

Outline of DR²AD

= Linking DRR to Sustainable Development =

May 2013

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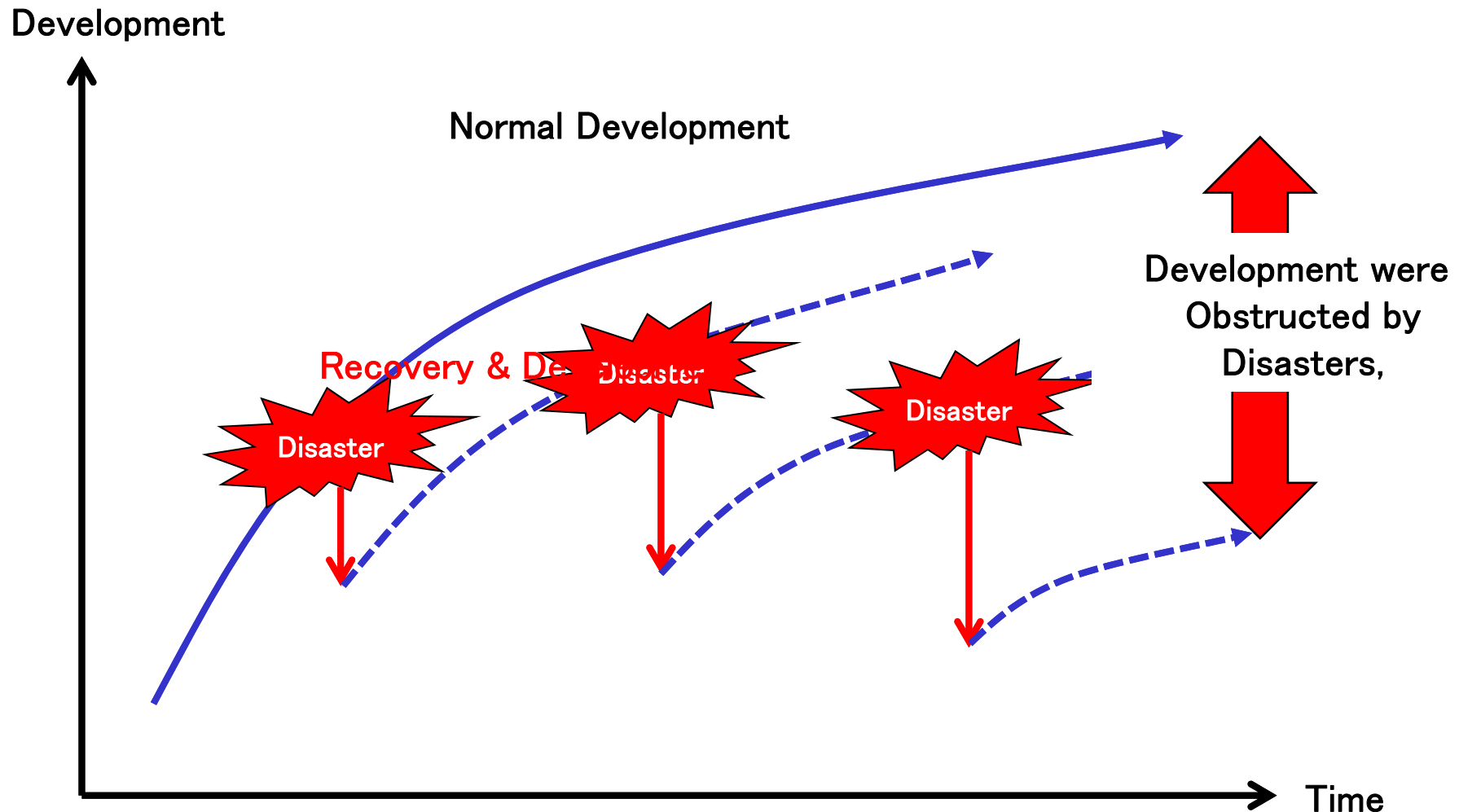


Why Japan can dedicates on DRR

- **Japan is the most natural hazardous country in the world.**
- **In the same time, one of the most technology oriented developed country.**
- **How Japan coexists with
Disaster & Development**

How Japan conquered disaster

At least, Build-back-better



History of flood control in Tone River basin (400years ago)

