

# Importance of Data and Information for Disaster Risk Management

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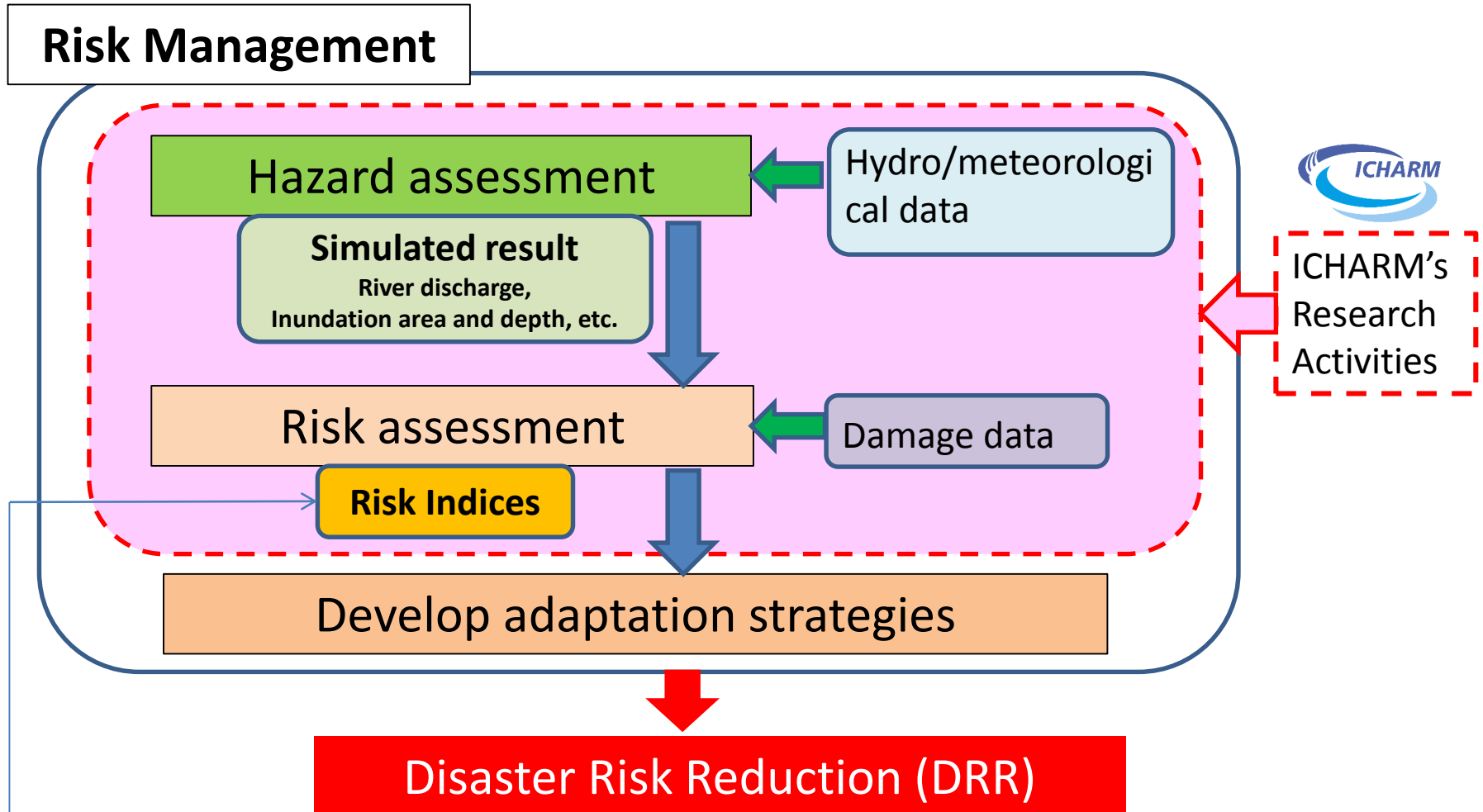
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# Importance of data and information for risk management

## 1. Significance of collecting and archiving data/information



The Sendai Declaration (3rd World Conference on Disaster Risk Reduction) the importance of such indices and recommends the development of indicators for worldwide monitoring of progress in implementation of mandates in disaster risk reduction.

# Importance of data and information for risk management

## 1. Significance of collecting and archiving data/information

By country level...

