

GEOSS ASIAN WATER CYCLE INITIATIVE (AWCI) – Sri Lankan platform for Water and Disasters

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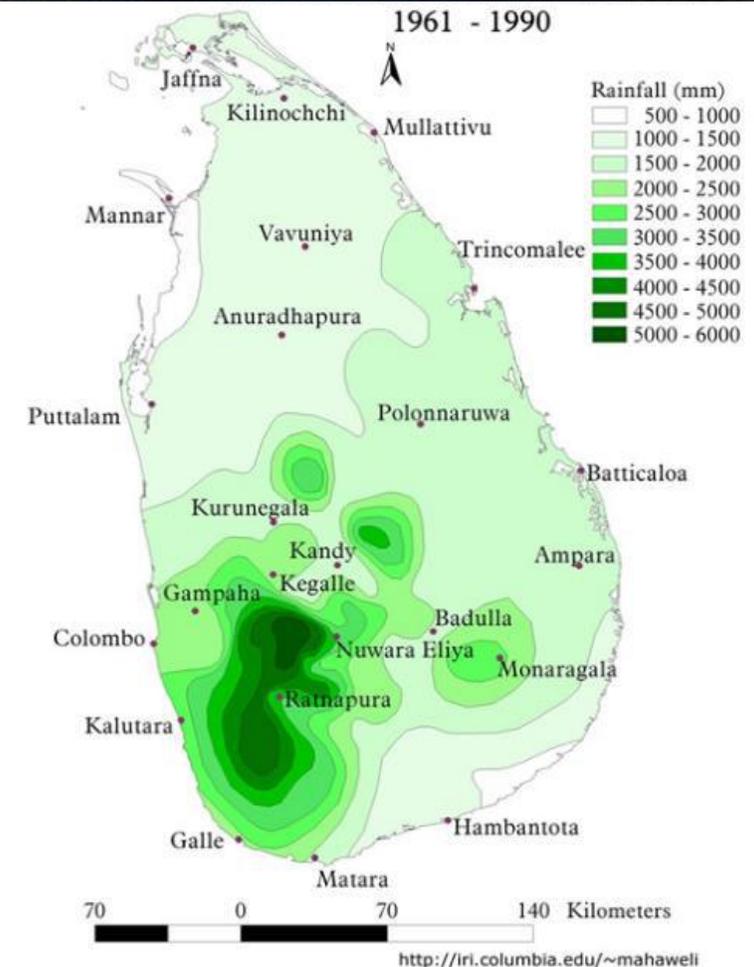
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Sri Lanka - An Overview



- ❑ Small Island - land area - 65640 Km²,
- ❑ High Annual Average Rainfall from 1000 mm to 5000mm,
- ❑ Higher rainfall zone located in the South Western region,
- ❑ River System is in radial directions starting from central hills and runs towards the sea,
- ❑ Totally 103 river basins,
- ❑ Flood Disasters can be found in almost everywhere,
- ❑ 25 river basins are identified as most vulnerable for floods.

- 2016 in Kelani: \$US 370 million
- Annual expected damages: \$US 100 to 150 million



Recent Flood during May 25th 2017



Ratnapura town under Kalu ganga Floods



Gin ganga Floods

Recent Flood during May 25th 2017



Land Slides at Bulathsinghala



Nilwala floods

Recent Flood in Gin Ganga during May 2017





Flood Damages



Nilwala Flood bund over topping- 2017 Flood



Flood Damages - Flood Protection Bunds



Southern Highway



A few points about Floods and Flood Mitigation:

1. Floods are caused by extreme rainfall
2. Climate Change: more frequent, more extreme
3. Investment in Flood Mitigation
 - Reduce probability of floods, reduce damage from floods
 - Cannot eradicate floods completely
4. Need a Flood Mitigation Strategy which includes:
 - Structural interventions
 - Non-structural interventions
 - Flood forecasting, flood warning and response systems

Inter-disciplinary corporation in Flood Management

- Sri Lanka has adopted **Sendai Framework for Action** for building disaster resilience and preparing an Action Plan combining all the stakeholders including **Irrigation Department**.
- Disaster Management Center – for overall coordination, providing relief and rescue operations (Disaster Management Act, 2005)
- Irrigation Department is responsible for planning and implementing flood mitigation measures, flood forecasting and early warning.
- Other stakeholders such as local authorities, local administrative setup, NGOs such as Red Cross, UNORCHA, etc. also take active part in flood management.
- Irrigation Department plays a key role including the role of technical advisor to other stakeholders.

