

ICHARM Activity Report

[from October 2010 to March 2014]



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1. Outline

1.1 History

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.



Signing ceremony on 3rd March, 2006



Establishment of ICHARM on 6th March, 2006

After its establishment, ICHARM has implemented various activities actively. In January 2011, ICHARM received a high evaluation from UNESCO. Accordingly, in July 2013, the agreement on the establishment of ICHARM was renewed between the Japanese government and UNESCO. Under this agreement, ICHARM continues its activities as a category II center under the auspices of UNESCO. The new agreement requires setting up the Governing Board, instead of the Advisory Board in the previous agreement, which reviews and adopts mid- and long-term plans for ICHARM.

1.2 ICHARM Three-pillar Activities

Since its official launch, ICHARM has been committed to the implementation of the Action Plan advised by the Advisory Board, which was devised with the following three pillar activities: research using advanced technology, training for local administrative officers in developing countries, and information networking for worldwide publicity to promote the presence of ICHARM.



Figure 1-1 Three-pillar of ICHARM activities

1.3 Organization

Although ICHARM is under the auspices of UNESCO as a category II center, it has been part of the Public Works Research Institute (PWRI) as an independent institute from UNESCO. Today, it is recognized as one of the four main institutes of PWRI.



ICHARM has tripled the number of research and office staff as it has expanded its activity, becoming larger than any other research group of PWRI.

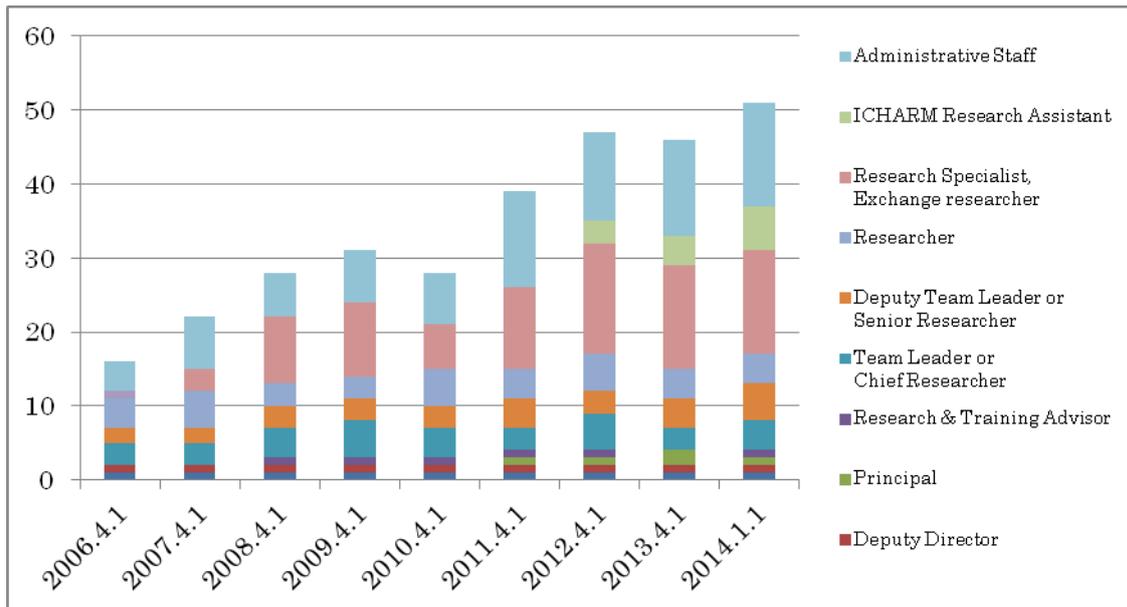


Figure 1-2 Trend of Number of ICHARM staff

1.4 Resources

The annual budget of ICHARM is funded by PWRI and other external sources. Figures 1-3 and 1-4 show changes in the ratio of the founding sources between 2006 and 2013. Although the total budget of PWRI is on a decreasing trend due to the current administrative and fiscal reform, the budget of ICHARM provided by PWRI has been on an increasing trend since its establishment in March 2006 (Fig. 1-3). Accordingly, the share of ICHARM in PWRI's budget has been on an upward trend (Fig. 1-4).

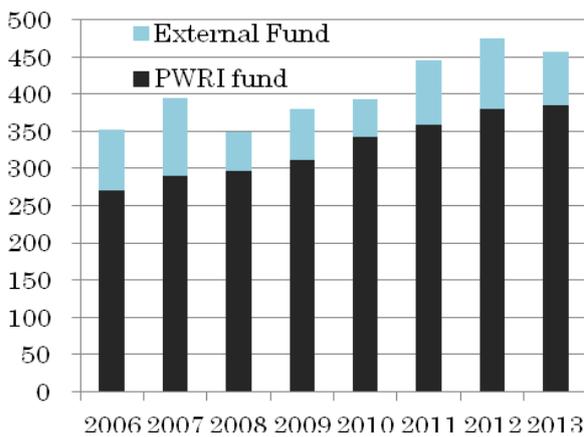


Figure 1-3 Trend of ICHARM Budget

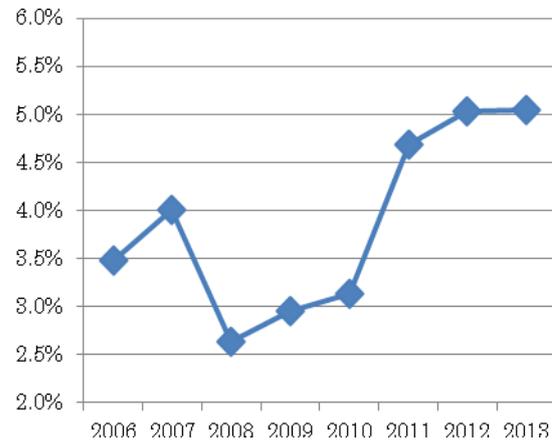


Figure 1-4 Trend of Budget Ratio (ICHARM/PWRI)

1.5 ICHARM Advisory Board and Achievement of ICHARM Action Plan



The 3rd ICHARM Advisory Board on 29th September 2010

The ICHARM Advisory Board was established based on the agreement in 2006, and 13 board members were elected. They provided advice on the ICHARM Action Plan submitted by the ICHARM Director, and reviewed the reports on the activities of the centre.

The current Action Plan 2010-2012, which was discussed in the 3rd Advisory Board, proposed its strategy to increase its capacity by quality improvement, namely, **“consolidation”**. This consolidation sought to consolidate its activities by enriching contents in order to shift its work plan from example demonstration to substantive application.

The following concrete goals set this consolidation in detail:



Figure 1-5
ICHARM Action Plan

Five goals presented in the last ICHARM Action Plan (2010-2012)

1. **Improvement of education programs** on water-related disaster management.
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.

Goal 1: Educational and training programs have been improved annually to put more emphasis on local needs and localism by linking those programs more closely to issues that training participants face as an administrative officer in a developing country. In addition, in response to a higher level of research needs that cannot be met by a master's-level program, a doctoral program was launched in 2010 and graduated the first student in 2013.

Goal 2: ICHARM has been working on upgrading of IFAS and the RRI model. To increase their applicability to all types of river basins worldwide, further research and development of the systems are necessary.

Goal 3: In Indonesia, ICHARM applied an upgraded IFAS to improve flood forecasting in the Solo River basin. In Pakistan, it assisted local engineers in flood control by implementing Indus-IFAS in collaboration with the Meteorological Agency of Pakistan and other local agencies with support from UNESCO. In Thailand, in response to a request from JICA, it provided technical assistance in development of a master disaster management plan after the 2011 Chao Phraya flood, and reproduced the actual flood by means of the RRI model. In Bangladesh, with the support of the Asian Development Bank, ICHARM participated in the joint effort with the government of Bangladesh in development of a basic policy for a flood forecasting and warning system.

