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Report on 2004 - 2008 JICA Training Course "Flood Hazard Mapping"

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ICHARM conducted the JICA training course "Flood Hazard Mapping" as a region-focused training course for East and Southeast Asia from FY2004 to FY2008. The training course aimed at flood damage mitigation by enhancing the technical level of flood countermeasures and promoting flood hazard mapping.

The target population was technical managers or engineers engaging in flood or river management. The training course basically accepted about 16 trainees per year, two each from the eight target countries (China, Cambodia, Indonesia, Laos, Vietnam, Thailand, the Philippines and Malaysia), and totally 78 participants over the five years.

This training course was one core activity of ICHARM and also contributed ICHARM information networking activities.

This is a report to describe the contents, evaluate the result of the course over the five years and contribute to plan the next new training course.

Key Word : Training course, Disaster mitigation, Flood hazard map

Report on

2004 - 2008 JICA Training Course “Flood Hazard Mapping”

－Content－

Chapter 1 Background and Objectives ・・・1

1.1 Background and Objectives ・・・1

1.2 What are flood hazard maps? ・・・1

Chapter 2 Preparation for the Training Course ・・・3

2.1 Target countries ・・・3

2.2 Expected results ・・・3

2.3 Development of the General Information ・・・4

2.4 Preliminary investigation on the target countries ・・・4

2.4.1 The Philippines

2.4.2 Lao PDR

2.4.3 Meetings with experts of other international organizations

2.4.4 Investigation results

Chapter 3 Outline of the Training Course ・・・9

3.1 Training period ・・・9

3.2 Curriculum ・・・10

3.2.1 Lectures

3.2.2 Exercises

3.2.3 Field trip

3.2.4 Discussions and presentations

3.3 Overall training schedule ・・・23

3.4 Trainees ・・・25

Chapter 4: Annual Training and Evaluation Reports ・・・32

4.1 FY2004 ・・・32

4.1.1 Training

4.1.2 Evaluation

4.2 FY 2005 ・・・37

4.2.1 Training

4.2.2 Evaluation

4.3 FY 2006 ・・・43
4.3.1 Training
4.3.2 Evaluation
4.4 FY 2007 ・・・52
4.4.1 Training
4.4.2 Evaluation
4.5 FY 2008 ・・・59
4.5.1 Training
4.5.2 Evaluation
4.6 Improvements made during the five-year training program ・・・71

Chapter 5 Follow-up Activities ・・・74

Chapter 6 Conclusion ・・・76

6.1 Results of this training program ・・・76
6.2 Previous trainees response survey ・・・76
6.3 Improvements for future training programs ・・・77
6.4 Conclusion ・・・77

- Acknowledgements -

【Appendix】

Appendix 2-1～5	Curriculum from FY2004 to FY2008
Appendix 3-1～5	Training schedule from FY2004 to FY2008
Appendix 4-1～5	Participant List from FY2004 to FY2008
Appendix 4-6	Participant List categorized by countries

Chapter 1 Background and Objectives

1.1 Background and Objectives

The Asia monsoon region, such as Southeast Asia, annually suffers from frequent floods, and human lives and property are lost to a considerable extent. Although structural measures, such as levees, are effective to mitigate such flood damage, it is equally important to distribute flood-related information to residents in the form of "flood hazard maps" in normal times. Flood hazard maps can inform residents of past inundations, anticipated inundation areas, evacuation routes and sites and other relevant information, which are all useful to prepare for future flood events. In developing countries where implementation of structural flood countermeasures may not progress as it should due to lack of financial and human resources, this type of non-structural measures is particularly effective and should be put into use promptly to alleviate flood damages.

Established in March 2006 as an integral part of the Public Works Research Institute (PWRI), the International Centre for Water Hazard and Risk Management (ICHARM) has been engaged in a wide range of activities organized around the centre's three principal pillars – "research," "training," and "information networking." ICHARM first started conducting the "Flood Hazard Mapping" training course as a region-focused training course for East and Southeast Asia in cooperation with the Japan International Cooperation Agency (JICA). It was in 2004 when it was still the Secretariat for Preparatory Activities of ICHARM, the centre's predecessor. The training course was conducted for five years from FY2004 to 2008.

The training course aimed at flood damage mitigation by enhancing the technical level of flood countermeasures and promoting flood hazard mapping in Southeast Asian countries. Table 1-1 shows the outline of this five-year training course.

1.2 What are flood hazard maps?

Flood hazard maps are produced principally to mitigate human loss during flooding due to levee breaches and other causes. They typically provide such information as anticipated inundation areas and depths as well as evacuation sites and their phone numbers (Figure 1-1). In Japan, local municipalities produce and distribute their local flood hazard maps produced based on anticipated inundation area maps prepared by the Ministry of Land, Infrastructure, Transport and Tourism (MLIT). As of November 2009, a total of 993 municipalities produced and published local flood hazard maps (according to the Hazard Map Survey conducted in November 2009 posted at the "MLIT Hazard Map Portal Site" http://www1.gsi.go.jp/geowww/disapotal/).