Trans-disciplinary corporation in Flood Management

- Irrigation Department (ID) has initiated the Climate Resilience Improvement Project (CRIP) under the World Bank funding. CRIP-DBIP: A comprehensive project for improvement of Climate Resilience
 - 10 river basins , mitigating the impact of both Flood and Drought
- Dam Safety and Water Resources Planning (DSWRP) Project, which also under world bank funding.
- Improvements to Hydro-meteorological Information System (HMIS) as the component II of DSWRP project.
- Pilot project under SAFE initiatives for modernizing early flood warning. Under this ICHARM agreed to train ID engineers in flood management.
- Irrigation Department has initiated corporation with Japanese, Thailand, Netherlands, Korean, Chinese and many other international organizations in the field of Flood Management.



DATA LOGGER

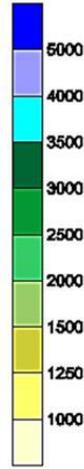
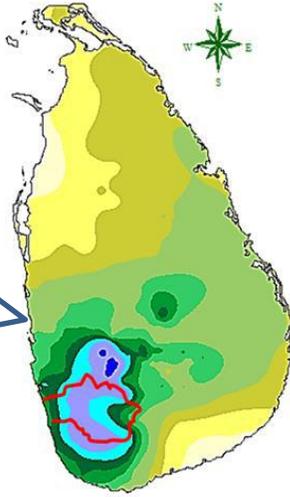


HMIS INSTALLATION WORK

Trans-disciplinary corporation in Flood Management

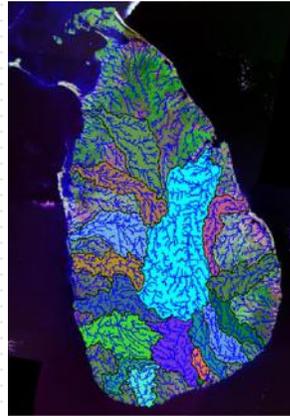
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High rainfall throughout the country



Background for the SAFE Project

Extensive River network



Good river stage monitoring system



Ratnapura 1st June 2003



Kelani Floods in May 2016



Ratnapura town June 2014

Background for the SAFE Project

- Sri Lanka is highly a flood prone country
- Flood experiences in almost all the river basins
- 25 major river basins out of total 103 river basins are vulnerable for floods.
- Fairly good river stage monitoring system for floods, and flood warning is mostly based on river stage monitoring.
- Rainfall-Runoff models are rarely used instead of Kelani River.
- Inundation models are still not used in Sri Lanka for flood warning.
- There is question whether flood warning is practiced in Sri Lanka up to required level....?

The project is inaugurated at the Kick off meeting held at Irrigation Department Head Office in Colombo in 18th January 2016

