectors.
- JICA plans to set mandatory process to all project, “Disaster Risk Assessment”

THANK YOU VERY MUCH FOR YOUR ATTENTION

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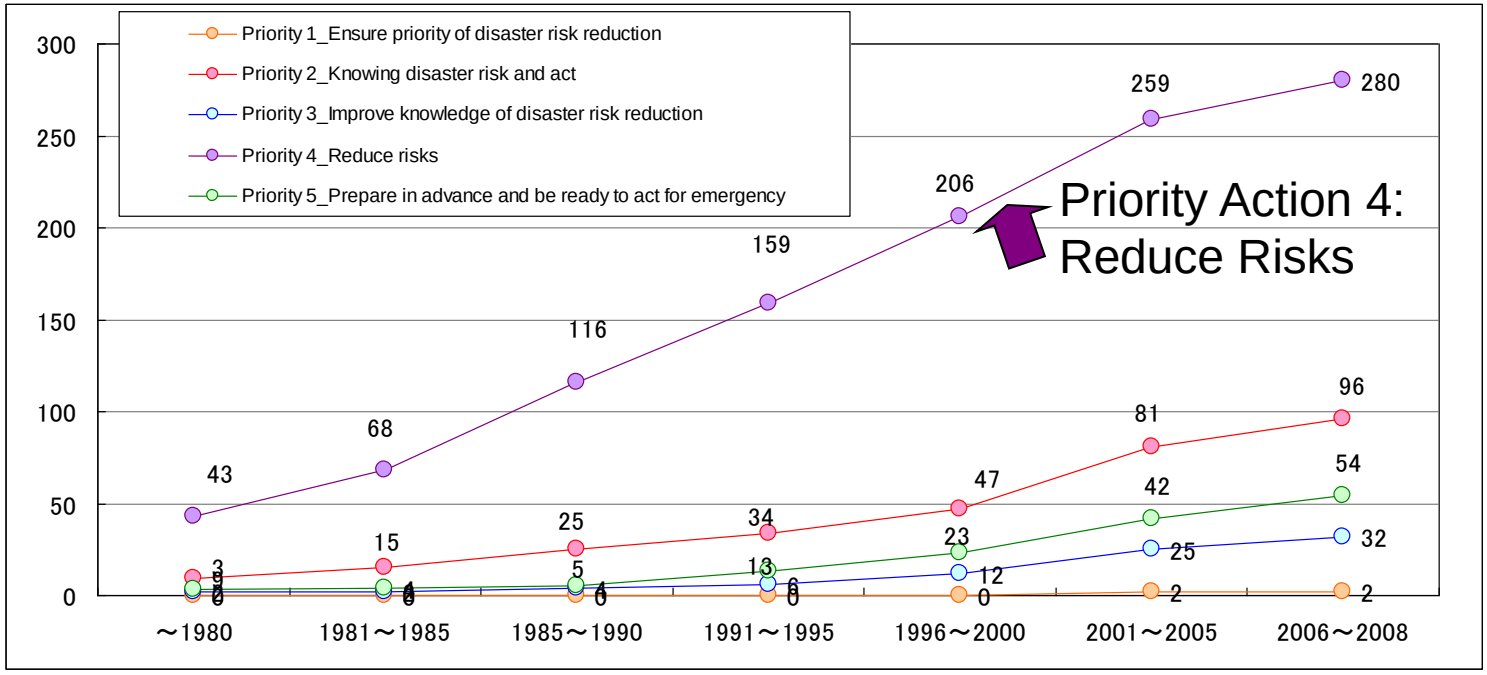


Type of Cooperation	Priority Actions						Total Number of Projects 1997-2008
	1	2	3	4	5	Total	
Development Study	3	35	14	60	21	133	70
Technical Cooperation	1	14	9	16	10	50	34
Grant Aid	0	14	4	11	3	32	30
Yen Loan	0	0	1	20	3	24	24
Total	4	63	28	107	37	239	158

-The projects related to priority action 4 are increasing rapidly compared to others.
- It entails the use of structural and non-structural measures.

EMERGENCY RESPONCE

Initial response and the establishment of the emergency headquarters

11 March, 14:50 Established the Response Office at Prime Minister's Office Convened the Emergency Response Team

15:14 Established the Extreme Disaster Management Headquarters (the first establishment after the enactment of the law)

15:37 1st meeting of the Extreme Disaster Management Headquarters (adopted a basic policy on disaster response countermeasures)

18:42 Dispatched government inspection team (to Miyagi Prefecture)

19:23 3rd meeting of the Extreme Disaster Management Headquarters (direction on relief measures for stranded commuters)

12 March 6:00 Established the Local Headquarters for Extreme Disaster Management (in Miyagi Prefecture)

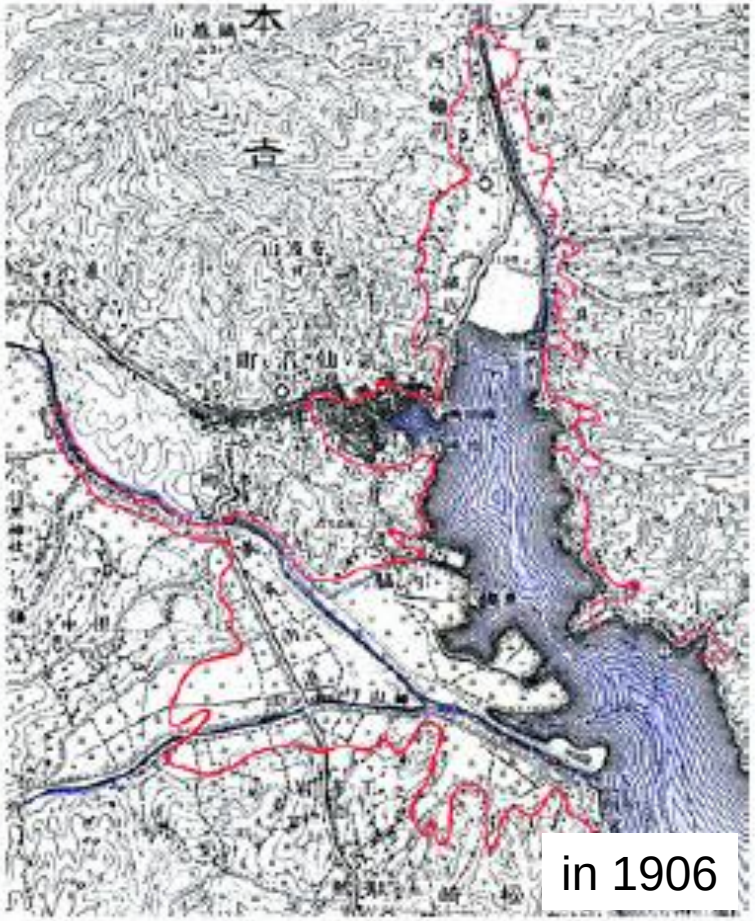



(Source: White Book)