- To **show effect and value of investment** for disaster mitigation considering national budget (which contributes **accountability for donor agencies**)

By municipality level..

- To **develop disaster effective management plans**

By community level..

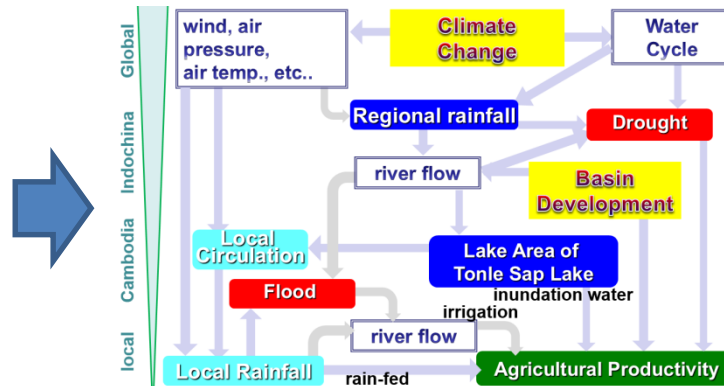
- To **help residents realize disaster risks** which are not realized in normal times and **act properly** for disaster mitigation

**BUT!**

- Most of developing countries have not seen much progress in collecting and archiving data.
- Collecting and archiving data has become a global issue.



In stakeholder meetings •••



They decide a strategy, but •••

**Data collection and archiving is the basis for all disaster management.**

# Importance of data and information for risk management

## 1. Significance of collecting and archiving data/information

To Promote **Integrated Flood Management (IFM)**...

***Enhancement of mutual collaboration among stakeholders by sharing disaster risk information is important!***

Objectives of IFI database toward IFM

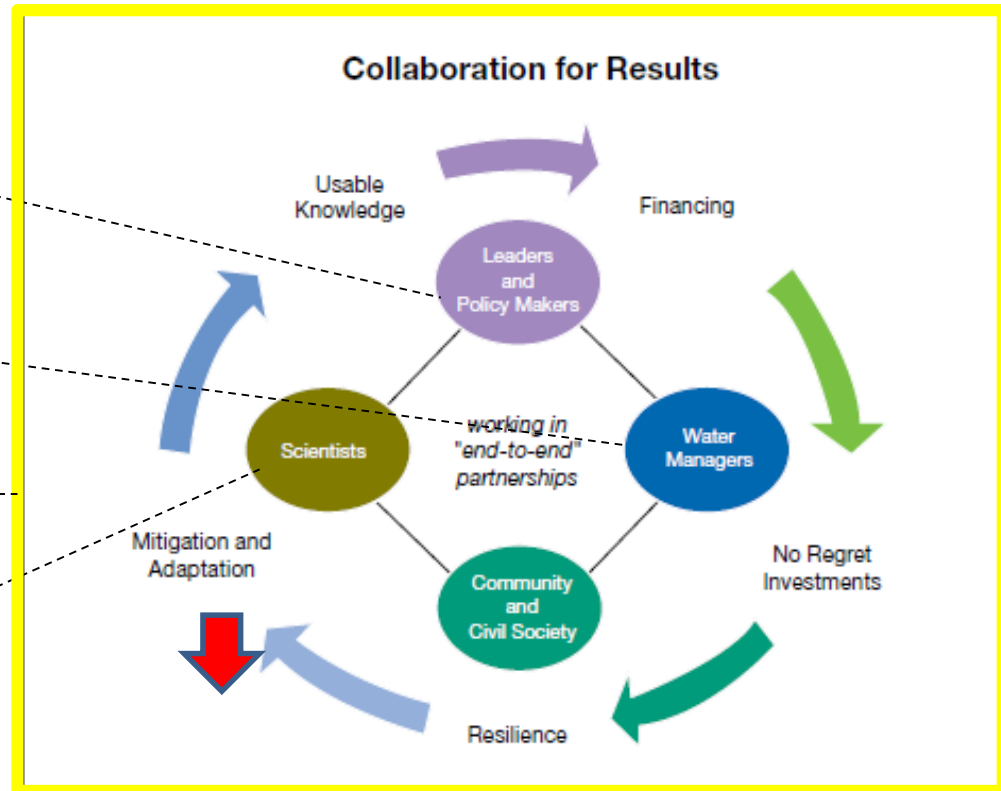
(1) Help leaders understand the status of flood risk and offer decision alternatives