Expectations of Stakeholders

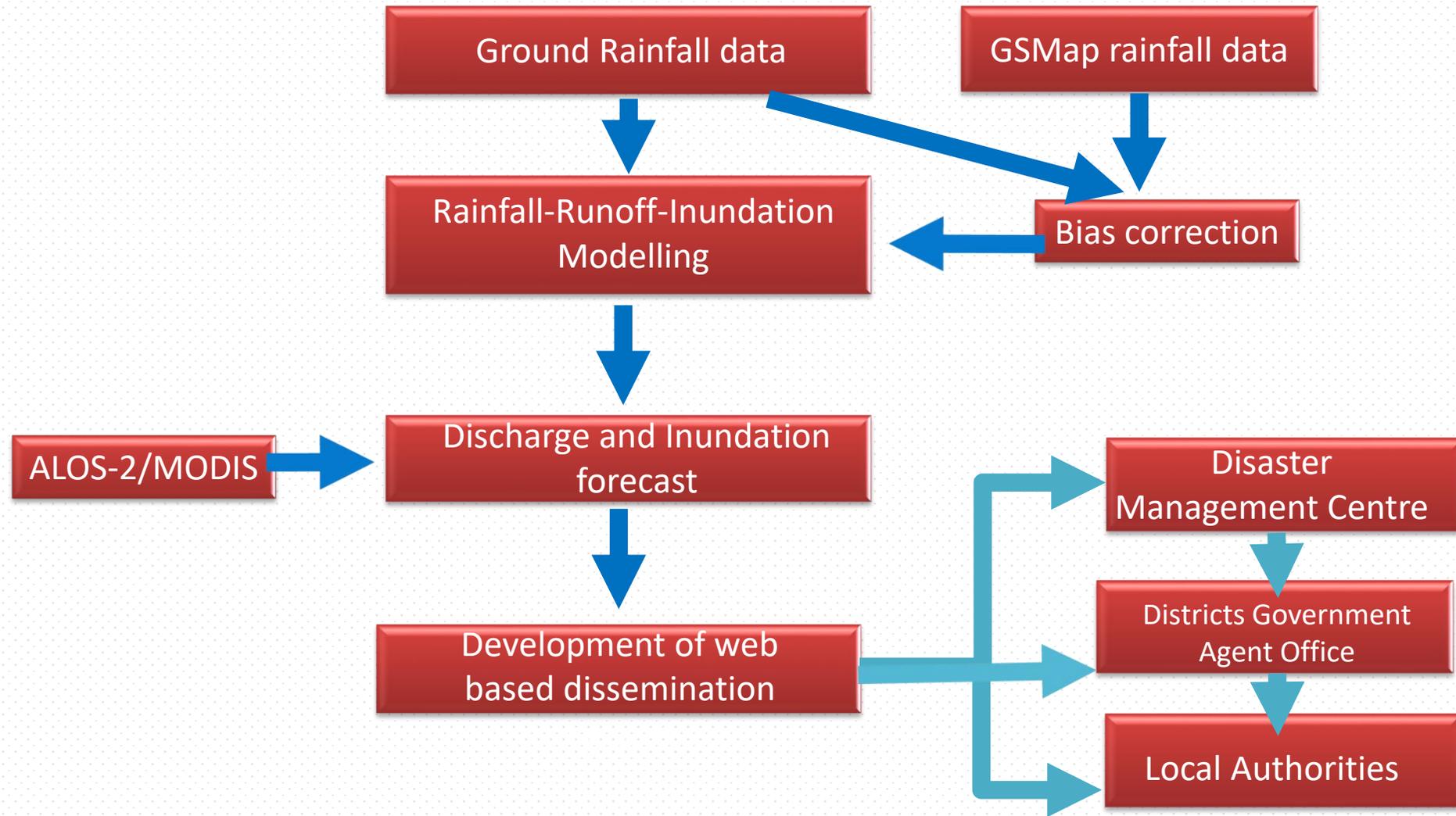
- Prior Flood Warning Message
- Reasonable lead time for the warning message
- Expected highest water level at the nearest water level gauge
- Possible inundation area map
- Web system or mobile app system for dissemination the message
- System shall cover not only the main river but the river branches too



