

# Sediment Disasters and Mass Movement (SD&M<sup>2</sup>)

(2014 – 2016)

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Theme leader

Sediment Disasters and Mass Movement



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- **Outline of SD&M<sup>2</sup>**
- **Major outcomes**
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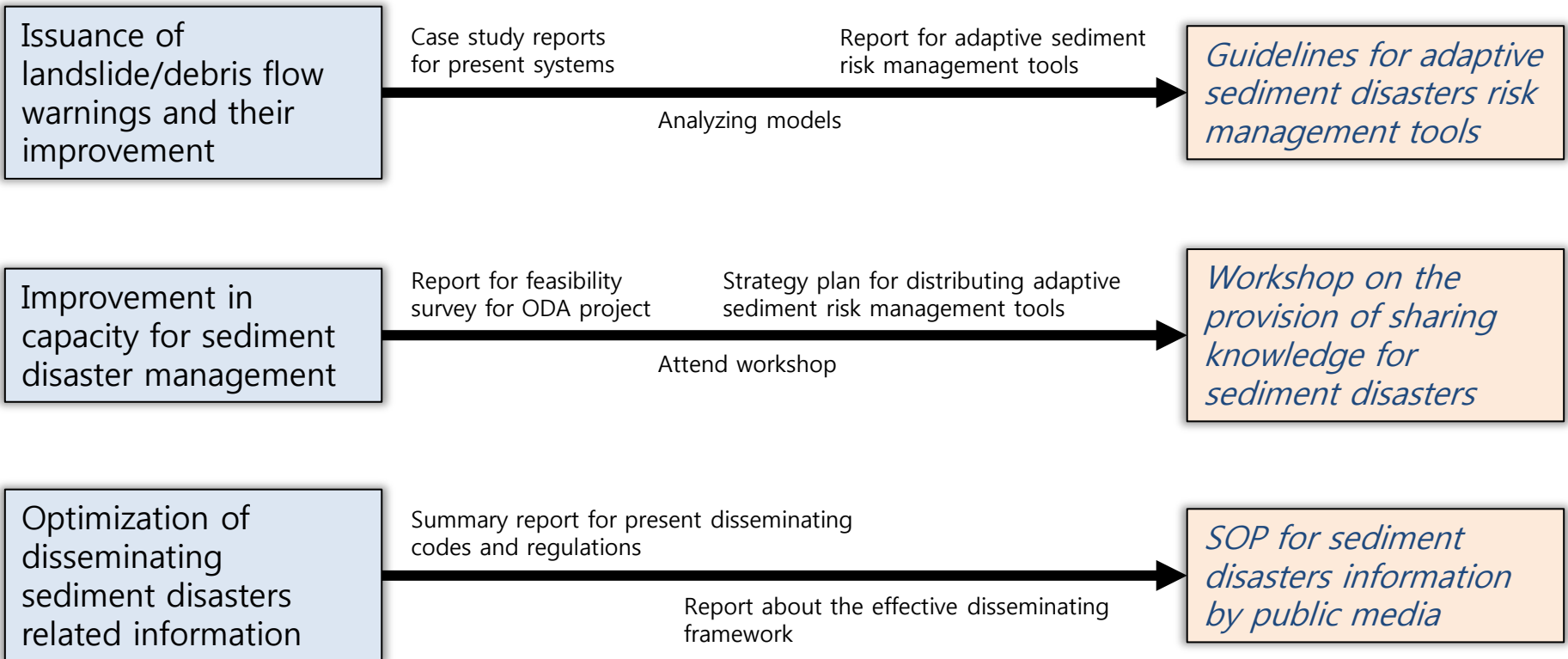
# Prologue