However, there are issues to be addressed. Even though a local government has provided flood hazard maps to every household, their effective use is totally up to residents. In many cases, the mere distribution of the maps does not lead to the expected results. Residents still need to be informed of how they can effectively use them.

Table 1-1 Outline of the Region-focused Training Course “Flood Hazard Mapping”

Course title	Region-focused Training Course “Flood Hazard Mapping”		
Implementing organizations	Japan International Cooperation Agency (JICA) International Centre for Water Hazard and Risk Management (ICHARM) of the Public Works Research Institute (PWRI)		
Target countries	Eight countries (China, Cambodia, Indonesia, Laos, Vietnam, Thailand, the Philippines, Malaysia)		
No. of trainees	Two trainees per country		
Training periods No. of trainees	Fiscal year	Training periods (No. of weeks)	No. of trainees
	FY2004	Jan.31-Feb.18, 2005 (3)	16
	FY2005	Nov.17-Dec.2, 2005 (4)	16
	FY2006	Oct.30-Dec.1, 2006 (5)	16
	FY2007	Oct.29-Nov.30, 2007 (5)	20(including two from a counterpart training course)
	FY2008	Oct.27-Nov.28, 2008, (5)	10
Target population	Technical manager or engineer engaging in flood or river management		
Language	English		

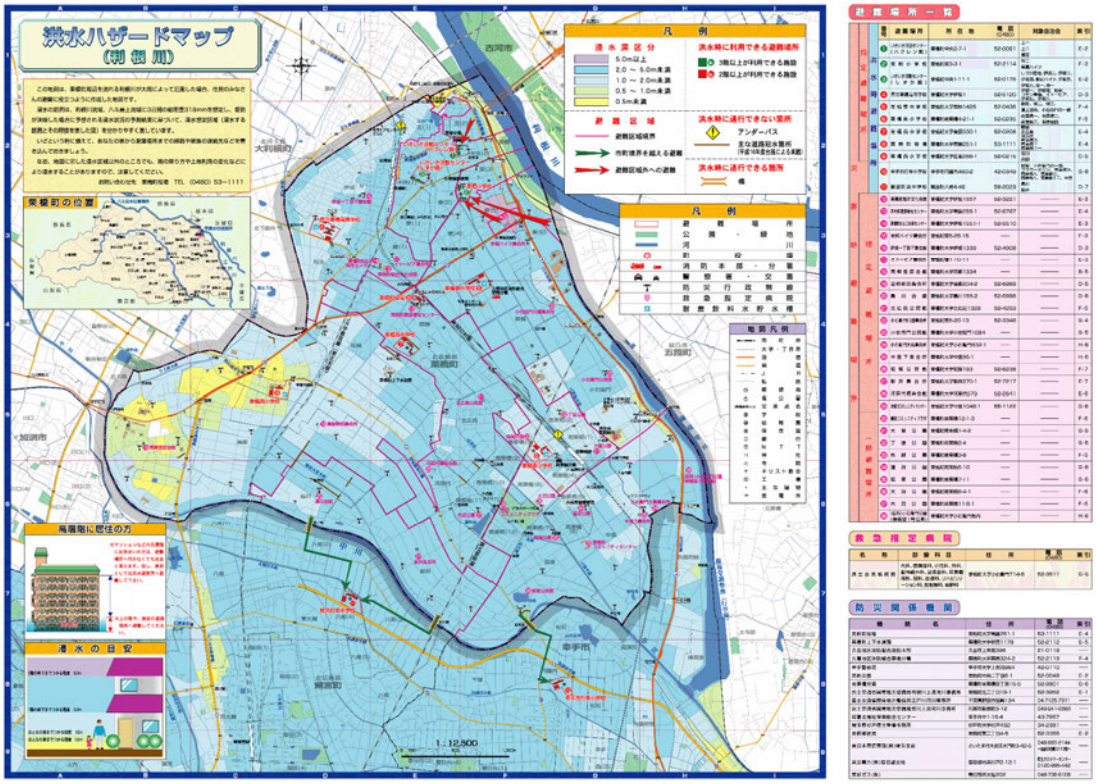


Figure 1-1 Flood hazard map (Kurihashi, Saitama Prefecture)

Chapter 2 Preparation for the Training Course

2.1 Target countries

Target countries were selected on the following conditions: they had consistently suffered from considerable flood damage, and they could use flood hazard mapping effectively in flood control. Eventually, the following eight countries were selected based also on requests from JICA local offices and coordination with other related agencies. Each country was allowed to send two trainees.

