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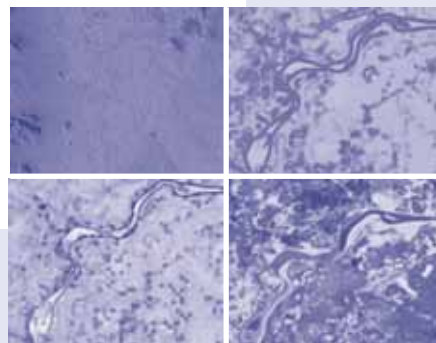


ICHARM Publication No.22

ICHARM Action Plan 2010-2012



March 2011



United Nations
Educational, Scientific and
Cultural Organization

**International Centre for Water Hazard and Risk Management
under the auspices of UNESCO (ICHARM)
Public Works Research Institute (PWRI)**

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Under the auspices of UNESCO (ICHARM),
Public Works Research Institute (PWRI)

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ICHARM Action Plan 2010-2012

International Centre for
Water Hazard and Risk Management
Under the auspices of UNESCO
(ICHARM)

Synopsis:

During the past four and a half years since the establishment on 6 March 2006, ICHARM has been building the key activities that were designed in the original plan of the center. They are research, training and information networking.

This is an action plan for the next biennial 2010-2012 that continues the current efforts to improve our services. ICHARM proudly presents this action plan with commitment and enthusiasm. ICHARM appreciate your cooperation and are looking forward to working with you in another two years and many more years to come.

Key Words: Action Plan, Water-related disaster, Hazard, Risk management

ADB	Asian Development Bank
ADRC	Asia Disaster Research Center
AGCM	Atmospheric General Circulation Model
AGU	American Geophysical Union
AOGS	Asia Oceania Geosciences Society
APHW	Asia Pacific Association of Hydrology and Water Resources
APRSAF	Asia Pacific Regional Space Agency Forum
APFM	Associated Programme for Flood Management
APWF	Asia-Pacific Water Forum
APWS	Asia-Pacific Water Summit
ASCE	American Society of Civil Engineers
AWCI	Asia Water Cycle Initiative
CIWHR	China Institute of Water and Hydropower Research
COE	Centre of Excellence
EGU	European Geosciences Union
ERCE	European Regional Centre for Ecohydrology
ESCAP	UN Economic and Social Commission for Asia and the Pacific
FCSEC	Flood Control and Sabo Engineering Center under the Philippine Department of Public Works and Highways
GEF	Global Environment Facilities
GEOSS	Global Earth Observation System of Systems
GFAS	Global Flood Alert System
HEC	Hydrologic Engineering Center of US Corps of Engineers
HTC	Regional Humid Tropics Hydrology and Water Resources Centre for Southeast Asia and the Pacific (Kuala Lumpur, Malaysia)
IAHR	International Association for the History of Religions
IAHS	International Association of Hydrological Sciences
IAHS/PUB	IAHS Prediction in Ungauged Basin
ICIMOD	International Center for Integrated Mountain Development
ICSU	International Council on Sciences
ICWaRM	International Center for Integrated Water resource Management
IDB	Islamic Development Bank
IDI	International Development Institute
IFI	International Flood Initiative
IFAS	Integrated Flood Analysis System

IFNet	International Flood Network
IRDR	Integrated Research on Disaster Risk
ISDR	International Strategy for Disaster Reduction
ISO/TC	International Organization for Standardization/Technical Committee
ITC	International Institute for Geo-Information Science and Earth Observation
IUGG	International Union of Geodesy and Geophysics
IWHR	China Institute of Water Resources and Hydropower Research -
IWR	Institute for Water Resources of US Corps of Engineers
JAXA	Japan Aerospace Exploration Agency
JCTC	Japan Construction Training Center
JICA	Japan International Cooperation Agency
JSCE	Japan Society of Civil Engineers
JWF	Japan Water Forum
KICT	Korea Institute of Construction Technology
K-water	Korea Water Resources Corporation
MEXT	Ministry of Education, Culture, Sports, Science and Technology (Japan)
MLIT	Ministry of Land, Infrastructure, Transport and Tourism (Japan)
MRC	Mekong River Commission
NARBO	Network of Asian River Basin Organizations
NDRI	Nepal Development Research Institute
NGO	Non Governmental Organization
NILIM	National Institute for Land and Infrastructure Management (MLIT)
PDA	Pilot and Demonstration Activity (ADB)
RCUWM	Regional Center on Urban Water Management, Tehran
RFMMC	Regional Flood Management and Mitigation Center
SFDH	Office of State Flood Control and Drought Relief Headquarter, China
TC	Typhoon Committee
UCD	University of California at Davis
UN	United Nations
UNESCO-IHE	UNESCO - Institute for Water Education
UNESCO-IHP	UNESCO - Int'l Hydrological Programme
UNSGAB	United Nations Secretary General Advisory Board
UNU	United Nations University

USACE	United States Army Corps of Engineers
USBR	US Bureau of Reclamation
USGS	US Geological Survey
WB	World Bank
WEP	Water and Energy Transfer Processes
WMO	World Meteorological Organization
WWAP	World Water Assessment Programme
WWDR2 / WWDR3	Second / Third World Water Development Report
WWF	World Water Forum

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FORWARD

The International Centre for Water Hazard and Risk Management (ICHARM) was established as an integral part of the Public Works Research Institute (PWRI) on 6 March 2006 under the auspices of UNESCO in cooperation with the Ministry of Land, Infrastructure, Transport and Tourism (MLITT), the Ministry of Foreign Affairs (MOFA), the Ministry of Education, Culture, Sports, Science and Technology (MEXT) and other related organizations. For the past four and a half years after the official launch, ICHARM has been actively involved in its three pillars of activities, namely research, training and information networking, which include the development of a satellite-based flood forecasting system, research on flood risk assessment and adaptation strategies to cope with climate changes, technology transfer to local areas in collaboration with the Asian Development Bank, and various training courses such as one-year Master's course on water-related risk management. As introduced in this Action Plan for the next two years, ICHARM plans to further enrich these priority activities in an integrated manner.

PWRI, which was established in September 1922 and relocated from Tokyo to Tsukuba 30 years ago, has been engaged in multifaceted research activities to prevent and mitigate water-related disasters, such as floods, droughts and landslides. Based on this long-accumulated experience and knowledge, I hope that PWRI, through the activities of ICHARM, will make a considerable contribution to the international society in the prevention and mitigation of water-related disasters across the world.

As the Chief Executive of PWRI, I heartily expect steady progress of ICHARM activities to achieve its mission and would like to ask experts and organizations worldwide to provide continued support for the centre.

Taketo UOMOTO

Chief Executive

Public Works Research Institute

PREFACE

During the past four and a half years since the establishment on 6 March 2006, ICHARM has been building the key activities that were designed in the original plan of the center. They are research, training and information networking. Among many others, in research, satellite based early warning system IFAS was developed. In training, ICHARM Master's course was established, and in information networking, the Asia Pacific Knowledge Hub started serving. Although they are still in the early stage of development, they have already established good reputation and expectation in the world. We are proud of such achievements, and as Director of ICHARM, I would like to express my deep appreciation to all the people and organizations supported us and the dedicated staff of ICHARM.

This is an action plan for the next biennial that continues the current efforts to improve our services. The urban concentration is increasing, hydro-meteorological extremes are intensifying and devastating water-related disasters are occurring all over the world. They all increase the expectation to ICHARM's role to help disaster risk reduction. It is our great pleasure to respond such expectation with our expertise and capacity. Nevertheless as core resources of ICHARM are limited, the service that can be made available is limited, too. Overloading and eventual disappointment in performance should by all means be avoided. In other words, the action plan presented here is subject to increasing supports from all partners of ICHARM.

ICHARM proudly presents this action plan for 2010-2012 with commitment and enthusiasm. We appreciate your cooperation and are looking forward to working with you in another two years and many more years to come.

Kuniyoshi TAKEUCHI

Director

**International Centre for Water Hazard and Risk Management
under the auspices of UNESCO**

1. Introduction to ICHARM

1.1 Establishment of ICHARM

In September 2004, the IHP Intergovernmental Council adopted the resolution to support the proposal of the Japanese Government to establish ICHARM as a part of the Public Works Research Institute (PWRI). In October 2005, at the 33rd UNESCO General Conference in Paris, the resolution to approve the proposal was adopted by 191 member countries, which was followed by the agreements between the Japanese government and UNESCO, and the Public Works Research Institute and UNESCO on 3 March 2006. Three days later, ICHARM was officially established on 6 March 2006.

