ICHARM Action for Water & Disasters

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(ICHARM) 
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ICHARM  
International Centre for Water Hazard and Risk Management  
under the auspices of UNESCO hosted by PWRI, Tsukuba

Objective: To serve as the Global Center of Excellence to provide and assist implementation of best practicable strategies to localities, nations, regions and the world to manage the risk of water related hazards including floods, droughts, land slides, debris flows and water contamination 2007~
**ICHARM’s Philosophy:** Localism
Delivering best available knowledge to local practices

**Local Practices**

**Rainfall-Runoff-Inundation Forecasting in the Chao Phraya**

- **Purpose:** Understanding and predicting the flooding in Thailand at the entire Chao Phraya River Basin with RRI (Rainfall-Runoff-Inundation) Model.
- **Simulation Domain:** 163,293 km²
- **Simulation Period:** 2011/07/01 0:00 (UTC) – 2011/11/30 0:00 (UTC)
- **Input Rainfall:**
  - 3B42RT (Satellite Based Rainfall) (Every 3 hours, Spatial Resolution: 0.25 deg)
  - JMA- GSM Weekly Weather Forecasting (Forecasting Lead Time: 8 days, Update every 12 hours)
- **Topographic Data by HydroSHEDS 2012-2015**
Local Practices

Partnership Project with Asian Development Bank

Objective:
Reduced vulnerability and increased resilience in the face of water-related disasters in the Asia and Pacific region.

Collaborating partners
ADB, ICHARM

Executing Agency
Implementing Agency

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<th>Country</th>
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<td>Bangladesh</td>
<td>Country</td>
<td>☑ Technical support for improvement of current Early Warning System (EWS)</td>
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<td>☑ Capacity building of engineers and managers</td>
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<td>Indonesia</td>
<td>Bengawan Solo river</td>
<td>☑ Capacity building on local disaster management</td>
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<td>Cambodia flood plain</td>
<td>☑ Support Mekong River Commission (MRC) in developing flood vulnerability assessment</td>
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<td>☑ Development of investment project and ability improvement of communities</td>
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<td>Philippines</td>
<td>Pampanga, Cagayan rivers</td>
<td>☑ Capacity development training for flood assessment</td>
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<td>☑ Satellite-based flood alert system</td>
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Project period: November 13, 2009 to March 30, 2013 (3 years and 4 months)

IFAS Early Warning for insufficient observed basin

• Geological data for modeling (free)
• Elevation data, Land use data and soil data (free)
• Satellite-based rainfall data (free)

Input: Geological data, Elevation data, Soil data

Output: River discharge, Water level, Rainfall distribution

Evacuation Warning

Judgment by River managers

Alert message by E-mail and PC display
Reach to the warning level

Tech + Localism + Cap Build ➞ Better Combination 2011-2015
Local Practices

Integrated Flood Analysis System

Solo river in Indonesia

Target Area: Solo River
River basin Area: 16,100 km²
Length: 540 km

Cagayan river in the Philippines

27,280 km²
5 rainfall stations
5 water level stations

Gamu station

Presently, IFAS is linked to ground observation station

IFAS results at Gamu station

Local Practices

Damages Assessment in Cambodian flood plain

Calculation

Water depth / duration distribution
Relative water depth with average flood level

Damage curves

Cultivation starting date

Agricultural damages

House damages

Agricultural damages

House damages

Damage curves

Results
**Local Practices**

Basic methodology from GCM rainfall to flood impact assessment under Climate Change situation

- Various GCM experimental on future/current climate
- Various scenario
- Downscaling/ Bias correction
- Uncertainty assessment
- Basin scale rainfall information
- Hydrological models IFAS / RRI
- Prediction of discharge variation
- Uncertainty assessment
- Prediction of water level variation
- Uncertainty assessment
- Prediction of water depth variation
- Socio-economic impact assessment
- Flooding frequency map
- 1/10, 1/25, 1/50 FHM
- Flood risk
- Drought risk
- Water resources assessment, water stress, risk partition
- Disaster Risk monitoring indices

2011-2015

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**Local Practices**

“Local cooperation and responsive type practice”

Research on Climate change impact assessment

PWRI-ICHARM

Development of Basic technologies for river basin scale impact assessment.
- Locally customized hazard assessment.
- Uncertainty assessment (CMIP5)
- Socio-economic impact assessment (floods • drought)
- Vulnerability monitoring system

Impact assessment for specific vulnerable areas:
- Hazard, socio-economic impact mitigation measures
- Socio-economic impact assessment
- Including uncertainty
- Necessary information for local adaptation

Indus  Chao Phraya  Mekong  Solo  Pampanga

Fund from MEXT, Japan

MRI  PMD  RID/TMD  BBWS  PAGASA  UNESCO  JICA  MRC  ADB  others.