ICHARM

Commitments to enhance regional cooperation in Asia and Pacific

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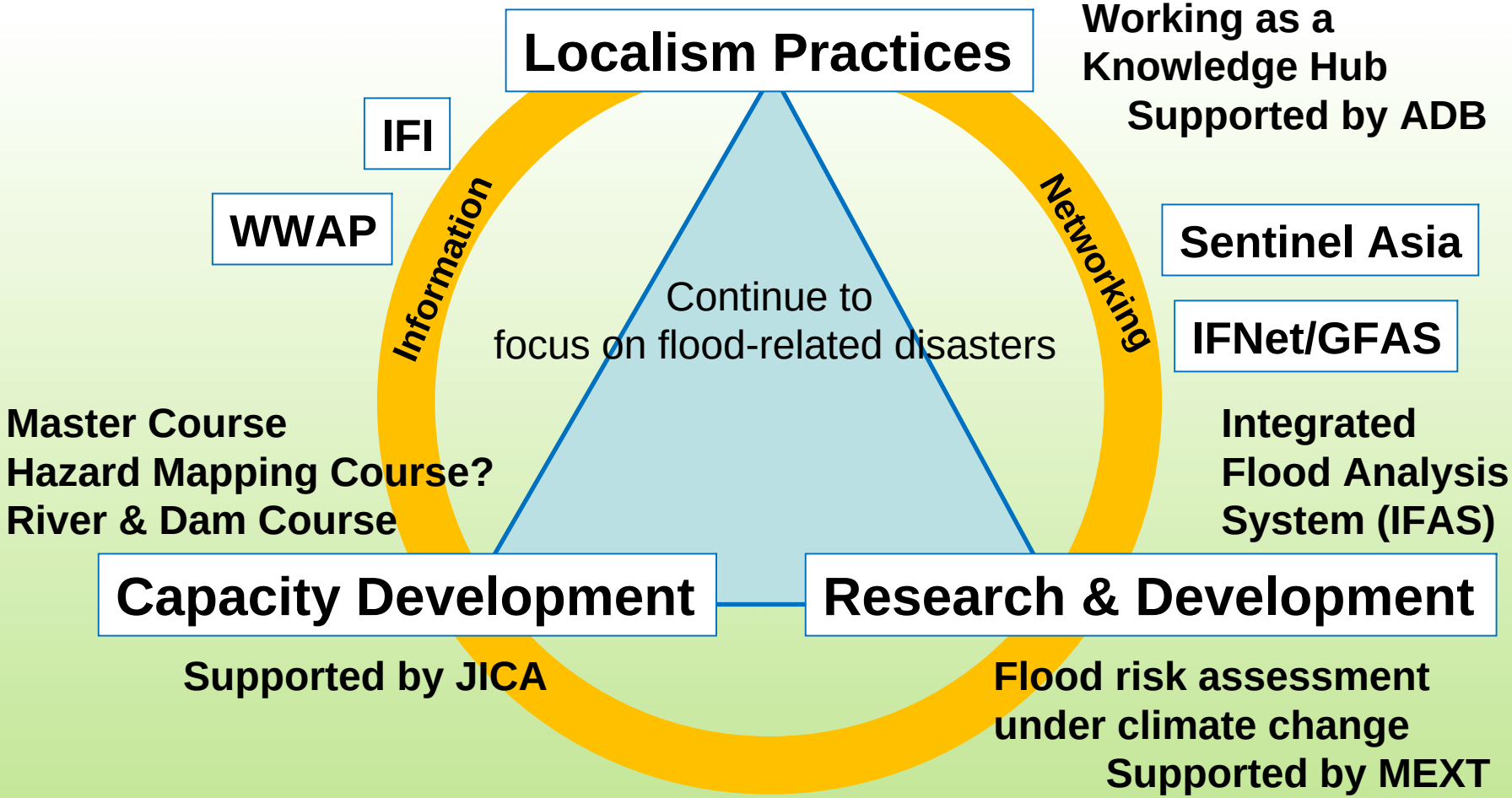
under the auspices of UNESCO (ICHARM) ,
Public Works Research Institute (PWRI),
Tsukuba, Japan

ICHARM

International Center for Water Hazard and Risk Management
under the auspices of UNESCO hosted by PWRI, Tsukuba, Japan

- Established on 6 March 2006 as a UNESCO Category II Center with agreement among UNESCO, Government of Japan and Public Works Research Institute (PWRI)
  - About 30 staff: 2/3 researchers & 1/4 non-Japanese
- Mission: To serve as a Global Center of Excellence to **provide and assist implementation of best practicable strategies** for water-related disaster reduction.
  - First phase focus is flood-related disasters
- Activities: Research, Training & Information Networking
  - **High technology** for early warning & hazard mapping
  - **Local practices** for implementation of IFM
  - **Capacity development**: Master course on water-related disaster management; Short -courses on flood hazard mapping etc.
  - **Information networking:** IFI, AP knowledge hub, …

Three pillars of activities of ICHARM



Research (examples)