# Outline of SD&M<sup>2</sup>

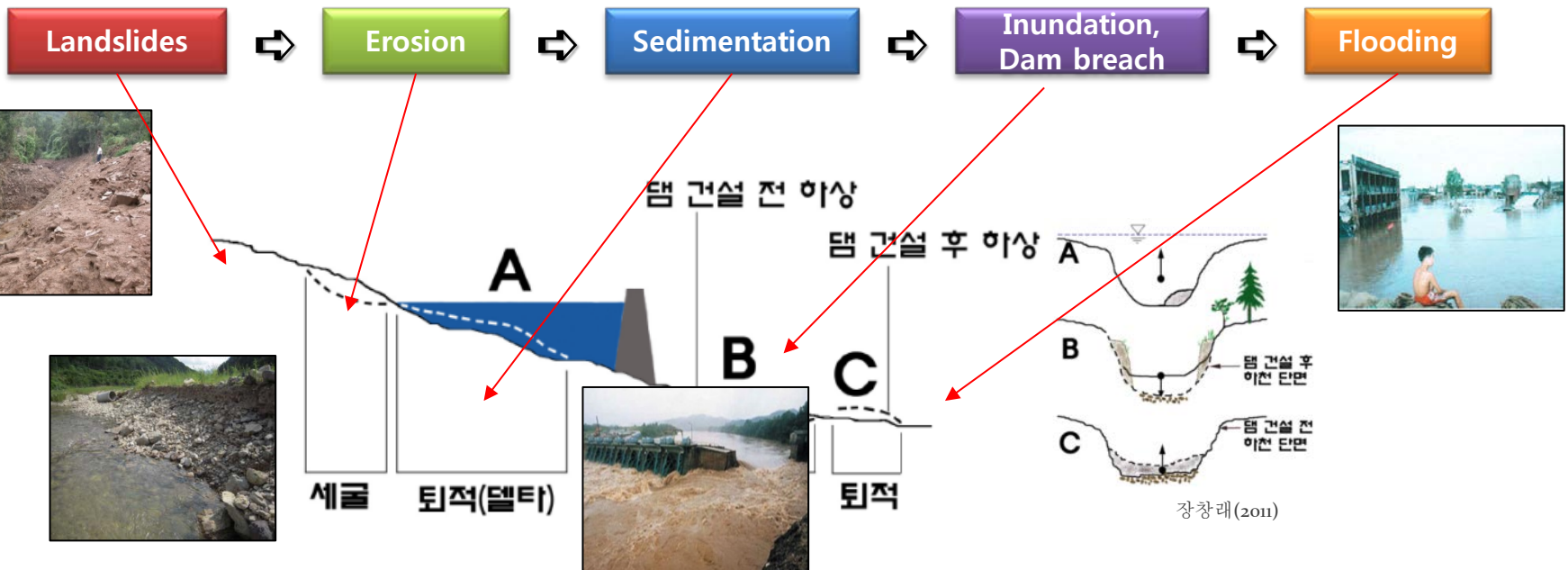
## Activities

## Outcomes



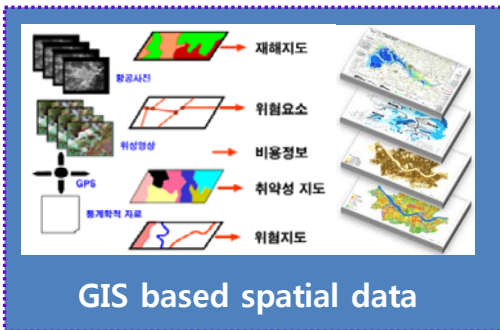
# Major outcomes

- (Act. 1) Issuance of landslide/debris flow warnings and their improvement
  - 1. Identify the mechanism of sediment disasters
    - Consequences of sediment disasters



# Major outcomes

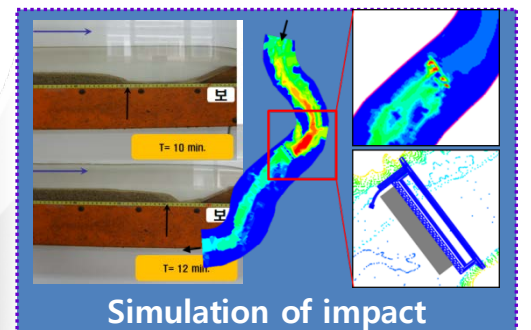
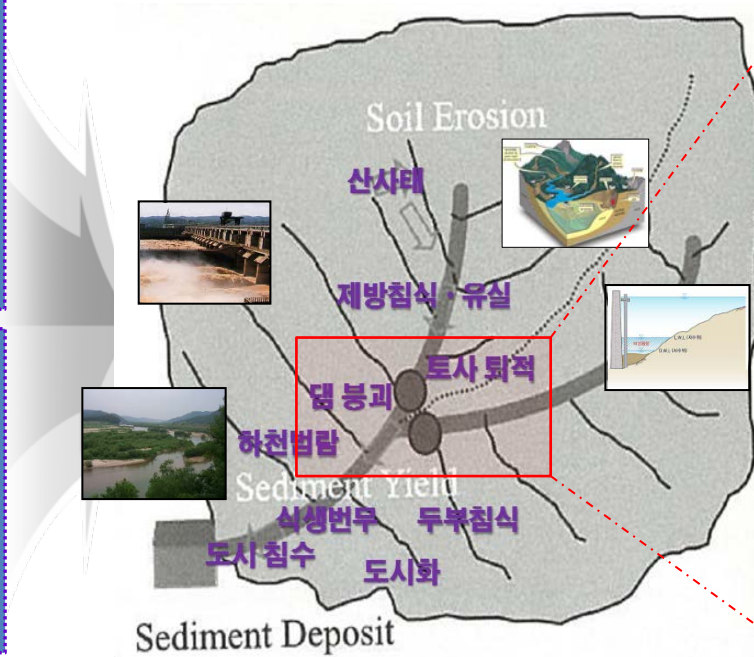
- (Act. 1) Issuance of landslide/debris flow warnings and their improvement
  - 2. Establish the analyzing system and DB



