United Nations
Educational, Scientific and
Cultural Organization

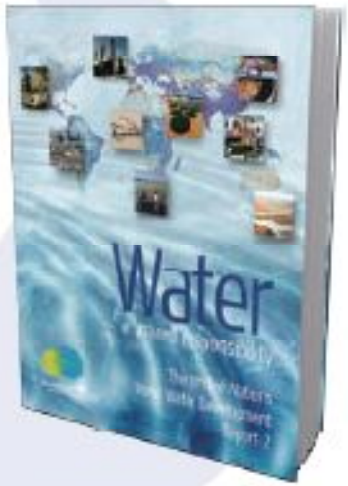
7th International Coordination Group (ICG) Meeting, GEOSS Asian Water Cycle Initiative (AWCI) , Tokyo, Japan, 5-6, October 2010

Capacity Building Activities at UNESCO-ICHARM

Kazuhiko FUKAMI

On behalf of K. Kudo, S. Tanaka and K. Takeuchi

International Center for Water hazard and Risk Management under the auspices of UNESCO (UNESCO-ICHARM), Public Works Research Institute



UN WWDR II (2006)

- Flood risk analyses in diverse localities in developing countries
- Development of flood warning systems that use satellite observations and other advanced technology
- Development of flood hazard mapping procedures able to meet various environmental and social conditions
- Development of community water hazards risk aversion systems with advanced flood warning and flood hazard maps as available means
- Promotion of basic research on hydrological measurement, analysis, and forecast to support ICHARM activities
- Participation in international research programs such as World Water Assessment Programme, International Flood Initiative, Group of Earth Observations and Predictions in Ungaged Basins

Research

Data

Results

Curriculum

Participation

Flood Hazard Mapping Training

Information networking

Knowledge

Network

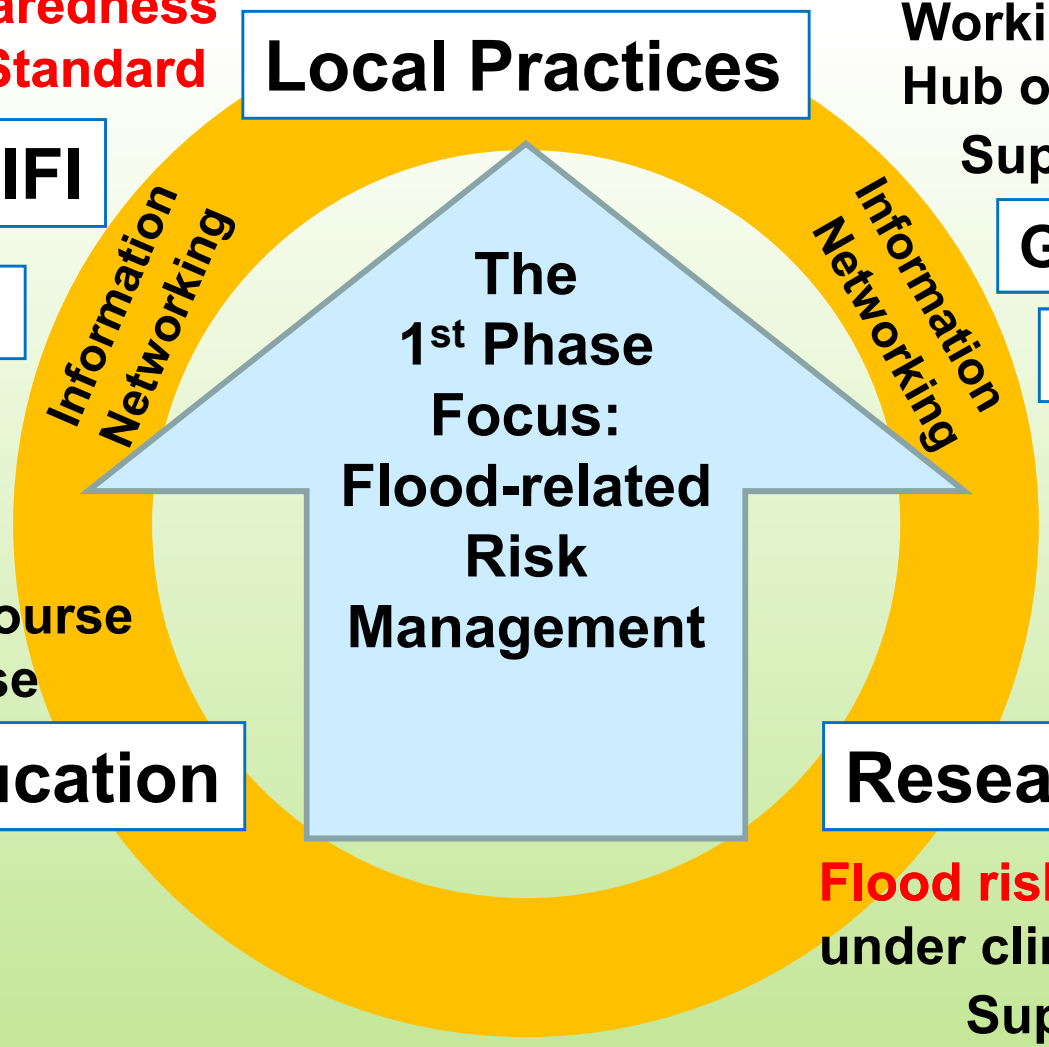
- Creation of a worldwide and inter-disciplinary network of practitioners, researchers and course graduates in the field of integrated water risk management
- Collection, analysis and dissemination of information and experiences regarding water-related disasters worldwide
- Timely organization of investigation teams when catastrophic water hazards occur
- Organizing and sponsoring workshops and symposia