- **Satellite & High-tech-based Flood Alert System** (with JAXA, IFNet/GFAS/IFAS etc.)
- **Floods & global warming: risk estimates and counter measures** (MEXT fund for FY 2007-2011)
  - JMA/MRI GCM (20km mesh) → translation to ground reality
- **Flood Hazard Mapping**:
  - methodologies to map in remote localities with poor data
  - effective and beneficial use of HMs in real local situation
- **Local studies** (Identification of the real needs of the people in diverse localities) → Diagnosis & Prescription
    - **Disaster (Flood) Preparedness Indices & ISO**

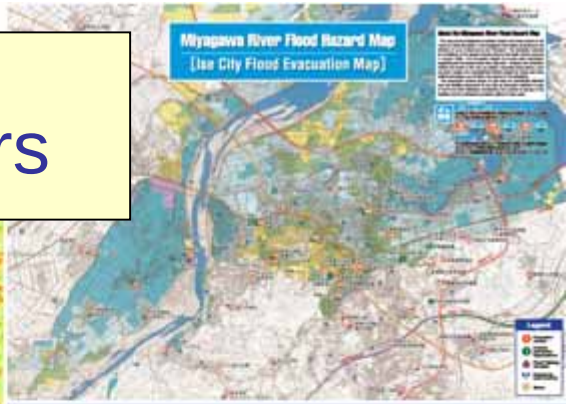
Kakushin Program of MEXT

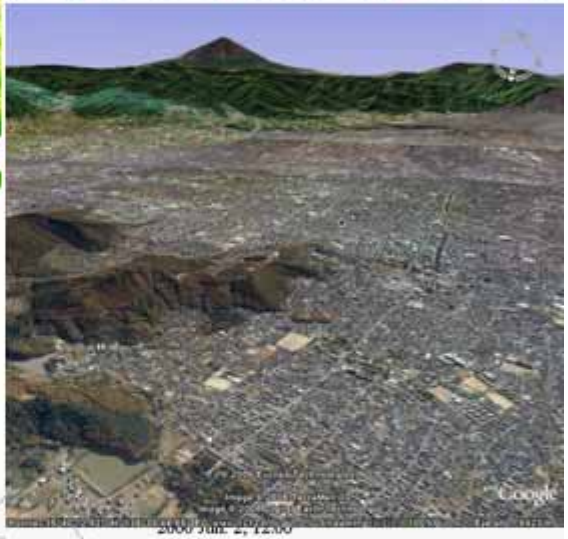
Innovative Program of Climate Change Projection for the 21st Century

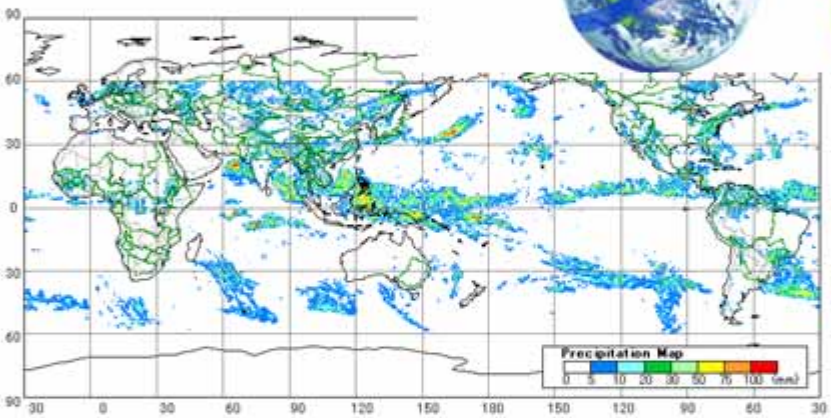
- MEXT research program for FY 2007-2011
- "**Assessment of climate-change impacts** on flood risk and its reduction measures on the globe and specific vulnerable regions"
- **MRI/JMA 20km resolution AGCM** climate forecasts for 2030 and 2100 by Earth Simulator