China, Cambodia, Indonesia, Laos, Vietnam, Thailand, The Philippines, Malaysia

2.2 Expected results

The training course set the some "expected results" for course trainees to achieve so that they would effectively acquire expertise in flood hazard mapping, which they could use to contribute to flood damage mitigation in their countries.

Those goals were modified every year over the five-year implementation period. The followings actually set for the last year of the training course. The course output also was described in the next section on "General Information".

Expected Result in 2008

(1) **To acquire general knowledge on the flood hazard map in Japan and the world and capability of explanation.**
(2) **To acquire professional knowledge and techniques of run-off analysis, GIS and inundation analysis, and be able to make an anticipated inundation area map and capability of explanation.**
(3) **To acquire knowledge on how to make, disseminate, and utilize the flood hazard map in Japan and capability of explanation.**
(4) **To consider the way to effectively make, disseminate, and utilize the flood hazard map through studying Japan's cases, and make action plans which include activities after returning to their countries.**

Trainees were given examinations and evaluated for class contributions to assess their achievement levels concerning the goals. The procedure was carefully carried out to secure objectivity.

2.3 Development of the General Information

The General Information (GI) is the recruitment guidelines for the training course. It was distributed to relevant organizations in the target countries through JICA local offices.

The following information was included in the GI.

- Outline of the training course (training period, objectives, curriculum)
- Application requirements
- Application procedures
- Rules during the stay in Japan
- Additional information (instructions on the ”Country Report” assignment and data that each trainee should bring for his/her research)

In September 2004, when the target countries were selected, ICHARM developed the GI with JICA and distributed it to relevant organizations in the selected countries.

The GI was reviewed and modified every year after each training period to improve the course contents for a subsequent period.

2.4 Preliminary investigation on the target countries

After the final decision was made on the implementation of this training course based on a multilateral discussion among PWRI, JICA and other relevant agencies, an investigation team consisting of PWRI and JICA staff members was organized and sent to visit the Philippines, Thailand, and Laos from 10 to 18 November 2004.

In the Philippines and Laos, the investigation team worked to collect information on their situations and needs in relation to the training course. The team had discussions with those in flood-related fields, visited affected areas, and collected relevant data. In Thailand, they had discussions with the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP).

The investigation was described in detail in the “Preliminary Investigation Report on Region-focused Flood Hazard Mapping Training Course for East and Southeast Asia (JICA Tsukuba International Center).” This report excerpts part of the Preliminary Report to outline the investigation.

The investigation consisted of the following members (the positions are at the time of the investigation):

Leader	Mr. Hisamitsu Nishio	Chief, Operation I, JICA Tsukuba
Technical Advisor	Mr. Tetsuya Ikeda	Senior Researcher, Secretariat for Preparation Activities for UNESCO-PWRI Center
Training Planner	Mr. Yoshikuni Sakamoto	Training Course Staff, Operation I, JICA Tsukuba

The purposes of the investigation were set as follows for the implementation of the training course.

(1) Understanding actual situations of flood control and river management in the target countries (two target countries were selected for this investigation)

(2) Identifying specific training needs

(3) Collecting information on effective ways of implementing the training

2.4.1 The Philippines

Flood damage in the Philippines is mostly caused by typhoons. The devastating flood damage in August 2004 was a typical case, where typhoon-induced flooding breached levees in the Pampanga River basin.

Two major agencies are involved in flood management: the Philippine Atmospheric, Geophysical and Astronomical Service Agency (PAGASA) and the Department of Public Works and Highways (DPWH). PAGASA is responsible for flood forecasting and warning, publishing flood reports, and investigating and assessing flood damage. DPWH is for public infrastructure development and restoration efforts in case of flood damage. DPWH has established the Flood control and Sabo Engineering Center (FCSEC) in collaboration with a JICA project.

More specifically, in the Philippines, the significance of early production of flood hazard maps and implementation of non-structural measures was widely recognized. Therefore, the authorities hold high expectations that participation in this training course would proactively enhance such efforts. They also consider the training course as a great opportunity to increase their knowledge about experience and actual cases that Japan can share with them, thinking that such knowledge would help produce flood hazard maps based on the Philippines' local conditions and promote and improve necessary measures. When put in place, they will eventually help improve public disaster preparedness and build future communities that are better prepared for coming disastrous events.

PAGASA is planning to send trainees to this training course for the next five years. As a whole, the Philippines show high demand for the training and is requesting to increase its trainee quota. There is also a possibility for other organizations besides PAGASA and DPWH to send trainees to the training course.