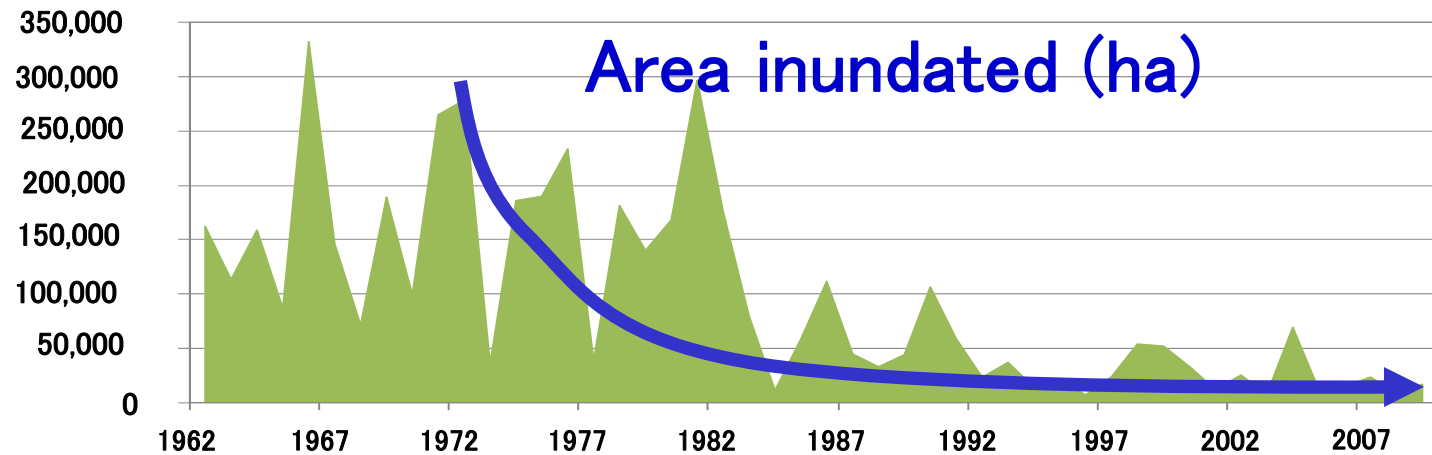
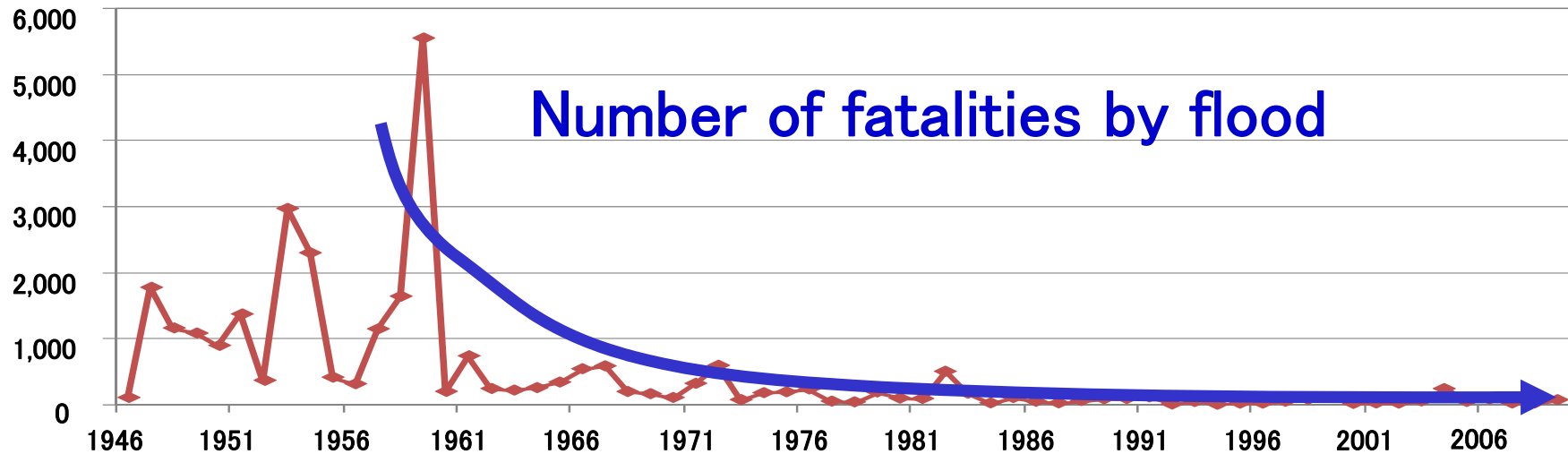
Up to 15th Century, Tone River crossed the Kanto Plain from north to south and flew into Tokyo Bay

From 1594 to 1654, Tone River was connected to Pacific Ocean by eastward channel

- After the flood in 1910, flood control measures in upper and middle reaches has changed from “flood control allowing inundation” to “sequential levees confinement”
- After this change, the maximum discharge in the Tone River Channel has increased, which became the main challenge of flood control in Tone River Basin