Training

- Training courses on practical risk reduction systems incorporating existing social diversities, for public officers and decision makers
- Human resources development for integrated flood risk management in cooperation with universities and related institutes worldwide
- Training courses of flood hazard mapping and river and dam engineering for researchers and engineers
- Providing follow-up activities for course graduates in their home countries

ICHARM's Challenge: **Localism**

Delivering best available knowledge to local practices



UNISDR GP-GAR

Flood Preparedness Indicators/Standard

IRDR

UNSGAB-HLEP

IFI

WWAP, AWDO

WWF, APWF

Working as a Knowledge Hub on WD through RETA Supported by ADB

GEOSS-AWCI

Sentinel Asia

IFNet/GFAS

Integrated Flood Analysis System (IFAS)

Master Course

Hazard Mapping Course

River & Dam Course

Supported by JICA

Ph.D. Course

Flood risk assessment under climate change Supported by MEXT

Capacity Development Programs

- **Short training courses**
  - Flood hazard mapping (FHM) course (2004-2008, JICA)
  - Local disaster operation plan with FHM (2009-, JICA)
  - River and Dam engineering course (1973-, JICA)
  - Comprehensive Tsunami training (2008, UNISDR)
- **Aftercare program** for implementation at trainees local communities (2006-, JICA)
  - KL, 2007; Guangzhou, 2008; Manila, 2009; Hanoi, 2010
- **Master Course on Water-related Disaster Management** with National Graduate Institute for Policy Studies (GRIPS) supported by JICA since October 2007
  - 10 students from Bangl., China, India, Nepal, Japan (2008)
  - 8 sts Bangl., China, Indns, Nepal, Ethiopia, Thai. (2009)
  - 12 students (2010), 12 enrolled (2011)