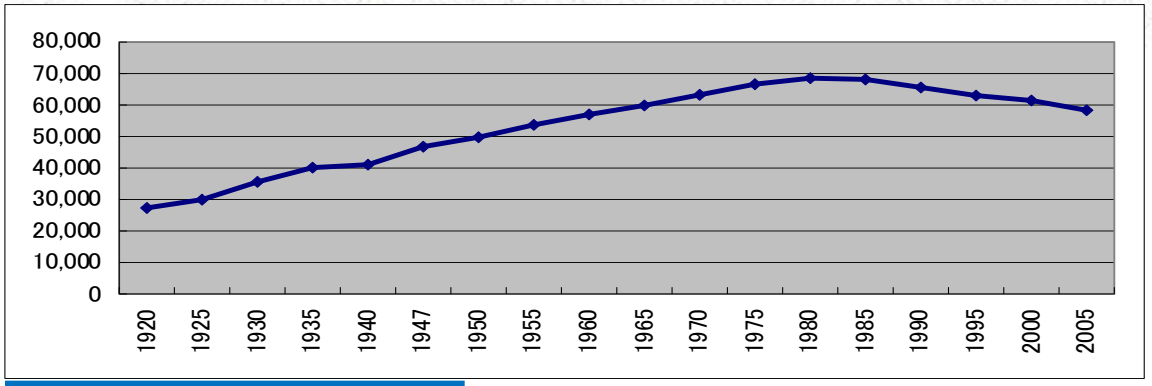
Existing idea on Disaster Risk Management

~ Combination of Structure and non-structure measures~

current



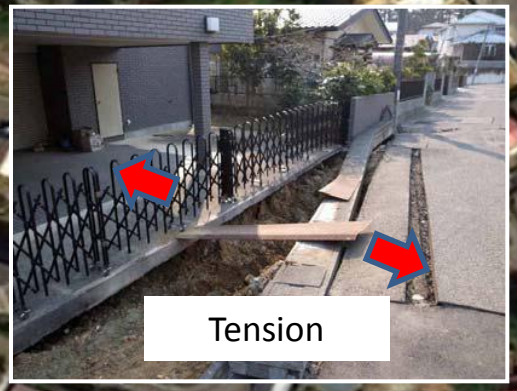
in 1906



水谷(2011)

Population Growth

Artificial valley fills (embankments)



Crack
- Tension
- Compression
- Sliding mass

Sliding mass

Direction

100 m

Base image provided by Google

Kamai (2011)

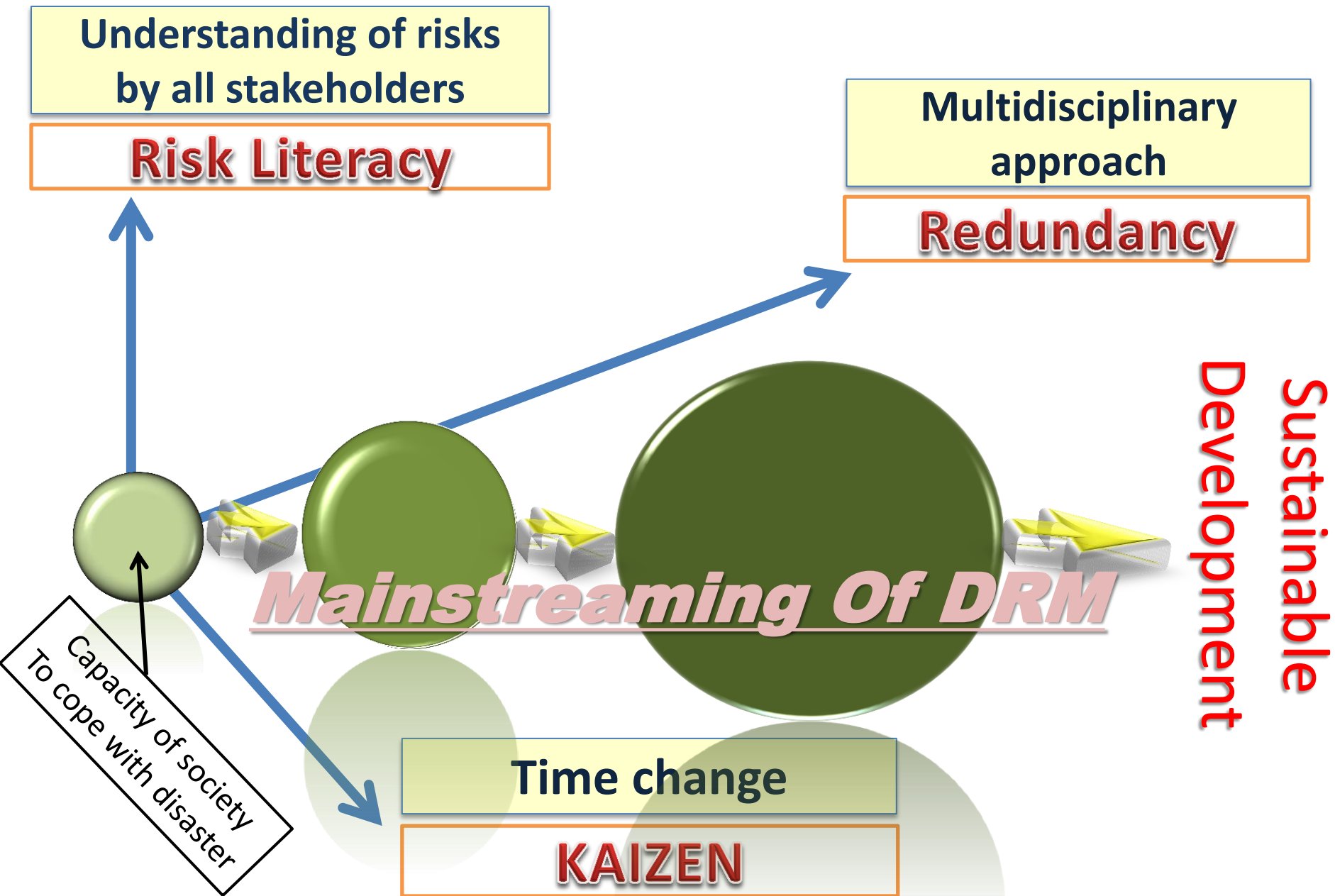
Recovery of Tohoku Shinkansen

A network of 97 earthquake detectors functioned 15 seconds before the quake hit the tracks on 11 March, 2011. Automatic brakes stopped the 27 bullet trains in operation without any trouble.

1,200 points were reported having small damages along 500 km tracks, but no serious damage to main structures. 8,500 engineers were deployed for rehabilitation.

