WMO/ESCAP Typhoon Committee (TC) and activities under TC framework including Flood Hazard Mapping

Katsuhito MIYAKE

Chair, Working Group on Hydrology, TC
Director, First Investigation Div., Japan Water Resources Environment Technology Center

25 Jan. 2005

General info. on TC

Typhoon Committee (TC)

- Established in 1968 under the auspice of WMO and UN/ESCAP
- A subregional network *for effective cooperation in Typhoon-related natural disaster reduction*
- A broad network involving related agencies/personnel in member countries: *to support preparedness and warnings against Typhoon-related disasters*
- Membership has increased from 7 to now 14: *Cambodia; China; DPR of Korea; Hong Kong, China; Japan; Macau; Malaysia; Lao PDR; Philippines; Republic of Korea; Singapore; Thailand; United States; Viet Nam*
- TC Secretariat has been housed by PAGASA, the Philippines – will be moved to Macao, China next year

Three major components of TC

- Meteorological component
- Hydrological component
- Disaster Prevention and Preparedness (DPP)

And two cross-cutting components

- Training
- Research

Responsible Agencies in Japan

- Meteorological Component ; Japan Meteorological Agency (JMA)
- Hydrological Component; River Bureau, MLIT
- DPP Component; Cabinet Office

This way, in each member three types of agencies take charge of TC matters

TC activities

- Activities mainly driven by each component/working group – Workshops, etc., keeping interaction with other components
- Cross-cutting and ad-hoc activities

All TC activities are reported to and discussed at TC Annual session

- Sep. 2005 – WGH WS in Kuala Lumpur, Malaysia
- Nov. 2005 – 38th Annual TC Session in Hanoi, Viet Nam

(In 2006, Philippines will host the next session)

Linkages among components

- Re-formulation of TC activities is ongoing to ensure better linkage among three components.
- For Hydro. Component – especially close action-oriented collaboration with newly established DPP component is necessary.

Regional Cooperation Projects driven by TC HC

Regional Cooperation Program Implementation Plans (RCPIPs)

- Core of substantial activities of TC aiming to achieve concrete outputs
- Each program is led by volunteer country and participated by other interested members
- *Each pgm. normally to be extended for 4-5 years*

Ongoing RCPIC Projects related to HC (1)

1. *Pilot project on the preparation of Inundation and Water-related Hazard Maps.* *Japan*
2. *Pilot project on the establishment on flash-flood warning system (including debris flow and landslides).* *Japan*
3. *Development of guidelines for the dam operation in relation flood forecasting.* *Korea*
4. *Evaluation and improvement of operational flood forecasting system focusing on model performance.* *Korea*

Ongoing RCPIC Projects related to HC (2)

5. *Extension of flood forecasting systems to selected river basins.* *China*

6. *Project on the evaluation and improvement of hydrological instruments and telecommunication equipment.* *China*

7. *On-the-job Training on Flood Forecasting between TC members.* *Malaysia*

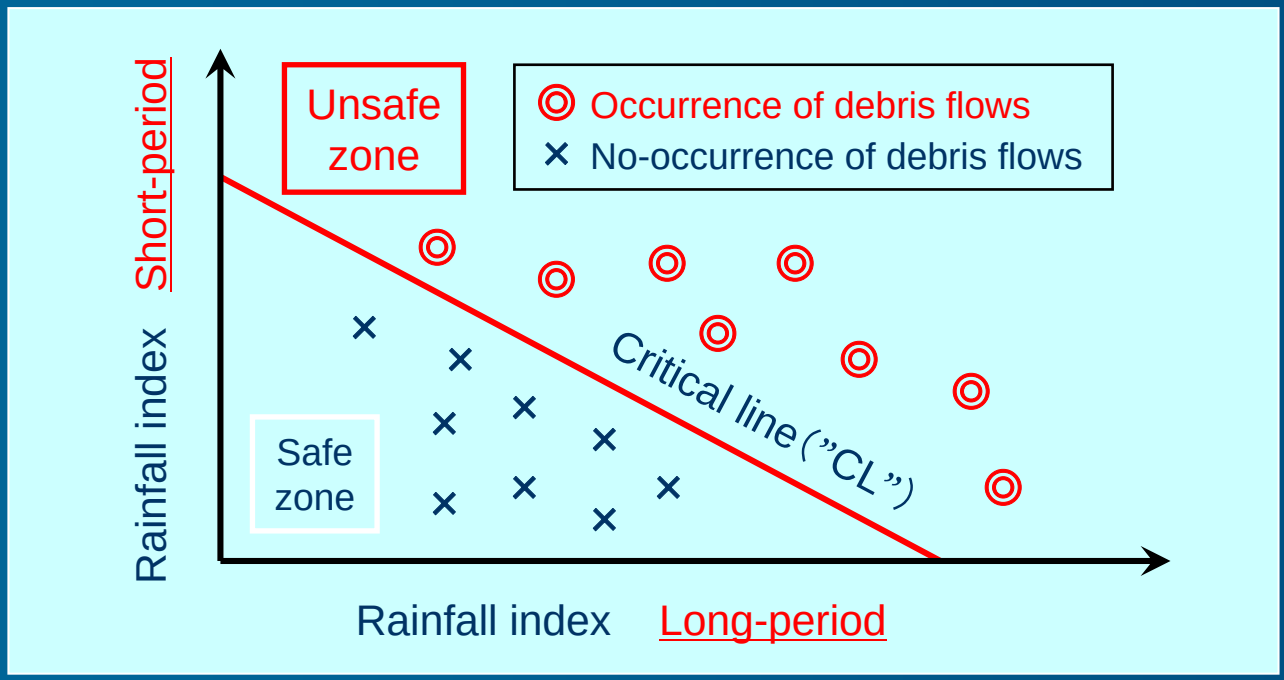
8. *Pilot project on the establishment of community-based flood forecasting system,* *Philippines*