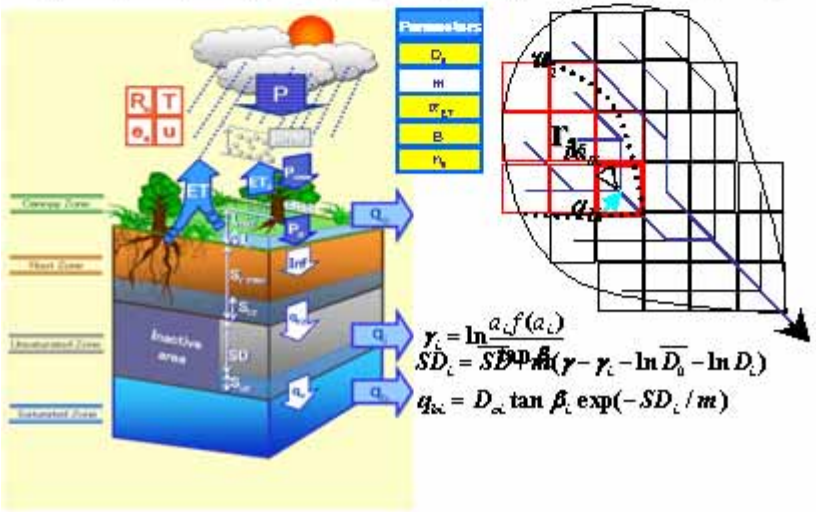
Advanced Early Warning & Hazard Mapping

Owned & operated by local practitioners





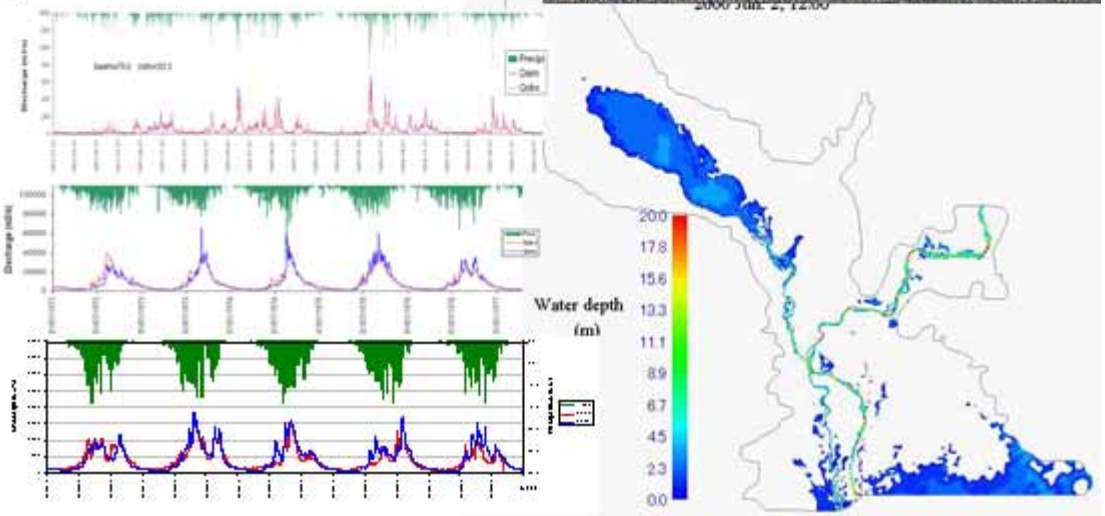




$$\gamma_i = \ln\frac{a_i f(a_i)}{\tan\beta_i}$$

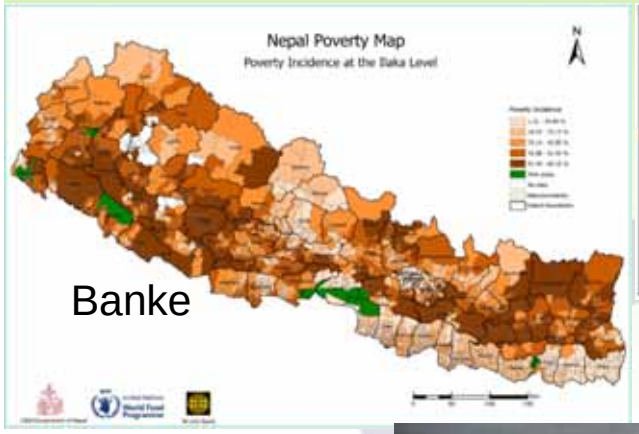
$$SD_i = \overline{SD} + m(\gamma - \gamma_i - \ln\overline{D_0} - \ln D_i)$$

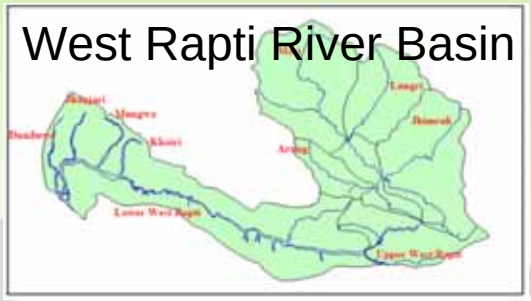
$$q_{bi} = D_\alpha \tan\beta_i \exp(-SD_i/m)$$