1.2 Resources

ICHARM is a research centre under the management of the Public Works Research Institute (PWRI), and base funding comes from PWRI. Because of recent budget reform policy of the Government of the Japan, human and financial resources are unfortunately becoming tighter and stricter. Therefore ICHARM has been trying to acquire more external funding.

The major part of ICHARM budget comes from PWRI, which is for FY 2010, JPY 249 million. In addition from MEXT JPY 22 million for promoting so-called KAKUSHIN project, and 550,000 USD (expected) from ADB for promoting RETA7276 activities. ICHARM is provided with necessary operational cost by JICA for conducting training and capacity development related activities under JICA's technical cooperation framework.

As of 28 September 2008, there are 36 ICHARM staffs which consist of 15 full-time PWRI employees, 19 contract employees hired based on the research budget and 2 exchanger researchers seconded by private or semi-private bodies. There are totally 27 water experts involved, regardless of positions. As an organization in charge of international activities under the auspices of UNESCO, ICHARM has been actively recruiting staffs through international recruitment scheme. As of 28 September 2010, as senior researchers, research and training advisors or research specialists, there are 11 internationally recruited members in ICHARM. ICHARM also adopts "external research advisor" system with the objective of obtaining advice and instructions on specific research topics. Currently one advisor is appointed.

1.3 Organization of ICHARM

In PWRI, ICHARM is one research group (Water-related Hazard Research Group) and in

which exist three teams (International Technical Exchange Team, Disaster Prevention Research Team, and Hydrologic Engineering Research Team). The International Technical Exchange Team is primarily responsible for planning and implementing training programs and follow-up activities after implementation. In addition, it is responsible for the overall adjustment of plans for information-networking activities. The Disaster Prevention Research Team is responsible for research activities related to risk assessment and risk management of water-related disasters. The Hydrologic Engineering Research Team is responsible for research activities in the field of hydrological observation, hydrological forecasting, and hydrological analysis, which form the base of ICHARM's research activities.

1.4 ICHARM Advisory Board

The advisory board provides advice on the action plan submitted by the ICHARM Director and also reviews the reports on the activities of the centre. In principle, the board meets biennially. Based on the advice from the advisory board, the PWRI Chief Executive makes the final decision on the action plan and budget of ICHARM.

The following is a list of ICHARM Advisory Board (IAB) Members as of September 2010.

UNESCO Regional Delegates

- (Group1) Mr. Eugene Stakhiv; Executive Director, Institute for Water Resources (IWR), U.S. Army Corps of Engineers
- (Group2) Dr. Zurab D. Kopaliani, Head; Head, Laboratory for Computation and Forecasting River Channel Changes, State Hydrological Institute (SHI)
- (Group3) Dr. Basil Fernandez, Managing Director, Water Resources Authority
- (Group4) Mr. Keizrul bin Abdullah; Former Director General of the Department of Irrigation and Drainage
- (Group 5a) Prof. Biémi Jean, Dean, UFR STRM, University of Cocody
- (Group 5b) Mr. Mohamed-Bahaa Eldins Ahmaed Mohamed Saad; Emeritus Professor, Hydraulics Research Institute, National Water Research Center

Members appointed by PWRI Chief Executive

- (UNESCO) Prof. Siegfried Demuth, Chief, Hydrological Processes and Climate Section, Division of Water Sciences, Natural Sciences Sector, UNESCO
- (UN/ISDR) Mr. Salvano Briceno; Director, UN/ISDR
- (WMO) Mr. Avinash C. Tyagi; Director, Climate and Water Department, WMO

- (UNESCO-IHE) Dr. Andras Szollosi-Nagy; Director, UNESCO-IHE
- (UNU) Mr. Konrad Ostervalder; Rector of UN University
- (MLIT, Japan) Mr. Kanotomo Komura; Vice-Minister for Engineering Affairs, Ministry of Land, Infrastructure, Transport and Tourism (MLIT)
- (JICA) Mr. Keizo Ohshima; Senior Vice-President, Japan International Cooperation Agency (JICA)

2. ICHARM basic strategies and highlighted activities for the next biennial period

2.1 Basic strategies for the next biennial 2010-2012

In the four and a half years since its establishment, ICHARM has established key activities on training, research and information networking. They include satellite based early warning system IFAS, ICHARM Master's course and the Asia Pacific Knowledge Hub on Water and Disaster. Although they are still in early stage of development, already good reputation and expectation have been established in the world. We are proud of it. However, this makes requests and expectation to ICHARM increased and tends to create an over loaded situation exceeding the present capacity of ICHARM.

In order to avoid over loading and meet the growing demand, ICHARM's strategy for the next biennial is to increase our capacity by quality improvement, namely, "consolidation". We have to consolidate our present activities by accelerating development of substance and enriching contents. Our continuing efforts to increase resources would be invested to this consolidation rather than mere expansion. We would like to shift our work plan from example demonstration to substantive application.

It is important to note, however, that consolidation does not mean a total van of expansion. In fact improvement of services within the available capacity is an important part of consolidation. For example, we consider that an increase in the number of trainees and Master's course students in existing courses is, if it is possible without diluting teaching density, not necessarily an expansion but a consolidation. By such consolidation of activities, we can better meet the increasing expectation from real world where water-related disasters are increasing and intensifying.

ICHARM put forward this Consolidation Program in the following concrete objectives:

1. Improvement of education program on water-related disaster management.
 - (1) Improve the quality and capacity of the Master program.
 - (2) Compile textbooks for Master Course education.
2. System development to deliver flood forecasts based on globally available data for any basin, at any time, and anywhere in the world.
3. Local customization of advanced technology in partnership with local practitioners. Especially, establishment of partnership for local use of IFAS with local engineers by integrating satellite information with ground observations.
4. Support of local disaster risk assessment and preparedness. Especially for functioning as the Asia Pacific Knowledge Hub on Water and Disaster in collaboration with ADB, JICA

and other funding agencies.

5. Other collaborative engagement on the activities of IFI, WWF, APWF, UNSGAB-HLEP, IRDR etc.

2.2 Development and dissemination of flood forecasting system for poorly-gauged river basins with local ownership

While advancing dissemination activities of the Integrated Flood Analysis System (IFAS) through various international conferences, training in JICA, etc., IFAS has just been increasingly recognized all over the world. One of the examples is that IFAS has been adopted as a basic tool to implement a flood forecasting system in the Solo River of Indonesia in an ADB RETA project. On the other hand, ICHARM has received quite a few opinions to improve and enhance the IFAS system. They suggest for tools to evaluate the influence of sea level rise under climate change, to evaluate flood risk enhanced by land subsidence under too-much groundwater uptake conditions, to evaluate long-term flow regime and droughts, etc. ICHARM will continue to improve functions of IFAS and to conduct pilot projects in developing countries to make it more competitive, persuasive, robust and well-tested in the next two years, and try to meet the requests from international organizations in case of disastrous events.

Activities:

- 1) ICHARM will implement (or improve) a hydrologic runoff analysis engine in IFAS to make long-term runoff calculations.
- 2) ICHARM will implement a hydraulic flood flow calculation system under the tidal effect along coastal areas.
- 3) Development of a methodology to further improve the accuracy of global satellite-based rainfall data with/without ground-based data, and its validation for flood forecasting on a river basin scale.
- 4) IFAS will be upgraded by adding more functions and libraries, such as Auto downloading, auto importing, auto calculation and auto alert function, Implementation of 3-tank engine, Improving modification method for GSMaP, Application for Windows 7 & Vista, and for 64bit OS PC users, Combined output interfaces with Google Earth, etc. Such improvement will enable more consistent and more convenient setting-up and

calibration of runoff forecast models in any river basin in various situations.

5) ICHARM provides early warning systems for evacuation from flood and inundation based on IFAS in the Bengawan Solo river basin, Indonesia. This is a pilot project for IFAS as the basis of implementing flood forecasting/warning systems in poorly-gauged basins in developing countries.

6) The implementation of flood forecasting/warning systems should be promoted through technical training activities provided by ICHARM. The activities should also help developing countries develop the sense of ownership on the system.