9. *Improvement of Hydrological products in response to user needs.* *Philippines*

Project on flash flood warning incl. debris flow and landslides

- Leading Country: Japan
- Project period: 2002-2005 (initial) - will be extended for a few more years

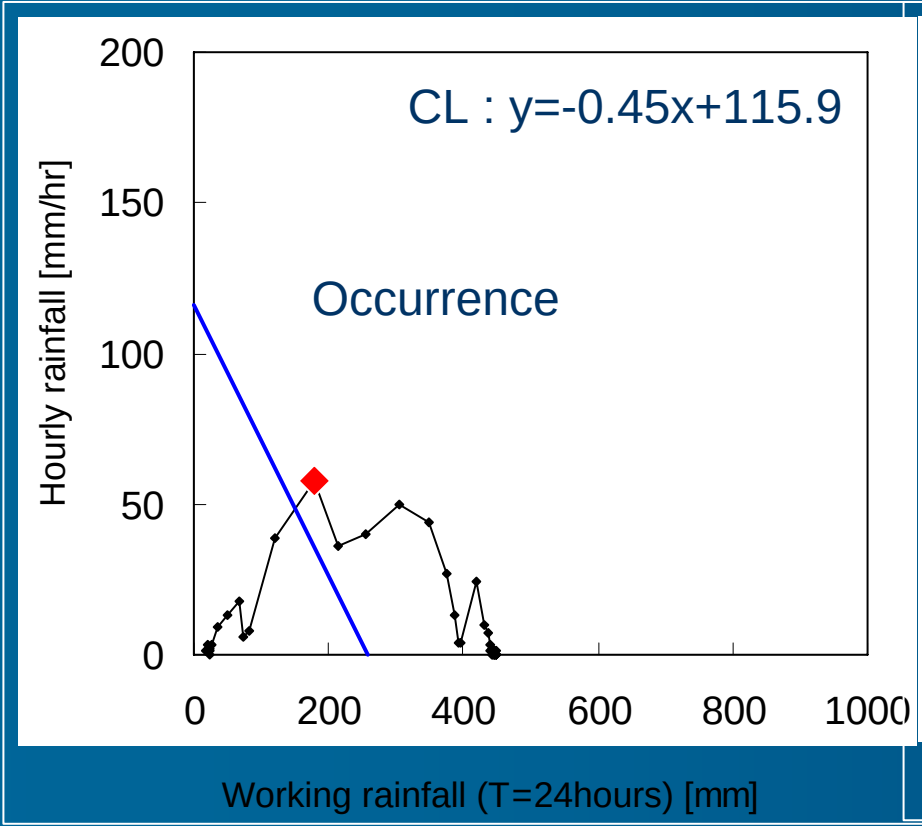
Defining of “standard critical line”