2.4.2 Lao PDR

In Laos, areas along the Mekong River and its tributaries suffer from flood damage every year, especially causing serious adverse impacts on agriculture. However, human loss is relatively low because floods by the Mekong River increase its water level slowly enough for people to evacuate safely.

Two government agencies are assigned to flood control. MAF is responsible for flood control related to farmland and MCTPC for urban areas. Flood control is hardly prioritized in the country's legal system.

More specifically, the MAF Irrigation Bureau leads infrastructure development to protect farmland from floods. The bureau is working on flood damage mitigation by altering the timing and pattern of crop farming and strengthening early warning systems. The MAF Meteorology and Hydrology Bureau records and analyzes water levels and rainfalls and conducts flood forecasting. MCTPC is responsible for the mainstream of the Mekong River, while MAF for its tributaries.

Laos expects that this training course will be helpful to promote flood hazard mapping and recognize the necessity of database development to provide basic data including flood-prone topography as well as that of flood hazard mapping itself. They also hope to find some clues which are useful to make decisions on what measures should be prioritized to mitigate flood damage in the future. Meanwhile, there are some concerns on their side. It might be difficult to find good candidates for the training course among the current government officials. It is urgent to enhance the capacity of younger professionals in flood-related areas.

2.4.3 Meetings with experts of other international organizations

The investigation team also had opportunities to discuss issues with experts from the Typhoon Committee (TC), the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), and the Mekong River Commission (MRC).

Recognizing the significance of flood hazard mapping, TC has already prioritized flood hazard mapping among its hydrological activities. They are willing to inform their managing areas of flood hazard mapping. They also pointed out the importance of filling gaps between different areas of expertise.

Dr. Le of UNESCAP also highly regards the JICA training course and expects that it can catalyze higher public awareness towards flood events. He also hopes that the training course will help the target countries address flood hazard mapping as one of their priority issues. In addition, he pointed out, at the meeting, a high demand for capacity development in the target countries, especially Cambodia and Laos. Moreover, he suggested the possibility of using TC workshops to keep the trainees update their expertise. During the meeting, he also mentioned that hazard mapping training should be expanded to include other water-related hazards, such as flash floods and debris flows, and other regions, such as the Caribbean, Oceanian, and Fijian countries.

MRC has been working on flood hazard mapping since 1997 and produced inundation maps based on radar satellite data, simulations, and field investigations. However, their maps do not include information that helps people with evacuation. MRC expressed the request to participate in the training course, and JICA will consider its possibility, including inviting lecturers from MRC for the course. Workshops between MRC and PWRI are another possibility to open a channel for information sharing.

2.4.4 Investigation results

One of the purposes of this preliminary investigation for planning the flood hazard mapping training

course is to identify and understand the present conditions of the target countries regarding flood hazard mapping. The Japanese type of flood hazard mapping is, naturally, based on flood types observed in Japan, which are affected by the country's topolographical and socio-economic characteristics. In Japan, flooding can cause damage relatively in a shorter period of time, because many rivers are steep and short. However, rivers in the target countries show very different characteristics. For example, the Mekong River increases its water level at a much slower pace; thus, inundation it causes also develops in a much slower process. In cases like this, the Japanese type of flood hazard maps may not be very practical for other countries.