Reduction of **flood damages** in Japan by continuous investment

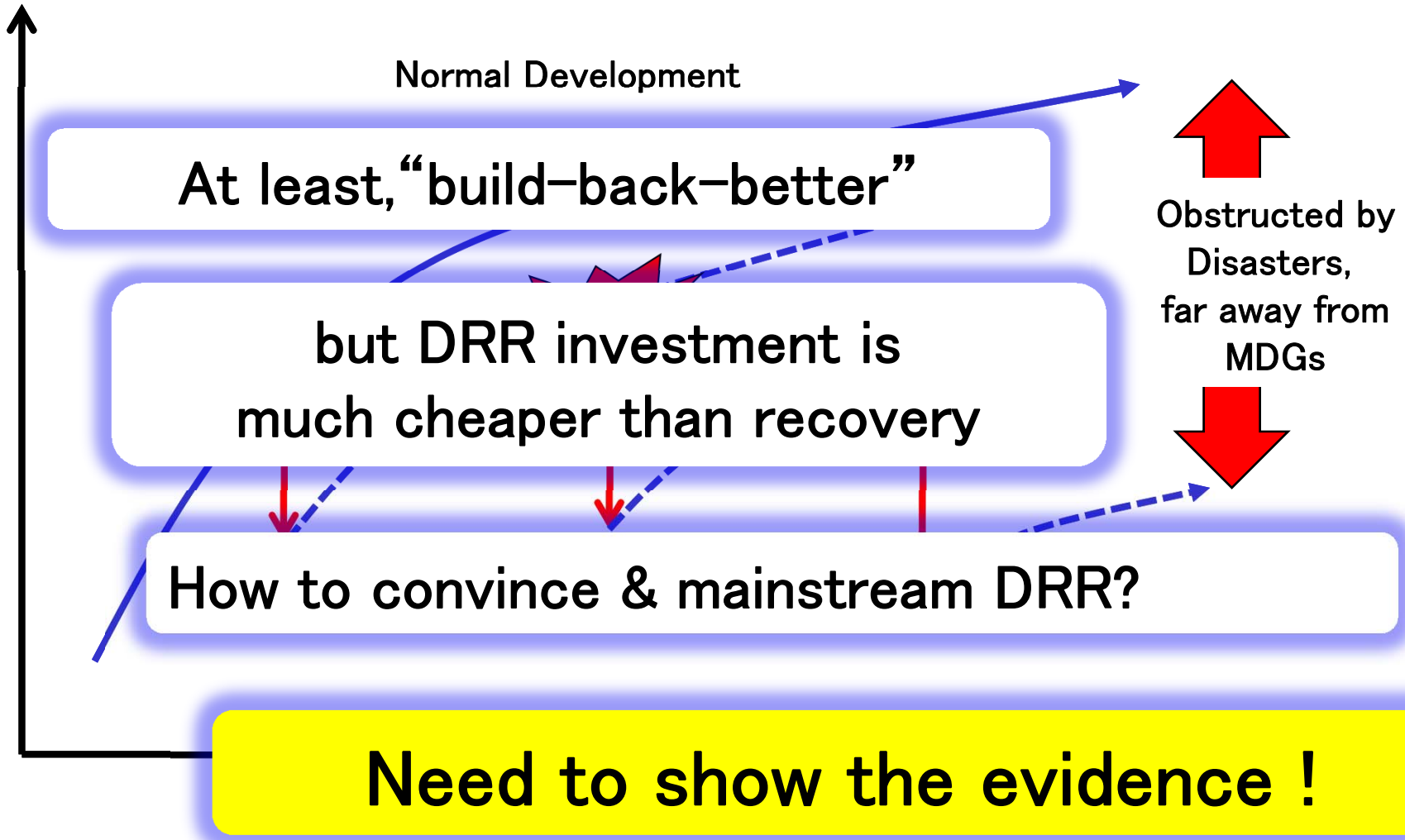


Number of fatalities and inundation area have dramatically been reduced in Japan due to continuous investment in and efforts for flood mitigation.

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

What is the barrier for mainstreaming the DRR

Development



Successful Evacuation by Students in Kamaishi City



More than 3,000 students decided to evacuate further to higher ground based on their own decision, as educated.

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

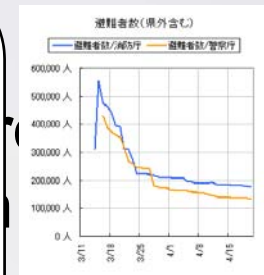


Tsunami Evacuation Situation in general