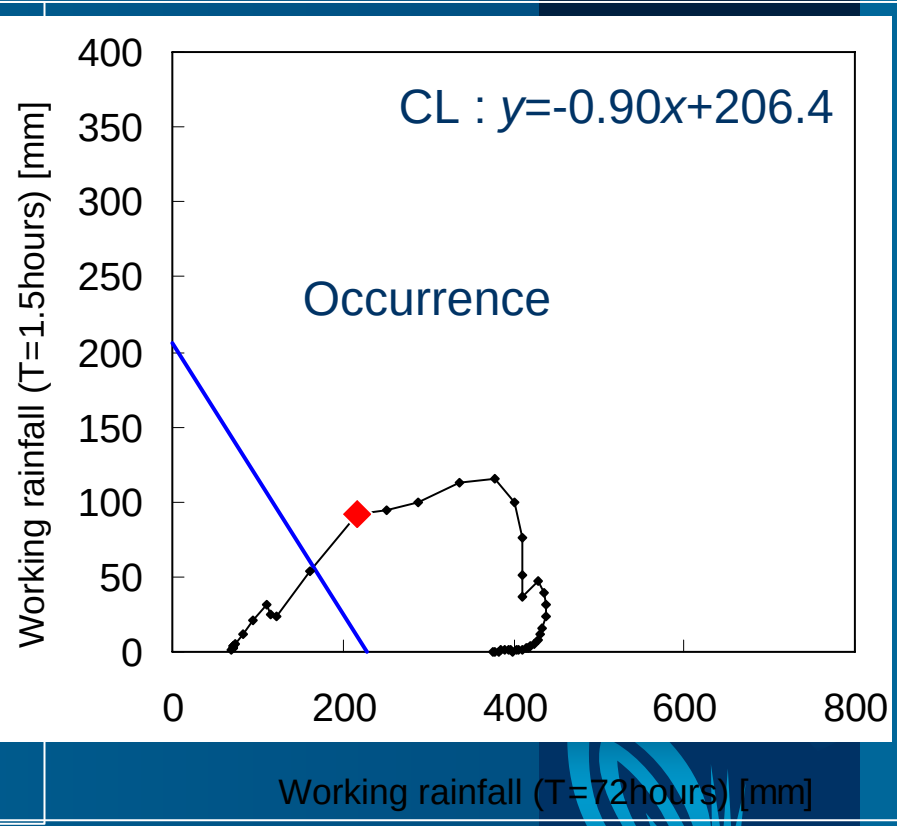
To define the critical line, you need to collect enough disaster data, rainfall data and so on.
If there is not enough data, it will be possible to define “standard critical line” based on characteristics of the region.
(regional conditions, rainfall conditions, geological conditions)

Results of verification (small rainfall area)
- Case Study in Tochio, Niigata pref. -

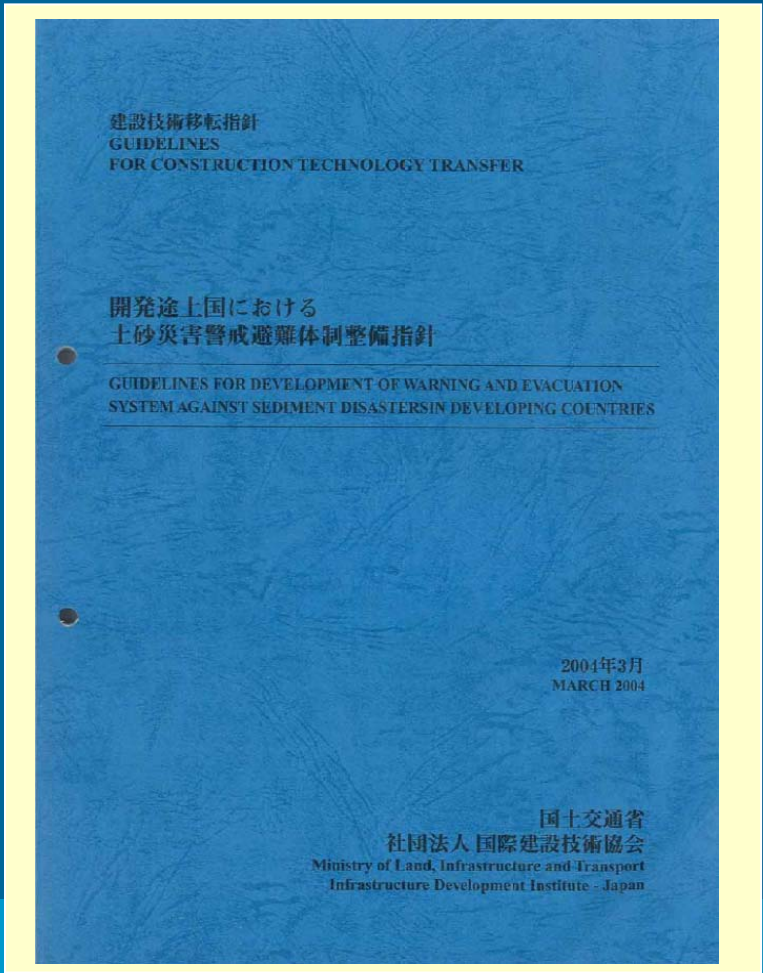
Guideline Method A



Committee Method



Guidelines for development of warning and evacuation against sediment-related disasters



prepared and distributed

Pilot project on Evaluation and improvement of operational flood forecasting system focusing on model performance

- Leading Country: RO Korea (by KICT team)
- Project period: 2004-2007

Objectives of the project

- To evaluate and improve the operational forecasting system focusing on model performance
- To exchange and share the experiences about the Flood Forecasting System (FFS) between members, etc.