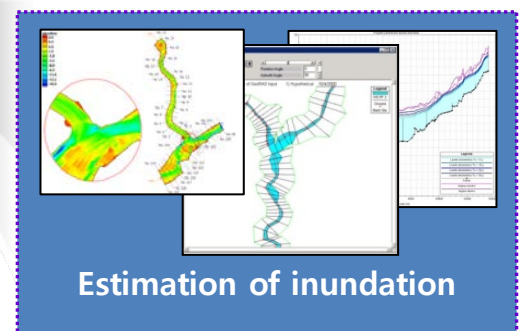
GIS based spatial data



Landslide hazard map



Simulation of impact

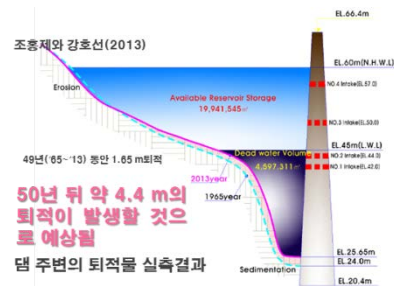


Estimation of inundation

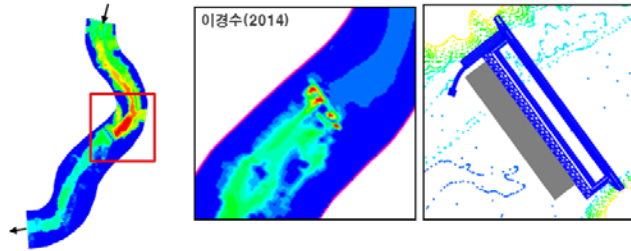
# Major outcomes

- (Act. 1) Issuance of landslide/debris flow warnings and their improvement
  - Detailed works