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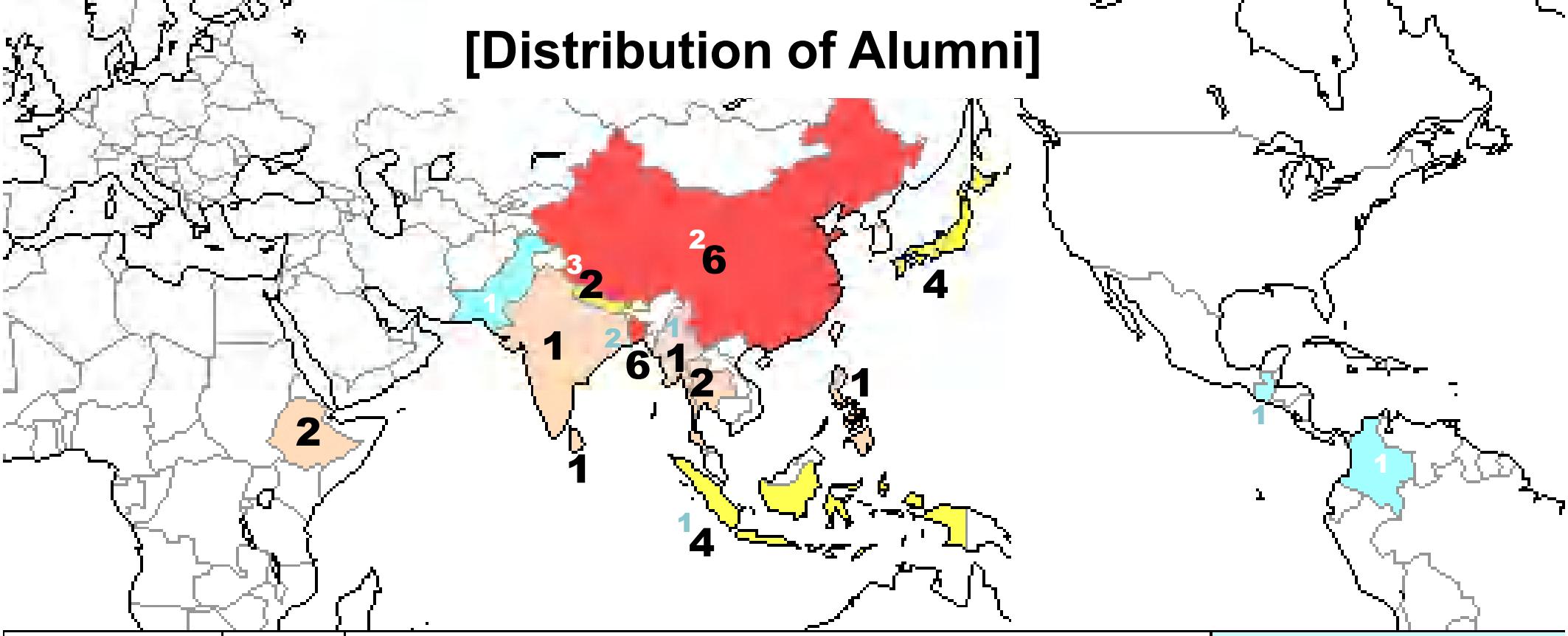
[Distribution of Alumni]