Research Members:

Kazuhiko FUKAMI, Seishi NABESAKA, Hironori INOMATA, Takahiro SAYAMA, Mamoru MIYAMOTO, Takahiro KAWAKAMI and Go OZAWA

2.3 Assessment of the impact of climate change on disaster risk and its reduction measures over the globe and specific vulnerable areas (Kakushin project)

As part of the third phase (FY2006 - 2010) of Japan's Science and Technology Basic Plan, the Ministry of Education, Culture, Sports, Science, and Technology (MEXT) launched a five-year (FY2007 - 2011) initiative called the Innovative Program of Climate Change Projection for the 21st Century (KAKUSHIN Program), which uses the Earth Simulator (ES) to address emerging research challenges, which is expected to contribute to the Fifth Assessment Report (AR5) by the Intergovernmental Panel on Climate Change (IPCC). ICHARM has been participating to one of its three major projects, "Extreme Event Projection," lead by the Meteorological Research Institute (MRI). ICHARM's subject is the "assessment of the impact of climate change on flood disaster risk and its reduction measures over the globe and specific vulnerable areas." Under this title, the following targets are set out for study:

- 1) Global assessment of flood risk changes in 30 years and 100 years.
- 2) Same assessment on a few special vulnerable areas.

In order to pursue these targets, as stated in the Biennial Report 2008-2010 of ICHARM, ICHARM has been engaged in the development of a bias correction method of GCM outputs, especially extremely heavy rainfall as a target of flood-risk control planning, the building of a hydrologic runoff analysis system for major rivers all over the world including the delineation of basins' boundary and river channel networks. Two special vulnerable areas, the West Rapti River of Nepal and the Mekong River, were selected as the target areas. In particular,

local studies on how to reduce flood risk in the West Rapti River have been conducted in the last two years.

The Kakushin Project studies have been conducted by using simulation results of MRI's GCM (GCM20) with the Earth Simulator, which has the finest spatial resolution in the world as a GCM in the world. As a result of the application of ICHARM's bias correction method, corrected GCM20 outputs in terms of extreme rainfall events for the present climate have been improved to be very consistent with historical observational data (Fig. **)/ However, there is still some criticism that no consideration has been made into the effect of uncertainties of future projection using GCM. Therefore, ICHARM has just started another study to quantify the uncertainty of flood runoff projection using multiple GCM outputs available in the world.

In total, the following sub-subjects are to be studied by the end of FY2012:

- 1) Identification of transformation formula relating MRI-simulated 20km-mesh precipitation/radiation prediction data with real ground observation data. (done)
- 2) Development of a scale-free stream networking method to cover the globe from 90m to 20km grids freely. (done)
- 3) Application of distributed hydrological and hydraulic models to estimate the change of global-scale flood hazards based on the above two research results.
- 4) Development of a methodology to evaluate global-scale flood risk and its change caused by climate change
- 5) Case studies to assess the change of local-scale flood risk and countermeasures based on the above research results.
- 6) Quantification of uncertainties of the above results using multiple GCM outputs available in the world

Research members: All researchers of ICHARM

2.4 Inauguration of Doctoral course

In October 2010, ICHARM and GRIPS will jointly launch a Ph.D. Program in Disaster Management. The broad aim of the program is to nurture professionals who can train researchers and take leadership in planning and implementation of national and international strategies and policies in the field of water-related risk management.

This program is planning to accept one to three students per year. The program examines and selects candidates who have already acquired a Master's degree or its equivalent

and have experiences in research and practice in water-related risk management at public or other organizations and with capabilities for doctoral level work. It is expected that after the completion of study they return to their home organizations and take a lead in exercising what they will have learned at ICHARM.

This program will provide the following courses:

1) Disaster Management (2 credit points each)

- Advanced Integrated Flood Management
- Advanced Hydrology
- Advanced Flood Hydraulics and Sediment Transport
- Advanced Mechanics of Sediment Transportation and River Changes
- Advanced Hydraulics

2) Development (2 credit points each)

- Advanced Disaster Mitigation Policy
- Advanced Topics in National Development Policy and Infrastructure Investment
- Advanced Disaster Risk Management

(In addition, there are courses offered in the University of Tokyo.)

ICHARM/PWRI will be able to employ some students for ICHARM Research Assistant positions. This provides an excellent opportunity for them to learn and experience the practical work of ICHARM while they carry out their own research.

To raise multiplier effect, Ph.D. students will teach and help students in the master's program.

2.5 Organization of the Fifth International Conference on Flood Management (ICFM5) - 27-29 Sep. 2011

The International Conference on Flood Management (ICFM) is the only recurring international conference wholly focused on flood related issues. It is designed to bring together practitioners and researchers alike, including engineers, planners, health specialists, disaster managers, decision makers, and policy makers engaged in various aspects of floodplain management. It provides a unique opportunity for these various specialists to come together to exchange ideas and experiences.

The 5th International Conference on Flood Management (ICFM5) marks the continued advancement of flood management practices and policies around the world. The name change from "Defense" as used in the previous four events to "Management" is reflective of more integrative approaches to flood management that nations are increasingly employing. The first International Symposium on Flood Defense, held in Kassel, Germany, in

2000, emphasized flood defense measures with each successive event (Beijing 2002, Nijmegen 2005 and Toronto 2008) evolving towards more integrative approaches, including risk, vulnerability and capacity building.

The ICFM5 theme is "Floods: From Risk to Opportunity", reflective of the continued trend towards a broader understanding of how we collectively make use of opportunities provided by floods and flooding, cope with risks posed by them, and plan for and respond to flood events. The flyer (second announcement) of the ICFM5 is attached as Annex 1. Also, ICHARM maintains the ICFM5 web-site at <http://www.ifi-home.info/icfm-icharm/icfm5.html>.

Expected ICFM5 Agenda:

ICFM5 will be held, Japan, on 27-29 September 2011. It will consist of 5 plenary sessions, 25 parallel sessions for oral presentations, poster sessions, special events and technical and cultural tours (30th September 2011). Attendees will have the opportunity to participate in various sessions such as the following:

Topic 1: Flood Risk Management (Prevention, Mitigation and Adaptation)

Topic 2: Flood Disaster Management (Preparedness, Emergency Response and Recovery)

Topic 3: Flood Forecasting and Early Warning Systems

Topic 4: Flood Management in Different Climate Conditions and Geographic Zones

Topic 5: Cross - cutting and other topics

2.6 Practice of localism in collaboration with ADB

After long preparation process, ICHARM and ADB agreed to officially start a regional technical assistance (RETA) project, for which the signing ceremony was held on 13 November 2009 at the ADB Headquarters in Manila, the Philippines. The project is officially titled as "Regional Technical Assistance (RETA) 7276: Supporting Investment in Water-Related Disaster Management" and scheduled to be carried out until late 2011. .

In this RETA framework support will be provided to Bangladesh, India, Indonesia, and to the Lower Mekong Countries (Vietnam, Cambodia and Laos) through the Mekong River Commission Secretariat. National executing agencies will be assisted with a package of advisory services and technical support based on advanced scientific know-how. The role of ICHARM is to offer technical assistance that will help each country make effective disaster management investment in the future. Some of the key country-specific activities included in this RETA project are as follows:

1) Model application of a satellite-based flood forecasting and warning system- so-called Integrated Flood Analysis System (IFAS) - to the Solo River basin in Indonesia

- 2) Demonstration of community-based flood management approaches (Indonesia and Bangladesh)
- 3) Review and proposals for improvement on the early flood warning system in Bangladesh
- 4) Development of flood vulnerability indices for the Lower Mekong Basin
- 5) Capacity building (training) of local experts at ICHARM on local disaster management plans for Bangladesh and Indonesia
- 6) Organization of regional workshops to share knowledge and the latest information on selected topics, such as adaptation to climate change

Up to September 2010, ICHARM members have conducted various activities in the selected countries and agencies and provided trainings on local disaster management at ICHARM. ICHARM and key counterparts has been further detailing plans for smooth implementation of expected activities. At the end of August 2010, an international consulting firm was finally selected by ADB and now ICHARM members are ready to work with consultant members and local counterpart agencies for the successful implementation of the project.

Expected completion dates of the project are as follows:

Deliverables	Completion Date
Second Progress Report	March 28, 2011
Draft Final Report	September 30, 2011
Final Report	October 31, 2011

3. Research

3.1 Overview

ICHARM concentrated its effort on three principal research areas during the past four and a half years -- namely, “satellite-based flood forecasting and early warning”, “hazard mapping” and “local studies”. Though these three areas will continue to be important for ICHARM’s future work, there are many other issues that should be recognized as emerging research areas for water-related disaster management, such as adaptation to global climate change. Apart from climate change, there are still other issues which are globally observed and aggravate vulnerabilities against disasters, such as increase in slum population and deforestation in river basins. How to translate wisely “advanced technologies” into “local application” needs to be actively tackled. ICHARM will try to improve the quality of research activities, with any means and spend the next two years concentrating its effort on the key research areas as described below.