Goal 4: ICHARM assisted Cambodia in disaster risk assessment with the support of the Asian Development Bank. Particularly, as a member of the Asia Pacific Knowledge Hub, it provided the government of Cambodia with technological assistance for community-based flood control by developing a flood vulnerability assessment method applicable to the Mekong River flood plain. It also developed the Flood Disaster Preparedness Indices to assess disaster preparedness at the community level and applied them to local communities in cooperation with the Typhoon Committee.

Goal 5: ICHARM has been making efforts in enhancing worldwide collaboration with more organizations. It hosted ICFM5 in 2011 and has been active in addressing the mainstreaming of disaster risk reduction in the international community. It has also concluded an agreement with institutes in Iran and Russia to cover a wider range of water issues such as those in cold regions and droughts.

In recognition of these achievements, the MLIT Evaluation Committee for Incorporated Administrative Agencies graded ICHARM as an S on a five-grade evaluation from SS to C for its excellent international contribution. ICHARM researchers have been awarded for their outstanding accomplishments as well.

The following sections outline the projects of ICHARM between October 2010 and March 2014 in each of the three pillar activity areas, i.e., research, training and information networking. It is noted that this report includes the projects scheduled as and when it has been published in February 2014.

2. Research –Advanced Technology-

2.1 Overview

The basic policy for ICHARM's research activities is to reduce damage induced by water-related disasters around the world. More specifically, it has prioritized research needed to implement water-related risk management in developing countries. When the center was first established, the focus was more on research to understand rainfall and runoff characteristics, which is essential to assess flood risk. In recent years, however, it has been expanding the research scope covering assessment of flood damage risk and risk management including development and implementation of effective countermeasures.

The following describes main research achievements of ICHARM.

2.2 Development and dissemination of Integrated Flood Analysis System (IFAS)

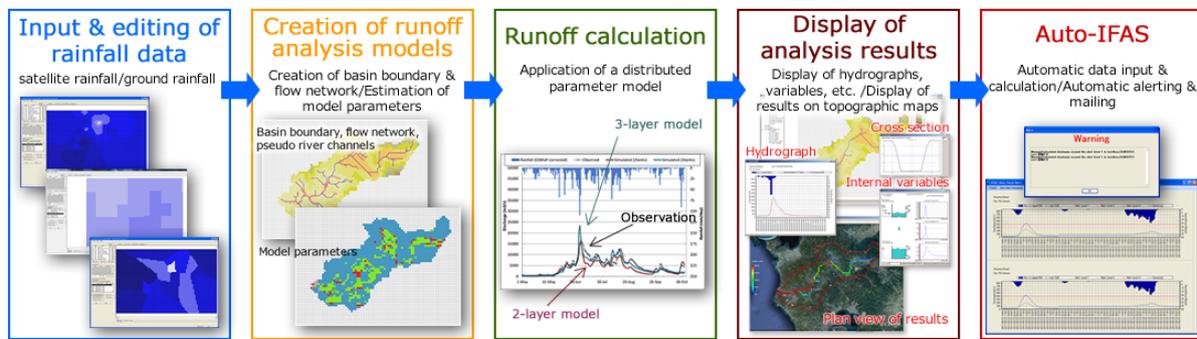


Figure 2-1 Calculation flow of IFAS

The Integrated Flood Analysis System (IFAS) is designed to help create a runoff analysis model easily by using topographic and land-use data which cover almost the entire globe and are available free of charge via the Internet.

With IFAS alone, users can conduct a series of tasks necessary for runoff analysis including data acquisition, model creation, rainfall-runoff analysis and result display. With an additional module named Auto-IFAS, the system is capable of executing automatic functions such as downloading satellite rainfall information, loading ground rainfall information, performing runoff calculation, issuing a warning, etc. With these automatic functions, users can build a real-time flood forecasting and warning system though the functions are minimal as a device for such a purpose.

IFAS with this additional module is very useful even in areas with limited Internet access. It can perform calculation while collecting data regularly according to a predetermined time schedule. In this way, the network and the computer can avoid being overloaded with information processing, which thus enables fast runoff calculation and quick flood forecasting and warning.

The IFAS execute file is downloadable free of charge on the ICHARM website at

<http://www.icharm.pwri.go.jp/research/ifas/>

Since the official launch in December 2008, the traffic to this download site has been increasing every year as IFAS has gone through several upgrades.

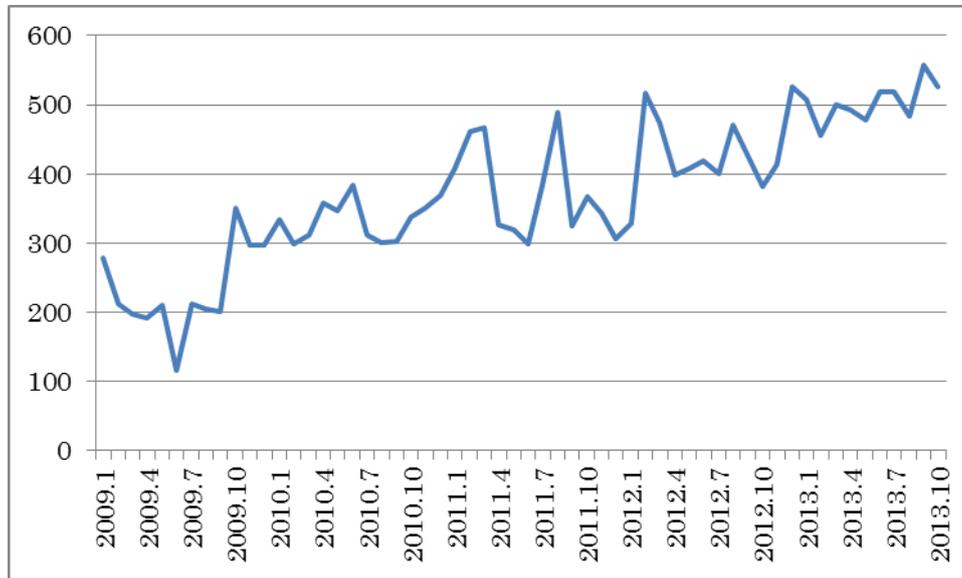


Figure 2-2 Changes in the number of access to the IFAS website

ICHARM has been conducted not only its development, but also its dissemination throughout the world on several occasions. In the duration of this report (October 2010-March 2014) ICHARM trained IFAS to about 560 participant out of total number of about 800.



IFAS training class in M.Sc. program



IFAS training class in Philippines

2.3 Development of RRI model

Conventional flood prediction models, which mainly focus on rainfall-runoff processes in mountainous areas, have difficulties in simulating floods on low-lying areas with large-scale

inundations, such as the 2010 Pakistan and 2011 Thailand floods. In addition, although it is important to quickly simulate a large-scale behavior of floodwaters in global-scale flood risk assessment and large-scale flood prediction, conventional models are not capable of quickly estimating river discharge and flooding from rainfall information. They can only predict river discharge.

To overcome this disadvantage, ICHARM has been developing a new numerical model called the Rainfall-Runoff-Inundation (RRI) model. The model simulates various hydrologic processes including rainfall-runoff, stream-flow propagation, and inundation over floodplains in an integrated manner.

By using the RRI model, we can assess future flood risks for different regions under different climate conditions including climate change. The model may also be applied to large-scale flood prediction on a near real-time basis by using satellite-based topography, land-use and rainfall information in a similar manner to the IFAS procedure.