Overview of the project

1) 2004 to 2005 year

- Send questionnaire to members re FFMs
- Review the operational FFS, input variables improvement tech., parameter improvement tech.
- Review and suggest optimal parameter estimation tech.
- Development of FFS evaluation tech.
- Structural analysis of FFS for improvement
- Evaluation tech. of FFS (By MOFF), etc.

Overview of the project (cont.)

2) 2006 year

- Space image application to improve the performance of FFS
- Application of parameter optimization tech., missing data treatment tech.
- Upgrade the MOFF to evaluate the member's FFS

3) 2007 year

- Suggestion of standardized tech.
- Application of the suggested tech. to member country
- Development of the pilot system including interface to evaluate the FFS
- Development of Guideline to evaluate the FFS

Pilot project on Development of guidelines for the dam operation in relation flood forecasting

- Leading Country: RO Korea (by KOWACO team)
- Project period: 2004-2007

Overview of the project

1) 2005 year
   - Survey the guidelines and related materials
   - Comparative study on guidelines collected, etc.

2) 2006 year
   - Establishment of General Reservoir Operation Guideline, etc.

3) 2007 year
   - Publication of General Reservoir Operation Guideline, etc.

Project on Extension of flood forecasting systems to selected river basins

- Leading Country: China
- Project period: 2003-2005 (initial) - will be extended for a few more years
- Results will be compiled as a guideline in 2006
- Results will also be fed into another project on OJT on FFS by Malaysia

Guidelines for Establishment of Flood Forecasting System

Contents (draft)

Project on the evaluation and improvement of hydrological instruments and telecommunication equipment

- Leading Country: China
- Project period: 2003-2005
- China will prepare a comparative review report which will be disseminated soon

On-the-job Training on Flood Forecasting between TC members

- Leading Country: Malaysia
- Project period: 2005-2007
- Actual OJT is under preparation stage, but will be started in next year. Outputs from China project on FFS will be incorporated.

Pilot project on the establishment of community-based flood forecasting system

- Leading Country: Philippines
- Project period: 2002-2007

PAGASA's initiatives in non-telemetered basins

Establishment of community-based flood forecasting and warning system (CBFFWS)

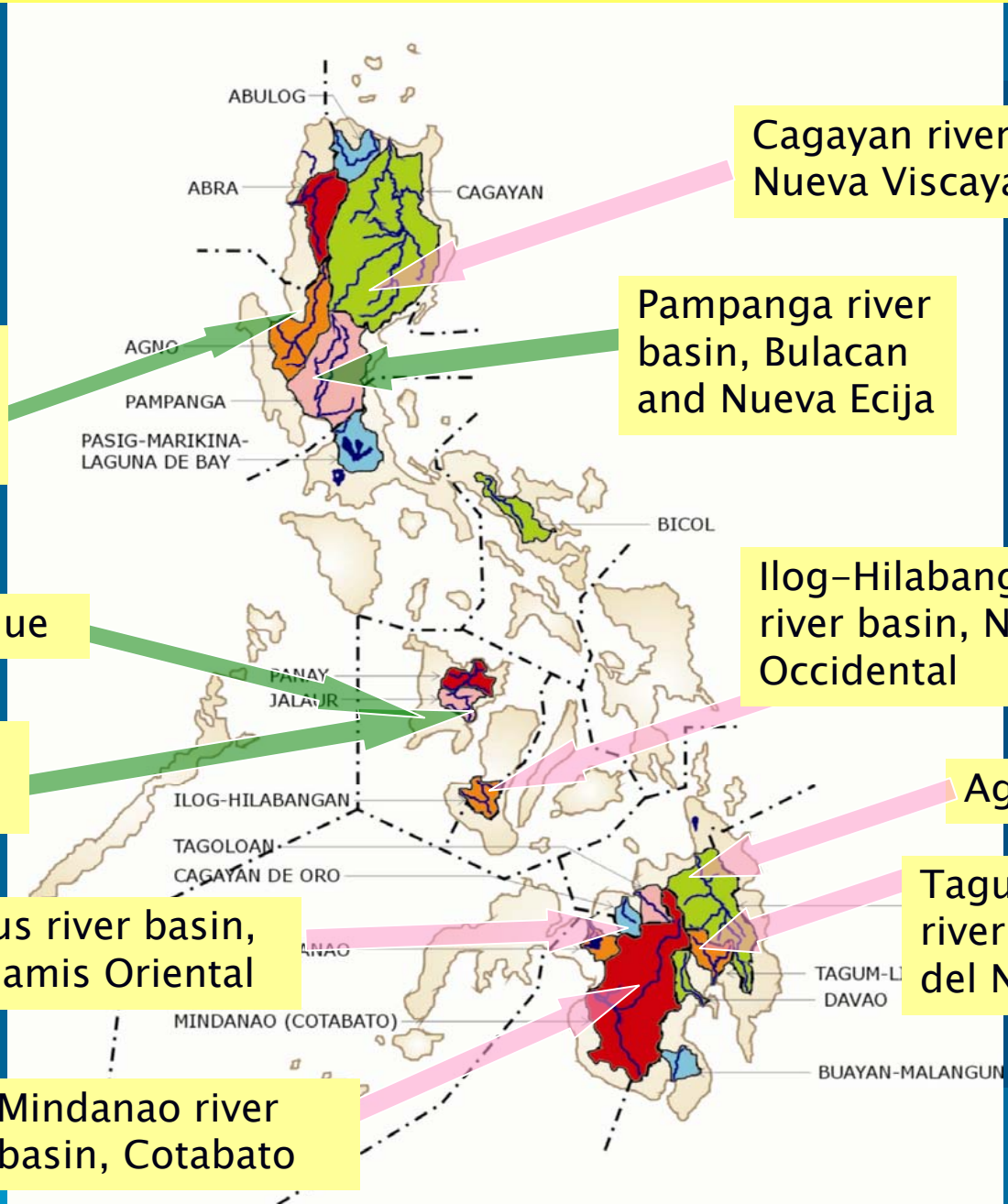
Activities:

1. Coordination with LGUs and concerned agencies
2. Conduct survey of sites
3. Fabrication and installation of monitoring facilities (rainfall and water level)
4. Signing of MOA
5. Training of observers (LGUs, volunteers)
6. Approval of a local ordinance for the maintenance of CBFFWS
7. Implementation/testing
8. IEC

Community-Based Flood Warning System (CBFWS)

On-going

Proposed



Cagayan river basin, Nueva Viscaya

Pampanga river basin, Bulacan and Nueva Ecija

Allied river basins of Agno, Pangasinan

Sibalom, Antique

Ilog-Hilabangan river basin, Negros Occidental

Jalaur river basin, Dumangas, Iloilo

Agusan river basin

Tagum-Libuganon river basin, Davao del Norte

Agus river basin, Misamis Oriental

Mindanao river basin, Cotabato

Pilot project on Improvement of Hydrological products in response to user needs

- Leading Country: Philippines
- Project period: 2003-2006

Previous Basin Flood Bulletin

Republic of the Philippines
Department of Science and Technology
PHILIPPINE ATMOSPHERIC, GEOPHYSICAL AND
ASTRONOMICAL SERVICES ADMINISTRATION
(PAGASA)
ATB Bldg., 1424 Quezon Avenue, Q.C.
Tel. Nos. 922-84-01 to 10

PAMPANGA RIVER BASIN
FLOOD BULLETIN NO. 10
FLOOD OUTLOOK
ISSUED AT 5:00 AM
AUGUST 4, 1989

LIGHT RAIN WAS RECORDED OVER THE BASIN DURING THE PAST 12 HOURS. THE WATER LEVELS AT ZARAGOZA, ARAYAT AND CANDABA GAUGING STATIONS CONTINUED TO RISE SLOWLY DURING THE PAST 12 HOURS.

LIGHT RAIN IS STILL EXPECTED TO PREVAIL WITHIN THE NEXT 12 HOURS. THE WATER LEVELS DOWNSTREAM OF RIO CHICO AND PAMPANGA RIVERS FROM ZARAGOZA TO APALIT ARE EXPECTED TO CONTINUE TO RISE WITHIN THE NEXT 12 HOURS.

THE INHABITANTS ALONG THE RIO CHICO AND PAMPANGA RIVERS ARE ADVISED TO WATCH FOR FURTHER FLOOD BULLETIN WHICH WILL BE ISSUED AT 5:00 PM, AUGUST 4, 1989.

APT/HTH/LPP/CAV/MFP/ECU

Present Basin Flood Bulletin

Republic of the Philippines
Department of Science and Technology
PHILIPPINE ATMOSPHERIC, GEOPHYSICAL AND
ASTRONOMICAL SERVICES ADMINISTRATION
(PAGASA)
1424 Asiatrust Bank Bldg., Quezon City
FAX: (00632) 3733424 • TEL. NO.: (00632) 3733444/3733425
Website: http//:www. Pagasa.dost. gov.ph

FLOOD FORECASTING BRANCH
PAMPANGA RIVER FLOOD FORECASTING AND WARNING CENTER
WFFC, Agham Road, Diliman, Quezon City
Telephone Numbers: 929-40-65/928-27-54

FLOOD BULLETIN NO. 5
ISSUED AT 4:00 AM, 19 JULY 2000
(VALID UNTIL THE NEXT ISSUANCE AT 4:00 PM TODAY)

AVERAGE BASIN RAINFALL:
PAST 42 HOURS ENDING AT 2:00 AM TODAY = 150 mm WITH MAXIMUM OVER NUEVA ECIJA
FORECAST FOR THE NEXT 24 HOURS = LESS THAN 5 mm

EXPECTED HYDROLOGICAL RESPONSE;

1. FURTHER RISE OF THE FLOODWATERS FROM UPPER PAMPANGA RIVER AND TRIBUTARY CORONEL RIVER.
   FLOODING IS EXPECTED TO PERSIST: IN THE LOW LYING AREAS OF LAUR, BONGABON, PALAYAN CITY, CABANATUAN CITY AND STA. ROSA UNTIL TOMORROW MORNING.