3.2 Development and dissemination of flood forecasting system for poorly-gauged river basins with local ownership; see sec. 2.2

3.3 Study on quick rainfall monitoring & forecasting system with high temporal & spatial resolution using X band MP Radars and the combined use of them with conventional C band radars

Recently, many flash flood disasters caused by localized torrential rainfall events have taken place at small- or medium-scale rivers in Japan. Because of that, there are strong needs to develop a high-speed monitoring and forecasting system of localized torrential rainfall events and flash floods caused by them. Based on this background, the Japanese Ministry of Land, Infrastructure, Transport and Tourism (MLIT) has started to implement new-generation X-band MP (multi-parametric) radar systems in major cities of Japan and promote research projects to cope with a new type of flash floods by using the X-band MP radars with MLIT’s research grants. ICHARM has participated in this MLIT 4-year research-grant project since 2009.

The ICHARM 4-year research project contains the following 4 sub-topics.

- 1) Quantification of temporal and spatial characteristics of radar-mesh-scale rainfall distribution observed by high-density ground rain gauge networks and X band MP radars
- 2) Quantification of accuracy of radar rainfall estimation required for flash flood forecasting

3) Development of high-speed localized heavy rainfall identification and forecasting technology with X band MP radar

4) Development of fundamental technology to establish the combined use of X band and C band radar systems for rainfall monitoring and forecasting

The theme 2) will start in 2011. The other themes 1), 3) & 4) has been initiated and some preliminary results for them will be acquired. MP radar technology is one of the most advanced state-of-the-art technologies but has potential to be widely applied to heavy-rainfall-induced flood risk areas in developing countries because MP radars do not necessarily require online calibration systems based on ground-based telemetered rainfall data.

Research members: Kazuhiko Fukami, Tomoki Ushiyama, Atsuhiko Yorozuya, Takahiro Sayama and Yuya Kanno

3.4 Development of automatic flood/sediment discharge observation system

ICAHRM and the National Institute for Land and Infrastructure Management (NILIM) have jointly started a research project since May 2008 for the enhancement of water/sediment discharge observation technology under the direction of the Japanese Ministry of Land, Infrastructure, Transport and Tourism (MLIT). The final target of the project is to provide a practical technique for an automatic flood-flow/sediment-discharge observation system. The system is planned to be composed of 1) flood flow observation with non-contact current meters, 2) river-bed observation with echo sounders installed in river flow with an oblique angle, 3) water-level gauges, 4) river-bed and bed-load discharge observation with a Horizontal Acoustic Doppler Current Profiler (H-ADCP), 5) precise flood-flow observation with an Acoustic Doppler Current Profiler (ADCP) to calibrate the system, and 6) sediment-discharge measurement with a sediment sampler. Although this project started from a Japanese domestic perspective, major technological results will be applicable to many rivers with a large gradient and sediment in humid and tectonic regions of the world such as the Asian-monsoon region.

In the last two years, ICHARM has already proposed 1) how to utilize a boat-mounted ADCP for high-flow measurement and 2) a fundamental scheme to make up a real-time high-flow monitoring system using non-contact current meters with the support of ADCP measurement. In the next two years, ICHARM is going to verify the high-flow monitoring system using non-contact current meters, hopefully for a variety of hydraulic conditions, and to propose a flood- and sediment-flow monitoring system using non-contact current meters

and echo-sounders.

Research Members:

Kazuhiko Fukami, Yuya Kanno, and Atsuhiko Yorozuya

3.5 Research on water- and material- cycle modelling to support basin-wide integrated water resources management

With increasing concerns over scarcity of freshwater resources and highly variable hydrologic conditions worldwide, integrated water resources management is needed to conserve and restore healthy hydrologic and material cycles, especially in rapidly changing urban environments. For such basin-wide management, it is indispensable for us to grasp and diagnose the whole system of water and material cycles in a river basin, including the effect of natural and human-induced impacts such as urbanization, agriculture and other social and economic activities.

From the perspective above, ICHARM has been devoted to improve the physically-based, distributed-parameter WEP (Water and Energy transfer Processes) hydrologic model, which had been originally developed jointly with Professor Yangwen Jia (former PWRI staff and presently at IWHR) and the Japan Science and Technology Agency (JST). They incorporated different phases of nutrient dynamics (nitrogen and phosphorous) and sediment erosion components, mainly for agricultural fields, while promoting model applications at the local level through local study series and at the international level through various research collaborations with IWHR (China), KICT (Korea), etc., to expand the knowledge-base vital for the development of integrated river basin management perspectives and guidelines.

Activities:

The new WEP with a nutrient (N-P) transfer sub model was developed and applied to the Yata-gawa River (Ibaraki Prefecture) and the Takasaki River in the Imbanuma Lake Basin (Chiba Prefecture). The new WEP application in the Yata-gawa River seemed successful. But its application to the Takasaki River was not sufficiently successful. Therefore, ICHARM will continue to tune up the N-P sub model for agricultural fields and to further implement sub models for city and forest areas. ICHARM will pursue to establish an international framework to jointly update the WEP system and promote it for the purpose of integrated water resource management including water quality in the world.

Research Members:

Kazuhiko Fukami, Hironori Inomata, and Dr. Mamoru Miyamoto

3.6 Study on utilization of satellite-based topographical data for flood risk assessment

ALOS data is available for the whole area of the world, but because of their error, they cannot be used as input data for flood simulation as they are. So they need to be modified by examining and validating its precision.

In Kariyata River basin, the distribution of the error of the topographic data of ALOS PRISM and that of a laser profiler were calculated over a lowland area, and the relationship between the two kinds of data was examined. As a result, it was found that the ALOS PRISM over this area can be modified by a linear function.

3.7 Study on the development of the integrated flood analysis system in developing countries

In this study, an integrated flood and inundation analysis system will be developed. The system will use rainfall as input data, perform run-off and inundation calculations, and display calculation results. In 2010, with the Miyagawa river basin as the study basin, a local study was conducted and applied the flood analysis system. The system was further improved based on the study results.

3.8 Research on flood hazard maps for developing countries

In this study, the International Technical Exchange Team will continue research on how to prepare, disseminate and utilize flood hazard maps (FHM) in developing countries. Because FHM are produced based on anticipated inundation maps, the research will first study how to prepare inundation maps. There are two ways to acquire information on inundation areas. One is to use past inundation records, and the other is to use inundation analysis. The latter needs accurate topographical data, which are not available in developing countries in general. Because of that, ICHARM is now studying the possibility of inundation analysis using satellite-based topographic data. Also, to promote public use of FHM, guidelines for utilizing FHM have been discussed based on comments and opinions of ex-participants in the FHM training course or water-related disaster management course (Master's course). Further, materials for education, training as well as awareness-raising are scheduled to be prepared.

Outreach & further study:

(a) Proposal on how to prepare FHM

(b) Proposal on how to disseminate and use FHM

(c) Preparation of educational and awareness-raising materials for disseminating FHM

Research members:

International Technical Exchange Team, Kei Kudo, Daisuke Kuribayashi, Hideo Yamashita

3.9 Research on sustainable tsunami countermeasures for developing countries - Investigation on community-communication process towards the implementation of coastal vegetation belt for tsunami disaster mitigation

The general roles and limitation of coastal vegetation in tsunami mitigation have been known. However, implementation of coastal vegetation for tsunami mitigation will vary from location to location depending on factors unique to each local area such as locally available vegetation species and topographical conditions. Land use and political and social conditions are involved as well. These “localities” impose various challenges in implementing plans and actions.

ICHARM have developed guidelines for planning and design of coastal forests for tsunami disaster mitigation. However, the guideline contents are now still limited to technical and engineering aspects. Contents on good examples of implementation and management are being considered as addition and should be useful for practical actions.

In order to collect good examples of the implementation process of coastal vegetation for tsunami disaster mitigation, observation and investigation on on-going implementation processes at certain locations will be very useful. In reality, not many examples of well planned and designed coastal forests for the tsunami mitigation purpose are available. The Matara project (Sri Lanka), a project at Pacitan Coast of Eas Java (Indonesia) and a project at the southern coast of Yogyakarta City (Indonesia) are some of those examples.