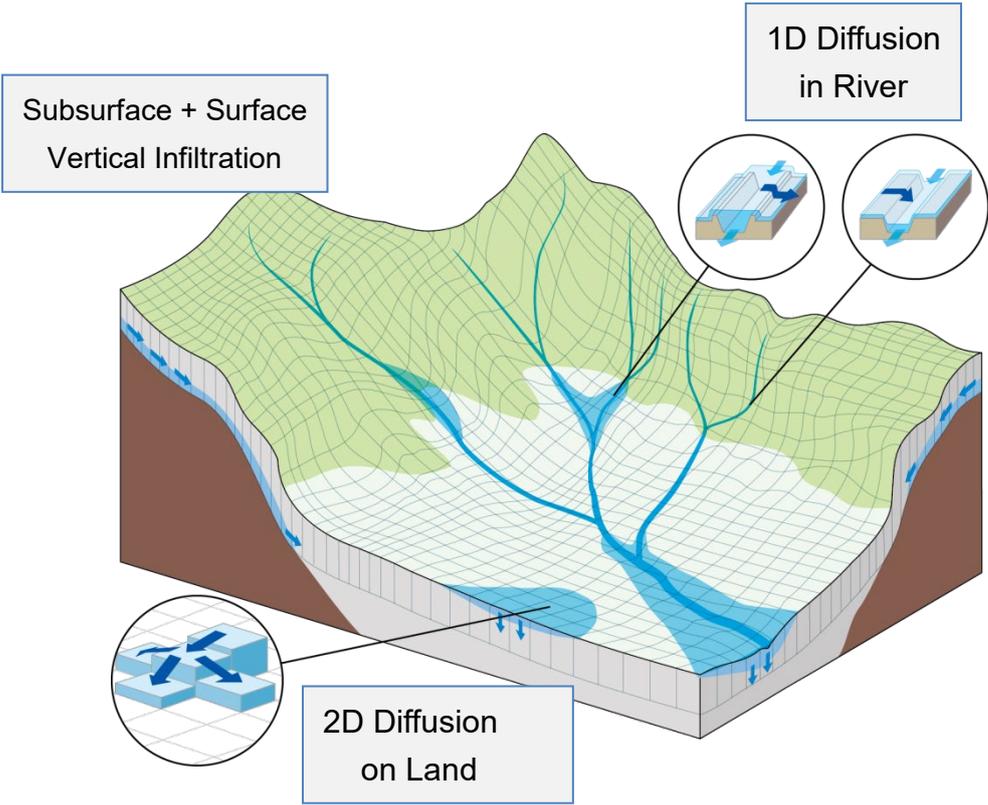


Figure 2-3 Schematic diagram of RRI Model

2.4 Contribution to MEXT research program (KAKUSHIN, SOSEI)

2.4.1 KAKUSHIN Program (FY2007 - 2011)

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) in 2007. The program used the Earth Simulator (ES) to address emerging research challenges and was expected to contribute to the Fifth Assessment Report (AR5) to be published by the Intergovernmental Panel on Climate Change (IPCC).

ICHARM was a member institute of one of the three major projects, entitled the Extreme Event Projection, led by the Meteorological Research Institute (MRI). ICHARM's subject was the "assessment of the impact of climate change on flood disaster risk and its reduction measures over the globe and specific vulnerable areas."

ICAHRM developed the following products in the program.

1. Statistical bias correction method of daily precipitation simulated in climate models, such as MRI-AGCM (atmospheric GCM developed by MRI of JMA).
2. Scale-free hydrographical river basin dataset for hydrological simulation over small to large scale basins, which will be eventually made applicable over the entire globe with little scale effect regardless of grid-size selection.
3. Block-wise TOPMODEL (BTOP) as a hydrological model applicable to small to large basins on the globe using the scale-free hydrographical river basin dataset.
4. New flood risk evaluation method using geological and socio-economic datasets and knowledge in combination with extreme river discharge from BTOP simulation conducted based on present, near-future, and future climate simulation using MRI-AGCM.
5. The assessment of flood-induced agricultural and property damage under the present conditions and also under the future conditions based on climate change scenarios

2.4.2 SOUSEI program (FY2012 – 2016)

MEXT has launched the Program for Risk Information on Climate Change (SOUSEI program), which carries on the work of KAKUSHIN program. This project began in FY2012 and will continue for five years. The aim of this program is to generate information to evaluate the probability of the occurrence of the extreme climate changes and the risk of various scenarios, disasters, damage, etc., and to play a role in risk management.

The project's specific research is divided into five themes. ICHARM is a member institute of Theme D: Precise impact assessments on climate change. ICHARM's subject is the "Development of risk assessment and adaptation strategies for water-related disaster in Asia."

ICHARM is working on the quantitative projection of how flood and drought risks may change around the world, mainly in Asia, as global warming progresses in consideration with projection uncertainties. This will eventually lead to the development of a methodology for socio-economic impact assessment, which will include methods for the global- and basin-scale assessment of flood and drought hazards as well as for the assessment of social vulnerability to those hazards. Coupled with multiple scenarios of the fifth-generation CMIP and

GCM-based climate projections, the methods will make such assessments viable by improving previously-developed technologies for bias correction, global flood runoff analysis and inundation hazard analysis.

2.5 River discharge measurement

ICHARM is developing and disseminating a next-generation discharge measurement system that ensures highly reliable measurements while requiring less labor and cost. The system under development is unique in that automated measurement using fixed current meters such as non-contact current meters (radio current meters) is combined with an acoustic Doppler current profiler (ADCP) for accuracy control. Through observational experiments, the system has been proven applicable even to severe flow regimes, typically seen in Japanese steep rivers. We are further exploring methods to observe river bed fluctuations by use of this advanced automated system.



ADCP experience

2.6 Development of Water and Energy Transfer Processes (WEP) model

The Water and Energy Transfer Processes (WEP) model was originally developed as a basin-scale water cycle model. Responding to the recent need for the management of nutrient load and runoff in closed water bodies, ICHARM has been further improving the WEP model into a basin-scale water/material cycle model by adding the function of simulating the behavior of nitrogen and phosphorus in both dissolved and particulate forms.

2.7 Flood Risk Assessment

Risk assessment is generally conducted through a series of analyses on possible hazards, vulnerability to and countermeasures for the hazards. ICHARM carries out risk assessment, based on one of the most important institute principles: localism. We started the process with thorough local investigation in each target basin to understand its physical, social and economic conditions, while also using advanced hydrological and hydraulic modeling technology. We then assess the impact of socioeconomic risk on a basin and propose effective countermeasures to cope with such risk.

2.8 ICHARM Research & Development (R&D) Seminars

The ICHARM R&D Seminar is a series of seminars irregularly held to improve ICHARM's activities and update the expertise of its research staff. As many as 18 R&D seminars were organized from October 2010 to March 2014 as tabulated in the Table 2-1.