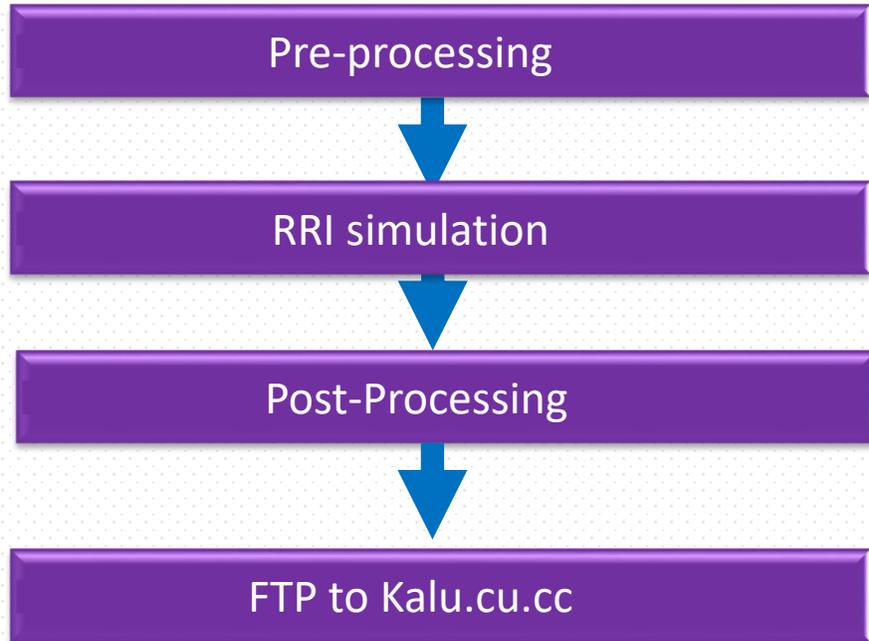
Objectives of the Project

1. Development and implementation of an advanced operational prototype system for **flood forecasting and early warning** by utilizing **in-situ** and near-real time satellite (**GSMaP**) observations and rainfall-runoff-inundation models.
2. **Capacity building** for staff of Irrigation Department