- Population of damaged area of 3 prefectures, 1km from coast is 460,000, 3km 1.0million, 5km 1.5million

96% > evacuated !!

**For the CBDRM project,
this is successful case**



and

- 65% of casualties were aged people, over 65 y.o.

Every Natural Disaster has forerunning phenomenon then we can predict disaster & let people evacuate

実写
奈良県



Even debris flow
We can predict



Japan International Cooperation Agency



but local economy
was completely destroyed,
Can we say this “**resilient**”?

We need more investment
to prevent disaster

宮城県石巻

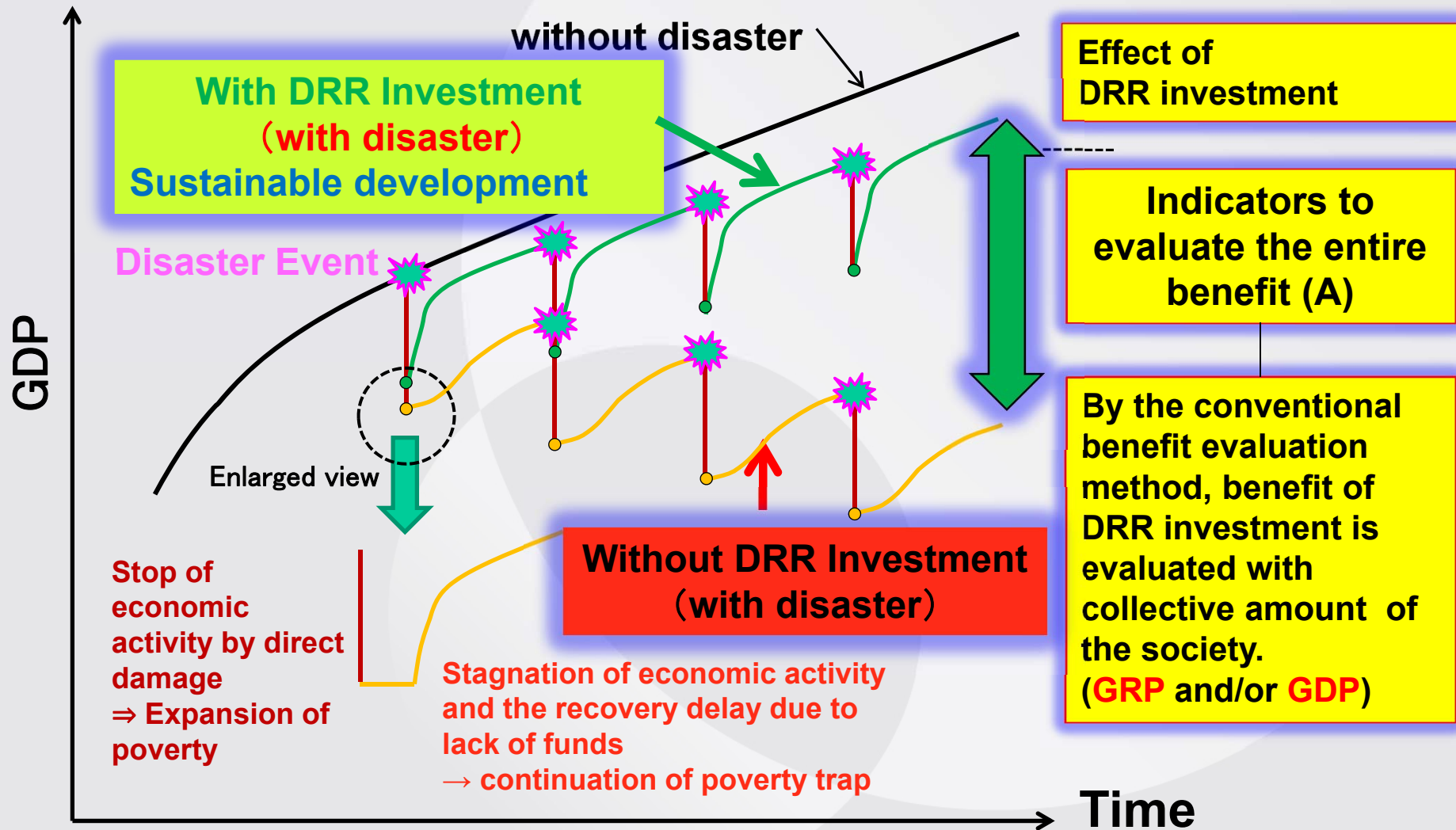
津波から早くも志
石巻市十字街路に想
し、サントで寝をとる
被災者たち。人口約16
万人の石巻市では、3分
の2以上が避難所での
生活を強いられている
撮影／AFLO