Table 2-1 List of ICHARM R&D Seminar

No.	Date	Lecturer	Position	Lecture Title
30	12-Nov-10	Prof. Shoji Fukuoka	Professor, Chuo University	Adaptation of River technology for climate change
31	25-Nov-10	Asso. Prof. Hiroshi Takebayashi	Associate Professor, Disaster Prevention Research Institute, Kyoto University	Application of bed deformation analysis on natural rivers
32	7-Feb-11	Asso. Prof. Frank van der Meulen	Associate Professor, UNESCO-IHE	Climate change and adaptation in Europe
33	13-Apr-11	Prof. Toshio Koike	Professor, University of Tokyo	Integrated Earth Observations and Predictions toward Flood and Water Use under the Climate Change
34	21-Jun-11	Dr. Rabindra Osti	Senior Researcher, ICHARM	Special lecture for ICHARM BEST PAPER AWARD
35	21-Sep-11	Prof. Djoko Legono	Gajah Mada University , Yogyakarta, Indonesia	THE TRUE COLLABORATIVE-BASED LAHAR FLOW MONITORING SYSTEM IN A CHAOTIC CONDITION
36	17-Oct-11	Asso. Prof. Pat Yeh	Special-appointed Associate, Institute of Insustrial Science, The University of Tokyo	Estimation of Evaporation and Terrestrial Water Storage Change over Global Large River Basins
37	13-Dec-11	Prof. Toshio Koike	Professor, University of Tokyo	GEOSS Water Cycle Integrator An Innovative Tool Contributing to Integrated Human Security and Green Growth
38	13-Dec-11	Prof. Takashi Asaeda	Professor, Department of Environmental Science, Saitama University	Ecological knowledge for natural disasters
39	28-May-12	Mr.Kenzo Hiroki	Principal, ICHARM	Water, Disasters, and Green Economy
40	11-Jun-12	1. Mr. Eisa Bozorgzadeh 2. Dr. Saied Yousefi	1. Deputy of technical and research affairs, 2. Sr. Technical Expert, IWPCO	1.Analytical Study of Drought Management: Remarks and Points 2. Forensic Management of Water Resources for Generating Hydropower in IWPCO
41	11-Sep-12	Mr. Imbe Masahiro	Executive, Association for Rainwater Storage and Infiltration Technology	Implementation of Well-balanced Hydrological System for the Development along the Tsukuba Express Line
42	26-Feb-13	Prof.Andras Szollosi-Nagy	Rector, UNESCO-IHE	How should a (flood) early warning system be developed in data poor nations?
43	27-May-13	Dr.Takahiro Sayama	Researcher, ICHARM	Rainfall-Runoff-Inundation of Large Scale Flooding: From Prediction to Process Understanding
44	12-Jun-13	Mr. Takezumi Ban	President, Association for World Peace Japan	Earthquake Disaster and Poverty Prevention – Work of Toyohiko Kagawa
45	18-Oct-13	Mr. Wouter T. Lincklaen Arriens	Leadership Coach and Advisor, UNESCO-IHE	Expectation for Japan for improvement in the water security in Asia
46	13-Dec-13	Mr. Hayato Nakamura	Project Formulation Advisor (DRM), JICA Philippine Office	Typhoon Yolanda: Gap between Philippine DRRM and Mega Disaster
47	16-Jan-14	Dr. Anthony Kiem	Hydroclimatologist/Senior Lecturer, Faculty of Science and IT, University of Newcastle	Understanding and Adapting to Hydroclimatic Variability and Change in the Asia-Pacific Region

3. Training -Capacity Development-

3.1 Overview

To cope with major water-related disasters like floods, it is important to empower not only individuals but also organizations involved in disaster management because there is a limit to what each individual can do.

Well aware of this, ICHARM provided many kinds of training programs that help improve both individual problem-solving capacity and organizational coping capacity in disaster management. After the courses, ICHARM has held follow-up activities such as seminars for ex-trainees, grasped their facing issues, and established new training courses. Most of these programs were 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.

In the duration from October 2010 to March 2014, ICHARM offered the following training program as shown in the table 3-1. The detailed number of the alumni is shown in the ANNEX 1.

Table 3-1 List of conducted training programs

Category	Course title	Duration	Num. of Participant	Collaboration
Ph.D. Program (3 years)	Disaster Management	2010.10-2013.9	1	GRIPS
		2011.10-2014.9	3 (2 were dropped out)	
		2012.10-2015.9	2	
		2013.10-2016.9	3	
M.Sc. Program (1 year)	Water-related Disaster Management Policy Program	2010.10-2011.9	12	JICA, GRIPS
		2011.10-2012.9	19	
		2012.10-2013.9	12	
		2013.10-2014.9	12	
Short Training Course/Workshop (several weeks)	Capacity Development for Integrated Flood Risk Management in Pakistan	2012.5	6	UNESCO
		2013.5	5	
	Capacity Development for Flood Risk Management with IFAS	2012.7-8,	13	JICA
		2012.12	7	
		2013.7-8	16	
	Local Emergency Operation Plan with Flood Hazard Map	2011.1-2	12	JICA, ADB
		2011.7-8	11	
	Capacity development for Adaptation to Climate Change in Asia	2011.2-3	7	JICA

3.2 Ph.D. Program

In October 2010, ICHARM and GRIPS jointly launched the Ph.D. program. This was the first and challenging attempt since PWRI establishment. 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 motivation and capabilities for doctoral level work, and are willing to take the lead for implementing water-related risk management learned at ICHARM after completion of this program. Until now, one Japanese student has graduated, and six students are in the program.

ICHARM/PWRI employed some Ph.D. 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.

3.3 M.Sc. Program

In 2007, ICHARM launched a one-year master's course "Water-related Disaster Management Course of Disaster Management Policy Program" in collaboration with GRIPS and JICA. This program was designed to provide trainees from developing countries with the mastery of knowledge and technology on flood-related disasters. A Master's degree in disaster management is granted after the completion of the program.



Graduation ceremony at GRIPS (Sep. 2013)

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.

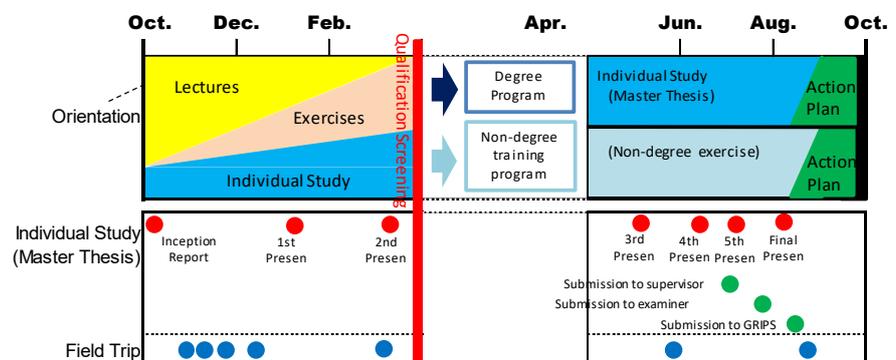


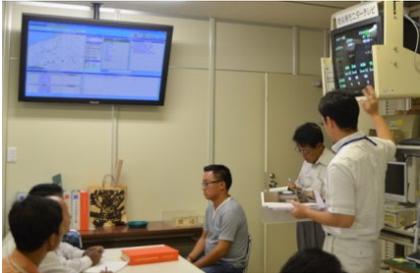
Figure 3-1 Outline of the annual schedule

From October 2010 to March 2014, ICHARM implemented four batches of the

program and 43 students in total have conferred a Master’s degree. Training programs has been improved annually. Based on the results of the post-training evaluation by students, the 2012-2013 course was the most satisfying of all conducted in the past five years.

3.4 Short-term training/workshop program

Short-term training programs were mainly conducted jointly with JICA. Participants learnt knowledge and technologies relevant to water-related disaster risk management for a period of several weeks. ICHARM has made efforts to recognize the latest water-related problems in developing countries and improve course contents and teaching staff to meet the needs of trainees.



Site visit at a local city office

3.4.1 JICA training program "Local Emergency Operation Plan with Flood Hazard Map" (JFY2009- JFY 2011)

The ultimate goal of the program was to increase local flood resilience through the development of local emergency operation plans combined with flood hazard maps and flood forecasting and warning systems and thereby reduce flood damage in the project-target countries. To achieve the goal, the contents were arranged to give the trainees many opportunities to think about what was lacking in their countries to provide emergency information that promotes timely evacuation and also about what they could do to fill such gaps in local emergency operation plans.



Town watching exercise

3.4.2 JICA training program "Capacity Development for Adaptation to Climate Change" (JFY2010)

The purpose of the program was to strengthen the abilities of government officials in developing countries to evaluate the impacts of climate change on rivers and to design adaptation strategies to them.

Seven trainees participated in the training; one each from Bangladesh, Thailand, the Philippines, Viet Nam and three from Indonesia.



Closing ceremony

In the post-training evaluation, five out of the seven trainees listed training on IFAS, PCM

and Trend Analysis as the most useful of all subjects. Evaluation results like this have been reflected in other short-term training opportunities conducted after this.

3.4.3 JICA training program "Capacity Development for Flood Risk Management with IFAS" (JFY2012- JFY 2014)

The program was designed to enhance individual flood-coping capacities and eventually to contribute to flood damage mitigation in their countries. To create as great synergy as possible with JICA's current and future local flood projects, the following two conditions were considered:

- The target basins were those also selected for JICA local projects.
- The target participants were selected from three categories of responsible personnel (meteorologists, river administrators, disaster management officials for public evacuation) who are currently working at organizations involved in the JICA local projects.