and practitioners to enhance practical know-how and scientific knowledge.
3. Development of **data and output sharing and supporting system for disseminating** real-time information for beneficiary agencies and to the public.

Methodology for Early warning system under SAFE



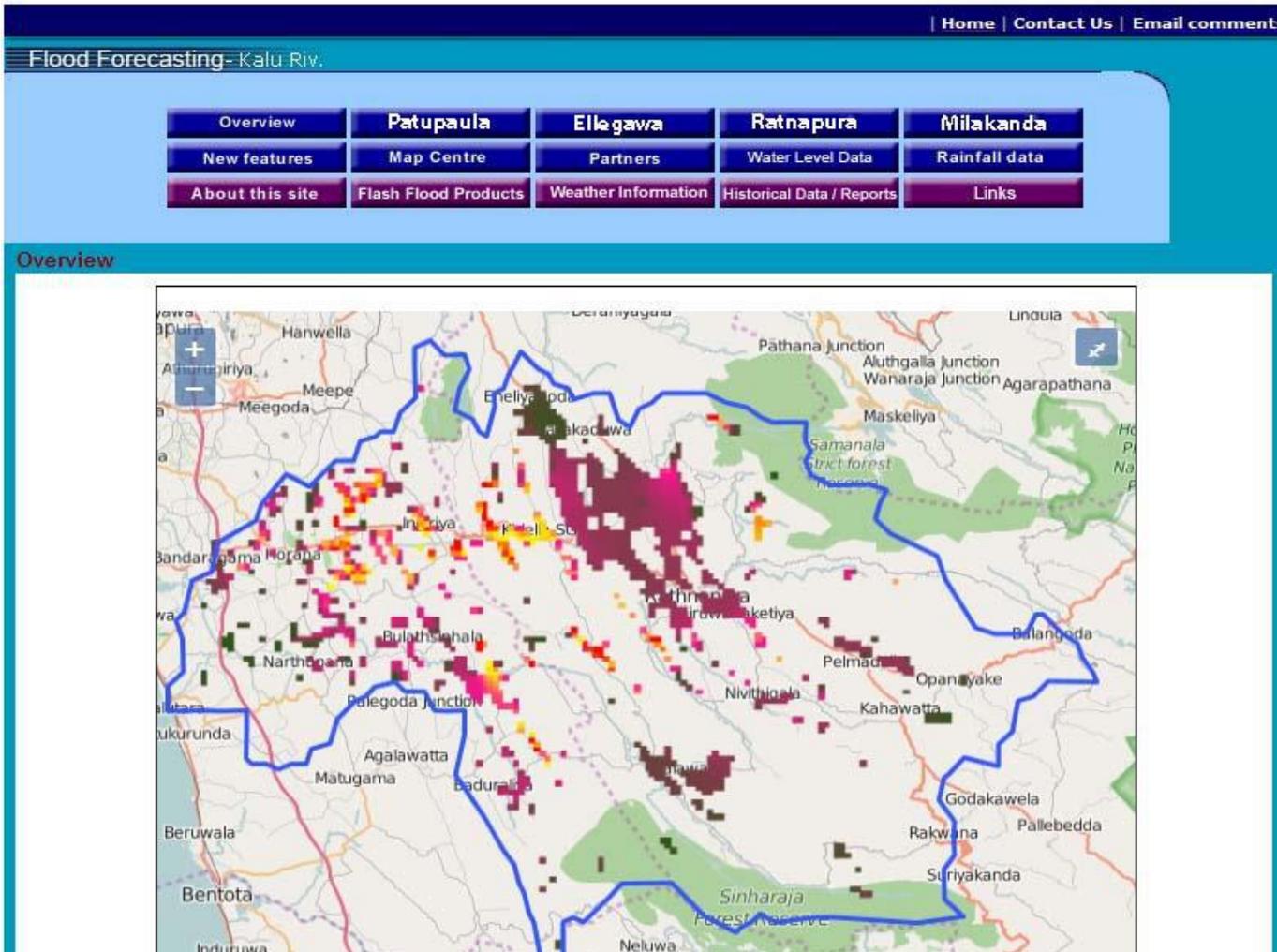
Flow chart of NRT Flood Forecasting system