2. RAPID RISE OF MIDDLE PAMPANGA RIVER AND TRIBUTARY RIO CHICO RIVER.
   FLOODING IS EXPECTED TO OCCUR: IN THE LOW LYING AREAS OF SAN LEONARDO, SAN ISIDRO, JAEN, CABIAO, ZARAGOZA, SAN ANTONIO AND ARAYAT BEGINNING THIS AFTERNOON.

3. GRADUAL RISE OF LOWER PAMPANGA RIVER.
   FLOODING IS THREATENING: IN THE LOW LYING AREAS OF SAN SIMON, SAN LUIS, APALIT, CALUMPIT, HAGONOY AND PAOMBONG BEGINNING LATE THIS MORNING.

4. SLOW RISE OF CANDABA SWAMP.
   FLOODING IS POSSIBLE: IN THE LOW LYING AREAS SURROUNDING THE CANDABA SWAMP BEGINNING THIS MORNING.

THE RESIDENTS AND THE DISASTER COORDINATING COUNCILS CONCERNED ARE ADVISED TO TAKE APPROPRIATE ACTION.

---

1. PATULOY NA PAGTAAS NG TUBIG BAHA MULA SA ITAAS NA BAHAGI NG ILOG PAMPANGA AT SANGANG-ILOG CORONEL.
   ANG BAHA AY INAASAHANG MANANATILI: SA MGA MABABABANG BAHAGI NG LAUR, BONGABON, PALAYAN CITY, CABANATUAN CITY AT STA. ROSA HANGGANG BUKAS NG UMAGA.

2. MABILIS NA PAGTAAS NG TUBIG SA GITNANG BAHAGI NG ILOG PAMPANGA AT SANGANG-ILOG RIO CHICO.
   ANG BAHA AY INAASAHANG MAGAGANAP: SA MGA MABABABANG BAHAGI NG SAN LEONARDO, SAN ISIDRO, JAEN, CABIAO, ZARAGOZA, SAN ANTONIO AT ARAYAT SIMULA NGAYONG HAPON.

3. UNTI-UNTING PAGTAAS NG TUBIG SA IBABANG BAHAGI NG ILOG PAMPANGA.
   ANG BAHA AY MAY BANTANG PANGANIB: SA MGA MABABABANG BAHAGI NG SAN SIMON, SAN LUIS, APALIT, CALUMPIT, HAGONOY AT PAOMBONG SIMULA NGAYONG UMAGA.

4. MABAGAL NA PAGTAAS NG TUBIG SA CANDABA SWAMP.
   ANG BAHA AY MAARING UMIRAL: SA MGA MABABABANG BAHAGI NA PUMAPALIGID NG CANDABA SWAMP SIMULA NGAYONG UMAGA.

ANG MGA KINAUUKULANG NANINIRAHAN AT DISASTER COORDINATING COUNCILS AY PINAPAYUHAN NA GUMAWA NG MGA KAUKULANG HAKBANG.

Prepared by: Noted by:

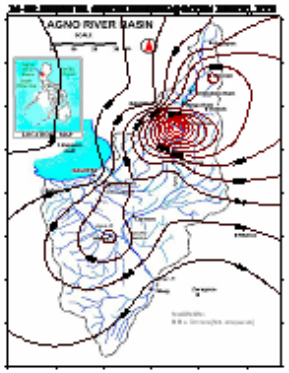
Future Basin Flood Bulletin

FLOOD BULLETIN NO. 5

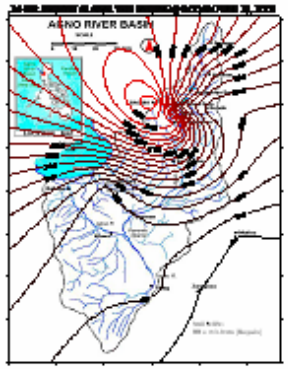
ISSUED AT 4:00 AM, 24 AUGUST 2005

(VALID UNTIL THE NEXT ISSUANCE AT 4:00 PM TODAY)

1. OBSERVED AND FORECAST RAINFALL



Past 24-hour Rainfall



Forecast 24-hour Rainfall

2. EXPECTED HYDROLOGICAL RESPONSE

Average Flood Depth

Municipality	Flood Depth (m)	Area Covered (has)
Aguilar	0.82	52.00
Bayambang	1.25	92.00
Bugallon	1.15	124.00
Camiling	0.95	40.00
Lingayen	1.75	348.00
Mangatarem	0.88	612.00
San Carlos City	1.05	388.00
San Clemente	0.66	152.00
Ubiztondo	1.43	288.00

THE RESIDENTS AND DISASTER COORDINATING COUNCILS CONCERNED ARE ADVISED TO TAKE APPROPRIATE ACTION.