Questionnaire by the participants found the following activities particularly useful:

- ◆ Lecture on a river information system in Japan,
- ◆ Application practices of PCM,
- ◆ Application practices of IFAS,
- ◆ Application practices of Town Watching ,and
- ◆ Study trip to the Shinanogawa River basin

They are expected to share knowledge and experience they acquired in this training with others at their respective organizations through lectures and workshops.

3.4.4 Short-term workshop "Capacity Development for Integrated Flood Risk Management in Pakistan" (JFY 2012 and 2013)

The workshop was originally organized as part of a project, "Strategic Strengthening of Flood Warning and Management Capacity of Pakistan," which was launched in response to the 2010 severe flood event in Pakistan. The project was funded by the Japanese government through UNESCO. In 2012 and 2013, ICHARM welcomed totally 11 participants of middle- to high-ranking officials of the Pakistani government.



Project Cycle Management (PCM) exercise



IFAS training



Watarase retarding basin

The participants praised the workshop for its excellent contents and organization. They were particularly impressed with river management in Japan, including how steadily plans are put into action. They also commented that retarding basins like the one they saw at Watarase retarding basin should be effective for flood control in the Indus River basin.

3.5 Follow-up activity

Follow-up activities of ICHARM are intended to encourage ex-trainees to promote their water-related risk management projects. Especially, follow-up seminars allow ex-trainees to update their knowledge about advanced technologies in the field, to visualize issues they may face in their daily work, and discuss them among the participants.

For these reasons, ICHARM has conducted three follow-up seminars as shown in the Table 3-2.

3.6 Internship

ICHARM has been actively accepting college students for short-term internship and researchers from overseas institutes, providing opportunities for them to deepen their research interests intensively. A total of 14 students and researchers used these opportunities between October 2010 and March 2014.



Short course “Early warning system for flood disaster mitigation”



Seminar on Sediment Hydraulics and River Management

Table 3-2 List of conducted follow-up activities

Date	Follow-up activity	Venue
Nov. 6-7, 2010	Short course “Early warning system for flood disaster mitigation”	Hanoi, Viet Nam
Feb. 20-23, 2012	Follow-up discussion (on the occasion of The Southeast Asia Flood Risk Reduction Forum)	Bangkok, Thailand
Feb.13-14, 2013	Seminar on Sediment Hydraulics and River Management	Dhaka, Bangladesh

4. Information networking

4.1 Outline

ICHARM promotes many types of information networks to disseminate research results and strengthen partnership with relevant organizations. The following introduces main networking activities.

4.2 International Flood Initiative (IFI)

IFI is a framework to promote collaboration in flood management among international organizations such as UNESCO, WMO, UNU and UNISDR. IFI focuses on research, information networking, education and training, community empowerment, and technical assistance in various areas including integrated flood management. ICHARM has been serving as its secretariat.



4.3 5th International Conference on Flood Management (ICFM5)

ICHARM organized ICFM5 in Tokyo on 27-29 September 2011. More than 450 people from 41 countries participated. Under its main theme, “Floods: From Risk To Opportunity,” the participants had productive discussions on five topic areas including flood risk management. The conference finally adopted the ICFM5 declaration crafted based on the discussion results of each topic-area (<http://www.ifi-home.info/icfm-icharm/icfm5.html>).



Plenary Session

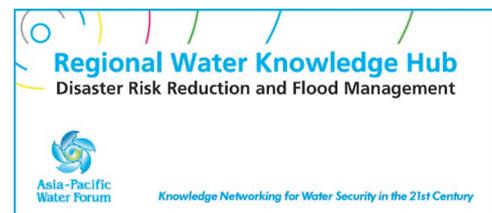
Selected papers presented at the conference have been published in the Red Book No.357, Journal of Disaster Research 7 (5), and a special issue of the Journal of Flood Risk Management (December 2012) .



Special Session

4.4 Asia-Pacific Knowledge hub

In June 2008, the Asia-Pacific Water Forum (APWF) officially acknowledged ICHARM as a Knowledge Hub with particular focus on disaster risk reduction and flood management. As a Knowledge Hub, ICHARM is expected to promote local application of high value-added know-how and research results in order to realize water security in the Asia-Pacific region under the framework of the APWF.



4.5 Typhoon committee

The Typhoon Committee is an inter-governmental body organized under the joint auspices of the Economic and Social Commission for Asia and the Pacific (ESCAP) and the World Meteorological Organization in 1968 in order to promote and coordinate the planning and implementation of measures required for minimizing the loss of life and material damage caused by typhoons in Asia and the Pacific. Mr. Minoru Kamoto, chief researcher of ICHARM, took a role of the chairperson of the hydrology working group.

ICHARM implemented a project of the Flood Disaster Preparedness Indices (FDPI), which can measure the capacity of disaster preparedness by communities, and reported in 2012.



Figure 4-1 Report of the Project on Establishment of FDPI (December 2012)

4.6 Contribution to UNSGAB

The United Nations Secretary General's Advisory Board on Water and Sanitation (UNSGAB) is an independent body established in March 2004 by United Nations Secretary-General, Mr. Kofi Annan, to give him advice as well as to galvanize action on water and sanitation issues.



Mr. Kenzo Hiroki, ICHARM principal and a member of the UNSGAB, has contributed to the activities jointly with MLIT. As a part of the activities, on March 6, 2013, ICHARM supported a special high-level session on water and disasters, convened by the UN Secretary-General H.E. Mr. Ban Ki-moon. This event marked the first high-level UN thematic event discussing issues at the nexus of water and disasters.



“Special high-level session on water and disasters” (March, 2013)

4.7 Agreement with organizations

Since its establishment, ICHARM has signed a research partnership agreement with 13 overseas institutes (Table 4-1) to make collaborative efforts to address water issues around

the world.

In 2013, to include droughts and other water issues in cold regions, it concluded such an agreement with research institutes in Iran and Russia.

Table 4-1 List of ICHARM partners

1	Korea	Korea Disaster Prevention Association(KDPA)
2	U.S.A.	Bureau of Reclamation of the Department of the Interior of the United States of America
3	Netherlands	UNESCO-IHE Institute for Water Education(UNESCO-IHE)
4	Iran	Regional Centre on Urban Water Management(RCUWM-TEHRAN)
5	Philippines	Flood Control and Sabo Engineering Center (FCSEC)
6	Japan	Yamanashi University
7	CHINA	International Research and Training Center on Erosion and Sedimentation (IRTCES)
8	Brazil	HydroEx
9	Indonesia	Tsunami & Disaster Mitigation Research Center (TDMRC)
10	Japan	Kyoto University
11	Lao PDR	Mekong River Commission (MRC)
12	Indonesia	Faculty of Engineering, Universitas GADJAH MADA (UGM)
13	Iran	The Iran water and power resources development company(IWPC), Ministry of Energy, Tehran, I.R.IRAN
14	Russia	State Hydrological Institute (SHI)

4.8 Overseas business trip

To promote international activities described above and local practices explained below,

ICHARM has sent roughly 440 staff members in total to overseas countries since October 2010 (Fig. 4-2). Particularly, overseas business trips dramatically increased due to the launch of the UNESCO Pakistan Project in 2011 (see 5-3 for more information). Participation in field studies, conferences and committees held abroad has been also on the rise as local projects progress further and ICHARM increases its presence worldwide.