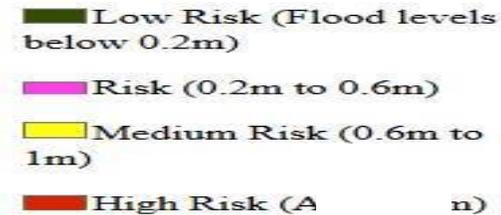
Cutting Edge Technologies Used

- DOS based Batch file for Automation
- Fortran coding and Gnuplot for post processing
- HTML
- KML
- JavaScript
- Openlayers (Java Script Library)

GSMaP NRT based simulation



- Could be used either with GSMaP or ground rainfall data
- Duration and start date automatically decided
Bias corrected GSMaP data provided
- Inundation map created at runtime.
- Dynamic with rime and scale.



Puttapaula	70	39	250	400
Ellegawa	41	75	100	250
Ratnapura	52	117	50	180
Milakanda	57	63	200	350

Alarming
Flooding

Location.txt for alarming and flood alerts

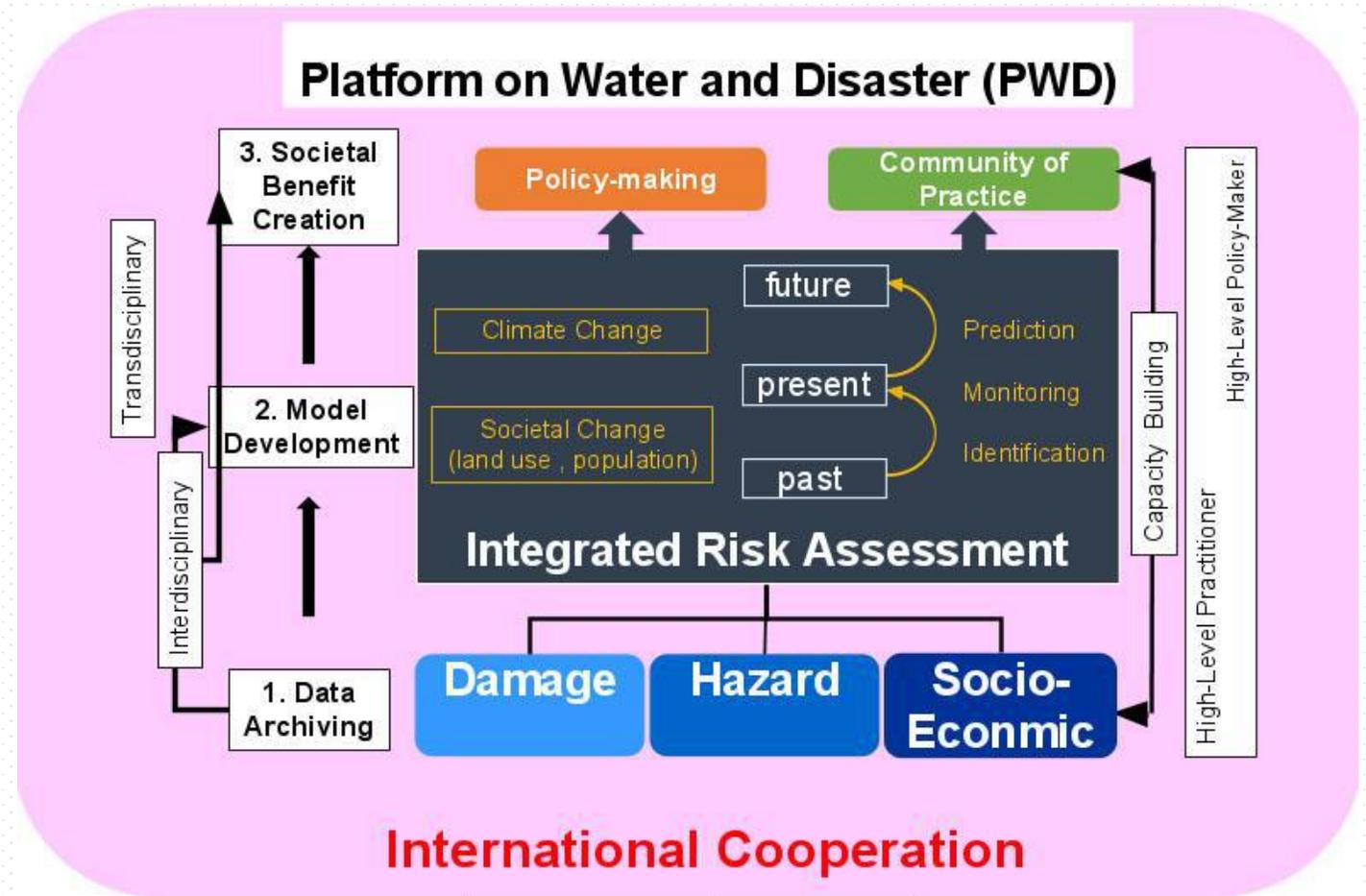
International Flood Initiative (IFI)

- International Flood Initiative (IFI) established a Platform on Water and Disasters in each country and has launched its activity.
- Plenary Session for the Platform on Water and Disasters were held at Irrigation department on 24th August 2017.



Organizations in the platform

- Irrigation Department(ID)
- Metrology Department(DOM)
- National Building Research Organization(NBRO)
- Disaster management Center(DMC)
- Survey Department(SD)
- Megapolis and Western Development (MMWD)



Target actions and agencies involved

- Early warning
ID,NBRO,DOM
- Adaptation planning for global change
ID,MMWD
- Economic effect of disasters
MMWD,DMC
- Contingency planning and mainstreaming DRR
DMC

Final discussion and training on automation of Early warning system during 28th to 30th August 2017



A person in a red shirt is paddling a white canoe on a large, calm blue lake. The water is still, reflecting the sky and the surrounding forested hills. In the distance, another small boat is visible on the water. The overall scene is peaceful and scenic.

Thank you