Considering potential lessons that can be learned from these on-going processes, both from engineering as well as social processes, research on the processes will be quite useful to provide important knowledge for the development of implementation guidelines from a management point of view. Therefore, in this research we will collect new data and information on the whole process of planning, design, and community-communication

towards the implementation of coastal vegetation-belt development for tsunami disaster mitigation.

Expected Output: Formulation of the important steps towards a successful implementation of coastal vegetation-belt development for tsunami disaster mitigation.

Research Members:

Shgenobu Tanaka, Katsuhito Miyake, Dinar Istyanto

3.10 Development of Food Preparedness Indices

In many local disaster cases, assistance from a central government is not often timely and sufficient. Therefore, raising the disaster preparedness level of communities and local governments is the key factor in local disaster management. In order to properly assess the flood disaster preparedness level of local governments and communities, it is necessary to use a common set of indicators for evaluation. However, there is no standardized set of indicators that are applicable to many countries and can be used for periodical assessment in localities. Therefore this study focuses on the development of FDPI for this purpose.

In 2009 ICHARM studied similar approaches that are already in place. However it was found that several examples in Japan and USA such as “Local Disaster Management Plan” are not suitable for periodical assessment because they require too many factors and consider the social capital of communities insufficiently.

As of September 2010, ICHARM has prepared a set of questionnaire based on the disaster management cycle (DMC), asking local disaster managers to answer about 80 question items. ICHARM also opened a web site at <http://www.fdpi.jp/fdpi/> for respondents to answer the questionnaire electronically. At a Typhoon Committee integrated workshop held in Macao this past September, ICHARM representatives invited member countries to participate in this survey. A good number of participants have been informed about the questionnaire and are expected to participate in promoting this survey. After the first set of questionnaire are collected and analyzed, ICHARM is planning to revise the questionnaire once again to improve its quality, combination and understandability.

Research Members:

Katsuhito Miyake, Tadashi Nakasu

3.11 Case study on comprehensive disaster management in Bangladesh

Bangladesh is one of the most disaster-prone countries in Asia; especially it is prone to coastal and riverine floods. Bangladesh has been practicing the conventional methods of disaster

mitigation such as embankment construction, cyclone shelter construction, early warning system, raising awareness among local residents, training, evacuation to a safe place or a cyclone shelter, which has constantly reduced life loss and property damage; but looking at the number of fatalities after disastrous floods, like that during Cyclone Sidr, the country still needs to introduce new innovative and cost effective methods.

Therefore, the scope of this case study extends as follows:

1. To choose a model cyclone-prone site where various data are expected to be obtained.
2. To enumerate combination of disaster prevention/mitigation scenarios which are thought to be economical and effective to protect people and property from floods
3. To select the best option and find out how it could be practiced in the locality where disaster ought to occur.
4. To compile recommendations to local authorities and people on better combination of measures that could be done within limited resources for reducing human loss from cyclones.

Research Members:

Katsuhito Miyake, Yoganath Adikari, Dinar Istyanto

3.12 Research on practical application of local experience on disaster management

Since the history of disaster is as long as the history of human life, it is believed that every localities have developed and implemented their own local disaster management unique to local geophysical and social conditions. Through its long history of implementation, several practices were failed and several others are suitably providing solution of disaster management in its respective localities. Types and the advancement of the developed local disaster management practices depend on the available knowledge and capacity of the respective local society. The longer the history of a society, the more various practices were developed by this society.

In this research, “local experience” is described as the “time-tested traditional knowledge or technologies that have been practiced for local specific condition”. The collected knowledge shall be in various forms such as physical art/structure, governance process, verbal forms (saying, stories, anecdotes, etc.), artefacts (monument, etc.).

This research will be carried out in three steps consecutively from FY2010 to 2012 as follows:

FY2010: Collection of local traditions, legends, techniques, knowledge

FY2011: Study on rationality of collected knowledge; compilation of knowledge

FY2012: Guideline development

At the present stage of data collection, management and presentation of the collected data is made in a tabulation form by using the following classification:

- a. Type of hazard: flood, drought, snow avalanche, debris flow, erosion and sedimentation control, tsunami, storm surge, long swell surge, etc.
- b. Local origin: origin of the local knowledge.
- c. Knowledge type: physical structure/system, governance process and dissemination forms.
- d. Function of the knowledge or its phase of implementation in Disaster Management Cycle.
- e. Outline of the practice: brief summary on the knowledge and its application.
- f. Practicing actors: Individual, Household, community, or government.
- g. Information on the present implementation: still implemented or re-implemented (location?) or no-longer implemented.
- h. Information on the availability of scientific analysis (if scientific analysis has been conducted or not).

Research output

1. GL/handbook compilation on local disaster management experience
2. Sharing knowledge through PWRI publication, wikipedia, etc.

Research Members:

Katsuhito Miyake, Dinar Istyanto, Tadashi Nakasu

4. Training

4.1 Introduction

To cope with major water-related disasters, such as floods, it is important and essential to strengthen not only individual but organizational capacity in disaster management because there is always limitation for what each individual person can do.

Well aware of this, ICHARM has been conducting many kinds of training programs designed to contribute to organizational capacity development. After the courses, ICHARM has held follow-up activities such as seminars for ex-trainees, grasped their facing issues, and established new training courses.

In year 2010-2012, ICHARM will offer the following training program.

- Ph.D. Program (3 years):
 - ✓ Disaster Management Policy Program (GRIPS)
- M.Sc. Program (1 year):
 - ✓ Water-related Disaster Management Policy Program (JICA, GRIPS)
- Short Training Course (2-3 months):
 - ✓ Comprehensive River and Dam Management Course (MLIT, NILIM, JICA)
 - ✓ Local Emergency Operation Plan with Flood Hazard Map (JICA)
 - ✓ Capacity development for Adaptation to Climate Change in Asia (JICA)
- Workshop (within 1 week):
 - ✓ IFAS workshop (ADB)
- Follow-up activities (within 1 week)

Most of these programs are intended for practitioners (i.e. for those with a certain level of field experience after college education) involved in river management and water resource development in developing countries. They are expected to disseminate the results of the training in their home countries.

Among these programs, the M.Sc. program is one of the core activities of ICHARM. ICHARM will make efforts to reach the full quota of 20 students and strengthen screening to ensure the quality of the course. ICHARM will continuously improve the learning environment, teaching system and course curriculum.

As for other short training courses and workshops, ICHARM will make efforts to recognize the latest water-related problems in developing countries and improve course contents and teaching staff to meet the needs of trainees.

ICHARM will develop an alumna network to conduct follow-up activities through which ICHARM can supervise the implementation of each ex-trainee's action plan and help

share and find solutions to problems they are facing. ICHARM will extend follow-up activities to another training program. ICHARM is now requested to collaborate training activities with UNESCO Category II Centers around the world.

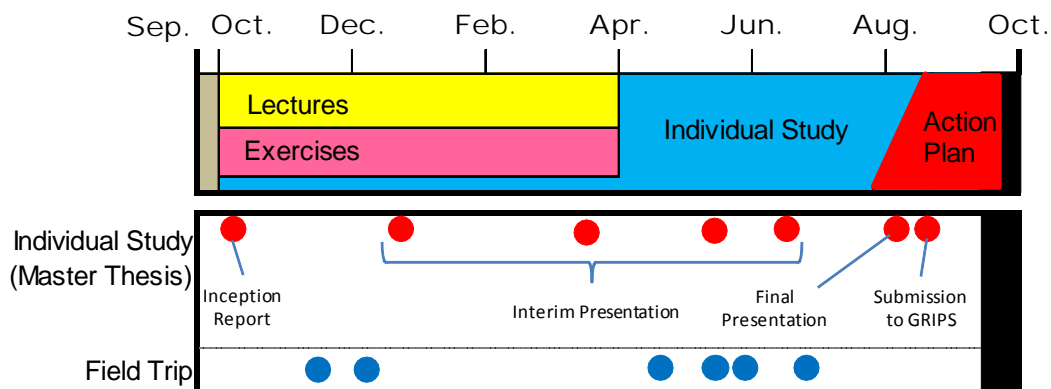
From October 2010, UNESCO-IHE has launched a Master's Program on coastal disaster management and requested ICHARM to implement some training modules based on Japan's experience. HidroEx, a newly established UNESCO Category II Center in Brazil, has expressed their expectation to ICHARM to accept some technological staff and teach them about flood early warning systems in Japan. ICHARM will have to strengthen the network among such water-related organizations to improve its capacity.