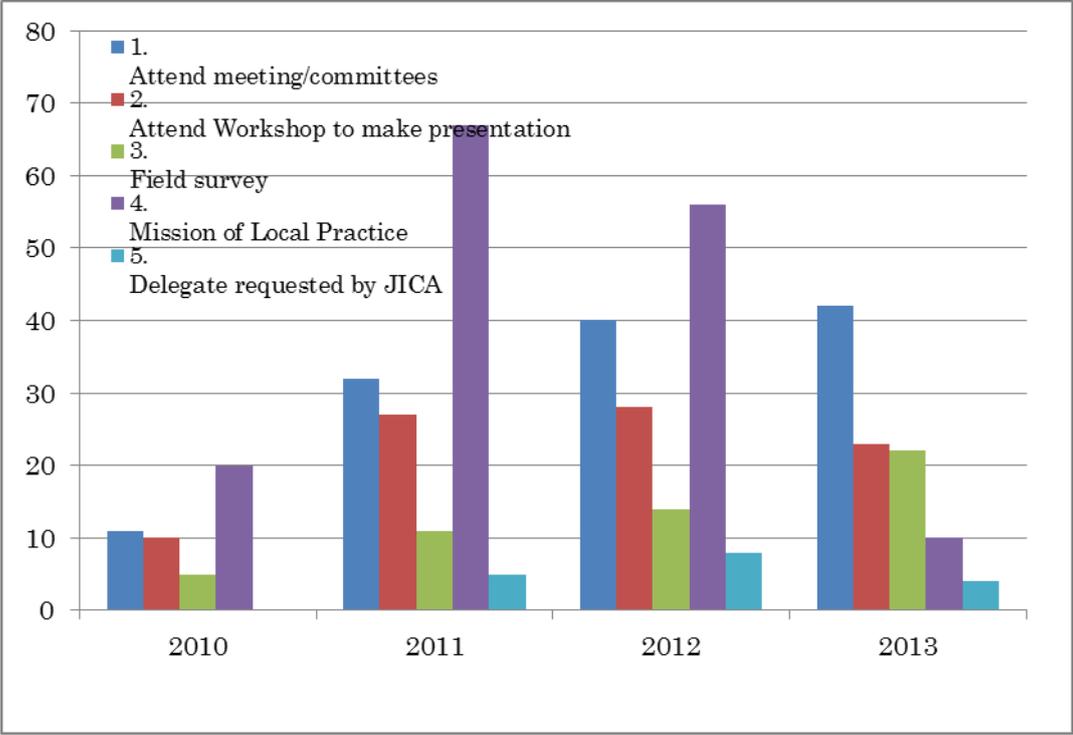


Figure 4-2 Trend of Overseas business trip

5. Local Practices -Localism-

5.1 Outline

ICHARM has participated in local projects organized by ADB and UNESCO and implemented activities in cooperation with local administrative and research organizations in order to test applicability of several models developed by ICHARM to local basins. Those projects have been successfully implemented despite difficulties in arrangement with local offices and problems in the actual implementation process. The following describes the outline of each project.

5.2 ADB Project: Technical Assistance No. 7276, Supporting Investments for Water-Related Disaster Management

Signing a collaborative agreement with ADB in November 2009, ICHARM conducted a project, “Regional Technical Assistance (RETA) 7276: Supporting Investment in Water-Related Disaster Management (TA7276),” which ended in March 2013. This project was planned to build an environment to encourage investment in disaster management in developing countries. In the 1st Asia-Pacific Water Forum in 2007, ICHARM was the lead organization of the water disaster session and assigned as a Knowledge Hub on disaster risk reduction and flood management. ICHARM’s involvement in this project was part of the responsibilities as a Knowledge Hub. This was the first international project that the Public Works Research Institute (PWRI) had ever conducted under a collaborative agreement, and it was a major challenge for ICHARM to broaden its scope of activity as an international organization.

In this project, ICHARM first conducted field investigations to collect a wide variety of local data on past inundations, observation systems, livelihood on hinterland, urbanization in basins before flood prediction and flood risk assessment. Complying with our principal policy of localism, we proposed solutions that were considered best suited to target localities based on the needs and conditions confirmed from the field investigations.

ICHARM was involved in the following five projects:

1. Bangladesh: Development of a basic plan for a new flood forecasting and warning

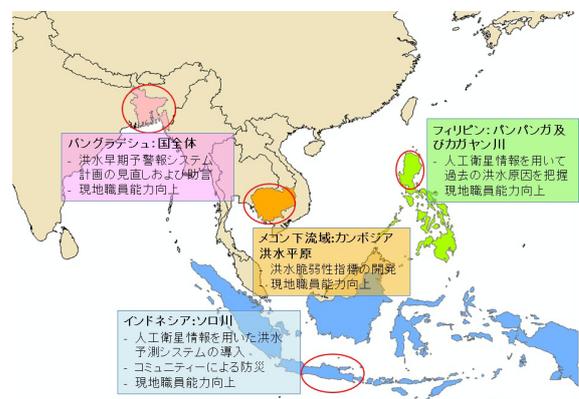
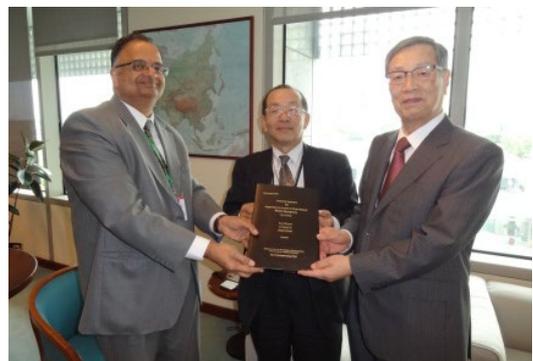


Figure 5-1 Target Project



Final Report to ADB
On 12th March, 2013

system

2. Indonesia: Implementation of a satellite-based flood forecasting system in the Solo River
3. Cambodia: Development of a flood vulnerability assessment method for the Mekong flood plain
4. Philippines: Implementation of flood management training using a satellite-based runoff model in the Pampanga and Cagayan rivers.
5. Development of the prototype of flood risk assessment indices for the Asian region

Projects 1 to 4 are efforts to contribute to national flood risk reduction while Project 5 contributes to regional flood risk reduction. The results of TA7276 are very promising, for the technologies and concepts produced for the projects can be applied to other river basins with some technological customization based on local basin characteristics.

In March 2013, Taketo Uomoto, the chief executive of PWRI, and Kuniyoshi Takeuchi, the director of ICHARM, visited Seethapathy Chander, the director general of the ADB Regional and Sustainable Development Department to report the results of the TA7276 project. Mr. Chander expressed deep gratitude and highly praised ICHARM for its achievements and hoped for its involvement in future projects as well. Convinced that the strong trust built between ICHARM and the counterpart countries through this technical assistance is indispensable, we will continue our commitment to water-related disaster risk reduction in the Asia-Pacific region, maximizing our strong technological advantage and adequate experience in disaster risk reduction and flood management as a Knowledge Hub.

5.3 UNESCO-Pakistan project

In late July 2010, the monsoon brought a record rainfall over northern Pakistan and caused the worst flood in the past 80 years. The flood had serious damage on the area, affecting 20.3 million people in total, killing 1,985 and damaging or destroying 19 million houses (Pakistan 2010 Annual report, National Disaster Management Authority).

As a part of the restoration effort from this flood disaster, UNESCO started a project called “Strategic Strengthening of Flood Warning and Management Capacity of Pakistan” in July 2011. This comprehensive project consisted of three components, and ICHARM has been assigned to two of these components: technical assistance and capacity development. In the first component, ICHARM assists Pakistani government in the development and implementation of “Indus-IFAS” and the production of flood hazard maps. Indus-IFAS is specifically designed to fit the conditions and needs of the Indus River basin by



Training in August 2013 with three ICHARM M.Sc. Alumni

combining IFAS and the RRI model. In the other component, ICHARM has provided the opportunity to participate in its M.Sc. program and short-term training programs for government administrators such as the Pakistan Meteorological Department, the Pakistan Space and Upper Atmosphere Research Commission and other agencies.

5.4 Thai Flood simulation

From July to November in 2011, a large-scale flood occurred in the Chao Phraya River basin of Thailand, causing tremendous damage to livelihood, businesses, and farming of local people. In mid-October, ICHARM started flood simulation with the Rainfall-Runoff-Inundation (RRI) model as part of emergency response in order to understand the prospective development of the flood in the basin. With the RRI model, it is possible to predict the progress of a flood, holistically considering the effects of discharge and inundation. In the case of simulation during emergency response, topographical information and estimated rainfall supplied by satellites are often used for simulation, because real-time local information is hardly available during a disaster. The Thai flood was simulated for the extent and duration of inundation by using estimated rainfall as input data. Part of the results were released to the public in a press conference held jointly with MLIT, and also provided to governmental agencies and media organizations, which drew a lot of media and public attention to ICHARM and the new technology.