(2) Help practitioners plan and implement effective flood management strategies

(3) Support the progress toward achieving the SDGs

(4) Provide scientific tools for monitoring the progress of the Sendai Framework

(5) Achieve the above in a seamless and effective manner



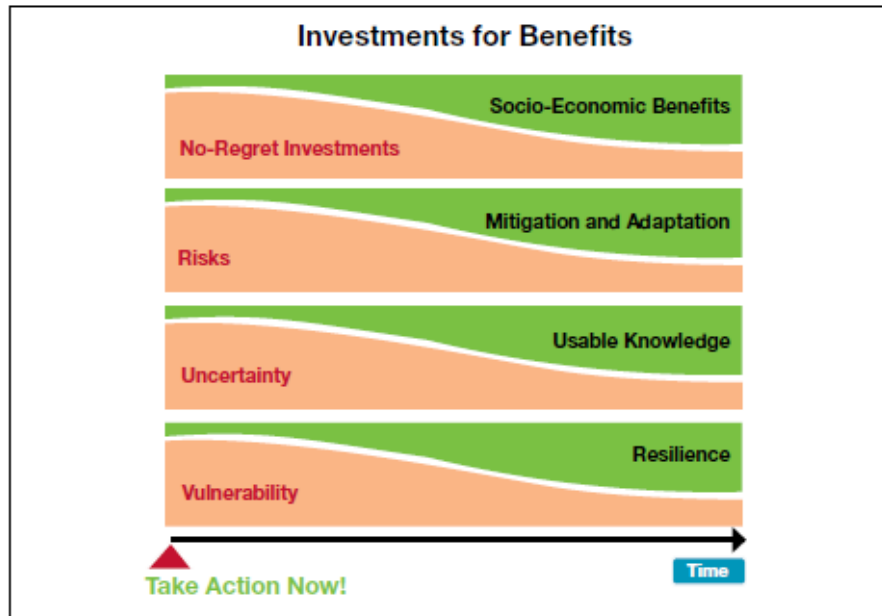
Source: "Framework Document on Water and Climate Change Adaptation", Asia-Pacific Water Forum, 2012

# Importance of data and information for risk management

## 1. Significance of collecting and archiving data/information

To Promote **Integrated Flood Management (IFM)**... *(cont.)*

**Utilization of field data is important for “No-regret investments”!**



Source: “Framework Document on Water and Climate Change Adaptation”, Asia-Pacific Water Forum, 2012