Specific Vulnerable Area: West Rapti River Basin, Nepal

-FY2007 & 2008- Kakushin Project sponsored by MEXT





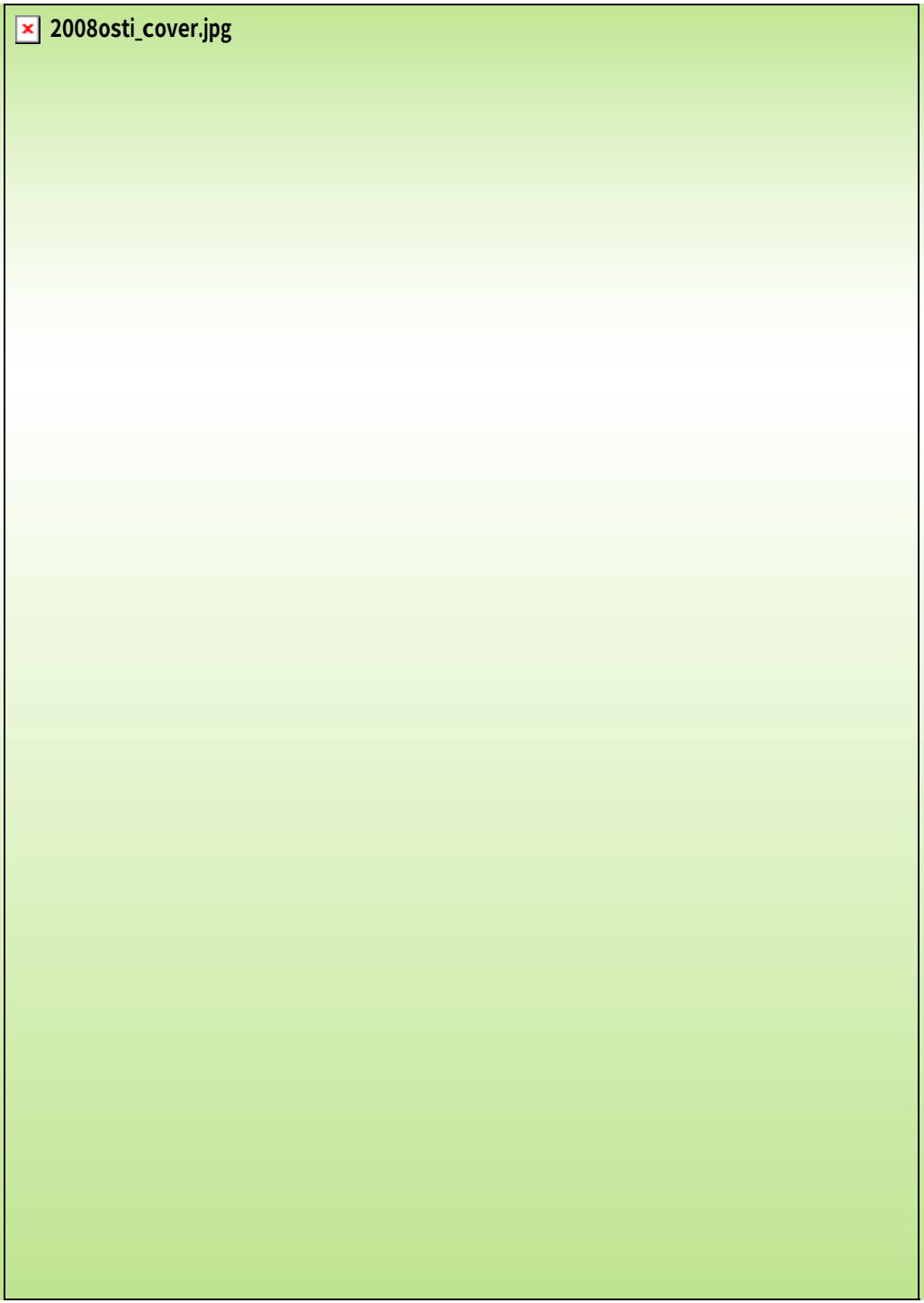
Community based flood hazard mapping

Consultation Meeting at local and national level

Field Survey

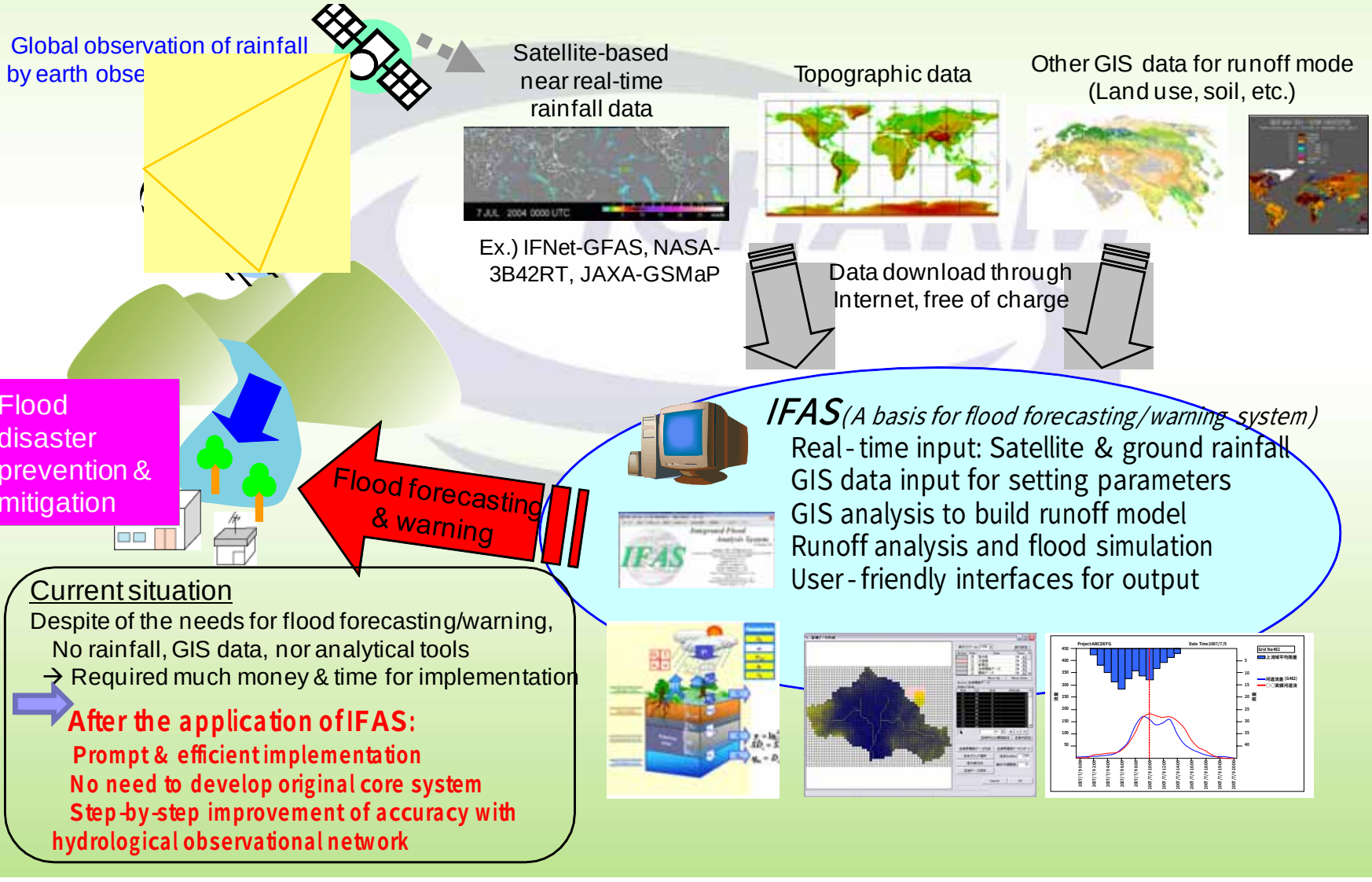
19/03/2008 Breached structure

ICHARM
Local Study Series No.1
Edited by
Phase 1



Integrated Flood Analysis System **IFAS**

Toolkit to implement "Global Flood Alert System (GFAS) – Streamflow"

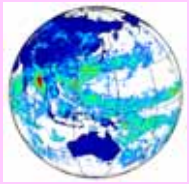


Development of local ownership of flood forecasts

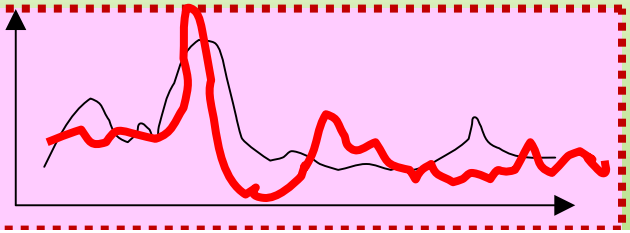
System

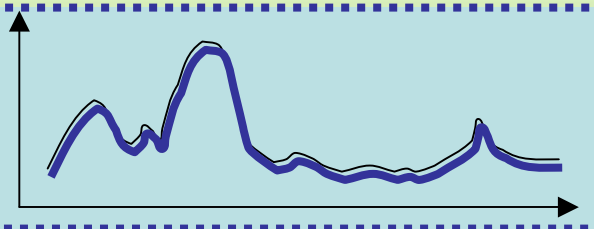
Training

Global Data



Local Data