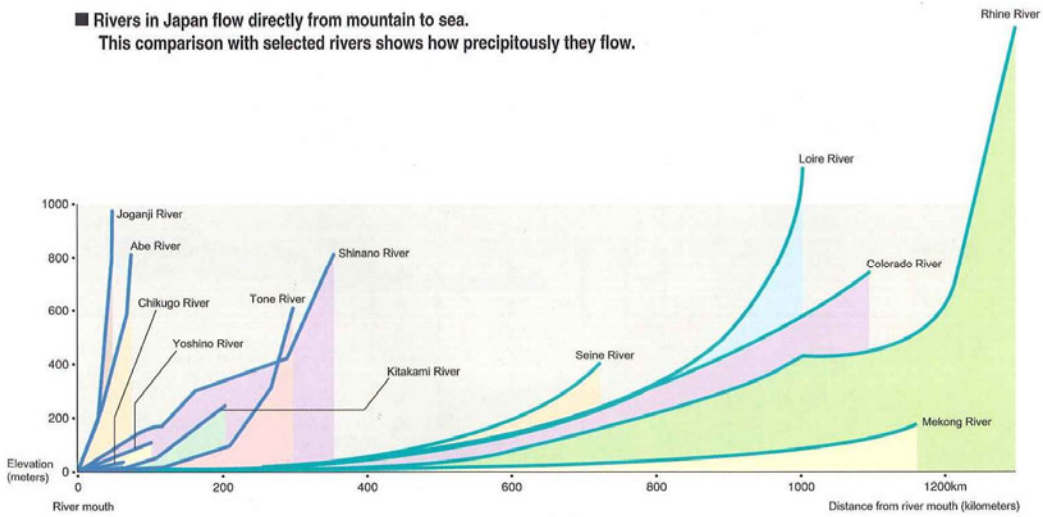


Figure 2-1 Comparison with rivers in Japan and in the world

The investigation team had opportunities to visit flood-affected areas and interview local residents. These opportunities found that settlements were formed without paying much consideration for flood risk and also that residents showed little awareness toward flood preparedness. However, these facts suggests that there are many aspects in which flood hazard mapping and resulting products can be useful in addition to helping residents with safe evacuation. Involving residents in the mapping process, it can help to raise their disaster awareness. Better evacuation sites can also be selected through public participation. Flood hazard maps can be used to plan community development or reorganization. They can be also helpful to protect farmland or live stock, which are often very important property of local residents. Other effective use of flood hazard maps are also suggested depending on flood type and socio-economic condition in each country. The course organizers need to keep those characteristics and considerations in mind and develop a course curriculum which adequately reflects conditions and needs of each country.

Through a series of meetings with flood management organizations in the three target countries, the investigation team found that those countries have produced some kind of maps showing past inundation or anticipated inundation areas. However, there are few cases working on the Japanese type of flood hazard maps that provide a complete set of information including

evacuation routes. Even government agencies specialized in flood control has inadequate recognition of such flood hazard maps. In those meetings, the team even discussed possible subsequent plans after the five-year training course. JICA sees the possibility of conducting follow-up surveys, while PWRI suggests that of keeping in contact with trainees even after training by offering post-training follow-up activities and sharing information including training course implementation with other international organizations (TC, MRC, etc.). MRC is particularly active in requesting its involvement in the training course. This can be another opportunity for collaboration with an international organization through a training program, including inviting lecturers from MRC for the training course.

The investigation team was also asked if it would be possible to provide classes on hydrological analysis using computers. This is because in the target countries, knowing how to conduct computer simulation is highly regarded as one of the training achievements. Some at the meetings even suggested that it would be even better if free software (specifically for flood analysis) were provided for course trainees. (In fact, PWRI have developed hydraulic and hydrological computer software.) Along with considering free distribution of such software, it is important to clarify advantages for the target countries to participate in this training course to increase the effectiveness of the training course.

Some of the organizations that the investigation team visited introduced trainee candidates to the team. They were all middle-ranking engineers with high motivation towards their jobs. If they are admitted to the training course, it will probably help them be better prepared to contribute to flood damage mitigation with enhanced expertise. Overall, local organizations have been done with the trainee selection with help from local JICA staff. The candidates selected are highly motivated and have already started working on required preliminary reports. This indicates their great expectations to the training course and its prospective outcome. The investigation team learned that other organizations that did not select any candidate this time were also hoping to send trainees to the training course in the future. Such organizations include the Irrigation Bureau of the Lao Agriculture Ministry as well as the Philippines's OCD, MMDA, and PHIVOLCS.

The investigation was conducted in a tight schedule, in which the team had to visit three countries within nine days. However, with great support from the local JICA offices, experts and administrators, it ended as a great success. The team was able to collect a lot of information to organize a truly practical training course. It cannot be simply said that there are similar needs and conditions in other six countries (China, Indonesia, Thailand, Cambodia, Vietnam, and Malaysia) because the close investigation this time was only done for the Philippines and Laos. However, it is also fair to say that the results from those countries should reasonably suggest a certain direction for the training course to take, since they represent island and inland countries, respectively. In the future, once the training course starts, more information on the target countries will be collected. In addition to the investigation results, such information will be also useful for more effective training planning and operation.

Chapter 3 Outline of the Training Course

This training course was conducted for five years from FY2004 to 2008.

Based on the results from the preliminary investigation on the target countries and annual course review, the training course was improved each subsequent year in terms of training duration, daily course schedule, curriculum, and field trip.

3.1 Training period

Table 3-1 shows changes in length of training, number of classes per day, and total hours.

Table 3-1 Changes in training length, number of classes per day, and total hours

FY	Training length	No. of days spent on exercise*	Minutes spent per class	No. of classes per day	Hours spent on classes per day	**Total hours**
2004	Jan.31-Feb.18, 2005 (3 weeks)	13	120	3	6	**78**
2005	Nov.7-Dec.2 (4 weeks)	18	100	3	5	**90**
2006	Oct.30-Dec.1 (5 weeks)	22	100	3	5	**110**
2007	Oct.29-Nov.30 (5 weeks)	21	90	4	6	**126**
2008	Oct.27-Nov.28 (5 weeks)	21	90	4	6	**126**

*The last day of the training is spent for a course evaluation meeting and closing ceremony each year and is not included in the number of training days in each fiscal year.
The ICHARM Symposium, held on 6 November 2007, is not included in the number of training days in FY2007.