***For “Mutual collaboration” and “No-regret investments” ...***

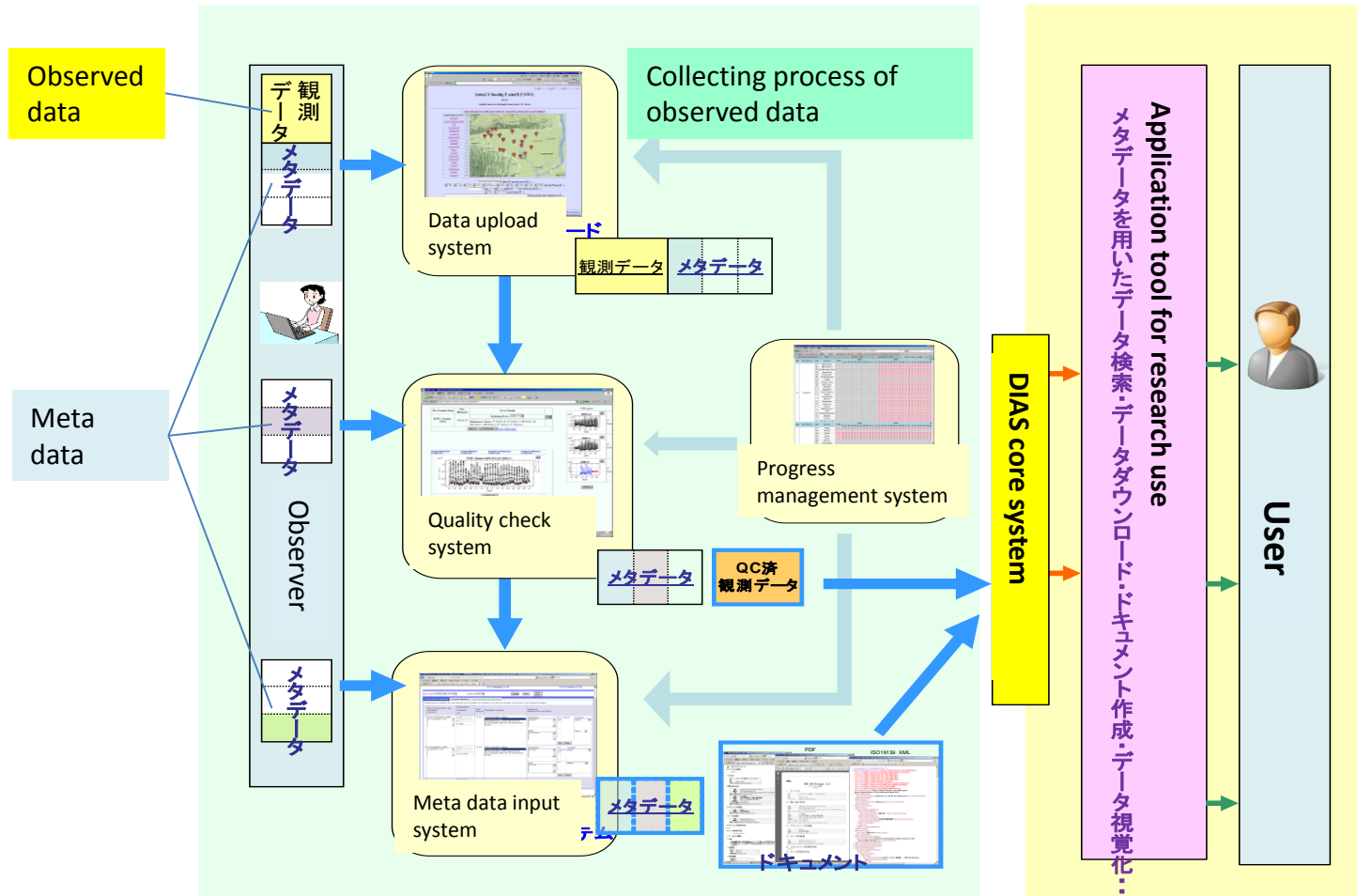
**Common understanding by risk indices through utilization of data**