JICA developed
Dynamic Stochastic General Equilibrium 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
- Philosophy from Japanese experiences
“DRR investment Account for Development

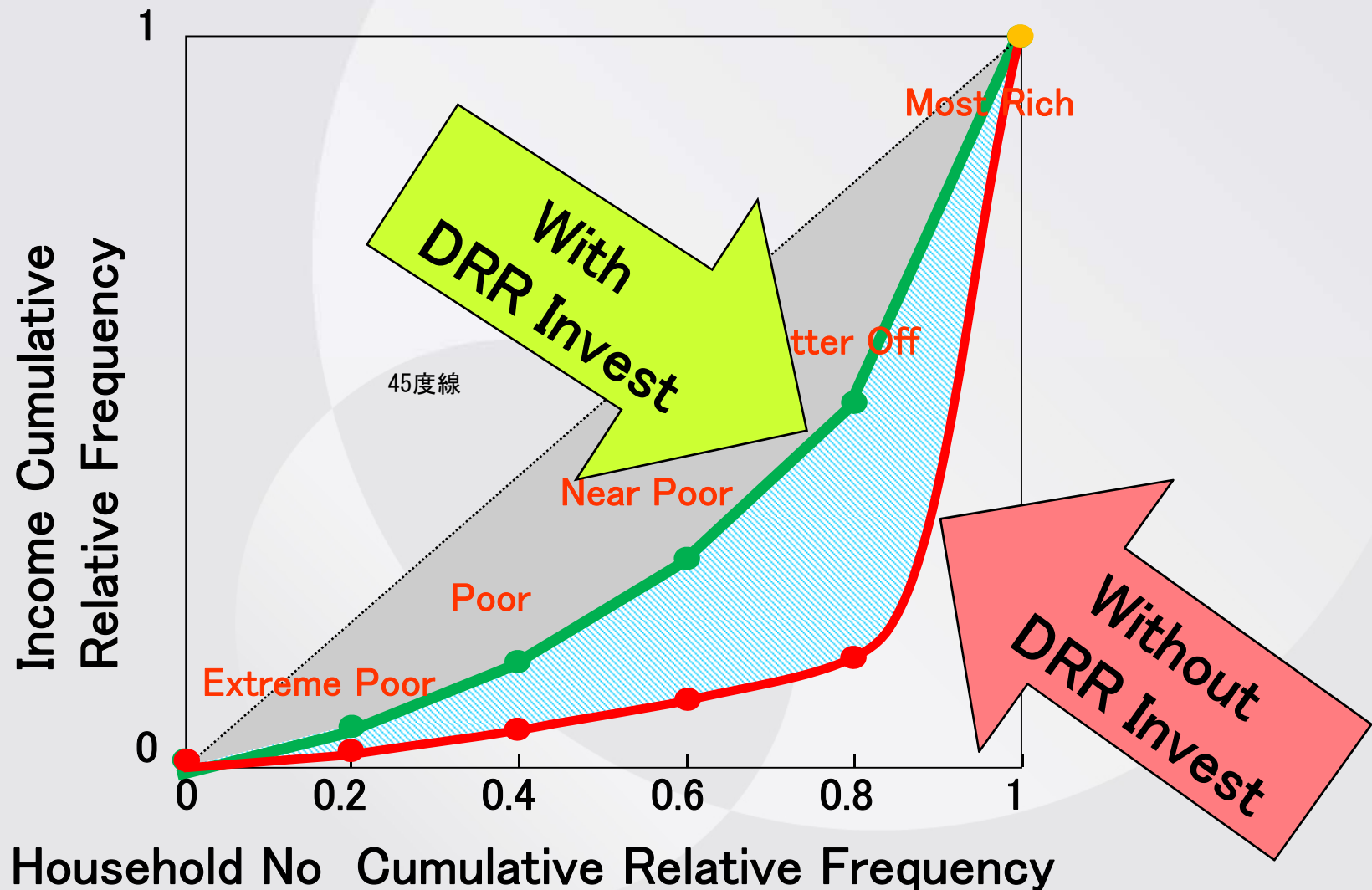
DR²AD Model

Differences with/without DRR investment to GDP



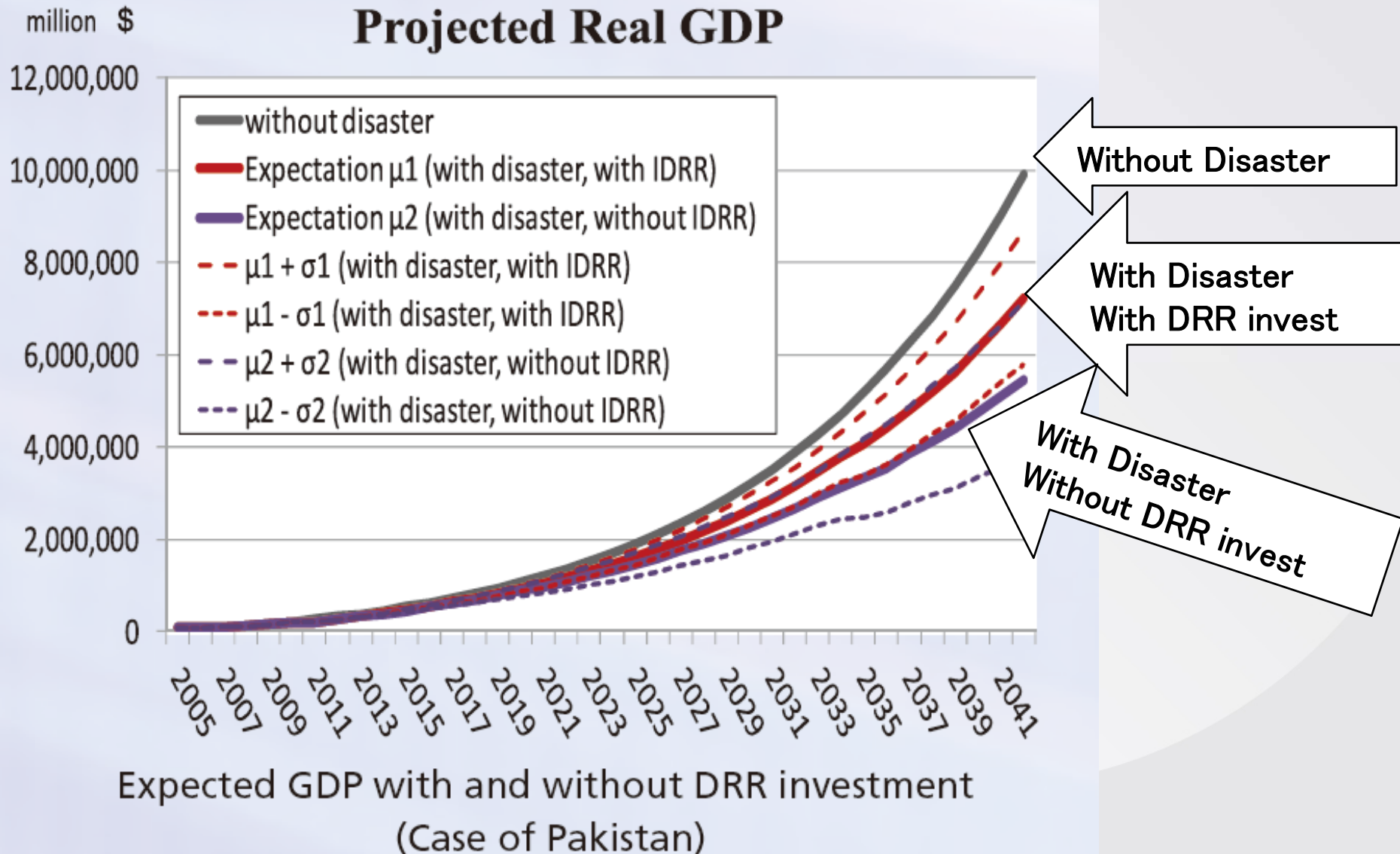
By disasters, increasing poverty and continued to be stuck in an increase in poverty, widening inequality, from the trap of poverty