The first training course was conducted in February, the middle of the winter season. In the course evaluation meeting, a trainee suggested that the training should be conducted in a warmer season because it had been too cold for field activities, including visits to flood control structures. Based on this feedback, the training was conducted in November, instead of February, from FY2005 on.

The total hours increased gradually over the five years. In the first year, FY2004, the training was three weeks long with a total of 78 hours. After that, the FY2005 training was extended by one week to four weeks, and in FY2006, by another week to five weeks, based on feedback from trainees each year. This prolonged training period, accompanied by the reorganized daily class schedule,

increased the total hours from the original 90 hours to 110 in FY2006, then to 126 in FY2007. The training course fully accommodated the trainees' requests.

3.2 Curriculum

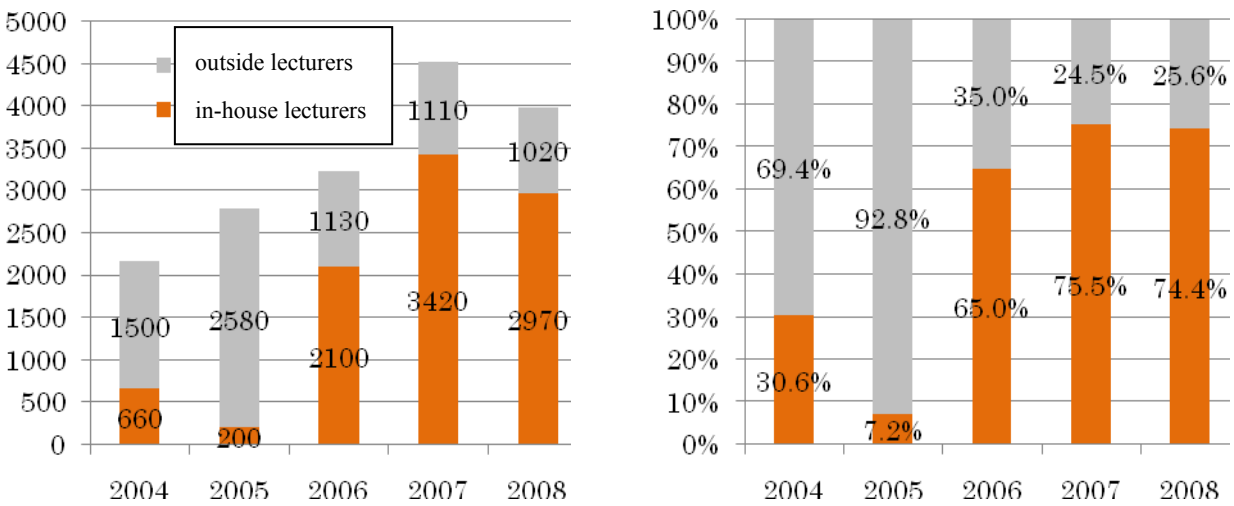
The course curriculum for each fiscal year consisted of four basic categories: "lectures," "exercises," "field trips," and "discussions and presentations." Annexes 2-1 to 2-5 show the details of the curriculum including lecturers.

Over the five years, ICHARM developed its training capacity in addition to research capacity. Table 3-2 and Figures 3-1 and 3-2 compare in-house lecturers (i.e., ICHARM researchers) with outside counterparts in total teaching time and show the development process of the educational aspect of the institute.

Table 3-2 Time taught by in-house and outside lecturers

FY	No. of in-house lecturers	Minutes taught	No. of outside lecturers	Minutes taught	Total No. of lecturers	Total minutes taught	**Percentage of time taught by in-house lecturers**
2004	4	660	10	1500	14	2160	**30.6%**
2005	2	200	22	2580	24	2780	**7.2%**
2006	3	2100	12	1130	15	3230	**65.0%**
2007	6	3420	12	1110	18	4530	**75.5%**
2008	5	2970	10	1020	15	3990	**74.4%**

*Professor Ogawa, who taught the "Town Watching" exercise, is included in the number of outside lecturers, but his teaching time is not included in the time taught by outside lecturers.



Figures 3-1 & 2 Time taught by in-house and outside lecturers (left: time, right: percentage)

The table and figures show the steady growth of ICHARM as a training institute.

Before established in March 2006, a fewer number of researchers at ICHARM were able to

deliver lectures and give exercise-based classes in water-related areas. Naturally, ICHARM had to invite lectures from the outside of the institute. In 2006, after the establishment, to enhance the centre's capacity in research and training, the number of classes taught by ICHARM researchers increased dramatically from 7.2% to 65%. In FY2007, the trend continued and the percentage finally reached 75.5%, the highest over the five years.