PREPARED BY: OFFICE / ID

Modified flood bulletin format after TCP

Project on Flood Hazard Mapping

Project on flood hazard mapping

- Leading Country: Japan
- Project period: 2002-2006 (initial) - will be extended until 2009

Advantageous Effects of Flood Hazard Map

1. Dissemination of the prior knowledge on flood risk and disaster prevention in case of emergency

2. Review of present disaster prevention strategy/plan; location of evacuation routes and shelters, communication measures, alert/evacuation information

3. Guidance to suitable land use and architectural design in due consideration of flood risk

Initial idea on 5-year Program of FHM Project

July 2002 **Workshop in Manila, the Philippines**
- Explanation of Flood Hazard Map Manual
- Nomination of Pilot Area

March 2003 WWF3 participation in Japan

Sept. 2003 **Workshop in Beijing, China**
- Distribution of Flood Hazard Map Manual
- Discussions on Inundation Record
- Discussions on Warning and Evacuation System

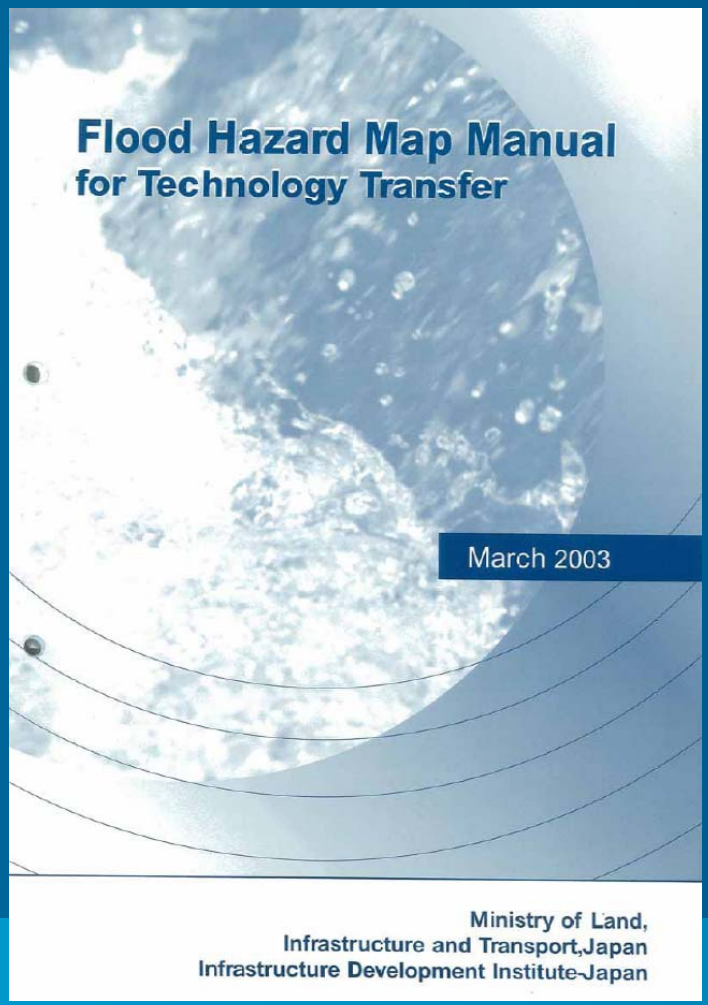
July 2004 **Workshop in Seoul, Korea**
- On-site trainers' training at the Anseong River in Pyongtaek City

Nov. 2004 Uploading of FHM Manual on IFNet homepage

Sep. 2005 **Workshop in Kuala Lumpur, Malaysia**
- Revision of the Manual (Original Schedule)
- Expansion of the projects to other river basins (Original Schedule)
- Proposal for next step

July 2006 **Workshop**
- Project evaluation

Flood Hazard Map Manual prepared and disseminated to members



Several members are progressing well, but some are not.

FHM OJT was also conducted at Seoul WS, in Sep. 2004

Identified Challenges (1)

1. Increasing disparities in progress among members with some deadlock due to following:

- Lack of detailed knowledge for preparing FHMs
- Lack of hydrological/inundation data -> how to cope with this situation
- Constraint in budget, manpower, etc.
- Difficulty in flood simulation as basis for FHM
- Difference in countries on social and administrative system concerned (incl. DPP system)

It was felt necessary to conduct FHM training seriously!!

PWRI FHM training was started taking this situation into consideration so that in each TC member country FHMs are prepared and assessed in a few years' time.