Differences with/without DRR investment to Lorenz curve

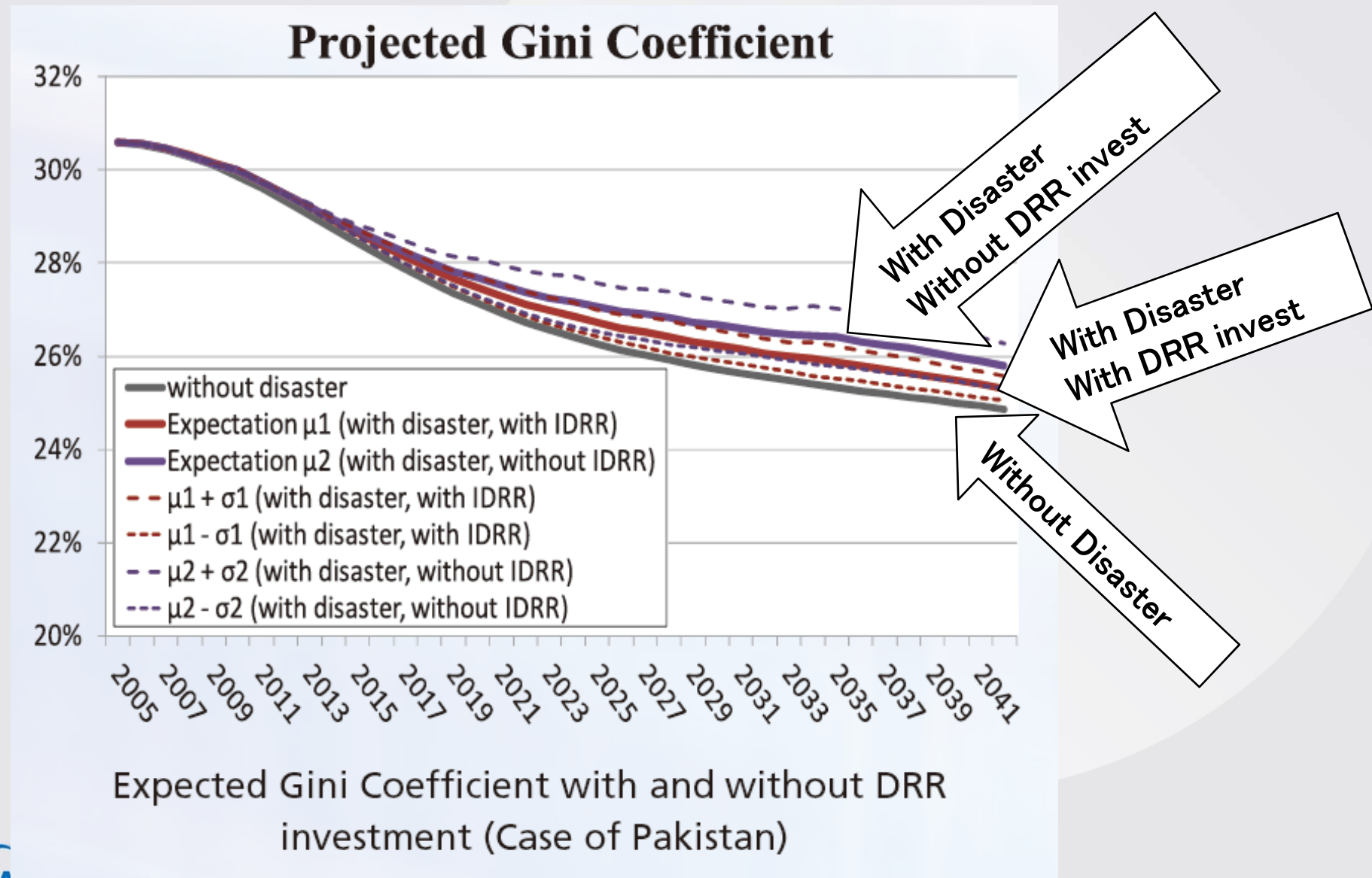


Pakistan case for 2042

GDP will 25% down without DRR investment



Pakistan case for 2042 : Gini Coefficient proportion with or without DRR



Show the evidence to Policy Maker

Mainstreaming DRR to Government Policy

DR²AD Model

Show how **Disaster Risk Reduction
Investment account for
Development**

GDP

Disaster Event

evaluate the entire benefit (A)

Conventional evaluation benefit of investment is

Enlarge

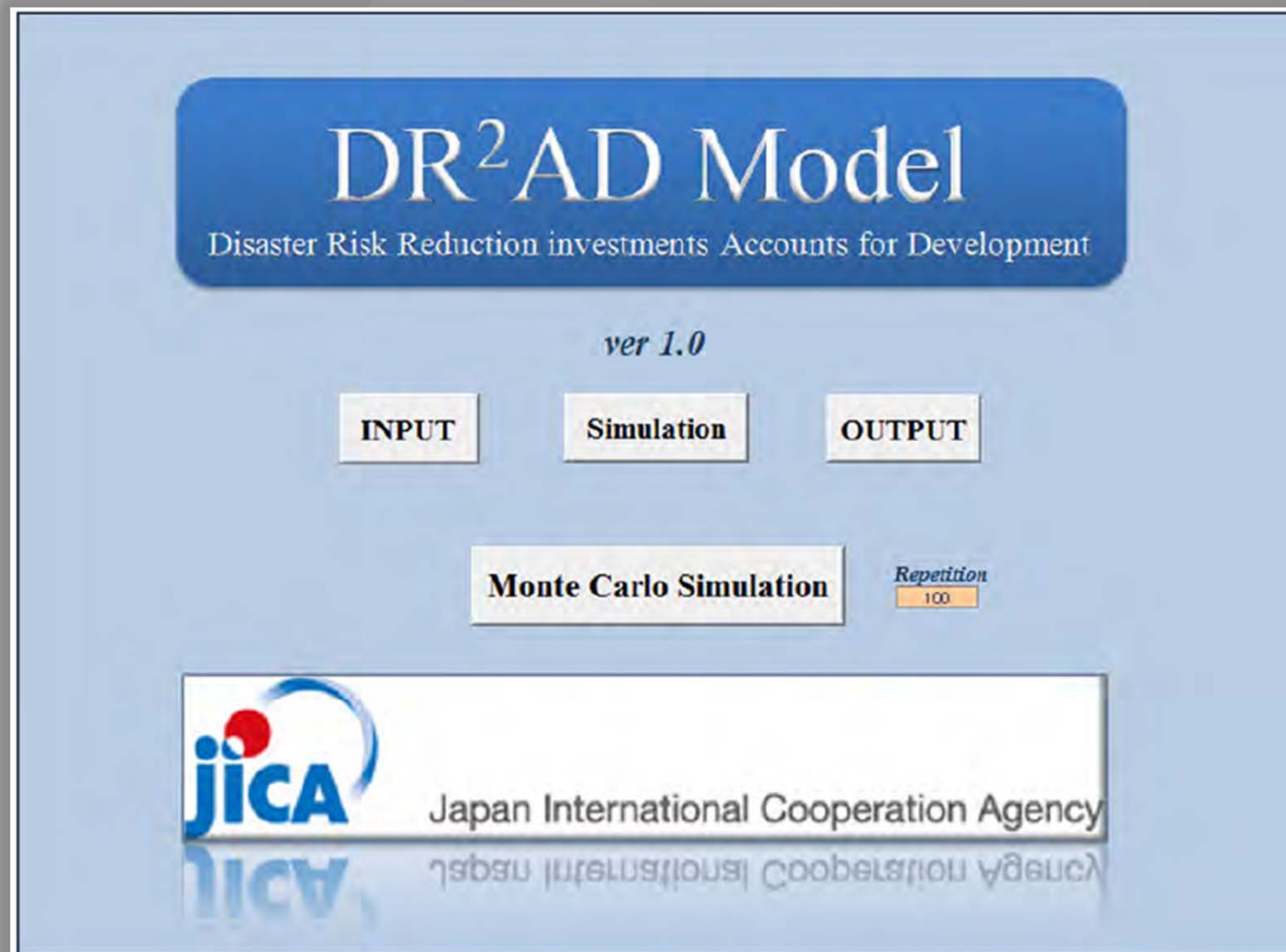
Without DRR investment (with disaster)

evaluated with collective amount of the society. (GRP and/or GDP)