## Measuring sediment

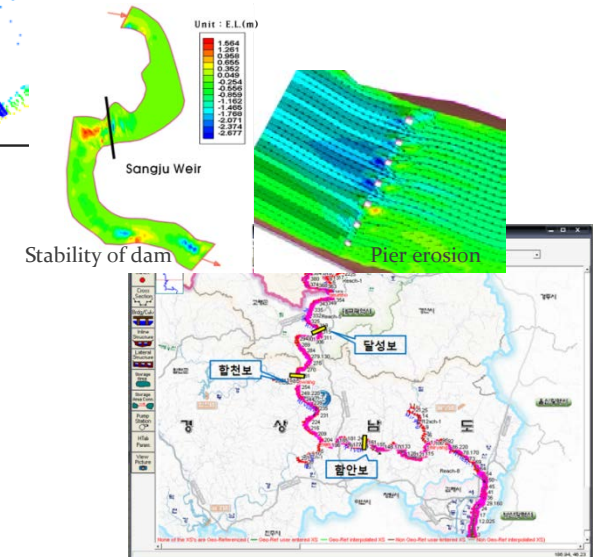


## Simulation of dam affect

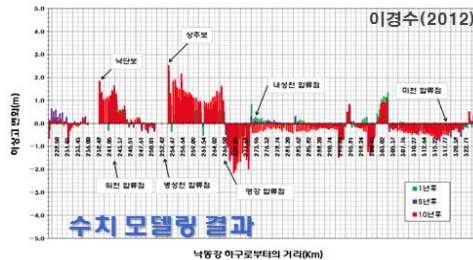


## Application in real river

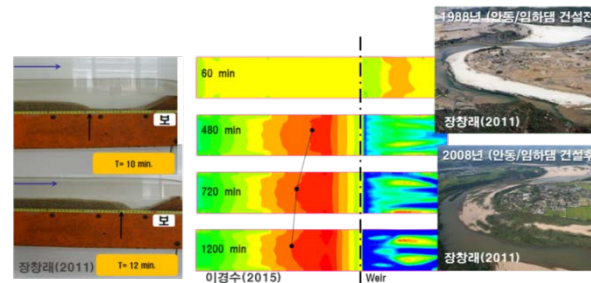
- ☞ Est. test bed
- ☞ Using laboratory



## Estimate the riverbed change

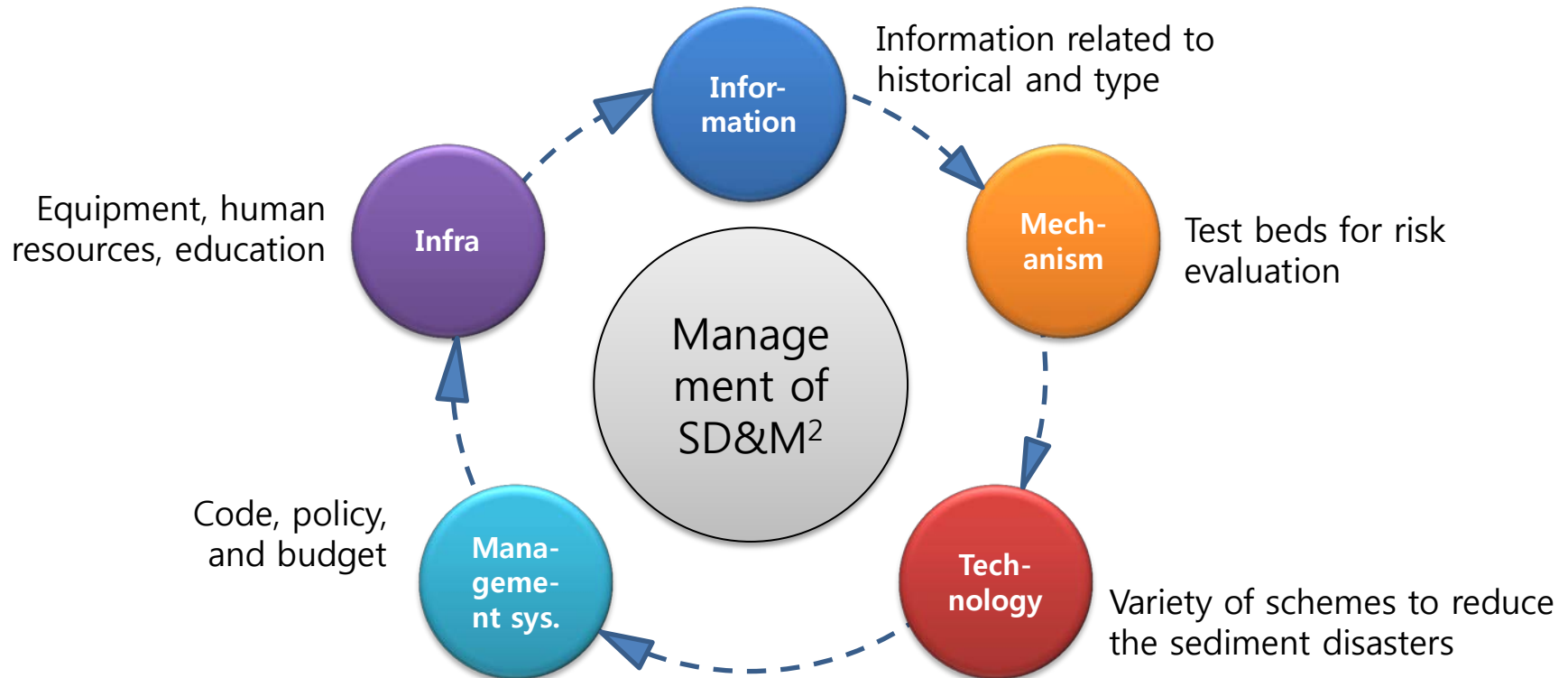


## Sedimentation experiment



# Major outcomes

- (Act. 1) Issuance of landslide/debris flow warnings and their improvement
  - 3. Develop various measures for SD&M<sup>2</sup>





# Major outcomes

- (Act. 1) Issuance of landslide/debris flow warnings and their improvement
  - Phased approach

Identify the mechanism of sediment disasters

- Understanding sediment disasters
- Analysis potential risk factors

Identification

Phase 1

Phase 2

Establishment

Establish the analyzing system and DB

- Evaluate the dam breach
- Establish the monitoring system
- Investigate the spatial data for sediment disasters

Develop various measures for SD&M<sup>2</sup>

- Develop guideline to reduce sediment disasters
- Develop standard DB and its management

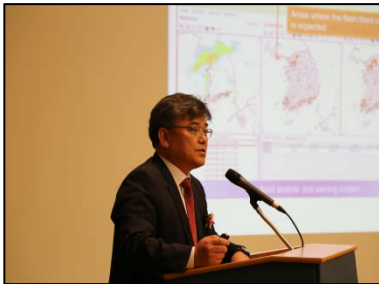
Development

Phase 3

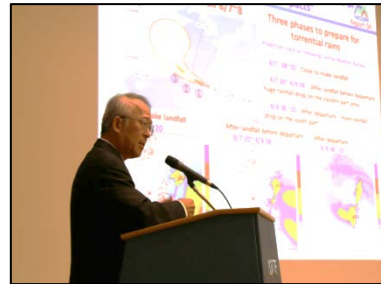
➤ Cont'd

# Major outcomes

- (Act. 2) Improvement in capacity for sediment disaster management
  - 1. International workshop among Korea, Taiwan, and Japan(July 5 – 7, 2016)



NDMI (KOR)



NCDR (TW)



NIED (JP)

- **Mutual cooperation of tech. and policy for disaster mitigation (since 2008)**

NCDR : National Science and Technology Center for Disaster Reduction  
NIED : National Research Institute for Earth Science and Disaster Resilience

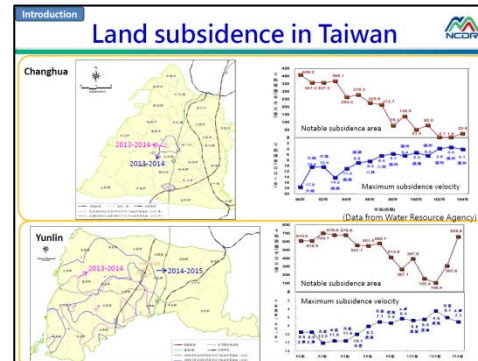
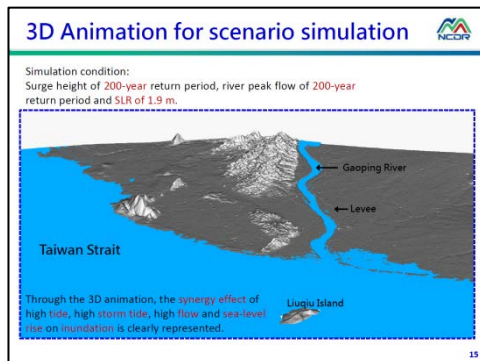
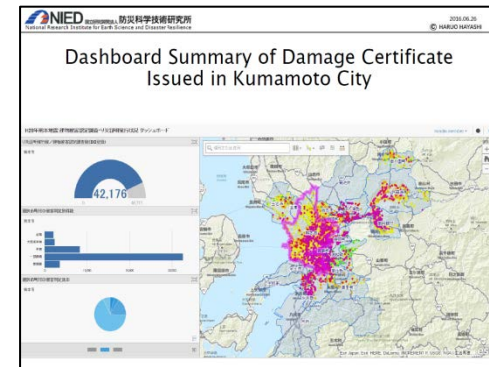
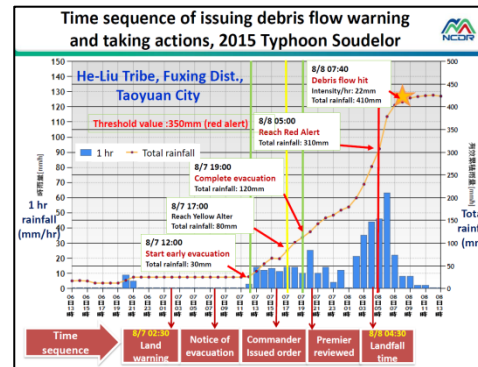
# Major outcomes