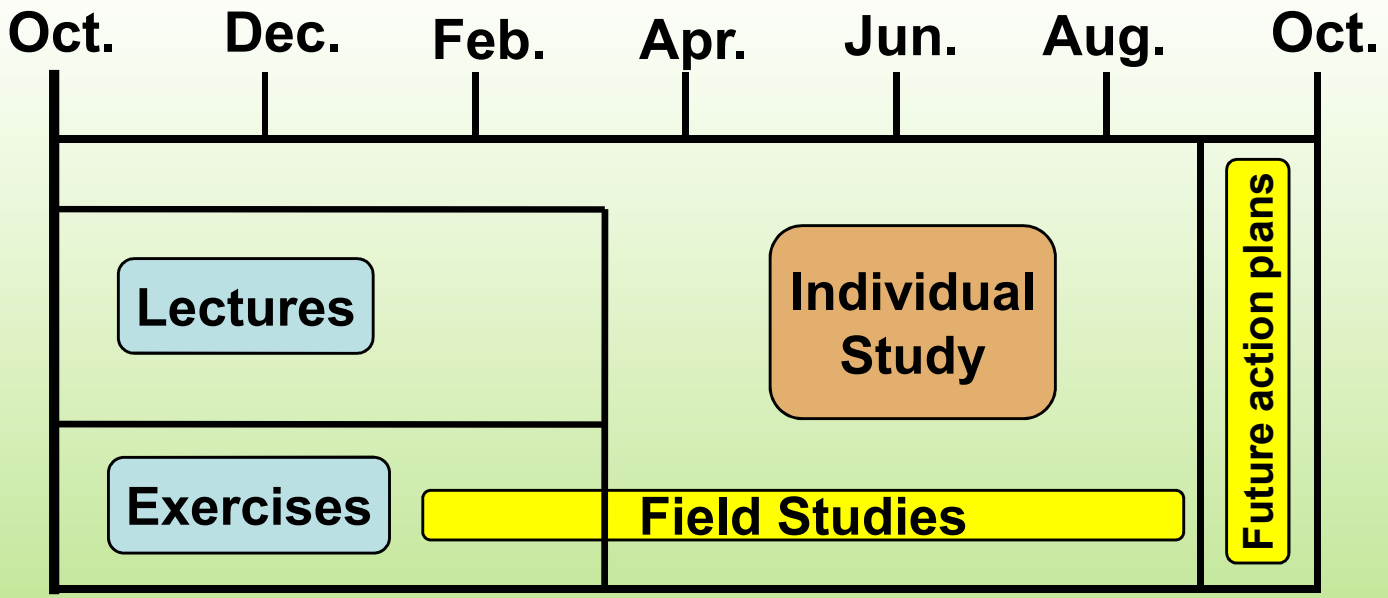


Country	Total	Organization	New Nations from 2010
Bangladesh	6	Bangladesh Water Development Board	Pakistan
China	6	Bureau of Hydrology, Ministry of Water Resources, etc.	Nicaragua
Ethiopia	2	Ministry of Water Resourse, Dire Dawa University	Columbia
India	1	Water Resource Dept., Govt. of Assam	
Indonesia	4	Ministry of Public Works	
Nepal	2	Department of Water Induced Disaster Prevention	
Myanmar	1	Ministry of Agriculture and Irrigation	
Philippines	1	Department of Public Works and Highways	
Sri Lanka	1	Department of Irrigation	
Thailand	2	Royal Irrigation Department, Ministry of Agriculture and Cooperatives	
Japan	4	Consulting companies, Japan Water Agency	

Master Course on Water-related Disaster Management

with National Graduate Institute for Policy Studies (GRIPS)
supported by JICA since October 2007

- 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 water resources management at national to local levels.



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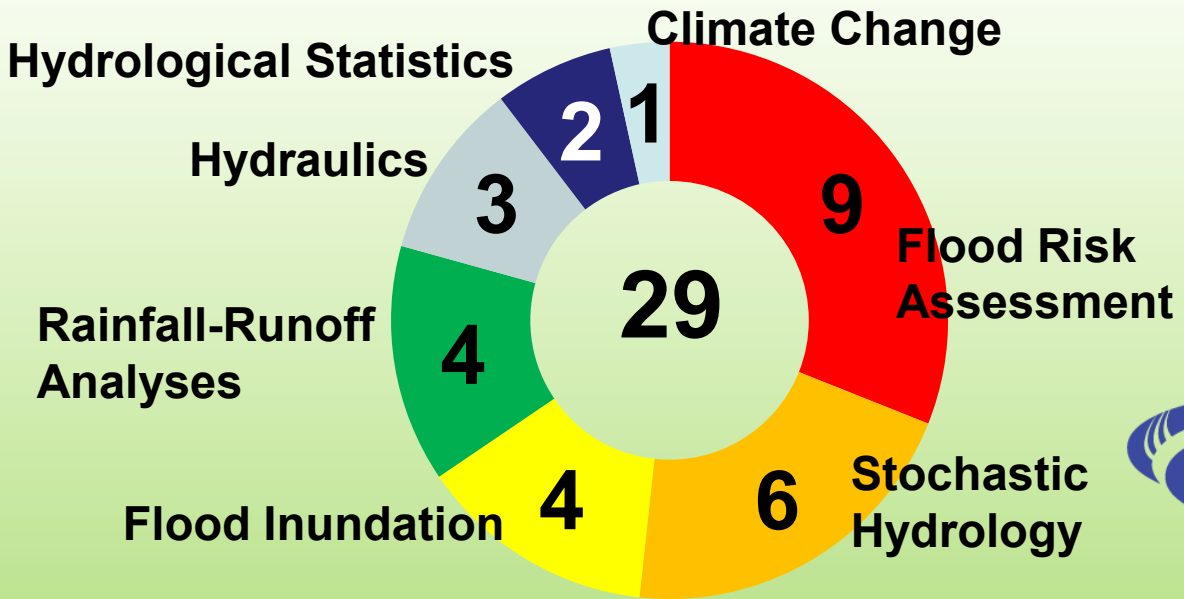
[Curriculum]