4.2 Inauguration of Doctoral Course; see Sec. 2.4

4.3 Further enhancement of the flood Master's course

In 2007, ICHARM launched a one-year master's course "Water-related Disaster Management Course of Disaster Management Policy Program" for mainly technical officials, engineers or researchers of organizations concerning river management in developing countries in collaboration with GRIPS and JICA. This program is designed to provide trainees from developing countries with the mastery of knowledge and technology on flood-related disasters. A Master's degree in flood disaster mitigation will be granted after the completion of the program. The program consists of lectures and practical assignments in the first semester, and the completion of Master's thesis concerning their flood disaster mitigation projects in the second. Field surveys are included in each semester.

Up to September 2010, ICHARM implemented three batches of the Ms. course and 29 students in total have conferred a Master's degree in disaster management. From year 2010, to ensure the quality of students, ICHARM introduced an oral interview in the enrollment process using a tele-conference system. And successful applicants are assigned math homework before the start of the course.



Schedule of the Course

	Bangladesh	China	Colombia	Ethiopia	Guatemala	India	Indonesia	Nepal	Myanmar	Pakistan	Philippines	Sri Lanka	Thailand	Japan	Total
2007-2008	2	3				1		1						3	10
2008-2009	2	2		1			1	1					1		8
2009-2010	2	1		1			3		1		1	1	1	1	12
2010-2011	2	2	1		1		1	3	1	1					12

Number of student of the Course

The course is the core activity as “capacity building” of ICHARM. ICHARM will make the following efforts to reach the initially expected quota of 20 students per year:

I. Participant-recruiting strategy

- Increase students from Caribbean and African regions in addition to Asia,
- Screen applicants severely in the enrollment process to ensure the quality of the whole course,
- Recruiting activities through alumnae and related organizations.

II. Lecturer

- Increase teaching staff such as professors and associate professors for enriching the contents of the course.

III. Facility

- Provide new classrooms and waiting rooms for lecturers to cope with the increase of students.

IV. Teaching material

- Develop e-learning contents and lecture notes from past lectures.

V. Scholarship

- Ensure the budget to cope with the increase of students.

VI. Networking

- Plan and carry out follow-up activities for alumna.

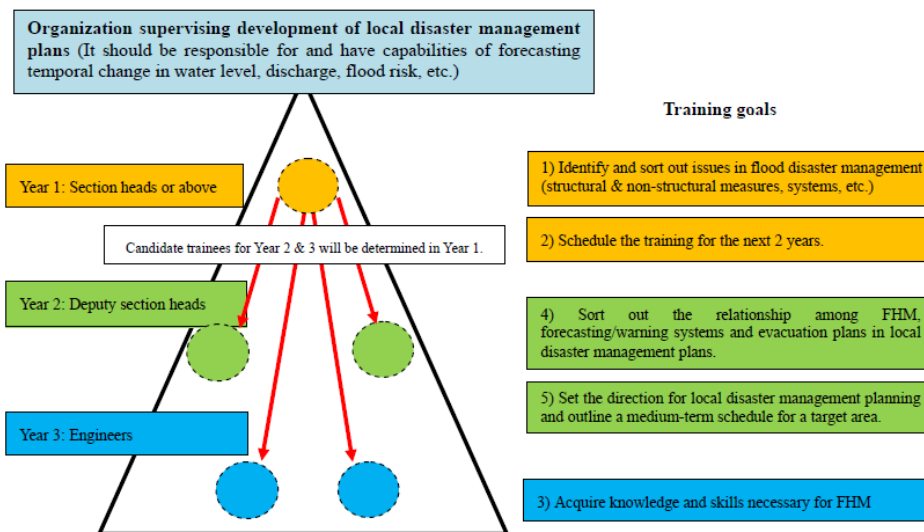
4.4 JICA Training Course “Local Emergency Operation Plan with Flood Hazard Map”

Background and Outline of the Course:

Recently the importance of a flood hazard map as a non-structural measure for flood disasters has been recognized, and its production and dissemination have become more urgent. However, just production and dissemination of flood hazard maps are not sufficient for the capacity building of communities in local disaster management. It is necessary to enhance their capacity in local disaster management by developing a local disaster management plan.

ICHARM of the Public Works Research Institute (PWRI) has conducted the training course of "Flood Hazard Mapping in East/Southeast Asian Region" for five years from 2004. This training course contributed to grow the understanding of the importance of hazard mapping in Asian countries. Based on the achievement of this training course that ended in FY 2008, a new course was prepared to provide improved training. This new course, targeting not only Asian countries but also all regions suffering from flood disasters, aims to strengthen the resilience of disaster management organizations and local communities against floods through making local disaster management plans combined with disaster prevention facilities, flood hazard maps and flood forecasting/warning systems.

This training course will be conducted for three years. First-year participants will be executive officers who are expected to make an executing plan for their home country and to select suitable participants for the next two years. Second-year participants are expected to acquire necessary skills for flood hazard mapping, and third-year participants will make an action plan that shows the direction and schedule to make a local disaster management plan. After finishing the three years of the training course, the action plan will be revised through follow-up programs.



Course objective/outcome:

Outputs:

Year 1: Report on flood disaster countermeasures comparing Japan with their country and 3-years' action plan.

Year 2: Sample anticipated inundation area map.

Year 3: Report on a local disaster management plan using FHM and a flood forecast/warning system.

4.5 JICA Training Course “Capacity Development for Adaptation to Climate Change in Asia- Climate Change Analysis”

In 2008, JICA launched a short term training course under the above title, which was planned to be conducted on a yearly basis for three years until FY 2010. The three-year plan consisted of 2 categories of training related to meteorology and hydrology/civil engineering. The training courses in 2008 and 2009 were conducted by the Meteorological Research Institute of Japan (MRI) with the purpose of analyzing and interpreting high-resolution MRI/JMA AGCM results with the experience, knowledge and technologies accumulated and developed in Japan. Training participants were expected to use such analysis and interpretation for the projection of current issues related to climate change in each country.

After successful implementation of the previous series of training done by MRI, ICHARM will undertake the third-year training in February 2011 with the following perspectives:

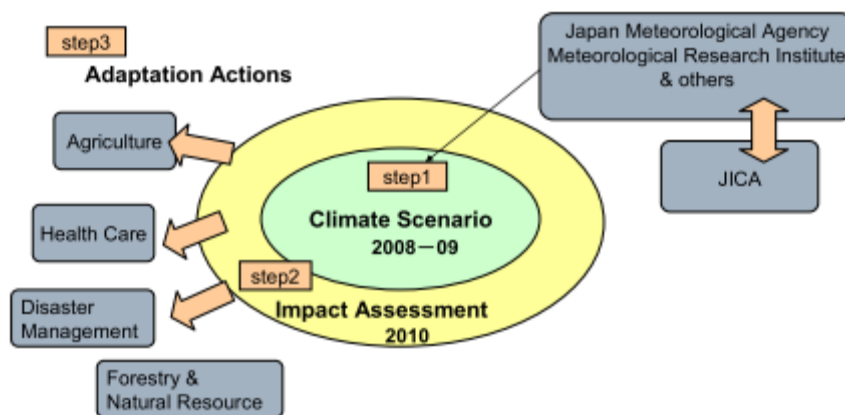
- 1) Target Organization: Authorities of the countries that are responsible for climate change

impact assessment in Asian countries. Participants will be for technical officials who are engaged in climate change issues.

2) Objective: To formulate an environmental impact assessment plan and to enhance related capabilities (To formulate a sectoral paper for impact assessment)

<Structure of the program>

Training Course “Adaptation to Climate Change”



Currently ICHARM is elaborating on the structure and contents of the expected training course for smooth and useful implementation of the course.

4.6 JICA Training Course “River and Dam Eng. III/Comprehensive Management of River and Dam”

River and dam engineering courses have been organized based on the philosophy that water management techniques which Japan has developed over years should also be useful for other countries. The objective of this program is to train engineers in such areas as flood control planning, water resources development and river environment by exposing them to knowledge and technology on river and dam engineering in Japan. The course has a history of 36 years and covers a wide spectrum of subjects ranging from the history of river and dam administration in Japan to advanced technical trends in river and dam engineering. Every year, around ten trainees from developing countries across the world participate in a three-month training, which includes lectures, assignments and field trips related to rivers and dams. After completion of the coursework, each participant will work on a specific

research theme at research laboratories of ICHARM, the Public Works Research Institute and the National Institute for Land and Infrastructure Management. In 2008, this course was reorganized and shifted its main focus from human resources capacity building to problem solving.