TRAINING WORKSHOP FOR THE GLOBAL FLOOD ALERT SYSTEM (GFAS) VALIDATION
3-8 Oct, 2008 JAPAN


Purpose of the training course

- To build capacities to undertake hydrological prediction/forecasting in relatively ungauged basins using satellite-based rainfall.

Participants

- Ethiopia, Zambia, Cuba, Argentina, Bangladesh, Guatemala, Nepal (7countries)

Program

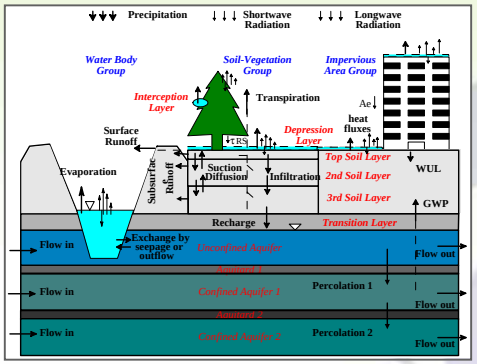
- Remote Sensing of Precipitation from Space (JAXA)
- Historical evolution of flood management system in Japan
- Introduction of Global Flood Alert System
- Operating procedures for IFAS
- Validation method of satellite-based rainfall
- Current conditions and problems in each country
- Validation plans using IFAS