- (Act. 2) Improvement in capacity for sediment disaster management

- Major issues

### International Research Cooperation

- In November 2007, MOU among NDMI (Korea), NIED (Japan), NCDR (Taiwan)
- Disaster information sharing
- International cooperation with disaster risk reduction aspects
- Hosting the annual workshop
- Promoting international joint research on Disaster Risk Reduction (DRR)



### 4. Field Application Techniques for DSI (cont'd)

#### Routine Investigations (cont'd)

#### Results

- Investigation into Failure of Steep Slopes in Gwang-ju (March 22, 2016)
- Investigation into Land Creeping in Ujin-gun(April 7, 2016)
- Safety Inspection of Dajeon Bridge in Ulsan (May 4, 2016)
- Investigation into the Collapse of a Retaining Wall in Wanju (April 21, 2016)

# Major outcomes

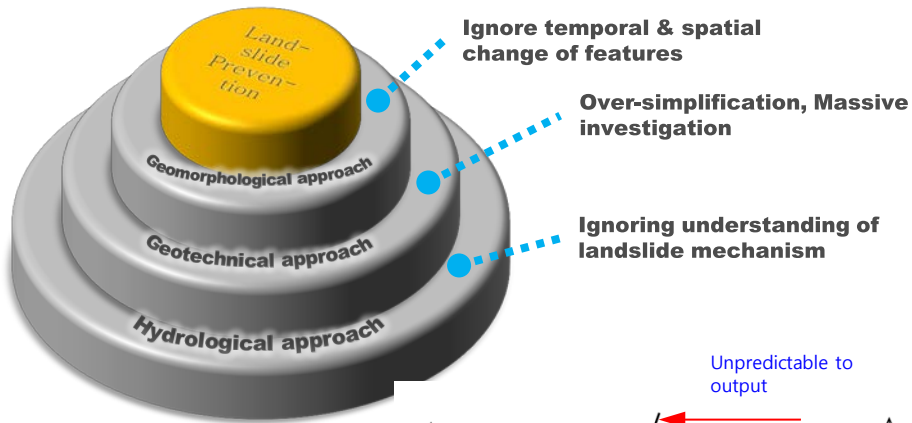
- (Act. 2) Improvement in capacity for sediment disaster management
  - 2. Korea-Italy bilateral symposium on landslide prediction and warning technology(Mar. 14-15, 2016)
    - Understanding recent development of technologies for landslide mitigation



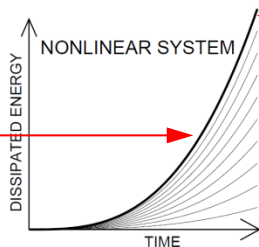
# Major outcomes

- (Act. 2) Improvement in capacity for sediment disaster management

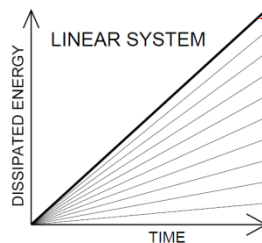
- Major issues



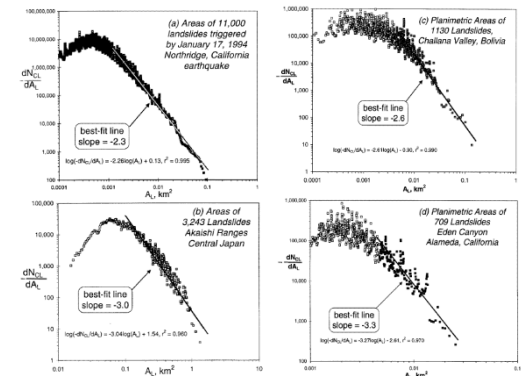
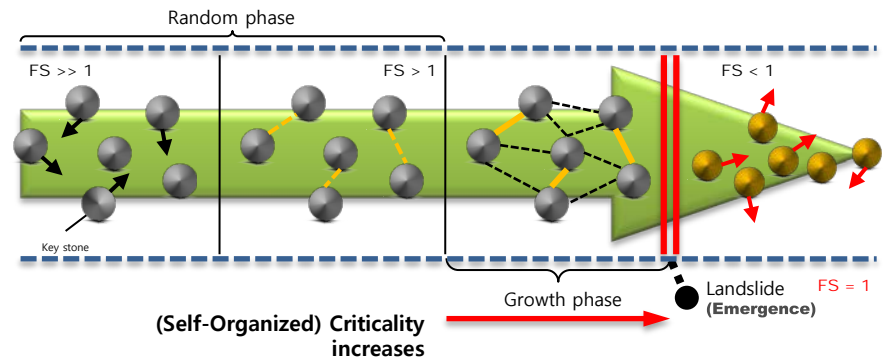
Governed by multiplicative factor