Stop of economic activity by direct damage

By c
pov

Deliver as a Computer Software in order **everyone can use**



Proposing tools for Post MDG/HFA

Political
Leaders

Practi-
tioner

Donors

Convince Policy Maker
by **DR²AD Model**

Three Principles approach for
Low Regret Investment

Disaster Risk Assessment
to all projects

Proposing tools for Post MDG/HFA

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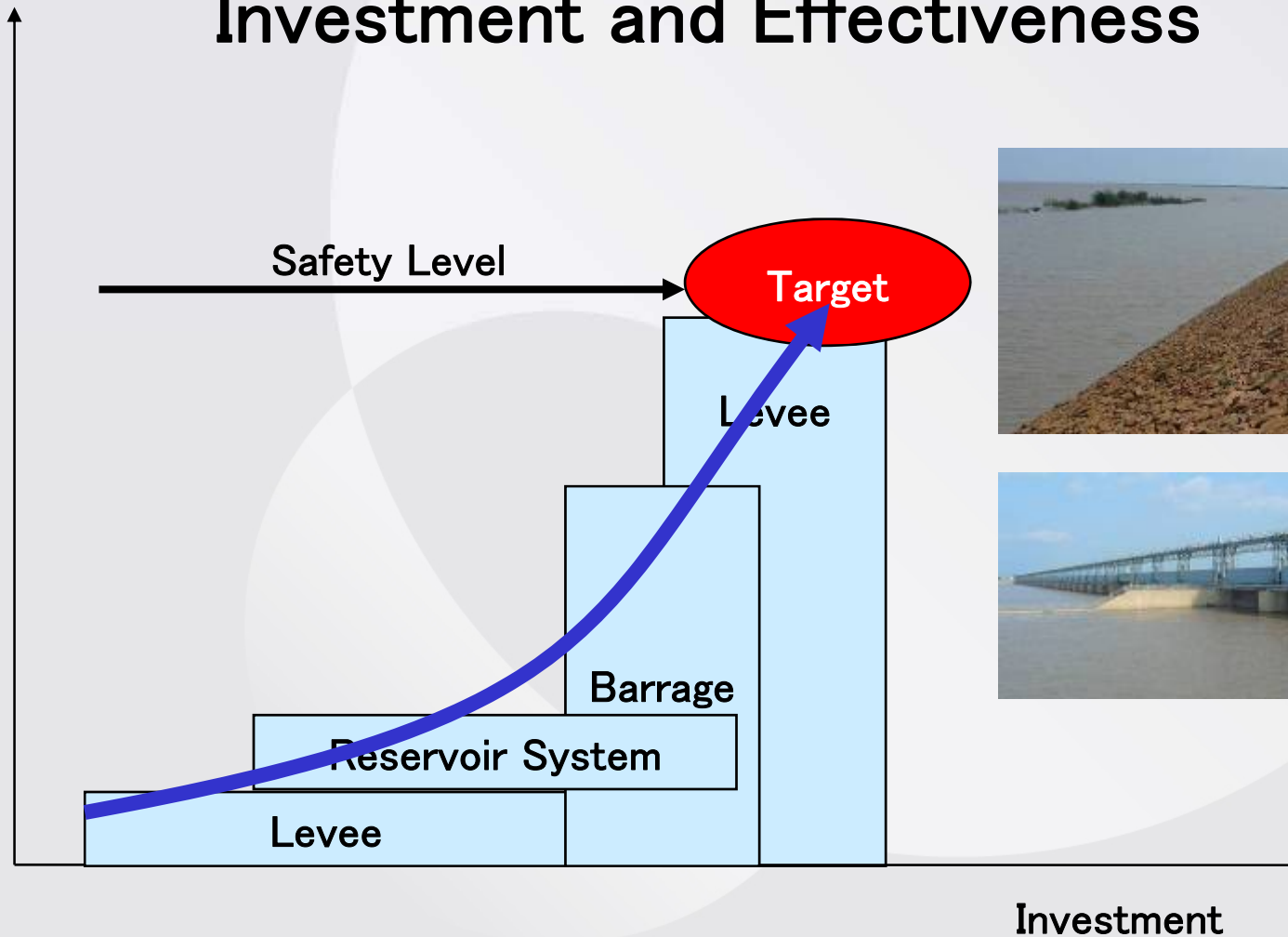
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Combination of Structural Measures and Non-Structural Measures

Effectiveness

Investment and Effectiveness



Combination of Structural Measures and Non-Structural Measures

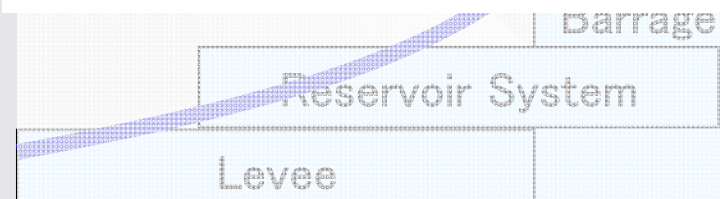
Effectiveness

Climate Variability?
Climate Change?