***are necessary.***

# Importance of data and information for risk management

## 1. Significance of collecting and archiving data/information

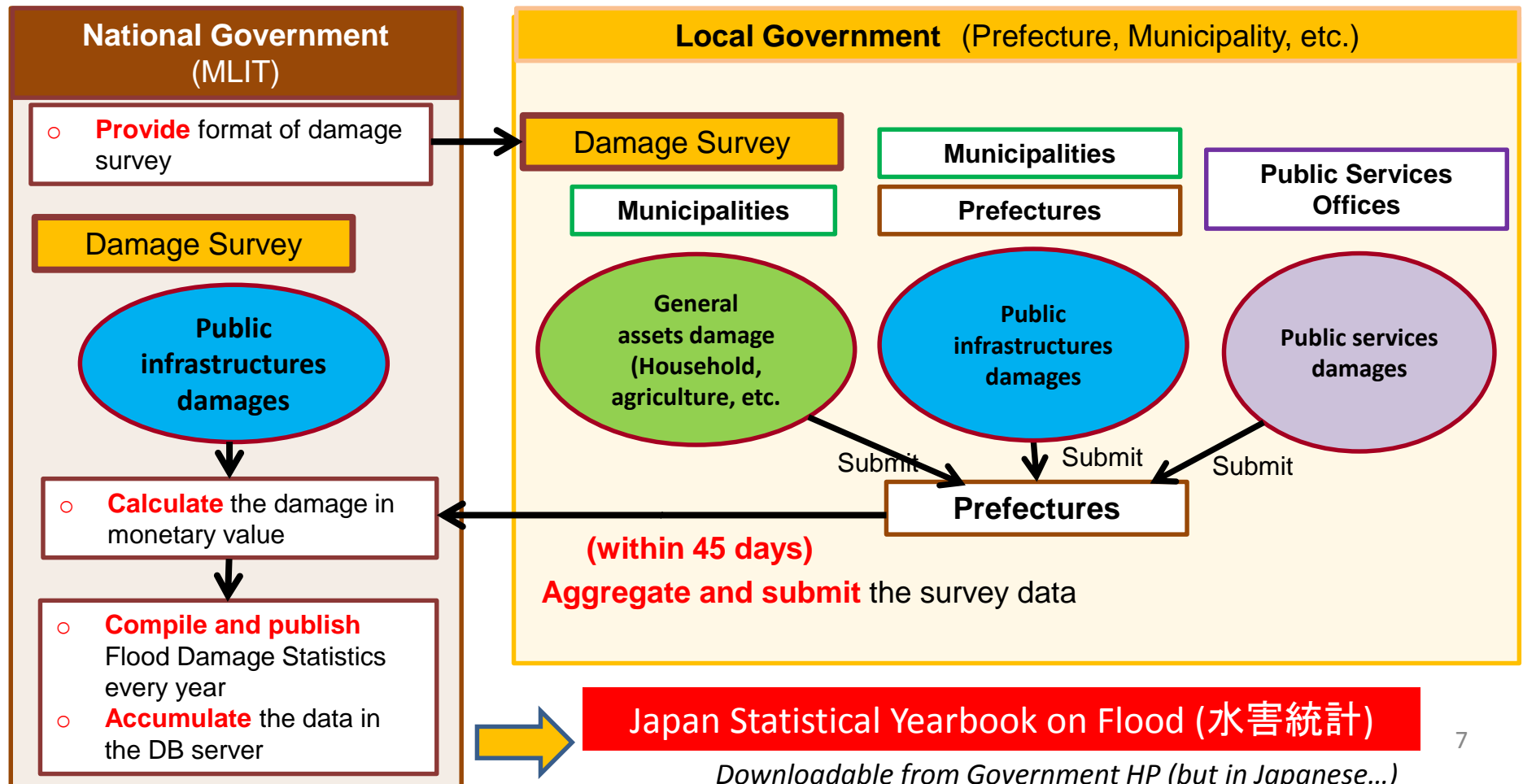
### DIAS (Data Integration and Analysis System)



# Importance of data and information for risk management

## 2. Case study in Japan

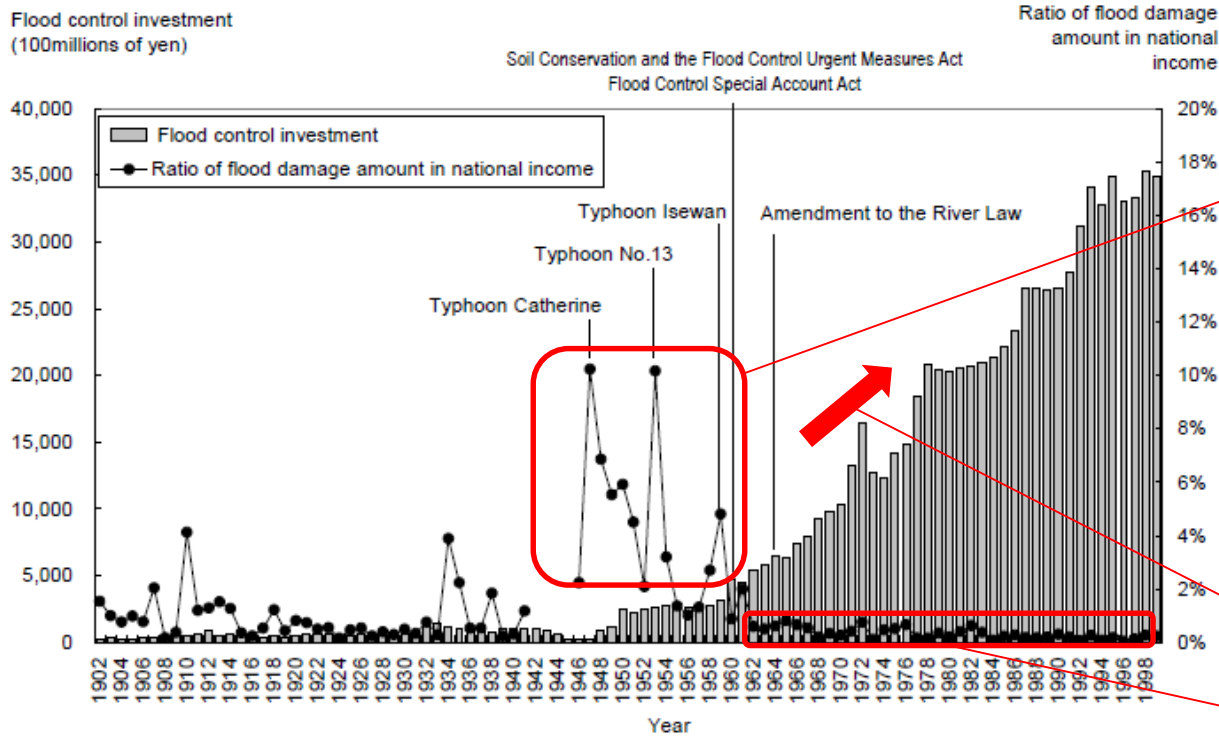
Damage Data collection system (水害統計)