Unpredictable to output



Proportional to input and output



# Major outcomes

- (Act. 2) Improvement in capacity for sediment disaster management
  - 3. NDMI's ODA project in 2016



Journey of Typhoon Washi



Arrived @ Nov. 18, 2011

Arrived @ Nov. 15, 2011



# Major outcomes

- (Act. 2) Improvement in capacity for sediment disaster management
  - Automatic Rainfall Warning Sys. (ARWS)



Warning station



Water level measuring station



Precipitation station

# Major outcomes

- (Act. 2) Improvement in capacity for sediment disaster management

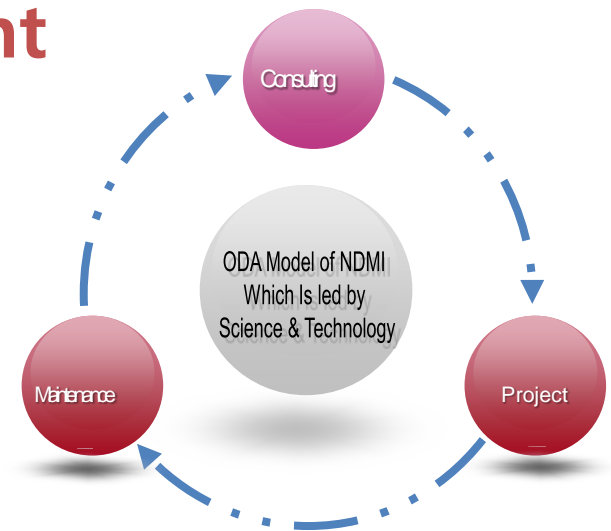
- Major issues

- Material aid
- Short-term plan
- Inappropriate assistance
- Lack of follow-up management
- Humanitarianism vs. national interests

- Solutions

- Change direction (Catching the fish → Teaching how to catch it)
- Establish long term plan
- Consider the technological level of recipient country
- Develop curriculum for educating