Category		Course
Basic Study	Management Basis	Disaster Mitigation Policy
		Disaster Risk Management
		Integrated Flood Risk Management
	Engineering Basis	Computer Programming
		Hydrology (Basic, Advanced)
		Hydraulics (Lecture & Practice)
Application	Management Application	Local Disaster Management and Hazard Mapping
		Practice on Local Disaster Management Plan
	Engineering Application	Urban Flood Management
		Flood Hydraulics and Sediment Transport
		Mechanics of Sediment Transportation and Channel Changes
		Dam Development & Management
		Sabo Development & Management
		Practice on Flood Hazard Modeling & Flood Forecasting

[Themes of Master's Thesis]



Ph.D. course starting Oct 2010

- Foster researchers who can guide and supervise researchers and research projects on water-related disaster risk management
- **Half work and half study**
- Publication of at least two papers in peer reviewed international journals from dissertation studies

TRAINING WORKSHOP FOR THE GLOBAL FLOOD ALERT SYSTEM (GFAS) VALIDATION

3-8 Oct 2008, 3-7 Aug 2009 JAPAN

Objective

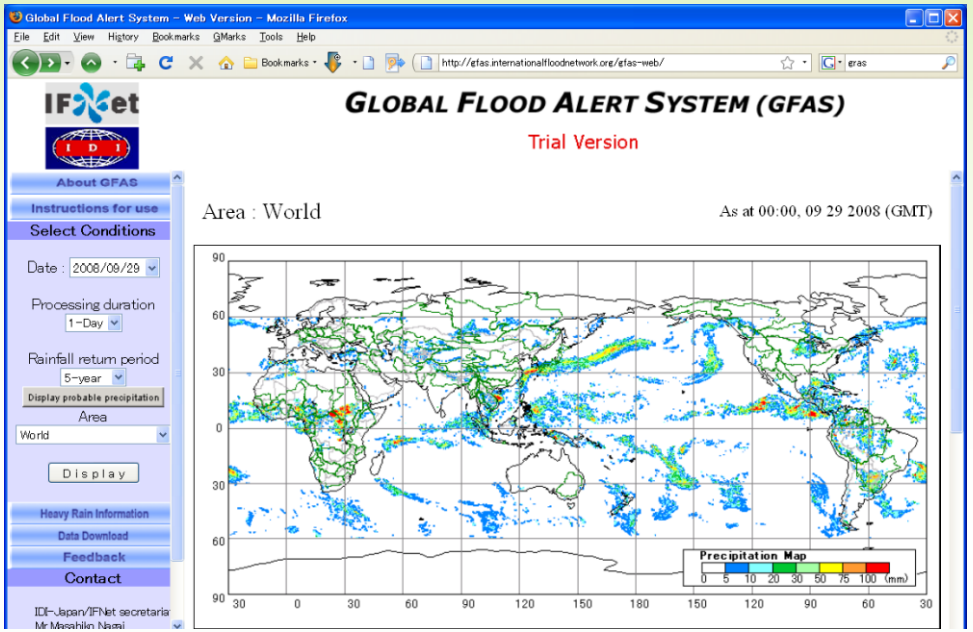
- Capacity development for local practitioners to validate GFAS-rainfall and translate it to GFAS-streamflow **(IFAS)** in ungaged or poorly gaged basins.

Participants from

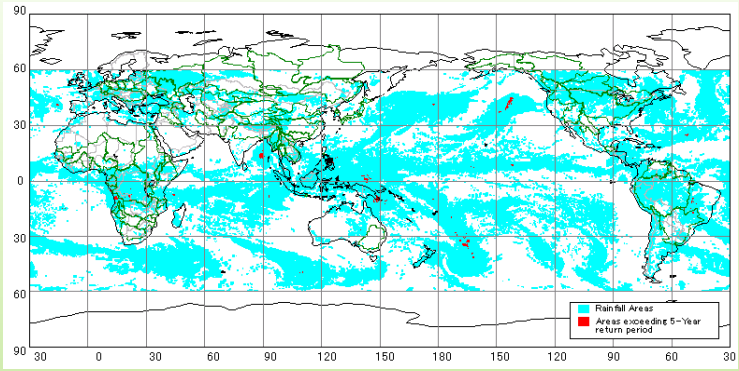
- **2008: Ethiopia, Zambia, Cuba, Argentina, Bangladesh, Guatemala, Nepal**
- **2009: Bangladesh, India, Indonesia, Laos, Nepal, Vietnam**
- **2010: In Hanoi, Myanmar, Nepal,**