(Source: International Herald Tribune Japan Edit. 29,Apr, Dr. Takahashi, Kyoto Univ., SankeiBiz)

Toward the mainstreaming of DRM



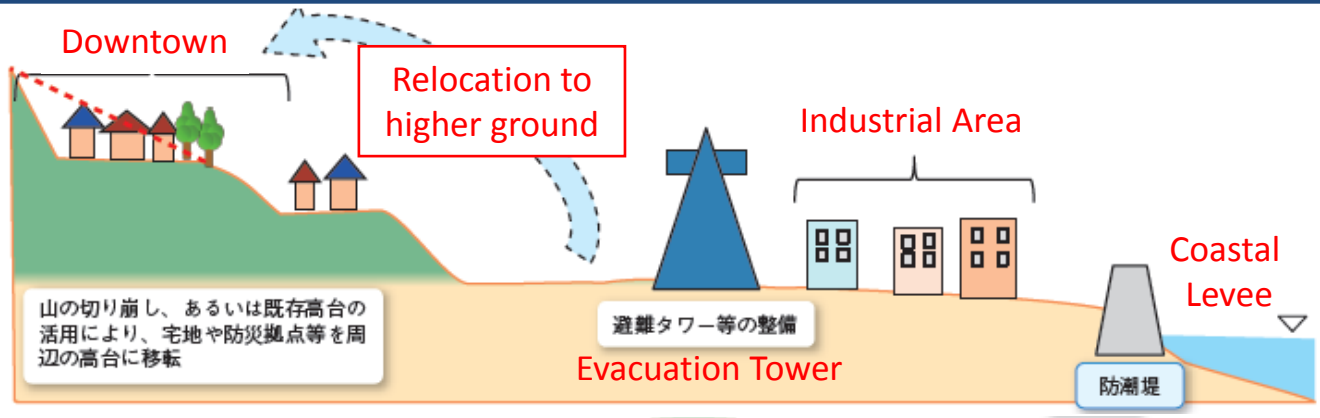
(Type 1)
Region with urban functions located in low-lying areas entirely affected by the tsunami

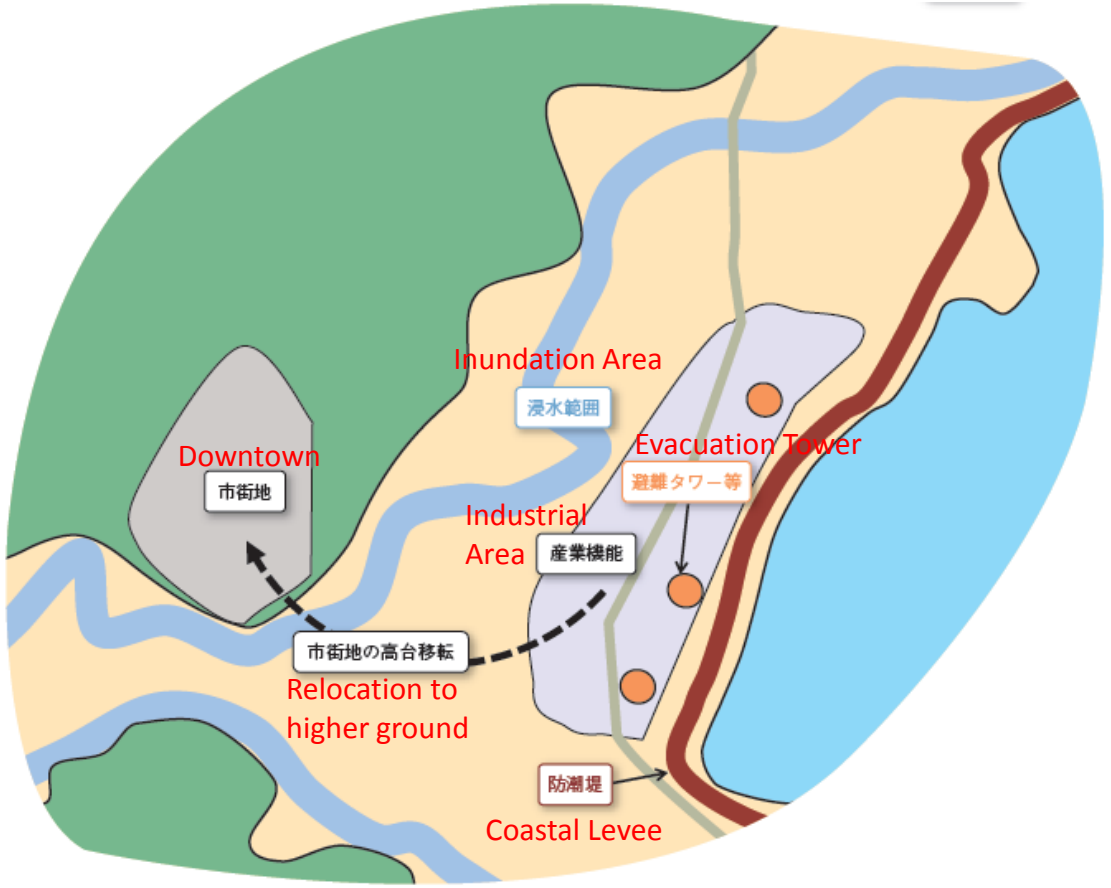
Points of the type

①Relocation of core urban functions and residents to higher ground.

②Important to maintain relationships of community

③Only such industrial functions to be located in plain or coastal area.