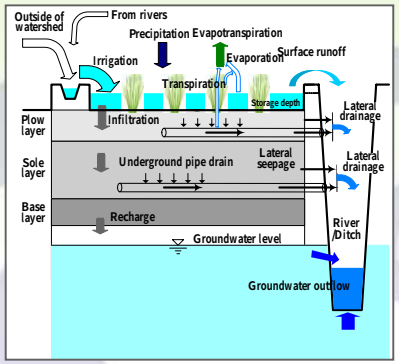


IFAS Training Seminar in Bandung, Indonesia (JICA), 2-3 February 2009

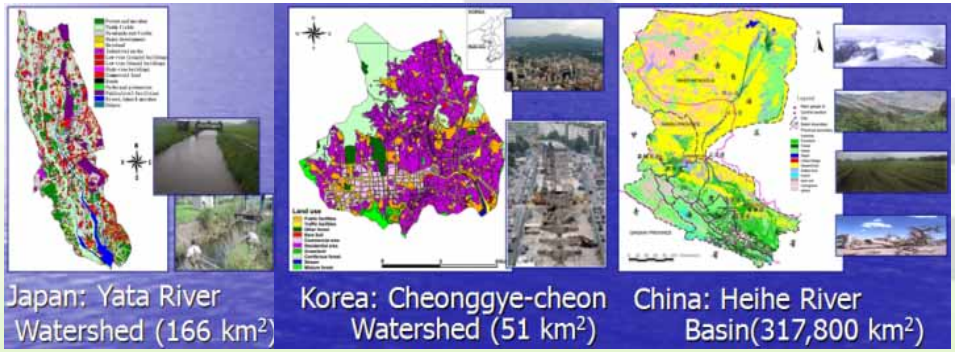
Special Session No.2 (SS2) for the 4th APHW, Beijing, China
8:45 – 12:00, November 4 (Tuesday), 2008

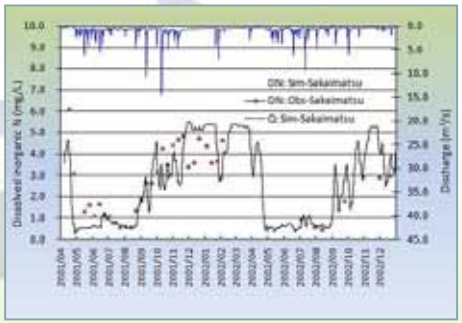
"Catchment-Scale Water and Material Cycle Studies with WEP and Its Future Potential"



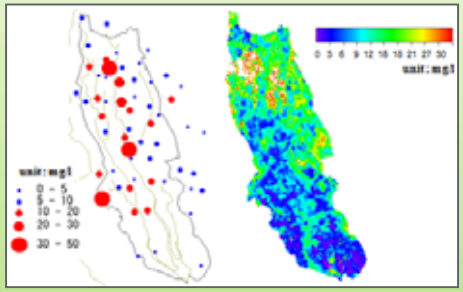


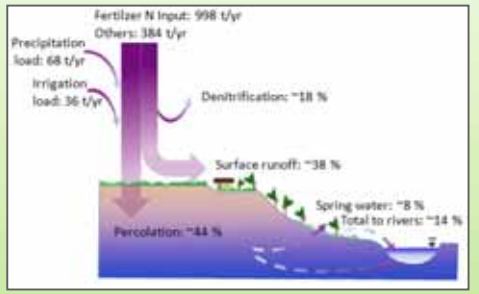
- ICHARM/PWRI
- China Institute of Hydropower and Water Resources (IHWR)
- Korea Institute of Technology (KICT)





From urban to agricultural area
From continental to small scale
From climatic and regional water cycle to water-quality issue





Training (examples)

- **Training courses**
  - Flood hazard mapping course (2004-, JICA)
  - River and Dam engineering course (1969-, JICA)
  - Comprehensive Tsunami training (2008-, ISDR)
- **Aftercare program** for implementation in trainees local communities (2006-, JICA)
  - KL, 2007; China, 2008; Manila, 2009
- **Master Course on Water-related Risk Management** with National Graduate Institute for Policy Studies (GRIPS) supported by JICA started in October 2007
  - 10 students from Bangladesh, China, India, Nepal, Japan

Objective of the Flood Master Program

- To foster **solution oriented practitioners** with solid theoretical and engineering bases who can serve for planning and implementation of flood management practices within the framework of integrated river basin management at national to local levels.