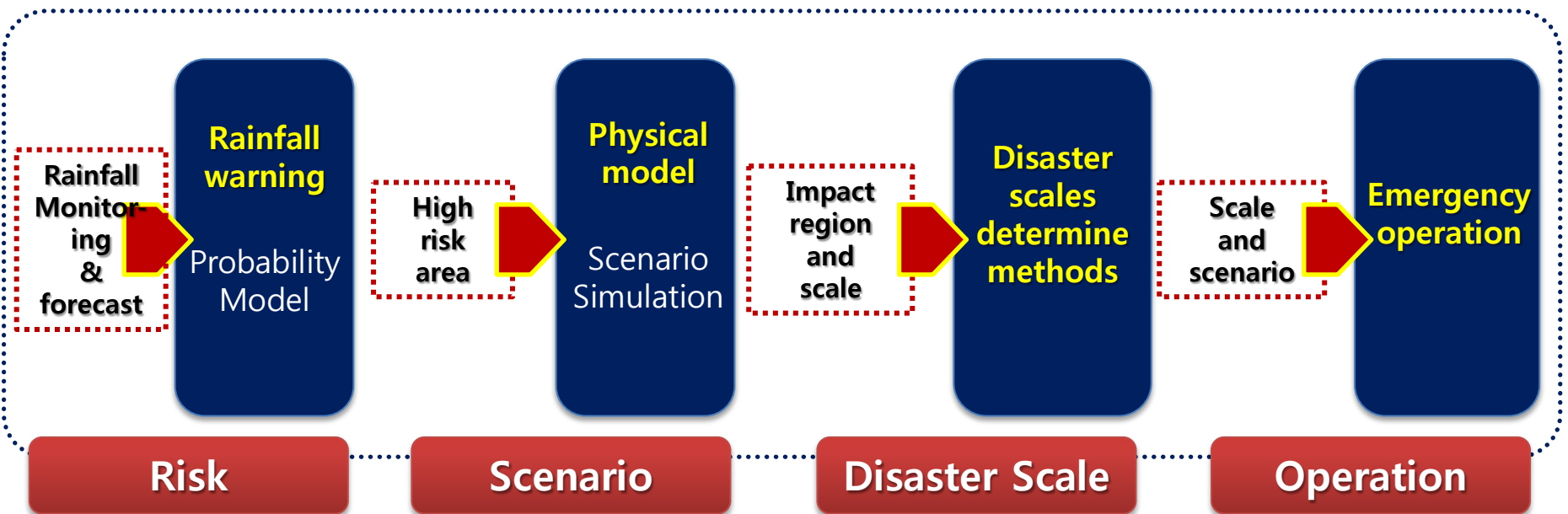
- 2016 : Vietnam and Laos





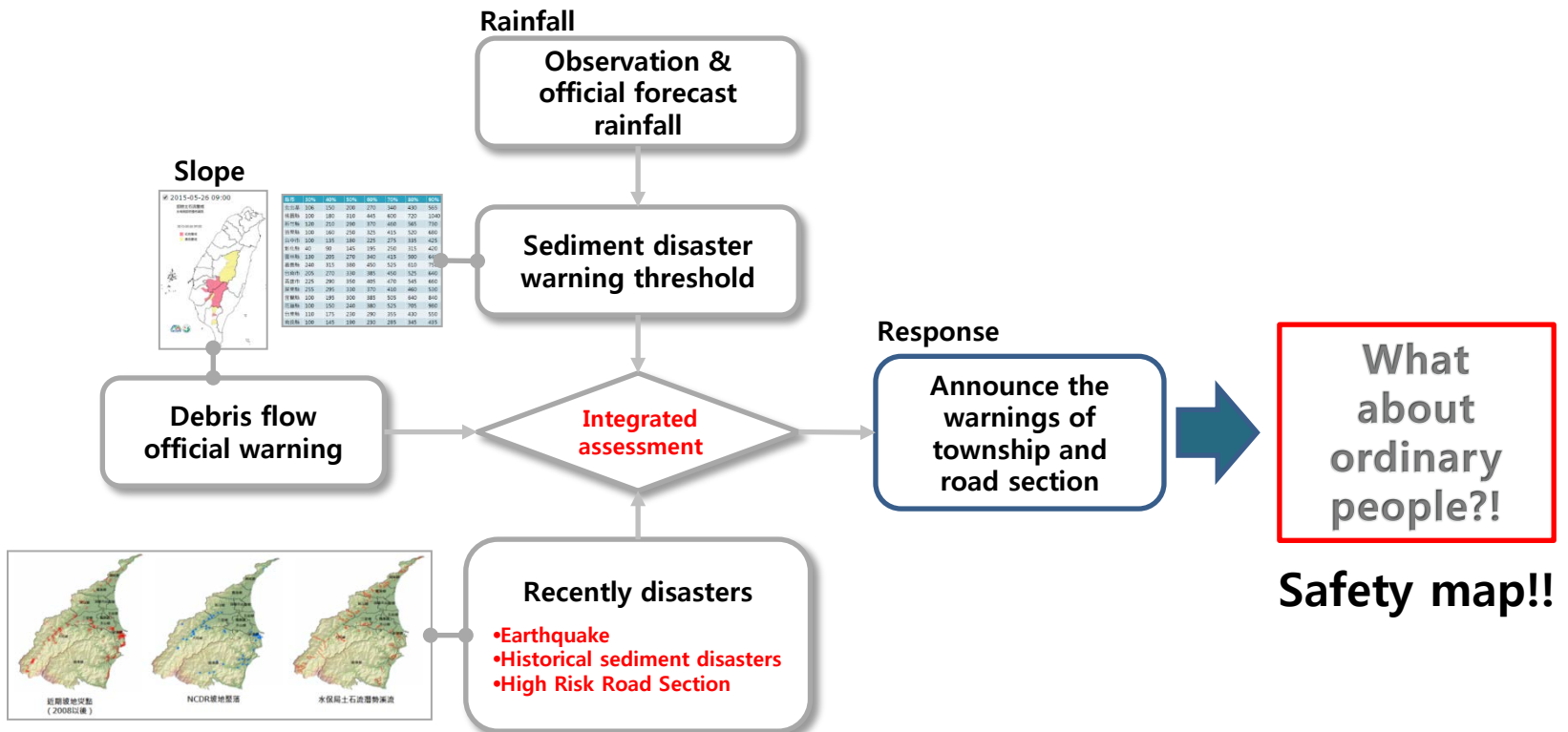
# Major outcomes

- (Act. 3) Optimization of disseminating sediment disasters related information
  - 1. Early warning framework
    - General concept of EW



# Major outcomes

- (Act. 3) Optimization of disseminating sediment disasters related information
  - Detailed processes