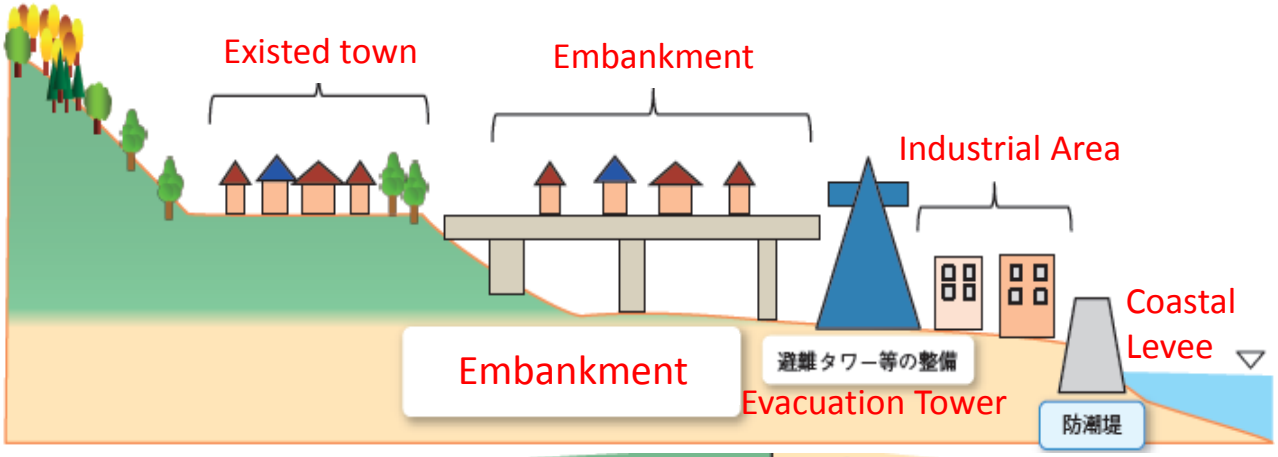
Source: http//cas.go.jp/jp/fukkou/

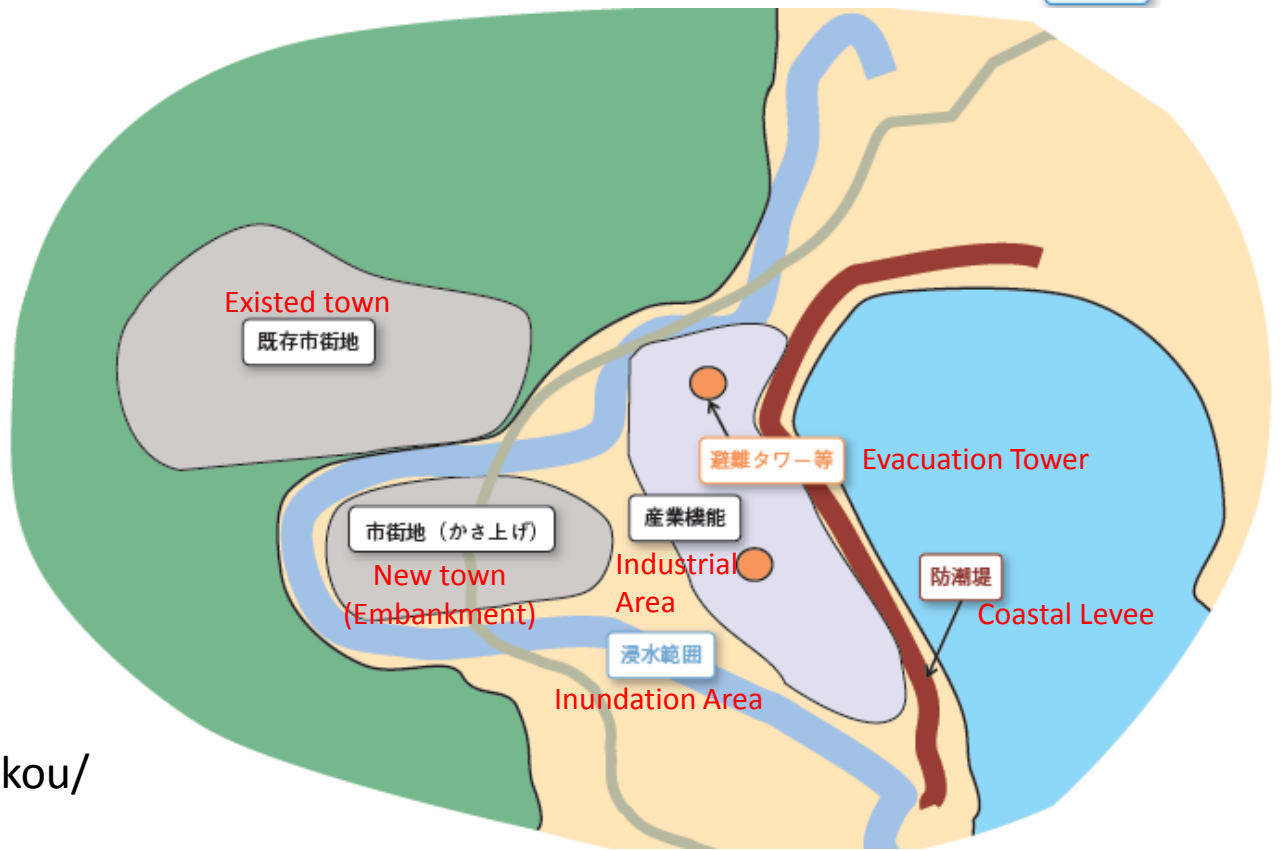
(Type 2)
Regions where low-lying areas affected by the tsunami / High ground without any damage

Points of the type

①Top priority to concentrate urban areas on high ground

②Only such industrial functions to be located in low-lying area.