Master Theses

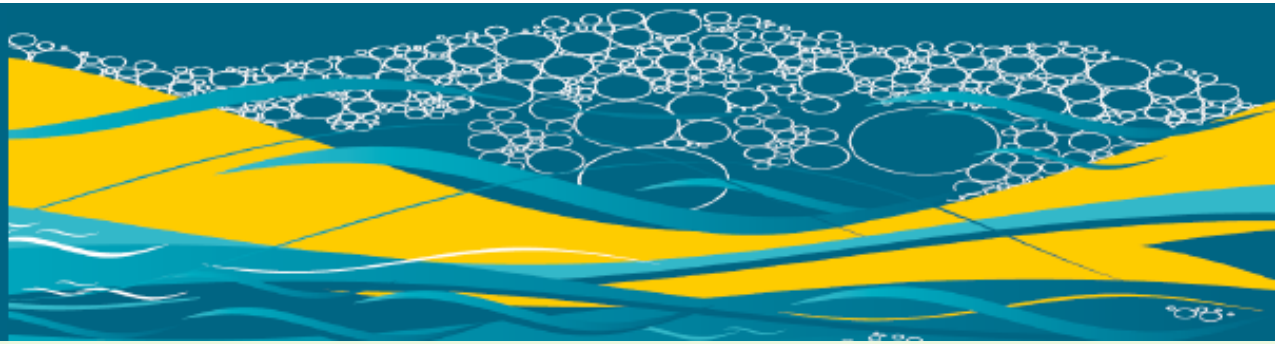
"Dam-break flood analyses in mid-down stream of **Han River**"	Mr. Dai, Ming-Long (China)
"Development of flood forecasting model in **Brahmaputra Valley** of India"	Mr. Khanindra Barman (India)
"Flood Hazard Mapping of **Dhaka-Narayanganj-Demra (DND)** project using geo-informatics tools"	Mr. Md. Aminul Islam (Bangladesh)
"Rainfall run off modelling and inundation analysis of **Bagmati River** at Terai Region of Nepal"	Mr. Mitra Baral (Nepal)
"Flood hazard and risk assessment in Mid-Eastern part of **Dhaka**, Bangladesh"	Mr. Muhammad Masood (Bangladesh)
"Flood risk analysis and risk management in **Mengwa Detention Basin**"	Ms. YE, Li-Li (China)
"Establishment of country-based **flood risk index**"	Mr. Yasuo Kannami (Japan)
"The analysis of flood risk awareness at resident level in **Mekong River Basin**"	Mr. Hirohisa Miura (Japan)
"Impact assessment of road construction on the flood inundation in **Dhaka**, Bangladesh"	Mr. Ryota Ojima (Japan)
"A fundamental study on the flows in the open channel network in **Wuxi City**"	Mr. Ji Zhou (China)

ICHARM works in alliance

with many relating organizations and programs

- Working in alliance with
  - UNESCO water centers IHE, USACE, IWHR, HTC, RCUWM
  - WMO, ISDR, UNU, Universities,
  - JICA, ADB, World Bank, UNEP, UNDP,
  - GEOSS-AWCI, IAHS/PUB, IAHR, APHW, CHES, KWRA,
  - ICSU, IUGG, GeoRisk Comm.,
  - JWF,NARBO, IFNet, APRSAF-Sentinel Asia, etc.

INTERNATIONAL FLOOD INITIATIVE



IFI aims to implement WSSD recommendations - taking into consideration the physical parameters of flooding, its socio-economic conditions and the risk a society is prepared to take in order to achieve its development objectives.

IFI promotes an integrated approach to flood management to take advantage of the benefits of floods and use of flood plains while minimizing the social, environmental and economic risks.

In close collaboration with:

International Hydrological Programme

World Meteorological Organization

International Strategy ISDR for Disaster Reduction

UNITED NATIONS UNIVERSITY

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In alliance with partners (1)

- JICA
  - Capacity Development
    - Master Course (one year)
    - Hazard Mapping, River & Dam etc. (short term)
- ADB
  - **Philippines** debris control

  (under planning)
  - Flood forecasting system etc., **Indonesia**
  - Indices development and risk assessment for **Lower Mekong** Basin countries
  - **India and Bangladesh** for flood risk reduction

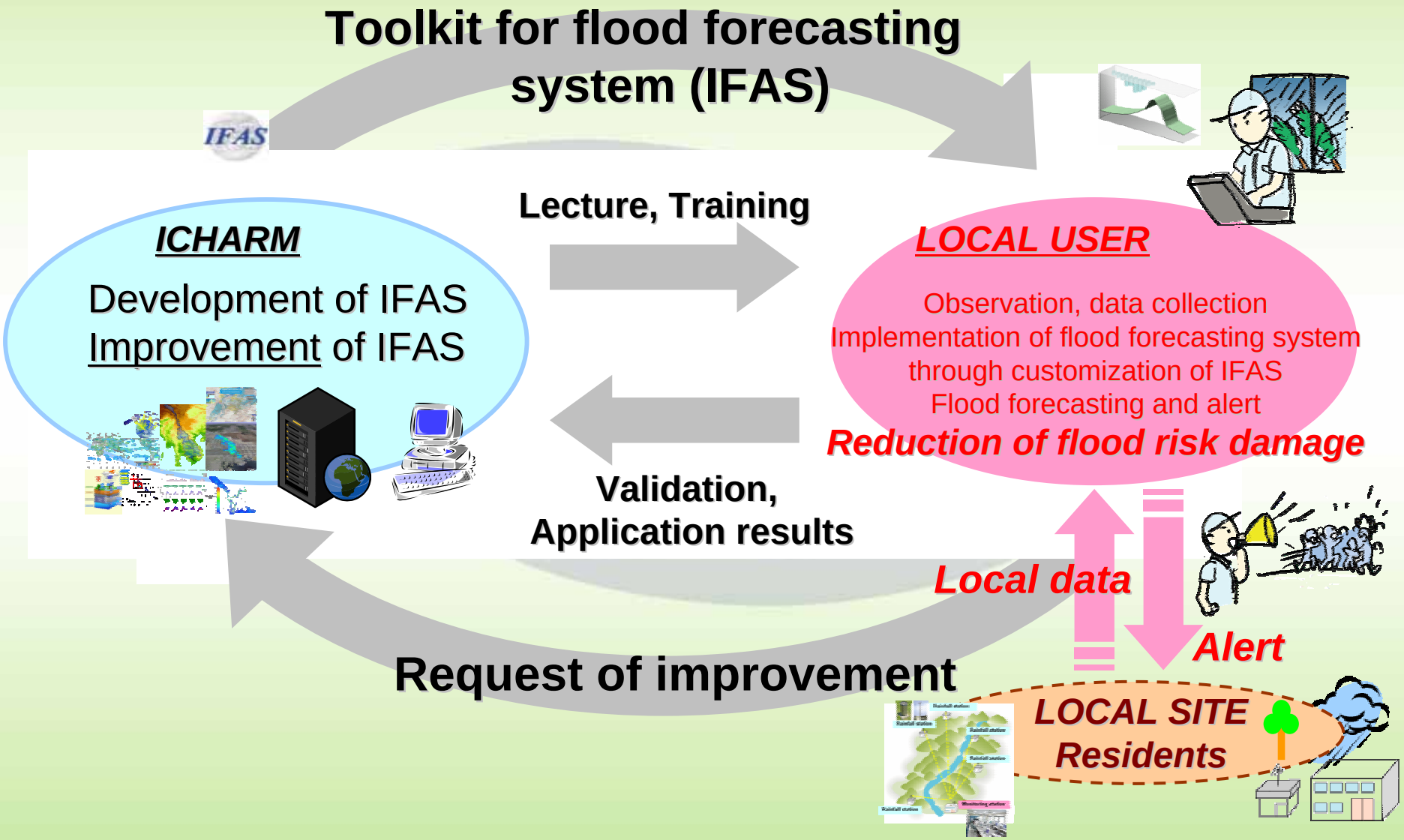
In alliance with partners (2)