GFAS - Rainfall

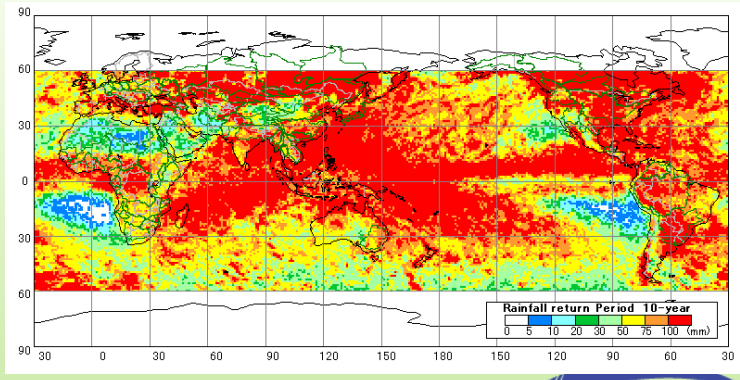
http://gfas.internationalfloodnetwork.org/gfas-web/



Real-time Map (every 3 hour)



Real-time estimation of rainfall areas Exceeding 10- (or 5-) Year Return Period



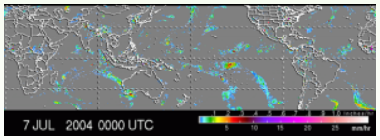
Pre-analyzed rainfall distribution exceeding 5 or 10-year return period

Integrated Flood Analysis System IFAS

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

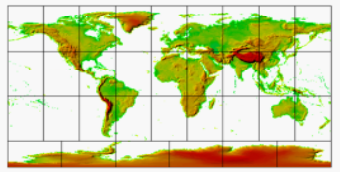
Global observation of rainfall by earth observation satellites

Satellite-based near real-time rainfall data

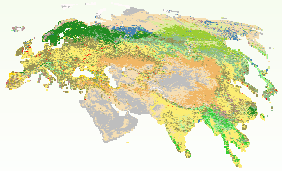


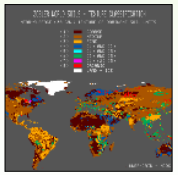
Ex.) IFNet-GFAS, NASA-3B42RT, JAXA-GSMaP

Topographic data



Other GIS data for runoff mode (Land use, soil, etc.)

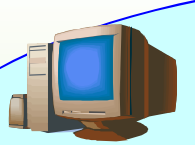




Data download through Internet, free of charge

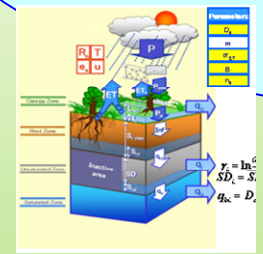
Flood disaster prevention & mitigation

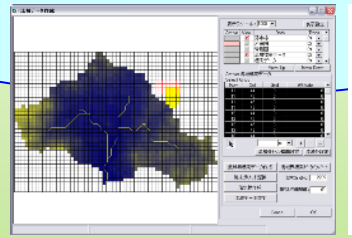
Flood forecasting & warning

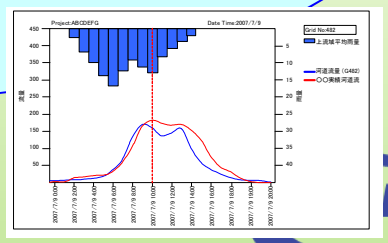


IFAS *(A basis for flood forecasting/warning system)*

Real-time input: Satellite & ground rainfall
GIS data input for setting parameters
GIS analysis to build runoff model
Runoff analysis and flood simulation
User-friendly interfaces for output







<u>Current situation</u>

Despite of the needs for flood forecasting/warning,
No rainfall, GIS data, nor analytical tools
→ Required much money & time for implementation

After the application of IFAS:
Prompt & efficient implementation
No need to develop original core system
Step-by-step improvement of accuracy with hydrological observational network

HARM

1st IFAS Seminar in Myanmar under Flood WG of Sentinel Asia (APRSAF-JAXA)