# Importance of data and information for risk management

## 2. Case study in Japan

### Preventive investment



Frequent flood in the 1950s in Japan



Enacted disaster prevention law in 1960



Started flood damage data collection from 1961



Increased flood investment



**Reduced flood damage!**

Source:

Flood damage amount:

1902-1935: Civil Engineering Bureau, Ministry of Home affairs. "Annual Statistics of Engineering Report No.30"

1936-1960: "Estimated Amount of Flood Damage after the War"

1961-: "Flood Statistics"

Flood control investment:

1902-1960: River Bureau. "Flood Statistics"

1960-: Economic Affairs Bureau. "Annual Report of Construction Works Statistics"

National Income:

1902-1942: Kazushi OKAWA (ed.), "The Growth Rate of the Japanese Economy since 1878"

1946-1951: Department of National Accounts. "Outline of Japanese Economy—Year 1957 Edition"

1952-1964: "Annual Report on National Income Statistics—Year 1978 Edition",

1965-: Annual Report on National Accounts—Year 1994 Edition—Year 2001 Edition"

**Figure 16 Decreased ratio of flood damage amount in national income by flood control infrastructure measures**

Source: "A study on Water Infrastructure Investment and its Contribution to Socioeconomic Development in Modern Japan Final Report, Japan Water Forum and The World bank"



# Importance of data and information for risk management

## 2. Case study in Japan

### Damage Reduction by Preventive Investment

#### ① Tokai heavy rain (September 2000)

[Shonai and Shin Rivers, Aichi Prefecture]



Effect of preventive project: about ¥550 billion

Effect: 7.7 (=550/71.6)

¥670 billion

¥120 billion

¥71.6 billion

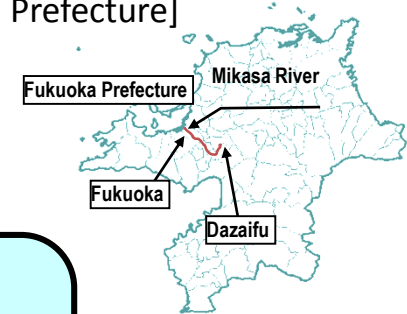
Actual damage

Simulated damage for same heavy rain after the preventive project completed

Preventive Project cost

#### ② Fukuoka heavy rain (July 2003)

[Mikasa River, Fukuoka Prefecture]



Effect of preventive project: about ¥460 billion

Effect: 8.3 (=460/55.3)

¥463.9 billion (Total of 1999 and 2003)

¥55.3 billion

Actual damage

Simulated damage for same heavy rain after the preventive project completed

Preventive Project cost

# Importance of data and information for risk management

## 3. ICHARM's challenge for risk management

### Ex. A: "Assistance for the Philippines in the development of a flood disaster response plan"

- ICHARM assists Calumpit City in the Philippines in developing a flood disaster response plan.
- The city is damaged by flood every year, but neither damage data nor other relevant data have been archived.

➔ **Necessary to collect and archive the basic damage data**

**BUT!**

**We have to consider "what kind of data" and "how" we should collect!**

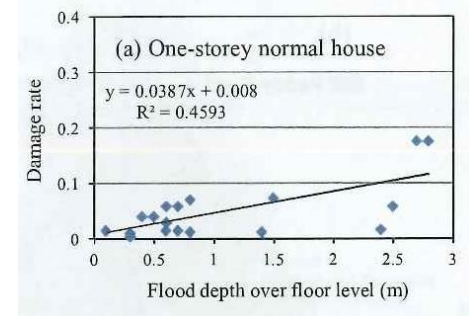
### Ex. B: "Study on flood risk to private houses in the Pampanga River basin of the Philippines"

- An on-site interview survey was conducted to the residents.
- No significant relationship was found between inundation depth and damage

→ Residents may not care about flood damage because floods have long been a regular part of their life.