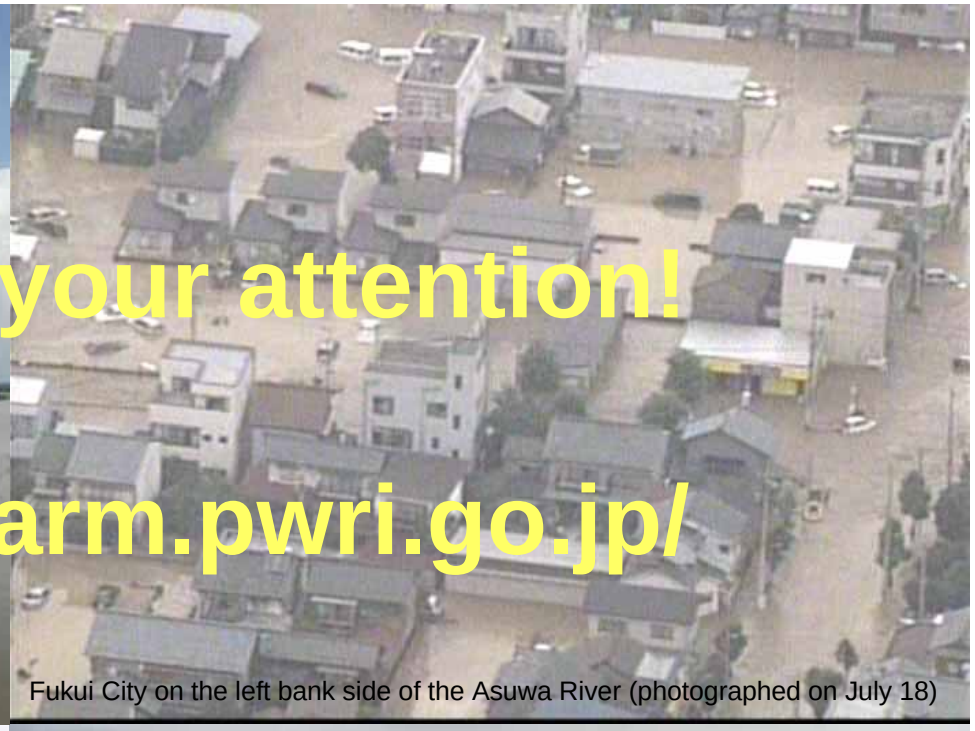
- IHE: Lecturers exchange
- RCUWM: Research collaboration on climate change impact
- ICWaRM: preparedness indices, IRBM
- NDRI, ICIMOD: GLOF, climate change adaptation, IFAS validation
- IRTCES/IWHR
- Eco-hydrology Center
- HTC, etc.

In alliance with partners (3)

- IFI
  - UNESCO, WMO, ISDR, UNU
- NARBO,
- Asian Water Cycle Initiative (AWCI)
- APRSAF- Sentinel Asia
- 5th ICFM (2011)
- IRBM, ICSU IRDR, etc.

An example of synergy of three-pillar activities of ICHARM:





Fukui City on the left bank side of the Asuwa River (photographed on July 18)

Thank you for your attention!

http://www.icharm.pwri.go.jp/

Fukui City on the left bank side of the Asuwa River (photographed on July 18)

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UNESCO International Hydrological Programme

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