June 22-24, 2010

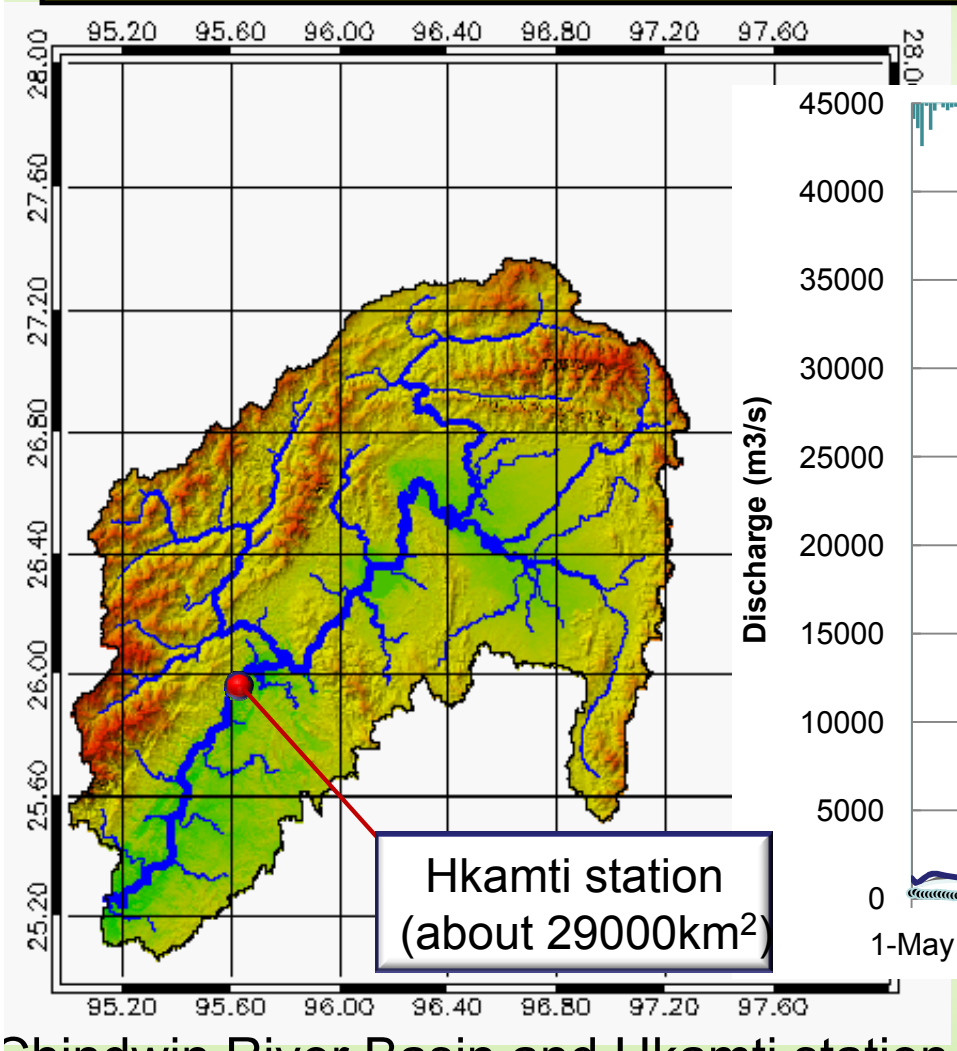
Venue:

Department of Meteorology and Hydrology,
Ministry of Transportation,
Nay Pyi Taw , Myanmar