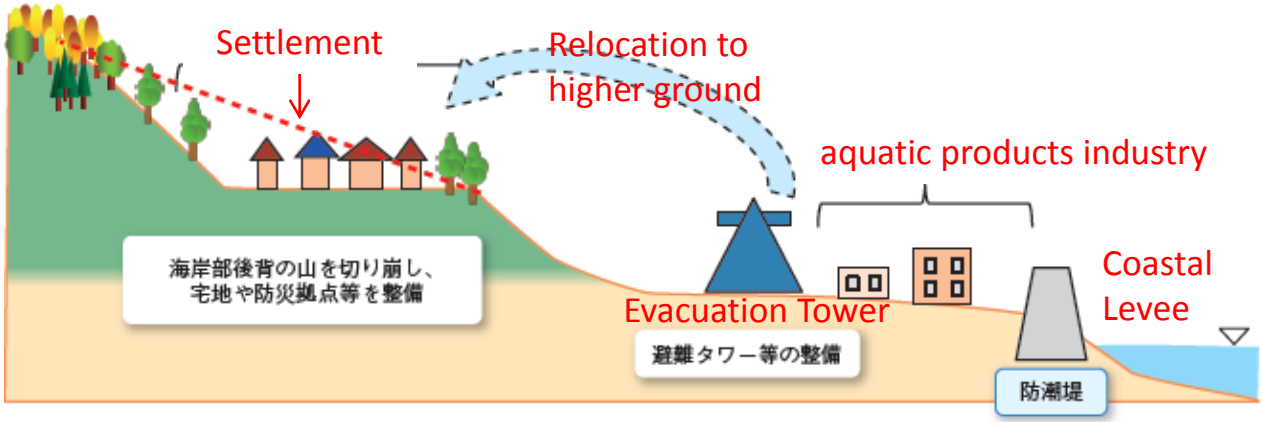
Source: http//cas.go.jp/jp/fukkou/

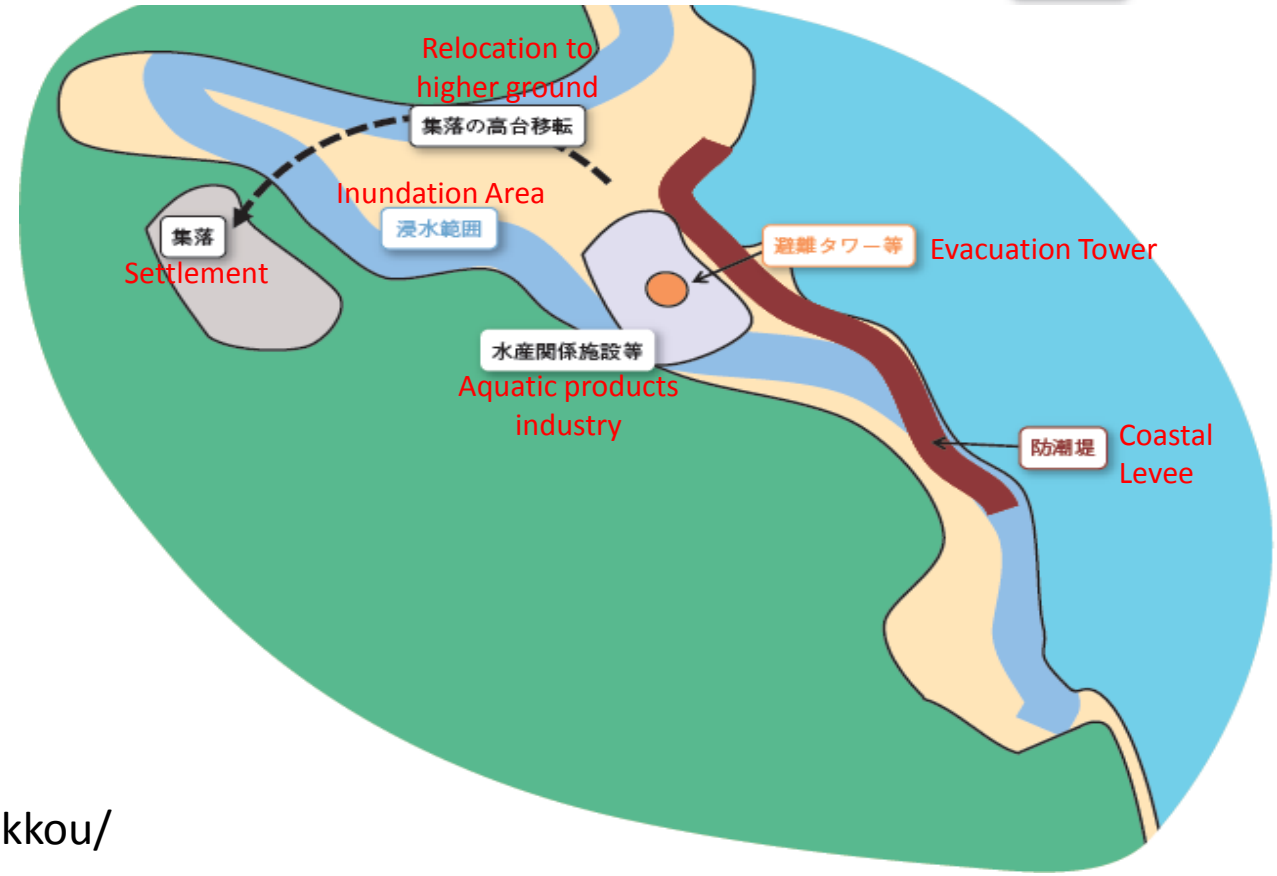
(Type 3)
Regions built on hills running down to the coast with few low-lying areas and settlement

Points of the type

①Fundamental principle to relocate homes by newly creating areas on high ground in back ground

②Only such industrial functions to be located in low-lying area.