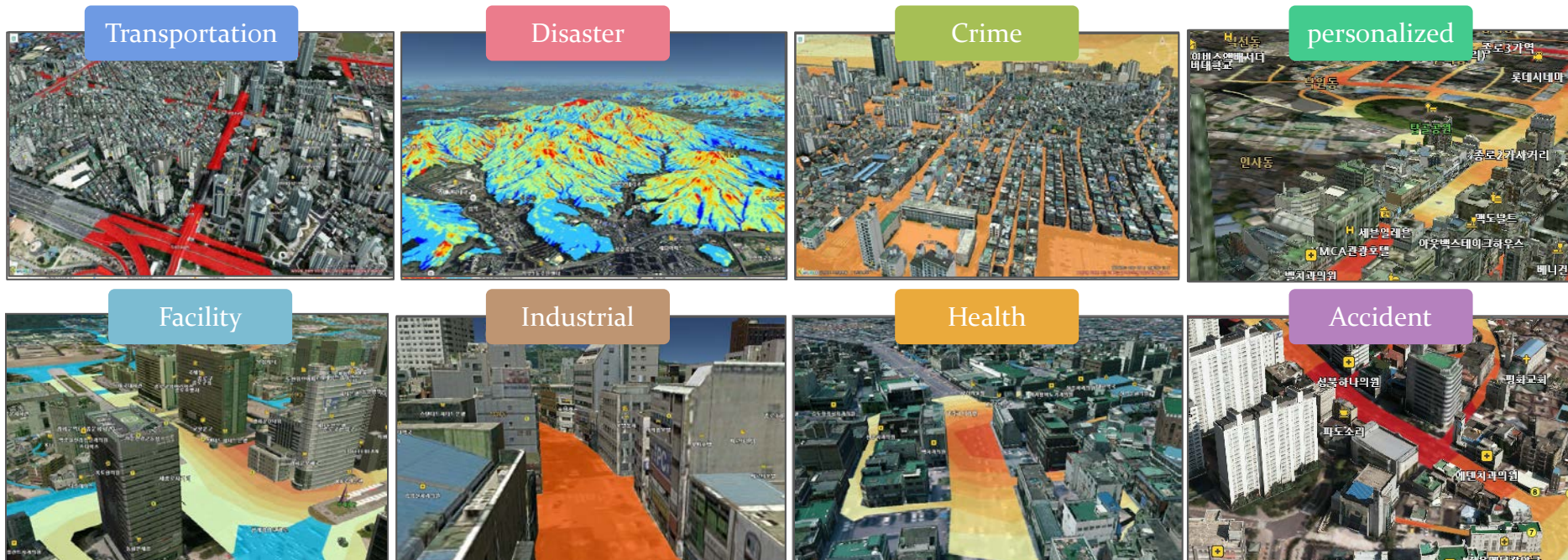
# Major outcomes

- (Act. 3) Optimization of disseminating sediment disasters related information
  - 2. Safety map (www.safemap.go.kr)
    - World's first portal site



# Major outcomes

- (Act. 3) Optimization of disseminating sediment disasters related information
  - 8 specialized services for safety (2D & 3D)



# Major outcomes

- (Act. 3) Optimization of disseminating sediment disasters related information
  - Communicating with people

**안전신문고**

**안전모니터봉사단**

**REPORT DATA**

92,766 신고  
2,806 확인  
89,960 완료

**REPORT DATA**

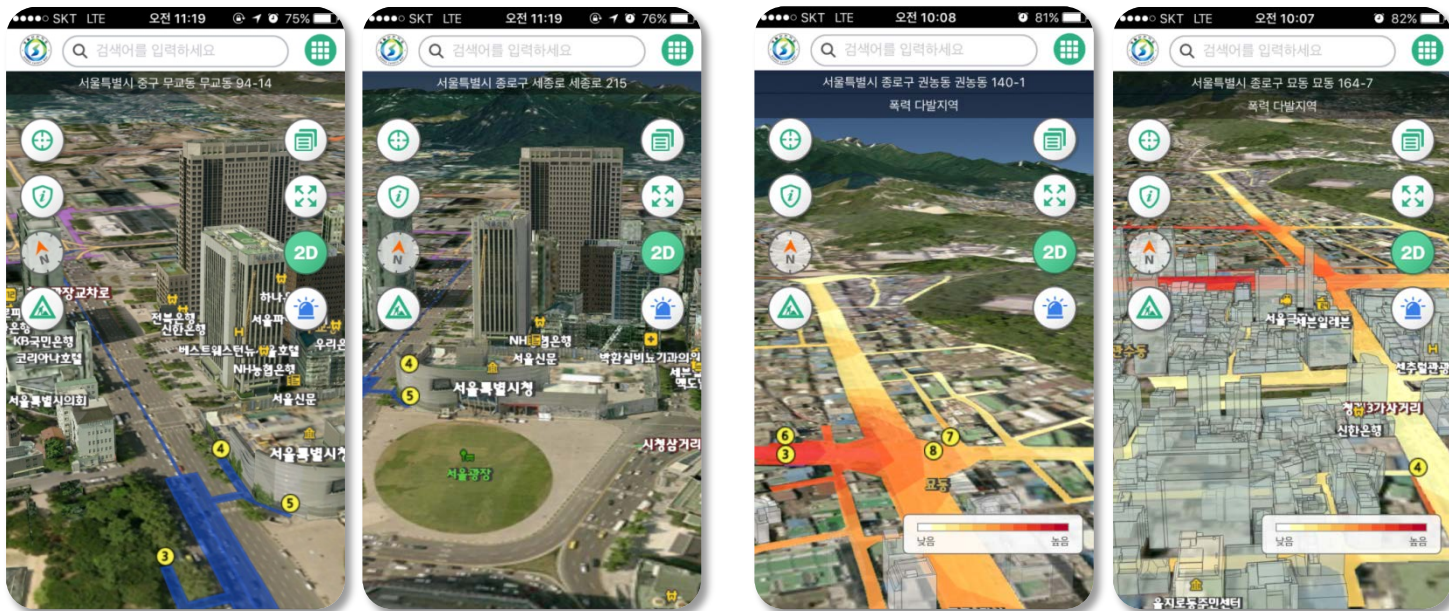
44,699 정보

**Reported by the people**

**44,699 information**

# Major outcomes

- (Act. 3) Optimization of disseminating sediment disasters related information
  - And even 3D mobile service



# Issues and conclusions

- Outcomes are not fully accomplished
  - *Guidelines for adaptive sediment disaster risk management tools*
  - *SOP for sediment disasters information by public media*
- Will be finished by end of 2016
- Can get least resources and structures for reducing sediment disasters and mass movement
- Need to refine!!

# Thank you for your attention!



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