Course Objectives/Outcome:

- (1) Understanding the history of Japan's river works and the present legal systems and organizations including environmental assessment, and recognizing water problems in the participants' countries.
- (2) Acquiring the skills of planning and designing related to river improvement and water use.
- (3) Acquiring the skills of design, construction and management of dams.
- (4) Producing a technical report including an action plan to tackle water problems in the participants' countries, based on the knowledge and experience gained from the training.

4.7 Distant learning program

ICHARM will explore launching of distant learning (e-learning) program during the next biennium period.

4.8 Other training activities

Occasional organization of IFAS training will continue to be provided as appropriate, whenever funding and resources are made available, such as funds from ADB.

Furthermore, on an irregular basis, ICHARM is willing to offer short-term trainings for practitioners in developing countries related to flood management, river and water management, etc. when funds and resources are made available.

4.9 Follow-up activities

In order to make training courses even more effective, it is important not only to give excellent lectures but also to enhance participants' ability to carry out projects relating to flood damage mitigation. In each training course, participants should make their own action plans for the future activities in their organizations. It is also important to ensure that action plans will be implemented as planned. For the FHM training course, ICHARM has held

follow-up seminars in Malaysia and China in collaboration with JICA. For new training courses, such as the Comprehensive Management of River and Dam training course and the Master's degree program in flood disaster mitigation, ICHARM and JICA will hold follow-up activities.

5. Information Networking

5.1 Overview

It is indispensable for ICHARM to collaborate and cooperate with relevant organizations and programs conducting activities in the related scope. Such collaboration should bring about mutual benefits by exchanging information and experiences, complementing and increasing efficiency in use of limited resources and creating synergy for common objectives.

For this reason, ICHARM is strongly promoting information-networking activities as the basis for its international collaboration. ICHARM's information networking extends across various activities, including following categories:

- 1) Participating as an active player in the activities of water-related international organizations and their programs, such as International Flood Initiative (IFI), Asia-Pacific Water Forum and Knowledge Hub Network and the World Water Forum.
- 2) Strengthening the linkage with existing UNESCO Water Centres for joint activities.
- 3) Creating and maintaining personal networks through ex-trainees of ICHARM training courses.
- 4) Signing MOUs with professional organizations for close collaboration, such as personnel exchange, joint research and joint meetings.
- 5) Seeking close collaboration and appropriate sharing of responsibilities with various international programmes supported by the River Bureau of the Ministry of Land, Infrastructure, Transport and Tourism, such as the International Flood Network (IFNet), Network of River Basin Organizations (NARBO) and Japan Water Forum (JWF), to achieve synergy among respective activities.
- 6) Planning and implementing various researches and training projects in collaboration with the Japan International Cooperation Agency (JICA), Asia Development Bank (ADB), World Bank and other funding organizations.
- 7) Knowledge dissemination activities through participating in international conferences, ICHARM website and Newsletters.

Because there will be a number of activities that are expected to be done by ICHARM in this category, and also it is not always easy to specifically identify the type and volume of activities to be done in partnership with specific agencies and initiatives, here mentioned are only some of example activities of this category for the next two years.

5.2 Contribution to IFI as secretariat

ICHARM is willing to continuously serve as the secretariat of the International Flood Initiative (IFI), a joint initiative in collaboration with such international organizations as UNESCO (IHP), WMO, UN/ISDR, UNU, IAHS and IAHR. ICHARM will keep maintaining the IFI website (<http://www.ifi-home.info/>) and compiling inputs, materials and tools provided by member agencies, while also providing its own outputs. Biannual newsletters are also planned to be published. Moreover, the ICHARM will make its best effort for IFI to realize active contribution to the organization of the ICFM5 to be held in Tsukuba in September 2011.

5.3 Collaboration with other UNESCO Centres

ICHARM will continuously collaborate and launch joint activities with other UNESCO Centres expecting synergy and mutually beneficial effects to be achieved. Among some of the activities expected to be launched during the next 2 years are the “joint organization of a master’s course on urban coastal zone management with UNESCO-IHE (under discussion)” and the “acceptance of master’s course students from Brazil and Portuguese-Speaking countries in coordination with HidroEx (under discussion)”.

5.4 Collaboration with ADB and Asia-Pacific Knowledge Hubs

ICHARM became one of the first KHs in the Asia-Pacific region on 26 June 2008 on “Disaster Risk Reduction and Flood Management”. ICHARM has been since then seeking ways to contribute to solving various water-related problems in the Asia-Pacific region through deepening the level of collaboration with colleague KHs and ADB. Currently a total of 17 KHs are established in the Asia-Pacific region. The partnership with ADB in implementing Regional Technical Assistance (RETA), launched in Nov. 2009, is expected to continue, hopefully expanding its target areas and activities. ICHARM would like to seek for possible collaboration with other UNESCO centers and KHs for the enrichment of RETA activities.

5.5 APWS2 and WWF6

It was recently announced that the Second Asia-Pacific Water-Summit (APWS2) is planned to be held in January 2012 in Thailand. Moreover, it has been decided that the Sixth World Water Forum (WWF6) will be organized in March 2012 in Marseille, France. During the

previous occasions of these two major water-related events, ICHARM made significant contributions as “Lead Organization of Priority Theme (APWS1)” or “Topic Coordinator (WWF5)”. For these events, the detailed plans are still to be discussed and crystallized from now on. ICHARM wishes to contribute to these occasions in whatever possible manners.

5.6 Others

It is not possible that at this moment to cite all possible organizations and networks that ICHARM would associate within the next two years. Also describing the manner, timing and types of collaboration with other organizations and networks is even more difficult, because by nature information networking activities depend on future actions to be taken by counterpart agencies. However ICHARM is willing to continue and expand its information networking activities so that ICHARM’s activities and products will be properly conveyed to the other research institutes, policymakers, flood managers and practitioners, and local people.

6 Closure

ICHARM committed ourselves to strengthen our current endeavors, “capacity development”, “advanced technology” and “local practices”. This is an action plan to guide our steps forward where “consolidation” based on the past achievements will be the basic strategy.

Nevertheless this is a living guideline to evolve with development of everyday conditions. Expectation to ICHARM is increasing as a result of increasing water-related disasters all over the world. In order to meet such expectation effectively with this Action Plan, we sincerely seek for an alliance with all related organizations, programs and individuals in localities, nations, regions and the world. Without your support, this action plan is just a picture. We ask your kind cooperation.

Annex 1

International Conference Flood Management (ICFM5)

Flyer

5th INTERNATIONAL CONFERENCE on FLOOD MANAGEMENT (ICFM5)

27-29 September 2011, Tsukuba-Japan

2nd Announcement

Call for Abstracts

Background

ICFM is the only recurring international conference focused solely on flood related issues. It is designed to bring together practitioners and researchers alike, including engineers, planners, health specialists, disaster managers, decision makers, and policy makers engaged in various aspects of flood management. The 5th International Conference on Flood Management (ICFM5) provides a unique opportunity for various specialists to come together to exchange ideas and experiences. ICFM5 marks the continued advancement of flood management practices and policies around the world. The first event, held in Kassel, Germany in 2000, emphasized flood defense measures with each successive event (Beijing 2002, Nijmegen 2005 and Toronto 2008) evolving towards more integrated approaches, including risk, vulnerability and capacity building.

ICFM5 will be held in Tsukuba, Japan on 27-29 September 2011, and will be organized by the International Centre for Water Hazard and Risk Management (ICHARM) under the auspices of UNESCO and the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) of Japan. ICHARM was established within the Public Works Research Institute (PWRI) in Tsukuba city in March 2006. ICHARM also acts as Secretariat of the International Flood Initiative (IFI).

Floods: From Risk to Opportunity

Risk management efforts provide opportunities to establish efficient institutional collaboration and promote living wisely with floods. The ICFM5 theme is "Floods: From Risk to Opportunity", reflective of the continued trend towards a broader understanding of how we collectively make use of opportunity in coping with risk of potential floods and flooding. International and regional cooperation and collaboration is critical to the success of the overall flood risk reduction process. Various nations and regions throughout the world are increasingly demonstrating their capacity to devise effective policies and measures to address the challenges they face due to increased risks from the impacts of climate change, increased urbanization, and environmental degradation.

ICFM5 Declaration to be delivered at international initiatives

The ICFM5 declaration will be prepared using presentations and discussions in plenary and parallel sessions and special events. The declaration will highlight ICFM5 outcomes in relation to international and regional events such as the 2nd Asia-Pacific Water Summit as well as the 6th World Water Forum.