Source: http//cas.go.jp/jp/fukkou/

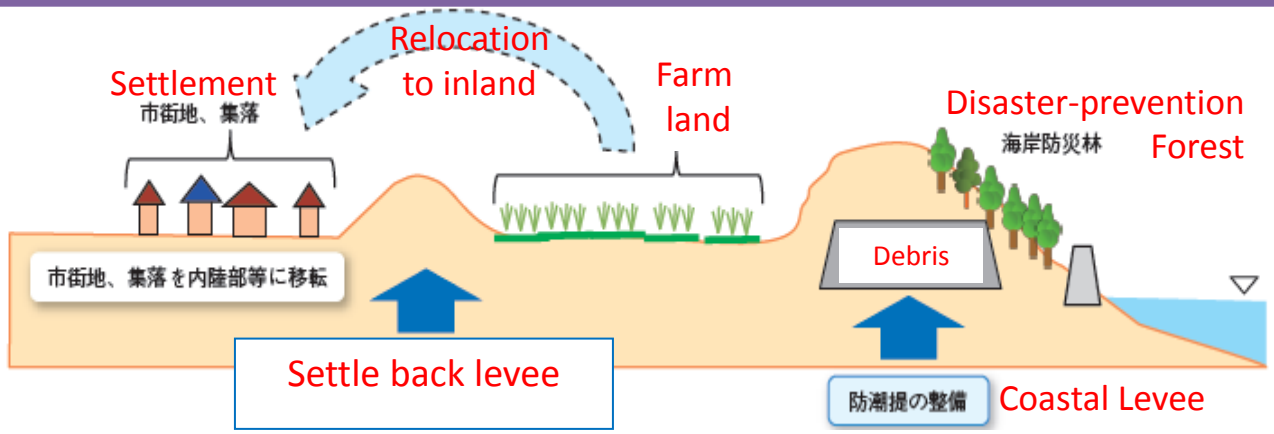
(Type 4)
Coastal Plain

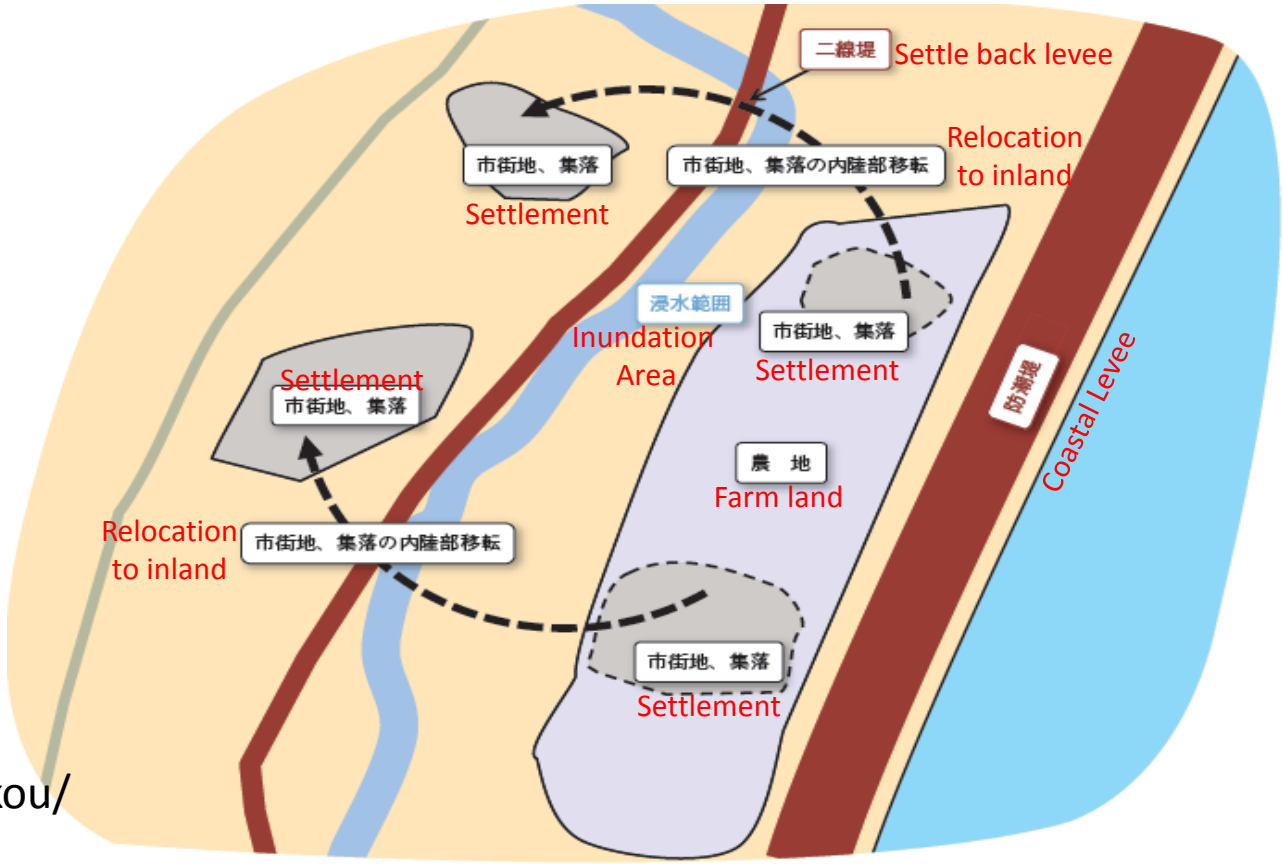
Points of the type

①Combination of construction of dike and regulation of land-use

②Consideration to keep community relation

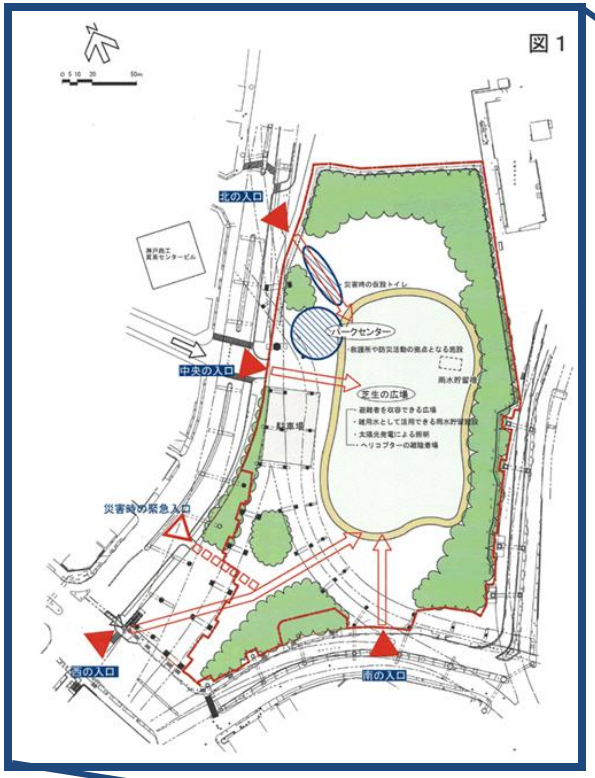
③Relocation of settlement behind settle-back levee