In response to this huge flood, JICA decided to provide assistance for the Thai government through the “Project on a Comprehensive Flood Management Plan for the Chao Phraya River Basin.” ICHARM supported this effort by offering technical advice as a member of the advisory committee formed within Japan for this project.

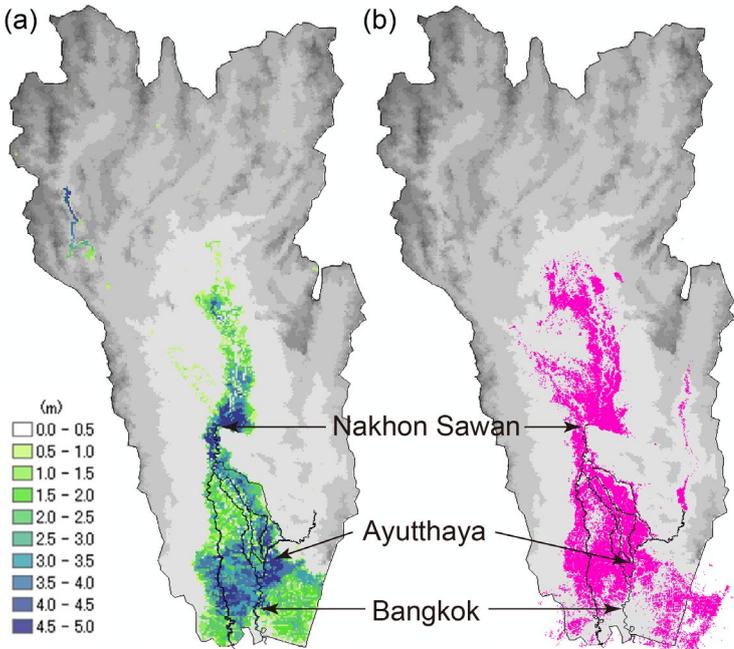


Figure 5-2 Inundation extent in the Chao Phraya River basin estimated (a) by the emergency response-type simulation and (b) by satellite remote sensing (provided by UNOSAT) for 2011 Thailand Flooding as of October 13, 2011

6. Public Relationship

6.1 Website

As a means of public relations, ICHARM disseminates up-to-date information through its website at <http://www.icharm.pwri.go.jp/index.html>. In recent years, our website has been accessed 5,000 to 6,000 times monthly.

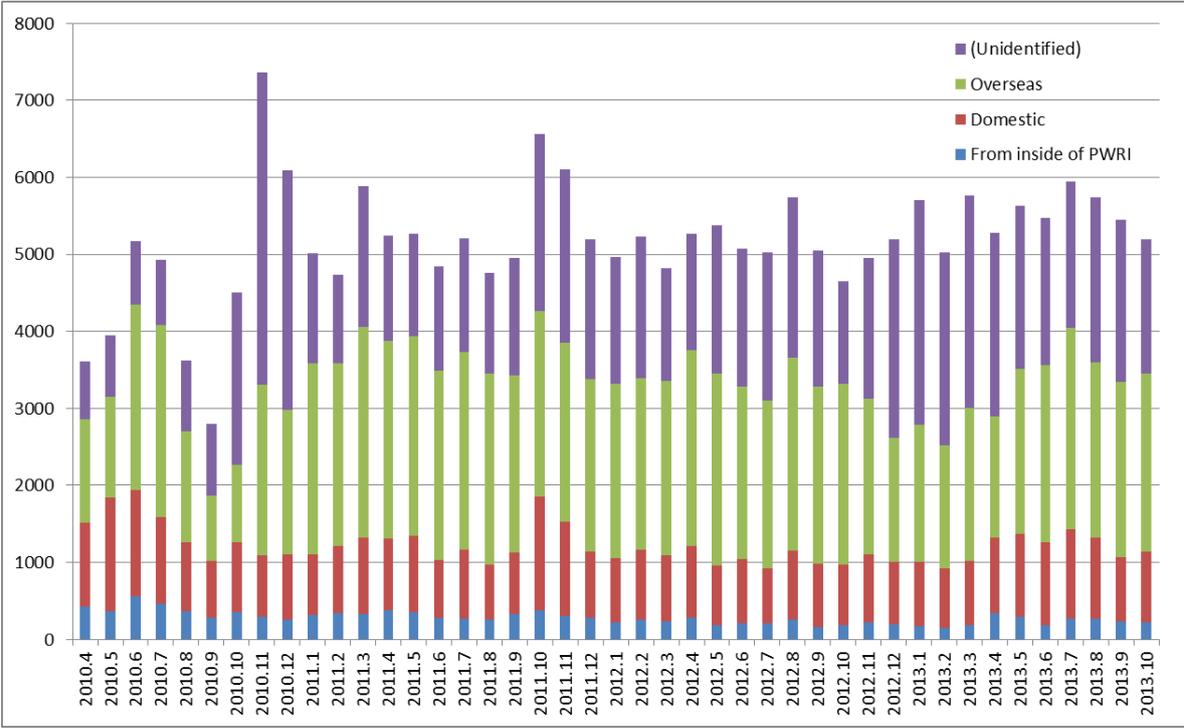


Figure 6-1 Trend of Access number of ICHARM web site

6.2 ICHARM Newsletter

ICHARM regularly publishes ICHARM newsletters on quarterly basis, to registered subscribers, and through other channels. ICHARM newsletters contain a variety of news and other articles such as message from Director, special topics, report of international meetings and seminars, visitors to ICHARM, ongoing research, training activities, and projects, etc.

Since the ICHARM establishment a total of 31 volumes of newsletters have been issued and of which 14 newsletters were published during the reporting period.

ICHARM Newsletter is available at <http://www.icharm.pwri.go.jp/publication/index.html>.

Newsletter

Volume 8 No. 4
Issue No. 31

January 2014

ICHARM

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

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Message from Director

ICHARM has started the year 2014 with a refreshed enthusiasm under a renewed agreement between UNESCO and the government of Japan signed last July. The new agreement requires us to establish the Governing Board, which was the Advisory Board in the previous agreement. We expect that the Governing Board of top international executives will examine ICHARM's activity plan to ensure proactive implementation. We are making our best effort to prepare for the first board meeting, scheduled on February 25.

Near the turn of the year, we had another devastating disaster, when storm surges by Typhoon Haiyan (locally called Yolanda) hit Leyte Island of the Philippines on November 8. It was reportedly the strongest typhoon ever recorded among the landed. Many houses and towns were completely swept out, and more than 6,000 people were killed. It was only 7 years ago when Leyte experienced a giant landslide, which occurred after weeks of heavy rains and killed more than ten thousand people. Meanwhile, in Japan, people in Oshima Island were still at a loss after a deadly debris flow, unable to make any plans yet for recovery. Right after the turn of the year, we also saw many pictures of floods in Southwest England and Wales. Indeed, extreme hydro-met phenomena have been increasing.



Under such circumstances, the role of ICHARM is growing. One of the reasons is that it assumes the responsibility of the most critical part of disaster prevention; that is, as Chinese philosopher Sun Tzu says, "If you know the enemy and know yourself, you need no fear even against a hundred battles." In disaster prevention, to know the enemy is to know the characteristics of the hazards and their forecasts, and to know yourself is to assess exposure and vulnerability of human activities, coping capacities and institutional arrangements.

ICHARM, together with foreign students, is concentrating on acquisition and production of such knowledge on hazards and society in combination with capacity development programs, and apply the research results to local practices by helping practitioners of national and regional governments. Based on such substantive experiences, ICHARM also takes part in international efforts of policy and strategy making.