Important Dates:

Abstract Submission Deadline: 1st May 2011

Acceptance Notification: By 31 May 2011

On-line Registration: By 31 July 2011

Co-organizers:



ICFM5 ABSTRACT

ICFM5 is the first international conference on flood management. Hence, topic areas are formed based on flood disaster management cycle. All abstracts should be on one A4 page with less than 500 words using the ICFM5 abstract template available on the ICFM5 website. The deadline for abstract submission is April 1st 2011. All abstracts will be reviewed by the International Technical Committee, and an acceptance notification will be sent to the authors of the accepted abstracts no later than April 30th 2011. All accepted abstracts will be published in the conference proceeding. Authors of some selected abstracts will be invited to submit their full manuscripts to be published in a peer-reviewed journal. **For detail of how to submit abstracts, please visit the ICFM5 website at:**

<http://www.ifi-home.info/icfm-icharm/icfm5.html>

Topic Areas for Abstract Submission (Oral, Poster)

Topic 1: Flood Risk Management (Prevention, Mitigation and Adaptation)

- 1.1 Structural measures (design, construction, operation and maintenance)
- 1.2 Non-structural measures
- 1.3 Flood risk management policy and strategic planning
- 1.4 Land use control measures
- 1.5 Climate change adaptation
- 1.6 Environmental and ecological consideration
- 1.7 Flood management in the context of Integrated Water Resources Management
- 1.8 Maximizing flood benefits

Topic 2: Flood Disaster Management (Preparedness, Emergency Response and Recovery)

- 2.1 Flood disaster preparedness
- 2.2 Flood hazard mapping
- 2.3 Emergency management and recovery
- 2.4 Risk communication and damage assessment
- 2.5 Social capital and community defense

Topic 3: Flood Forecasting and Early Warning Systems

- 3.1 Observation, monitoring and forecasting of precipitation and discharge
- 3.2 Hydro-meteorological processes
- 3.3 Rainfall-runoff modeling, flood routing and inundation modeling
- 3.4 Prediction in ungauged basins
- 3.5 Flood warning visualization and dissemination

Topic 4: Flood Management in Different Climate Conditions and Geographic Zones

- 4.1 Urban floods, flash floods, riverine floods, storm surges
- 4.2 Landslides and debris flow
- 4.3 Floods in deltas and estuaries
- 4.4 Floods in arid areas and seasonal rivers,
- 4.5 Floods in cold regions
- 4.6 Trans-boundary rivers floods
- 4.7 Glacial lake outburst floods (GLOFs)
- 4.8 Dam malfunction flood, dam break and natural dams after earthquake, etc.
- 4.9 Reports on recent floods (lesson learned and the best practices)

Topic 5: Cross-cutting and other topics

- 5.1 Flood risk index (assessment and indicators of exposure, vulnerability and capacity)
- 5.2 Integrated flood management approaches
- 5.3 Uncertainty analysis and management
- 5.4 Role of training, information networking and public awareness
- 5.5 International cooperation and assistance
- 5.6 Indigenous flood management knowledge

Tsukuba
Japan

27-29 September 2011

ICFM5

5th International Conference on Flood Management

Conference Structure

ICFM5 will consist of parallel sessions for oral presentations by participants, five plenary sessions and keynotes, poster session, special events, side-meetings and technical and cultural tours.

Parallel sessions: About 25 parallel sessions are currently scheduled in three days to provide opportunity of oral presentation and discussion for the selected abstract.

Poster session: As an integral part of ICFM5 technical program, participants will be provided with unique exposure and discussion opportunity to display their posters.

Special events and Side-meetings (Proposals are welcome): The ICFM5 organizers would like to arrange special events on various aspects of flood management according to the conference topics. The conference organizers will also accept proposals for special events and side-meetings at the occasion of ICFM5. The Conference Secretariat will provide rooms and facilities based on pre-requests and reservations. Please contact ICFM5 Secretariat or visit ICFM5 website for more detail.

Technical visits and cultural tours will be organized on 30 September 2011 for interested participants and guests.

Keynotes and Plenary Sessions

ICFM5, among other objectives, will also provide a follow up on the actions identified by HLEP/UNSGAB (High-Level Expert Panel/ UN Secretary-General's Advisory Board) in the "Water and Disaster" Action Plan. All attendees will have the opportunity to participate in the following five plenary sessions, derived from the HLEP/UNSGAB Action Plan:

Plenary 1: Flood forecasting and early warning systems

Conveners: UNESCO and WMO through the International Flood Initiative (IFI)

Plenary 2: Impact of climate change on flood risk

Convener: International Center for Integrated Water Resources Management (ICIWaRM), USACE

Plenary 3: Flood resilient societies through community preparedness

Conveners: United Nations University (UNU) and ICHARM

Plenary 4: Flood risk management in mega deltas

Convener: To be announced soon

Plenary 5: Floods, landslide and debris flow due to torrential downpours

Convener: China Institute of Water Resources and Hydropower (IWHR)

Online registration has started!

Registration Categories	Fee (Japanese Yen)
Full Registration (Early-bird, From 1 st March to the end of April 2011)	30,000 JPY
Full Registration (From 1 st May to the end of June 2011)	35,000 JPY
One day registration	15,000 JPY
Accompanying Person Registration	15,000 JPY

Full Registration includes: Technical sessions, coffee breaks, welcoming reception, luncheons, book of abstracts, and CD proceedings.

One Day Registration includes: Technical sessions, coffee breaks, luncheon on that day, book of abstracts, and CD proceedings. Welcoming reception is not included for and tickets must be purchased separately.

Accompanying Person Registration includes: Technical sessions, coffee breaks, welcome reception and luncheon. There is no registration for accompanying persons that would like to join only the welcoming reception. For them tickets must be purchased separately.

* There is a 50% discount in all categories for students. For more information contact ICFM5 Secretariat.

ICFM Ad-hoc Committee

Slobodan Simonovic	ICLR(ad-hoc committee chair), Canada
Jos van Alphen	Rijkswaterstaat, Netherlands
Paul Bourget	IWR-USACE, USA
Xiaotao Cheng	IWHR, China
Erich Plate	Karlsruhe University, Germany
Kuniyoshi Takeuchi	ICHARM, Japan

International Technical/Organizing Committee

Giuseppe Arduino	UNESCO- Jakarta Office
Mustafa Altinakar	IAHR, The University of Mississippi
Arthur Askew	IAHS
Mukand Babel	AIT, Thailand
Salvano Briceno	UN-ISDR
Liang-Chun Chen	NCDR, Taiwan
Yong-joo Cho	KICT, Korea
Ian Cluckie	IAHS-ICRS/Swansea University, UK
Johannes Cullmann	National IHP/HWRP, Germany
Siegfried Demuth	UNESCO-IHP
Koichi Fujita	NILIM, Japan
Shoji Fukuoka	Chuo University, Japan
John Harding	UN-ISDR
Srikantha Herath	UNU
Pierre Hubert	IAHS
Toshio Koike	GEOSS/University of Tokyo, Japan
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Zbigniew Kundzewicz	RCAFE, Poland
Soontak Lee	UNESCO-IHP/ Yeungnam Uni., Korea
Kungang Li	MWR, China
Katumi Musiaka	FDN of River&Watershed Env. Mgmt, Japan
Arthur Mynett	IAHR
Hajime Nakagawa	JSCE/Kyoto University, Japan
Taikan Oki	University of Tokyo, Japan
Naoyoshi Sato	MLIT, Japan
Byung-Ha Seoh	KDPA, Korea
Michiharu Shiiba	JSHWR/Kyoto University, Japan
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Soroosh Sorooshian	CHRS, U.C. Irvine, USA
Eugene Stakhiv	ICIWaRM, USA
Bruce Stewart	WMO & IFI
Kengo Sunada	University of Yamanashi, Japan
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Stefan Uhlenbrook	UNESCO-IHE
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Kazunori Wada	PWRI, Japan
Nigel Wright	University of Leeds, UK
Tadashi Yamada	Chuo University, Japan
Gordon Young	IAHS

Local Organizing Committee

Kuniyoshi Takeuchi (Co-chair)	ICHARM
Koji Ikeuchi (Co-chair)	MLIT
Minoru Kamoto	ICHARM
Kazuhiro Nishikawa	NILIM
Norio Okada	DPRI, Kyoto University
Yuji Okazaki	JICA
Kotaro Takemura	JWF
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Supporting Organizations



Floods: from Risk to Opportunity



Contact and Registration

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