Increasing the ratio of in-house over outside lecturers is considered to have several positive effects on the training course. First of all, duplication of lecture and exercise contents can be avoided. When trainees interact more with ICHARM researchers through classes, they feel psychologically closer to the researchers, which makes it easier for them to ask for advice. Because the researchers usually work in the same building as the trainees study, it is also convenient for the trainees spatially; they can consult the researchers whenever it is necessary. These conditions help the trainees gain a better understanding of course contents. Moreover, the increased ratio of in-house lecturers enhanced the efficiency of the training. Outside lecturers tended to start their classes by outlining historical or current flood control in Japan. Although such a historical outline has its own significance, they were not necessarily contributing to trainees' efficient learning. As more in-house lecturers started teaching, the training improved in this respect, too.

For further improvement of the training course, the course organizers invited Professor Katsuaki Suzuki of Kumamoto University in 20th July 2006 to lecture on the "Development of Effective Teaching Materials." In his lecture, the professor emphasized the importance of providing multiple opportunities for trainees to acquire key concepts as well as the importance of evaluating their knowledge before and after each class. Based on the lecture, some modifications were made on the FY2006 training. The Town Watching exercise was conducted twice, and the trainees were given opportunities to evaluate their understanding before and after each lecture series. JICA staff also participated in the professor's lecture. Inspired by it, they invited him to a JICA meeting to involve other staff members to promote improvement of other JICA training courses.

The following describes the four major areas of the training – "lectures," "exercises," "field trips," and "discussions and presentations."

3.2.1 Lectures

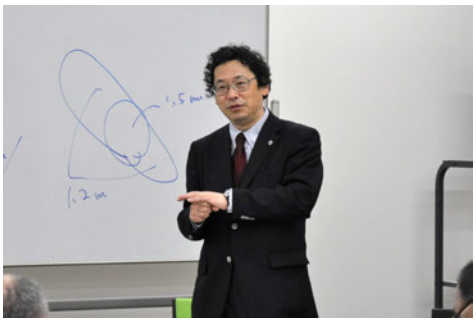
Lectures are the very core of this training course. They were intensively provided in the first half of the training period. They addressed issues on:

- -Legal framework and overall system to promote hazard mapping
- -Outline of hazard mapping (its importance, history, etc.)
- -Hazard mapping method
- -Effective use of flood hazard maps
- -Evacuation planning

Lectures covered not only the fundamentals of hazard mapping but also oversaw hazard mapping projects in China and Asian and European countries by inviting lecturers from the Mekong Committee, the China Water Use and Hydropower Science Institute, UNESCO-IHE, and other organizations. In FY2006 from UNESCO-IHE Dr. Klaas-jan Douben was invited as a lecturer, and from FY2007 to FY2008, Asso. Professor Frank van der Meulen gave lectures on "Climate Change and Water/Risk Management" as an invited lecturer. He also accompanied "Town Watching" in Ise city and discussed with trainees.

Asso. Prof. Meulen, UNESCO-IHE

In addition to lectures on the above contents, a special lecture on "Human Behavior and Social Psychology at Emergency" was also delivered each year from FY2005 by Professor Haruo Hayashi of Kyoto University (though the lecture title changed every year, it dealt with similar issues in the area). The lecture was highly evaluated by trainees each year.



Prof. Hayashi, Kyoto Univ.

The training had also provided a lecture on "Hazard Mapping for Sediment-related Disasters" since 2005. Comparing this to flood hazard mapping, trainees became aware of deference, which helped them explore issues and more effective use regarding flood hazard maps.

The field trip to Ise City, Mie Prefecture, started in FY2005 and continued for four years. Trainees each year visited Enza District of Ise City. The district is a good example where public disaster awareness greatly improved before devastating damage due to the Miya river flood in 2004. At every visit, Mr. Ueda, community leader, kindly explained how they promoted public awareness with photos of the flood time. The visit to Ise City was a good chance for trainees to learn about "self-help," "mutual support" and "public assistance," which are the fundamental concepts in Japan's disaster management.

Mr. Ueda, former community leader of Enza district

In FY2006, the training started providing lectures related to "Integrated Flood Management" to consider the importance of flood hazard mapping from a broader point

Prof. Umitsu, Nagoya Univ.

of view. In the same year, a lecture on “Topography of Rivers and Alluvial Plains” by Professor Masatomo Umitsu of Nagoya University was added to the series of lectures. Trainees learned the importance of past inundation mapping and hazard mapping.

In FY2007, a lecture by Mr. Hideki Kamei started every time trainees visited Ise City. Mr. Kamei was the Deputy Mayor of Ise City at that time and had experience working at the Mie Prefecture Risk Management Department. His lecture was about the municipal role in disaster management, specifically in relief and restoration efforts in case of emergency. The lecture was also another good opportunity for trainees to realize the importance of “self-help,” “mutual support” and “public assistance.”