We hope ICHARM receives even further cooperation and support from the world to continue activities under the renewed agreement.

31 January 2014
Kuniyoshi Takeuchi
Director of ICHARM



ユネスコのカテゴリー2センターに関わるルールの見直しに伴い、昨年7月、ユネスコ・日本政府間の協定も改定されました。したがって2014年は、ICHARMにとって新協定下での新年になります。センター員一同、気持ちも新たに活動を開始しました。新協定では、従来の諮問委員会に代り、運営理事会にICHARMの運営を審査頂くこととなります。理事会には内外関係機関のトップを迎え、大所高所からの審査とご指導を期待しています。第一回理事会は2月25日に開催の予定で、それに向けた準備を進めています。

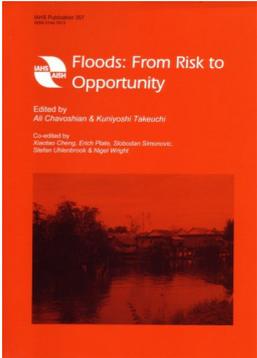
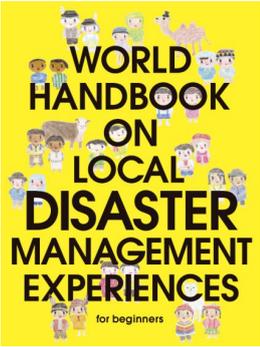
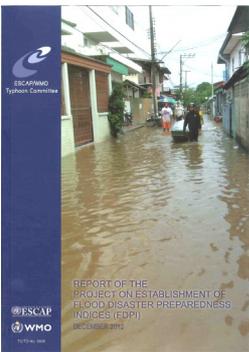
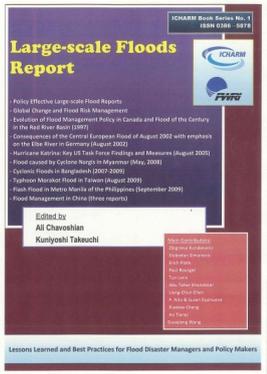
昨年末には、また悲惨な災害が起きました。11月8日にレイテ島を中心に襲ったサイクロン・ハイヤン(台風30号)による高潮で、多くの町が壊滅し6000人以上の方が亡くなりました。上陸した台風としては観測史上最大規模だったと報じられています。レイテ島ではわずか7年前、巨大地すべりで1000人以上の方が亡くなったところです。日本ではこれに先立つ台風26号で、大島の土石流災害により50人近くの方が亡くなり、避難された方々の帰還の計画も立たない時期でした。新年早々にはイギリスから、暮れからの雨で各地で洪水が発生したニュースが届けられています。気象の極端現象は進化の一途をたどっています。

そんな中でICHARMへの期待はますます高まっています。水防災という戦いの中で最も重要な、「敵を知り己を知れば百戦危うからず」と言うところを分担しているからです。敵を知るのはハザードの特性研究、予報であり、己を知るのは人間活動の暴露と脆弱性の評価です。対策や社会の仕組みの評価も含まれます。これら敵と己を知る技術の研究を、能力開発プログラムを一体に、留学生と一緒に研究し、その成果を現地の実務者を通じて実践に移しています。その上で、リスク削減の国際政策や体制作りにも参加しています。新しい協定の下でのICHARMの発展に、一層のご支援をお願いします。

6.3 Publication

ICHARM has published the following books and leaflets related to water disasters.

Table 6-1 List of Publication

<p>IAHS Red Book “Floods: From Risk to Opportunity”</p> 	<p>HANDBOOK on Local Disaster</p> 	<p>Report of the Project on Establishment of Flood Disaster Preparedness Indices (FDPI)</p> 	<p>Large-scale Floods Report</p> 
<p>IAHS Publication No. 357 (2013), ISBN 978-1-907161-35-3, 480 pages</p>	<p>Leaflet, 2013, 38 Pages</p>	<p>Typhoon Committee, Leaflet, 2012 26 Pages</p>	<p>Book, 2011, 232 Pages</p>
<p>Dr. Ali Chavoshian, Dr. Kuniyoshi Takeuchi, Mr. Minoru Kamoto</p>	<p>Dr. Megumi Sugimoto</p>	<p>Mr. Tadashi Nakasu, Mr. Toshio Okadumi, Mr. Yoshikazu Shimizu</p>	<p>Dr. Ali Chavoshian, Dr. Kuniyoshi Takeuchi</p>

6.4 Paper list

ICHARM members have been active in trying to disseminate research results or new findings through various channels, such as submission of papers to internationally recognized journals, contribution to book chapters, and publication of various reports as shown in the table 6-2. The list of these activities are shown in the Annex 2.

Table 6-2 List of Papers

	2013	2012	2011	2010
Book	1	1	1	1
Journal	12	4	8	4
Paper	12	8	6	10
Abstract or Conference	10	18	45	27
Articles or Others	4	7	14	9
PWRI Technical Note/PWRI research report	2	4	2	3
Total	41	42	76	54

7. Award

ICHARM researchers have been awarded several times since 2010 in recognition of their excellent work.

Awardee	Award	(reason)
Dr. Kamimera	Award from the Ministry of Natural Resources and Environment (MONRE) of Vietnam, 2013	Contribution to the development of hydrometeorology in Viet Nam
Dr. Sayama	15 th Infrastructure Technology Development Award, July 5, 2013	Development of the Rainfall-Runoff-Inundation (RRI) model
Mr. Tatebe, Dr. Sayama, Dr. Tanaka	Best Research Exchange Award in 2013 SAT, Jan, 22, 2013	Flood simulation for emergency response in the case study of the 2011 Thai flood
Dr. Sayama	Young Scientists' Prize by the Minister of Education, Culture, Sports, Science and Technology , Apr, 2013	Development of the Rainfall-Runoff-Inundation (RRI) model
Dr. Takeuchi	International Hydrology Prize, Oct. 23, 2012	Outstanding contribution to hydrology internationally

8. External Evaluation

ICHARM has been evaluated for its achievements by external organizations such as the PWRI External Committee and the MLIT Evaluation Committee for independent administrative agencies. ICHARM has also been evaluated recently by UNESCO for the renewal of the agreement between the Japanese government and UNESCO. Table 8-1 lists the evaluations and their results.

The MLIT Evaluation Committee awarded PWRI with three or five S's for its activities in the past three years, and one of the S's was always given to ICHARM in the three consecutive years, showing that the committee recognizes its high-quality international contributions.

Table 8-1 List of external evaluation

Month Year	Evaluator	Evaluation Result
Aug. 2013	MLIT 2012 Performance evaluation of incorporated administrative agencies under MLIT	PWRI received the highest rating "S" for 3 out of 15 evaluation items. ICHARM contributed to one of the three. (i.e., training and educational programs, the International Hydrology Award received by ICHARM director, etc.)
Sep. 2012	MLIT 2011 Performance evaluation of incorporated administrative agencies under MLIT	PWRI received the highest rating "S" for 3 out of 15 evaluation items. ICHARM contributed to one of the three. (i.e., training and educational programs, contribution to flood control measures in the Chao Phraya River of Thailand, etc.)
Sep. 2011	MLIT 2010 Performance evaluation of incorporated administrative agencies under MLIT	PWRI received the highest rating "S" for 5 out of 23 evaluation items. ICHARM contributed to one of the five. (i.e., training and educational programs, launch of the doctoral program, implementation of ADB projects, etc.)
Jan. 2011	UNESCO Evaluation Team	ICHARM was evaluated as the most active among the UNESCO water centers around the world.
Aug. 2010	Audit Report on the Division of Water Sciences of the UNESCO Natural Science Sector (UNESCO external auditors) [185 EX/32 Part II – page 14]	"...One characteristic of the field of water sciences is that there are 13 category 2 institutes or centres. One of the most active is ICHARM , which serves as the secretariat for the International Flood Initiative (IFI)."... http://unesdoc.unesco.org/images/0018/001888/188888e.pdf