Safety Level

Target

or Project is not
completed yet



Investment

Combination of Structural Measures and Non-Structural Measures

Effectiveness

Goal

Safe and/or Resilient

Mitigation

Re-Foresting

Appropriate Land Use

Flood Proof Living Style

Flood Forecasting

Early Warning

Evacuation

Insurance

Structural Measures
(Basic Infrastructures)

Control, Protection

Investment

JICA's Lesson Learned from Mega Disaster from 2011 March 11, Tsunami & Thailand Flood 1

- Was there anything out of our mind?

The ability to recognize risk and
take action properly

Risk Literacy

JICA's Lesson Learned from Mega Disaster from 2011 March 11, Tsunami & Thailand Flood 1



JICA's Lesson Learned from Mega Disaster from 2011 March 11, Tsunami & Thailand Flood 2

- Was there anything out of our mind?



Continuous Adaptation to Change

**continuous improvement to deal
with changing risk**

JICA's Lesson Learned from Mega Disaster from 2011 March 11, Tsunami & Thailand Flood 3

- Was there anything out of our mind?

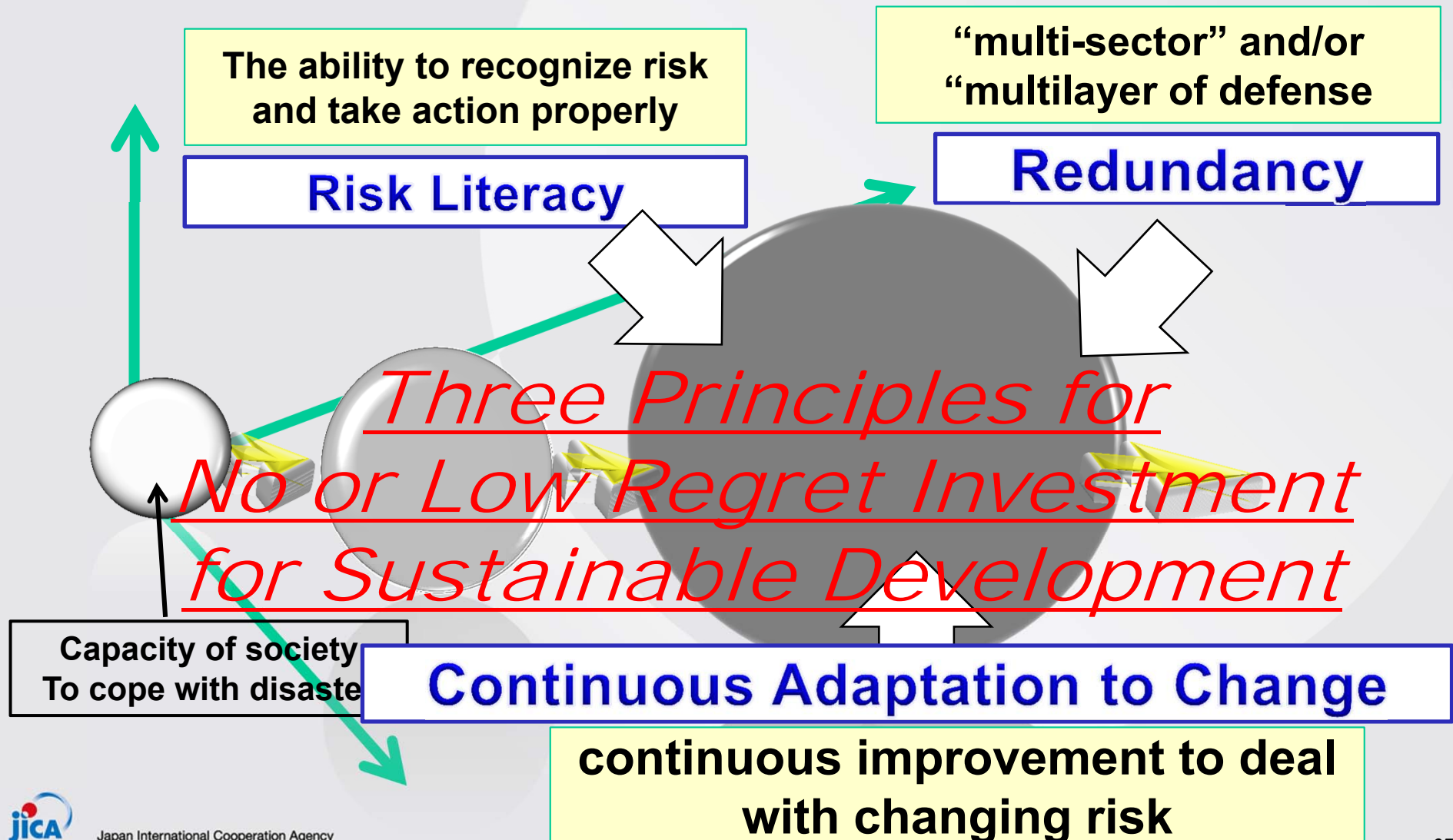
“multi-sector” and/or
“multilayer of defense

Redundancy



JICA's Lesson Learnt from MEGA Disaster =2011 March 11, Tsunami & Thailand Flood=

- Was there anything out of our mind?



JICA's Mainstreaming DRR initiative

- There are so many project which forgot to pay attention to DRR, same as Thailand industrial zone
- JICA internally planning to mobilize the process mainstreaming DRR into every JICA project
- Set the mandatory process to all project, **“Disaster Risk Assessment”**

Proposing tools for Post MDG/HFA

Political Leaders

Practitioner

Donors

**Convince Policy Maker
by **DR²AD Model****

**Three Principles approach for
Low Regret Investment**

**Disaster Risk Assessment
to all projects**