→ Now considering assessing inconveniences in daily life as risk instead of damage in monetary terms.

➔ **Important to understand flood damage from multi-perspectives, based on local needs and conditions.**



**Fig.** Relationship of household damage rates with the flood depth (Shrestha et al. 2014)

# Importance of data and information for risk management

## 3. ICHARM's challenge for risk management

### Ex. C: Development of Smartphone Application for Self-Inspection for Flood Damage to Buildings

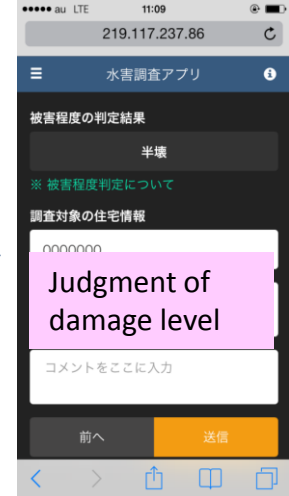
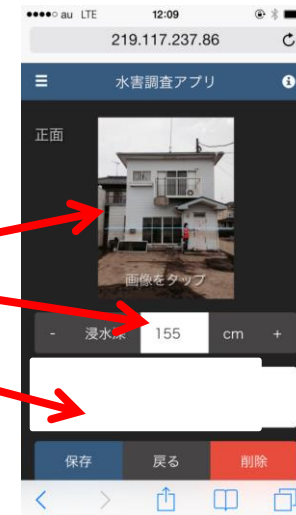
- Homeowners upload building damage
- ↓
- Damage level are easily judged with less work load



Upload Building Photo

Input water level (cm)

Input some comments on damage



### Ex. D: "Quantitative assessment of agricultural flood risk in the Pampanga River basin of the Philippines"

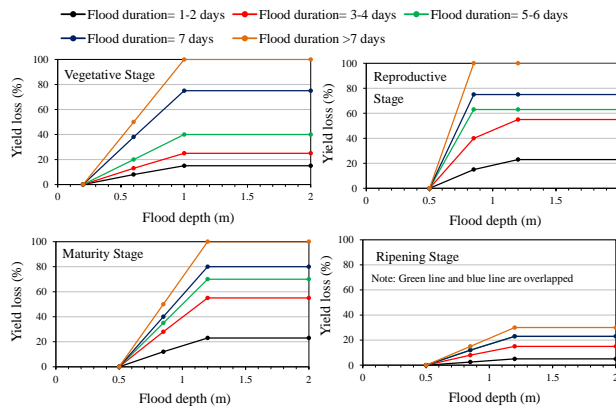


Fig. 1 Developed flood damage curves for rice-crops (Shrestha et al. 2014)

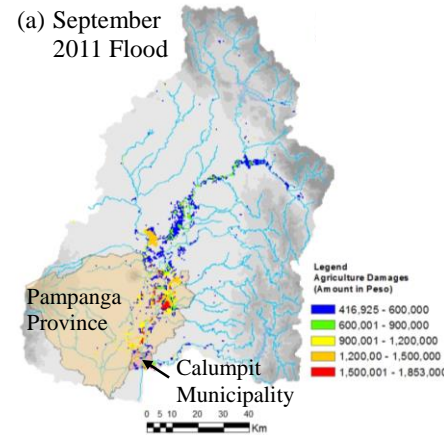


Fig. 2 Calculated agricultural damages for the September 2011 flood, 50- and 100- years return -period flood cases (500 m × 500 m).