Identified challenges (2) –

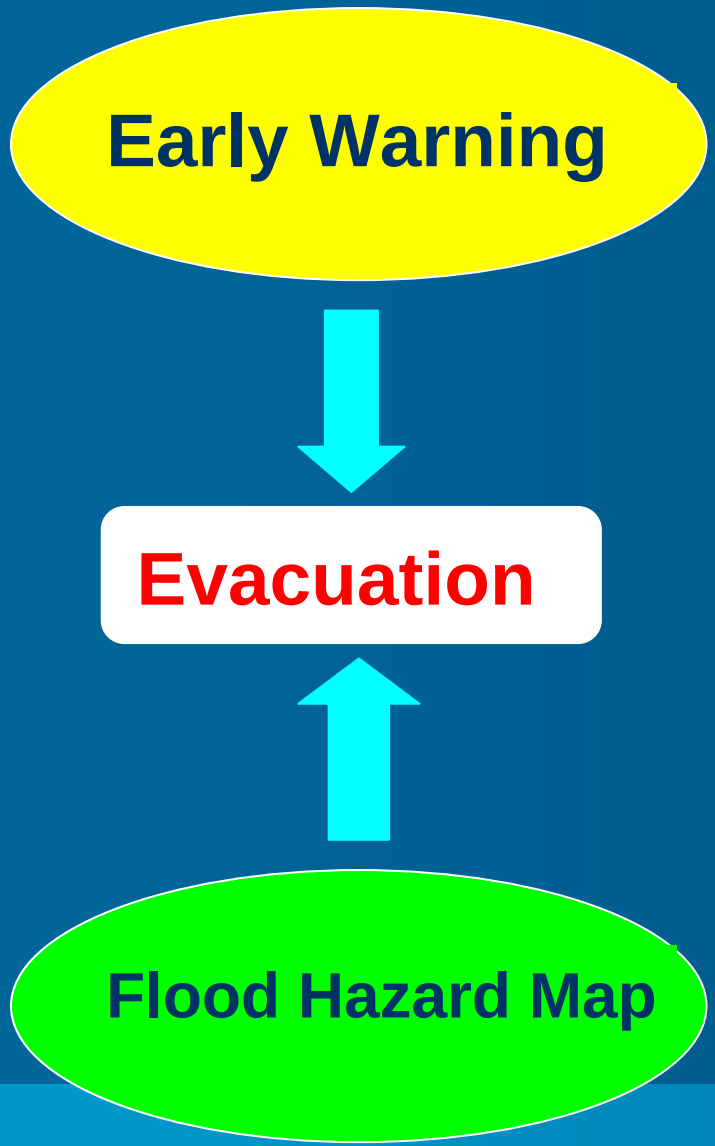
Even for advanced members,

2. DPP's involvement, community participation
3. Usage in normal times such as drill, education, or other public awareness activities.
4. Assessment of FHM and EWS effectiveness for evacuation

- How people at risk responded after hearing Early Warning, Evacuation Advice /Order ?
- What percentage of people evacuated?
- How quick was evacuation taken?
- Were the evacuation routes and shelters appropriate?

If these results aren't satisfactory, how to improve the situation?

FHM and EWS: both are necessary



1. Early warning doesn't necessarily lead to quick and safe evacuation.

2. FHM provides local residents with prior information on flood disaster and safe evacuation.

3. The synergy by both early warning and information of flood hazard map can lead to voluntary activities by people at risk.

Necessary steps for the future

1. **Effective Information on Hydrological, Flood Forecasting Warning and Disaster Prevention**
   - Contents and expression leading to accurate risk judgment and quick evacuation by people at risk,
   - Certain way of transmission to anybody at risk.

2. **More Accurate Flood Forecasting**
   - Flush flood forecasting in urban small/meddle river basins,
   - Simple and workable system including community participation.

3. **Flood Hazard Mapping**
   - Participation of all related agencies and communities in the process of production of FHM,
   - Usage in normal times for flood risk awareness and disaster education and flood fighting drill,
   - Collaboration with PWRI's FHM training.

We decided to extend FHM Project term

1. Extension Term

   Three Years (2002-2006 to 2002-2009)

   - Taking into consideration the term of PWRI's FHM training (2005-2009)

2. Objectives of Extension

   - Collaboration with PWRI's FHM training (trainees' participation in WS to report post-training activities)
   - Further promotion of adjustment of FHM manual in line with each country's condition
   - Participation of DPP agencies in production and awareness raising activities

Collaboration between TCWGH and JICA/PWRI Training

TC members' Participation in training in order to:

- fill in the members' progress gap in FHM project,
- promote TC WGH activities,
- promote FHM in TC member countries.

TC WGH FHM Project ⇄ Collaboration ⇄ **JICA/PWRI FHM Training**

We welcome your participation in TC WS so as to:

- present achievement of post-training activities as a follow-up of the training,
- know other countries' efforts and achievements,
- Ensure better linkage with DPP groups

Thank you