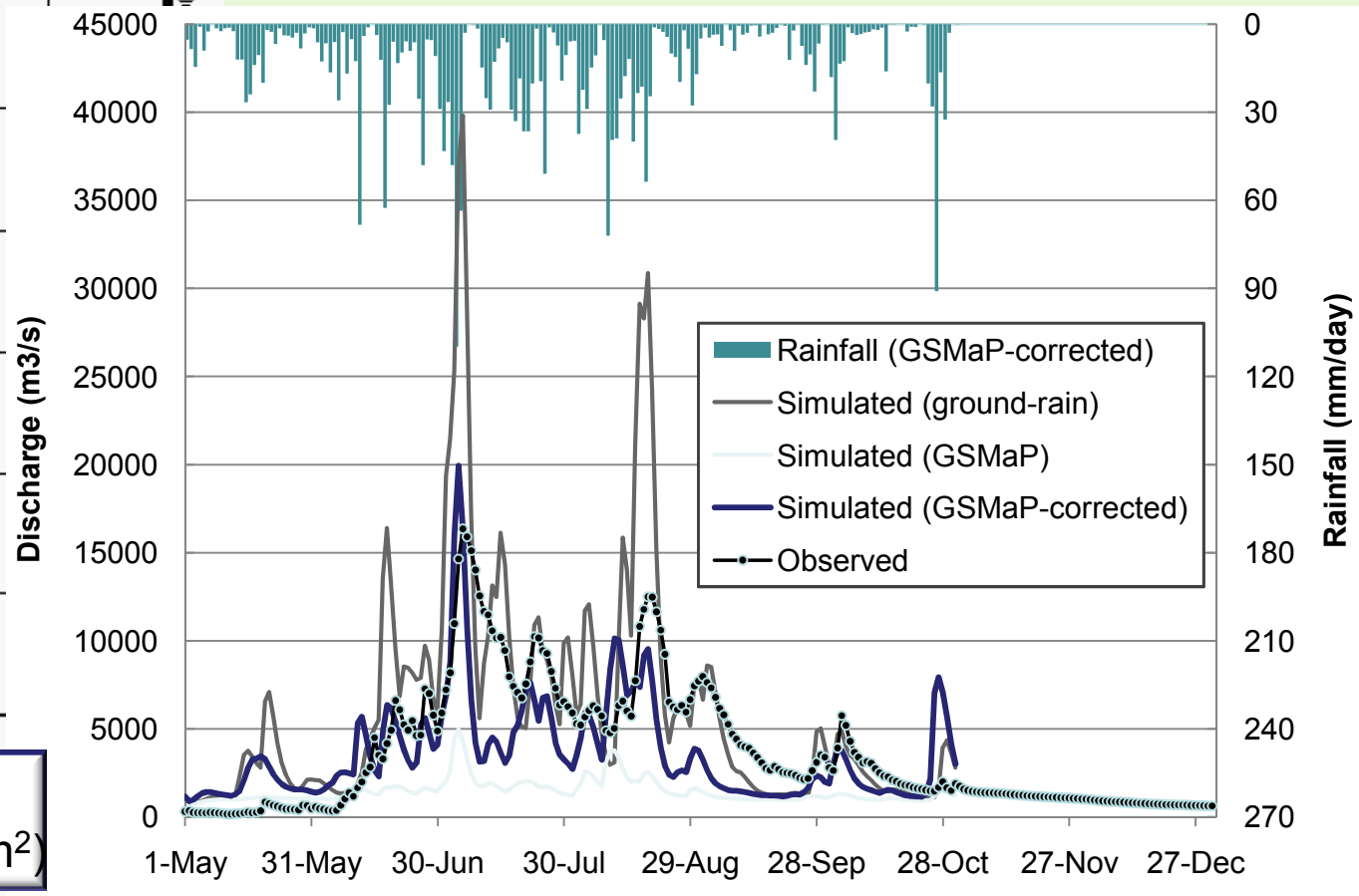
Participants: 15

22 Jun (Tue)	
9:00～10:20	Opening Ceremony
10:40～12:00	(1) Introduction of Sentinel Asia (2) Introduction of GFAS
13:00～14:30	Flood hazard in Myanmar etc.
15:00～16:30	Flood forecast and hydrological observation in Japan
23 Jun (Wed)	
9:00～10:20	Introduction of GFAS IFAS and satellite-based rainfall
10:40～12:00	Demonstration of IFAS
13:00～14:30	IFAS install IFAS training using demo data (1)
15:00～16:30	IFAS training using demo data (2)
24 Jun (Thu)	
9:00～10:20	IFAS training about Myanmar area (1)
10:40～12:00	IFAS training about Myanmar area (2)
13:00～14:30	IFAS training about Myanmar area (3)
15:00～16:30	IFAS training about Myanmar area (4) Ending Remarks

Preliminary runoff analysis at the Hkamti Station in the Chindwin River, using IFAS



Chindwin River Basin and Hkamti station



Comparison of observed discharge and simulation results by IFAS

As for simulation results for HY2008 at the Hkamti station, the application of the self-corrected GSMaP_nRT showed the highest accuracy.