# Importance of data and information for risk management

## 3. ICHARM's challenge for risk management

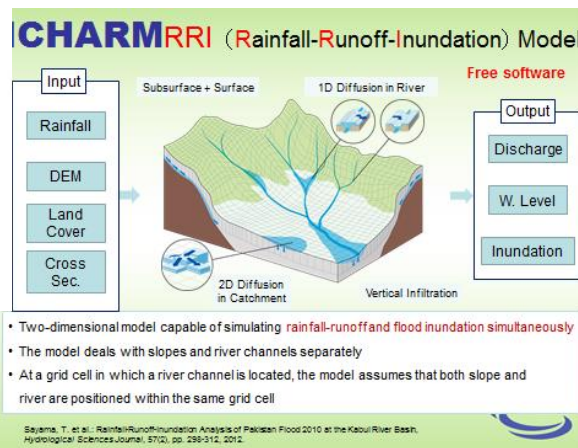
### Ex. E: "Risk assessment and management in Myanmar (ADB project)" using RRI model

*A good example of local practice by ICHARM, which excels at conducting hydrologic and hydraulic research and risk management research as one package in basins with low data availability.*

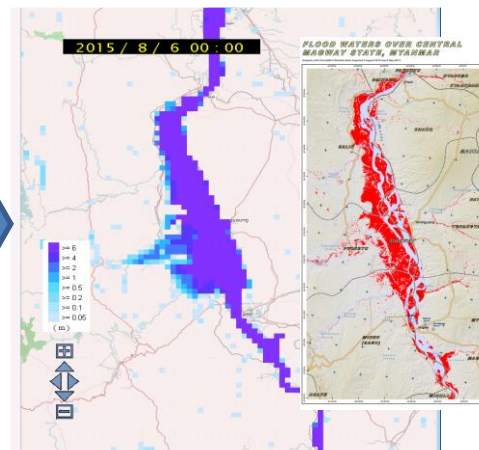
- RRI model can identify flood inundation areas even with limited data and information, e.g., only by using satellite products.
- Risk assessment is conducted along with several meetings with local officers.
- It has been a challenge to propose an effective risk management approach under limited data availability.



Target 3 cities in Myanmar



Simulation by RRI model



Calculated and observed inundation areas around Magway Province (6 August 2015)

Risk assessment (ongoing)

# Importance of data and information for risk management

## 3. ICHARM's challenge for risk management

### For disaster-resilient society...

- ✓ Damage data collection and archiving
- ✓ Risk assessment based on hazard simulation
- +  
✓ **Human, Institutional, and social capacity**

### Ex. F: “Flood risk reduction using FDPI (Flood Disaster Preparedness Indices)”

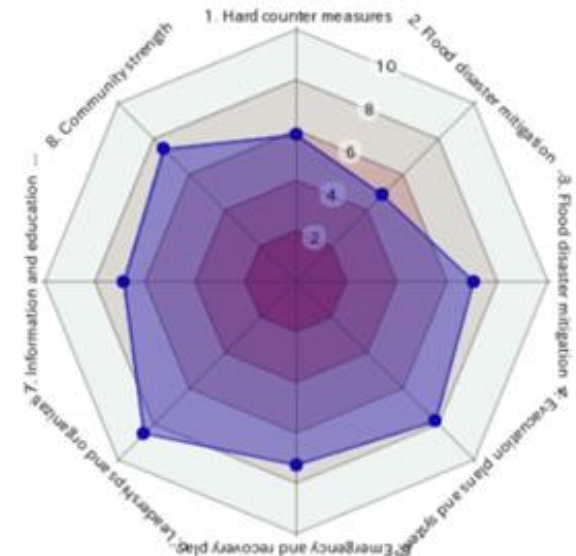
[fdpi.jp](http://fdpi.jp)

- Self-assessment tool to evaluate the present level and progress in local preparedness for the flood hazard by several indices.
- Available in 14 languages.
- The indices help each locality identify which activity of local preparedness should be improved.



- ✓ Evaluation of disaster preparedness
- ✓ Visualization of your weakness
- ✓ Easy for self-evaluation
- ✓ Cost-free and periodic evaluation

Score is shown in octagonal chart



# Importance of data and information for risk management

## 4. Conclusion

- Risk management starts from hazard and risk assessment, which demand **data collection and archiving**.
- Data should be accumulated place by place because even for the same severity of hazard, resulting damage may differ **due to the differences in social vulnerability and economical conditions**.
- Flood damage statistics has been conducted in Japan over 60 years. **Japan has been successful to reduce flood damage** by utilizing data-driven risk analysis for actual investment.
- The characteristics of ICHARM, which can conduct **both hydrological analysis and risk assessment at once** even in areas with low data availability, have been proven highly advantageous in many projects.



*Thank you for your attention!*

PWRI and  
Mt. Tsukuba



ICHARM building