Source: http//cas.go.jp/jp/fukkou/

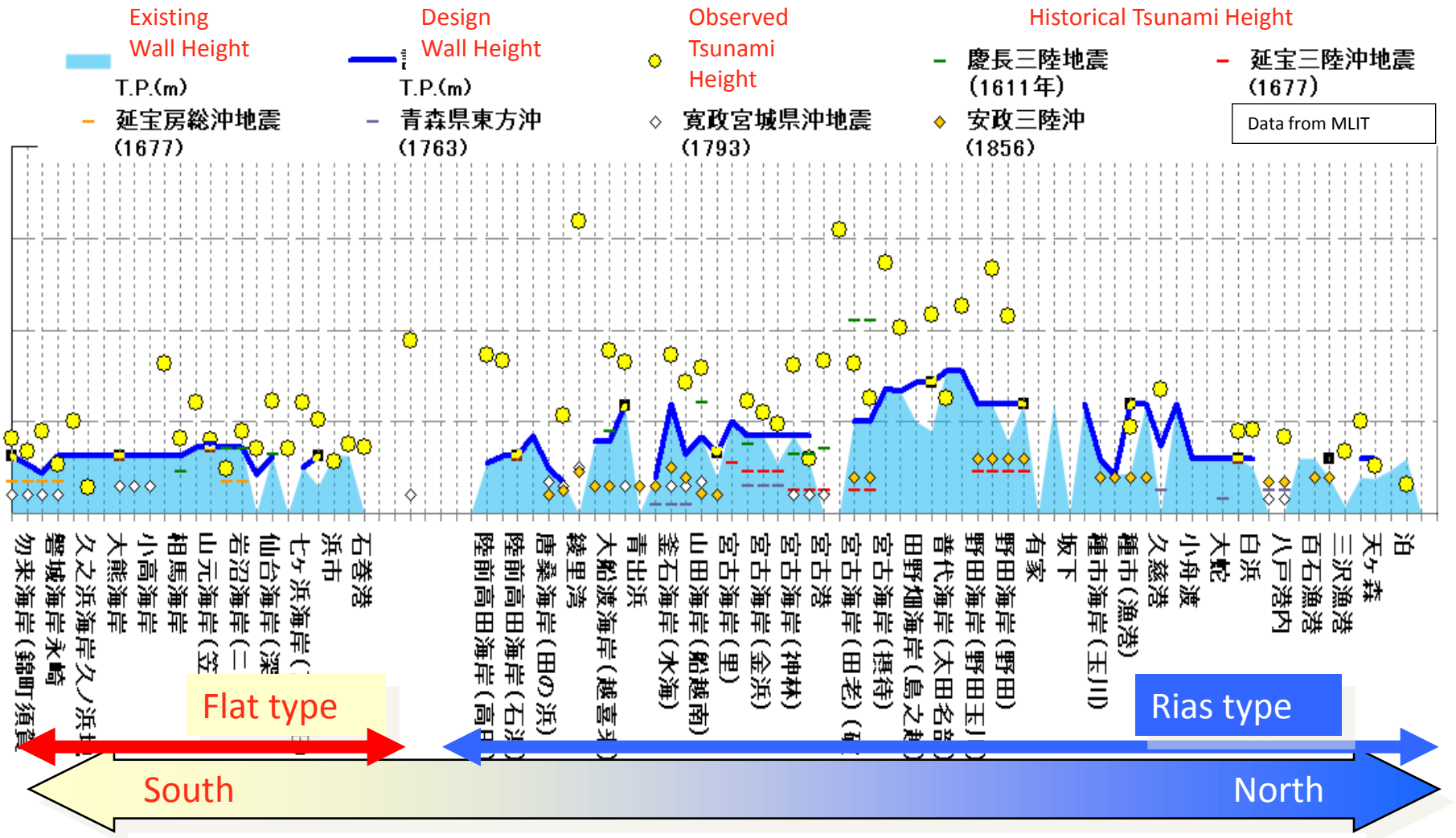
KOBE MEMORIAL PARKS



Source: City of Kobe

Historical Tsunami, Infrastructure and 3.11 Tsunami

- Prepared for each zone's probable earthquake, not only scientific approach but also refer to the historical data



Catchment management

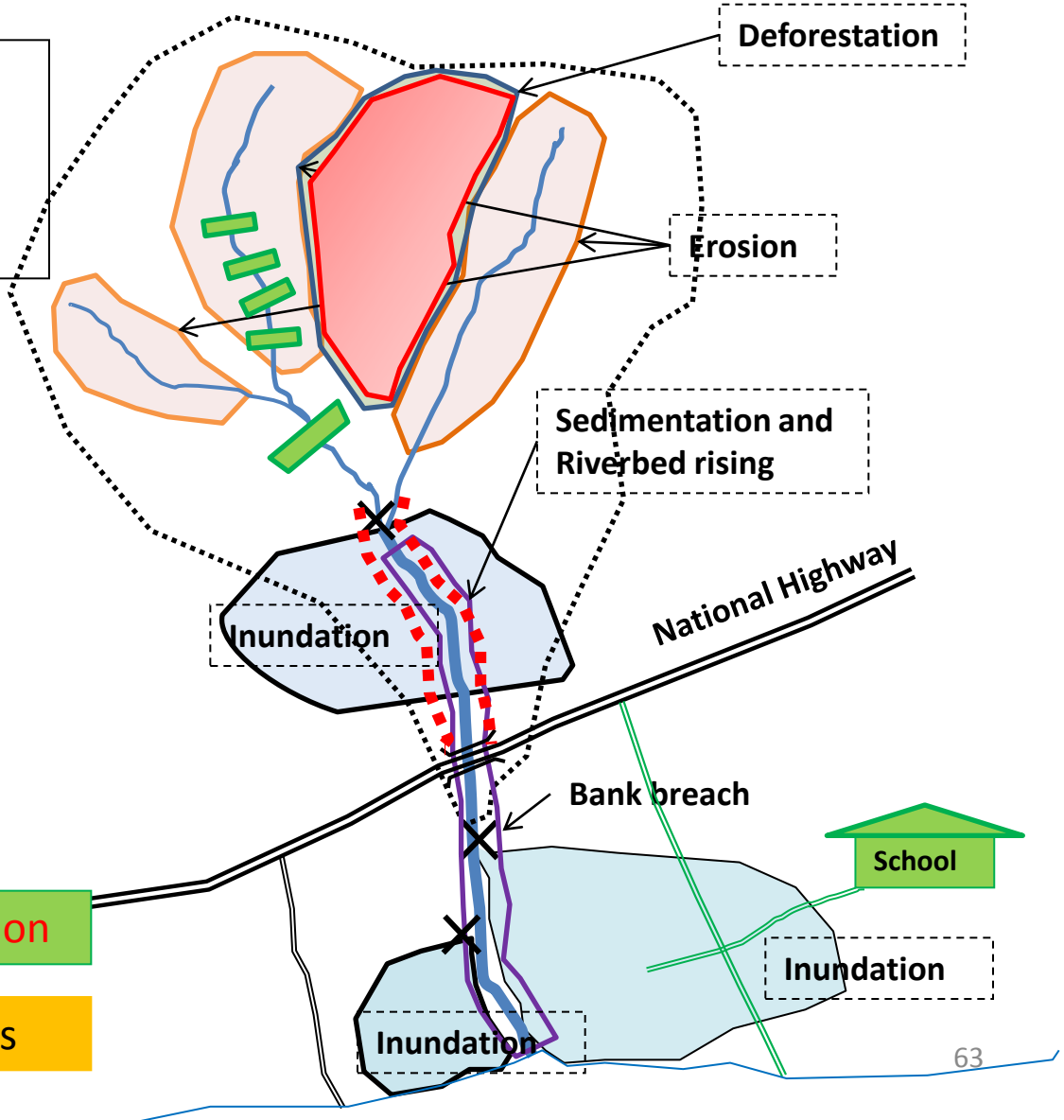
- **To consider whole catchment/river basin**
- **To seek the most appropriate combination of interventions**

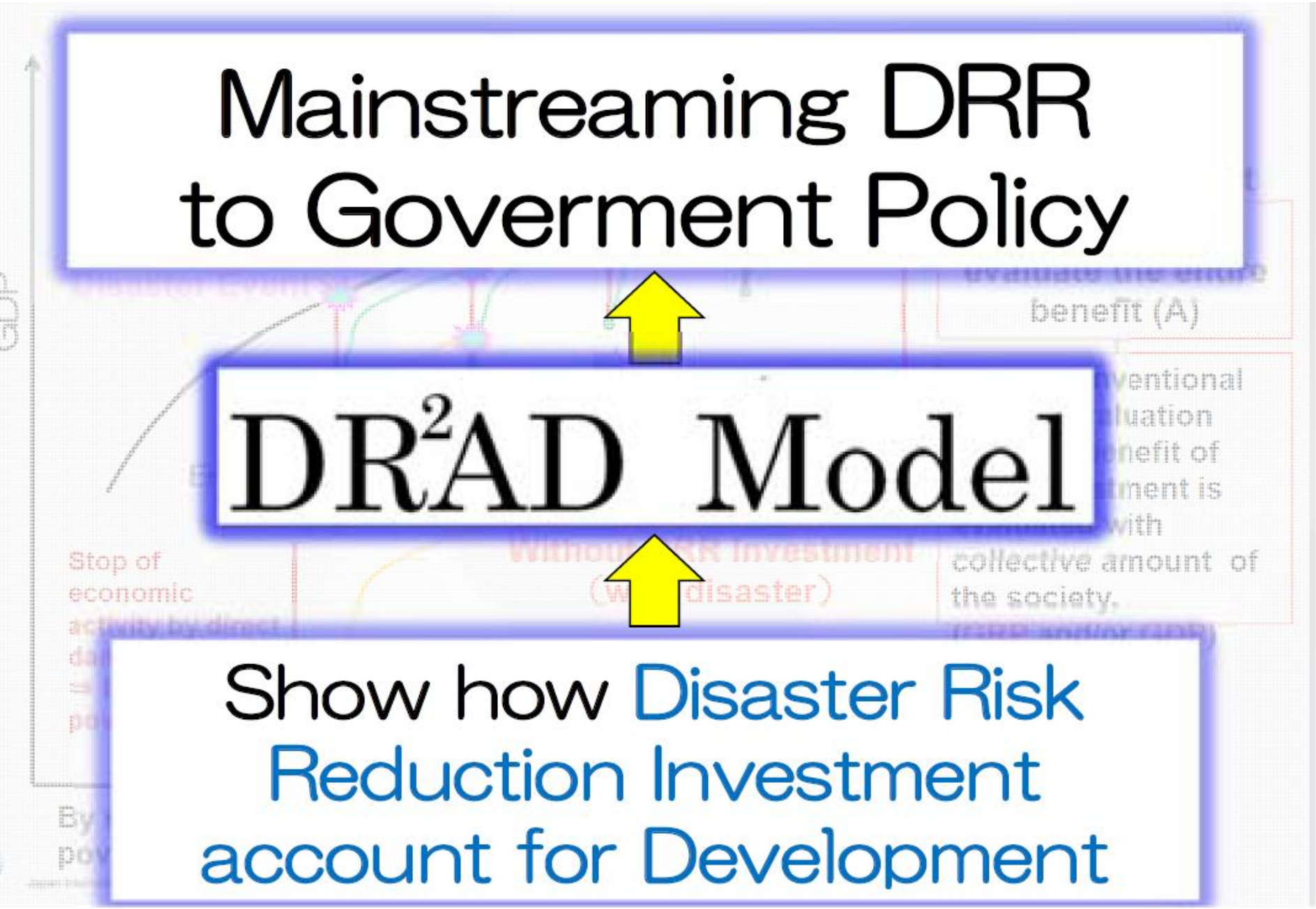
Structural Measures

- Dam
- Dyke
- Check dam

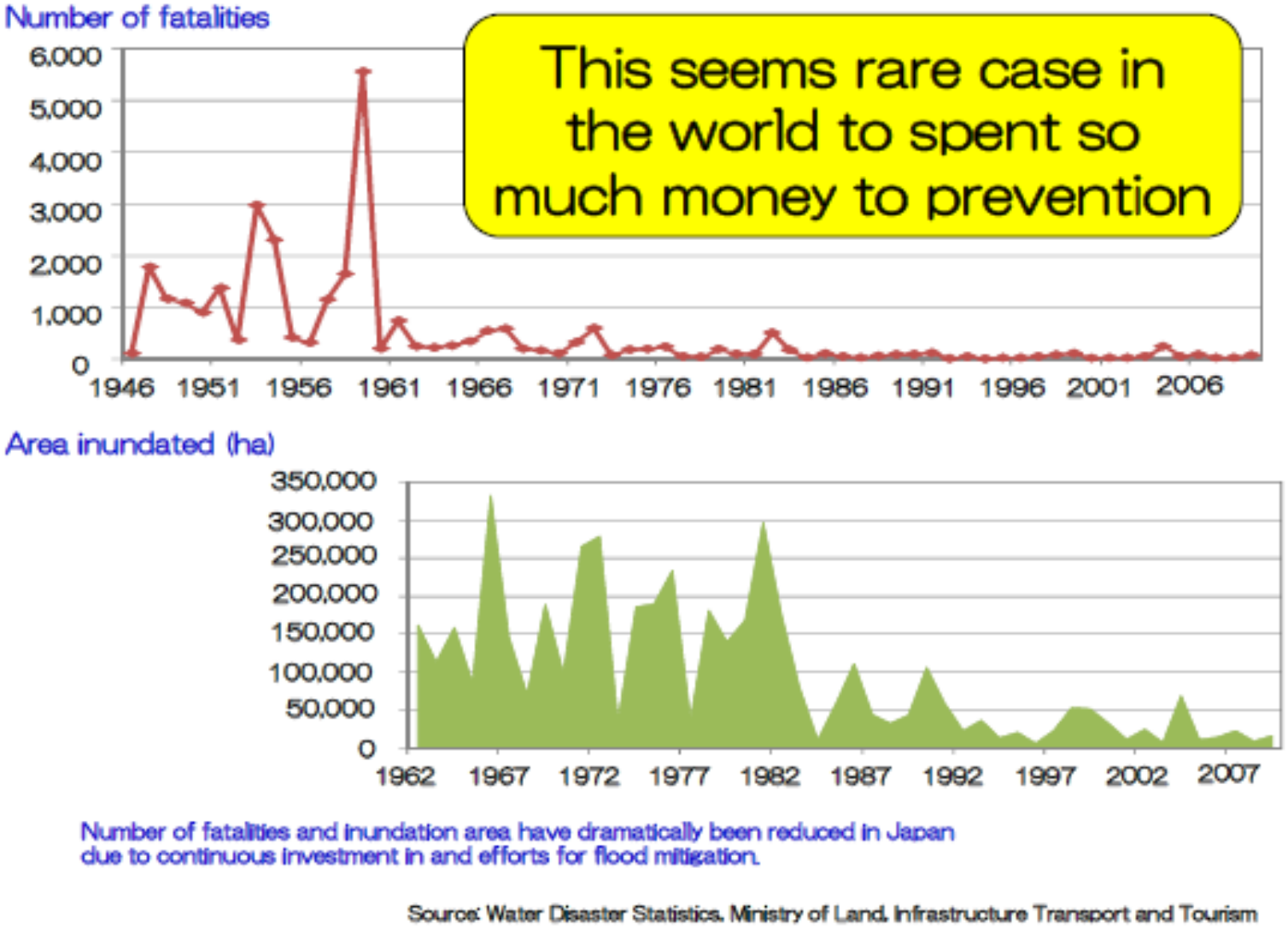
Non-structural Measures

- Tree Planting
- Early Warning / Evacuation
- Raising Public Awareness




Mainstreaming DRR
to Goverment Policy
DR²AD Model
Show how Disaster Risk
Reduction Investment
account for Development

Reduction of flood damages in Japan by continuous investment



Number of fatalities and inundation area have dramatically been reduced in Japan due to continuous investment in and efforts for flood mitigation.

Source: Water Disaster Statistics, Ministry of Land, Infrastructure Transport and Tourism

Disaster Risk Management Pays.

Long-period vibration