Mr. Kamei,
former deputy mayor of Ise city

Another new lecture started in FY2007. Mr. Atsushi Yoshii, former group leader of PWRI for cold regions, was invited to give a lecture on “Education for Disaster Awareness.” Based on a case study on the evacuation behavior at the eruption of Mt. Usu in Hokkaido, he emphasized the importance of educating residents about effective use of hazard maps.

In FY2008 former team leader Shigenobu Tanaka of ICHARM conducted virtually all of the classes regarding flood hazard mapping, including production method, dissemination, legal framework, and effective use. Other ICHARM staff gave lectures on the fundamentals of FHM. Lecturers were also invited from the outside of the centre to teach applications of hazard mapping and its resulting products.

Furthermore, “Dynamic Hazard Maps” and the most advanced flood simulation were introduced as the latest hazard mapping technology in Japan. However, trainees did not necessarily give them high evaluation. That was probably because they did not think that such advanced technology would be practical in their countries, considering the accuracy and quantity of data required. This should be reflected in future course planning.

Dr. Magome, ICHARM Researcher

3.2.2 Exercises

The following exercises were considered necessary for hazard mapping and provided in the training course:

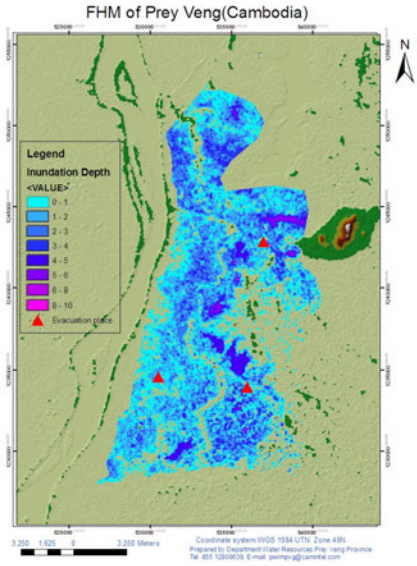
- Topography mapping and GIS
- Hydrology and hydrologic statistics
- Runoff analysis
- Inundation analysis

Dr. Osti, ICHARM Researcher

- Hazard mapping exercise

As described in 3.3 in detail, the course organizers received feedback from trainees each year. They suggested that more time should be spent on exercises, and the training curriculum was modified accordingly. In particular, a hazard mapping exercise started in FY2006 by using sample data of Ise City to practice applying knowledge and technology learned in the training to a practical case. This contributed to the enhancement of trainees' attainment of the training content. In 2008, further improvement was made and another hazard mapping exercise was added to the training. Trainees were required to produce hazard maps for a river basin in their countries based on local hydrological and topographical data. This exercise was very effective because it made trainees think about how they should apply knowledge and technology they had learned in Japan to actual cases in their countries.

Since the first year of the training course, a unique exercise called "Town Watching" (i.e., in-depth field investigation) had been an important part of the training. In this exercise, people generally walk around the target area to identify locations of disaster management facilities (e.g., radio communications systems) and places which may pose danger to safe evacuation during flooding (e.g., narrow alleys, street gutters, and obstacles). They then discuss the findings and produce maps with useful information, such as possibly dangerous places and evacuation sites. Through this exercise, where residents are actually involved in field investigation, dangerous places usually left unnoticed can be found. In addition, working together nurtures the sense of community in the map production process, which will in turn facilitate better cooperation in disaster management efforts.



FHM made by participant in 2008

In the Town Watching exercise over five years, trainees each year were taken to walk around actual towns, such as Kurihashi Town and Ise City. Although checking key locations, including disaster management facilities and possibly dangerous places, is important in an actual Town Watching, it was impossible for them to do it since such towns were new to them. Thus, the purposes of the exercise were set somewhat different from actual cases. Trainees were given this exercise to strengthen the capability of identifying what should be identified in terms of flood hazard mapping. In addition to that, they were expected to become aware of the significance of community-based education and preparedness, which underlie effective disaster management.

"Town Watching" exercise in Ise in 2008

"Town Watching" exercise in Kurihashi in 2008

"Town Watching" exercise in Ise City in 2007

Table 3-3 lists the locations of Town Watching each year.

Table 3-3 Town Watching locations

FY	Locations (No. of Town Watching conducted)	Date
2004	Kurihashi Town (1)	Tuesday, Feb.8, 2005
2005	Ise City (1)	Thursday, Nov.24, 2005
2006	Kokai River, Ise City (2)	Thursday, Nov.2 & Friday, Nov.17, 2006
2007	Kurihashi Town, Ise City (2)	Thursday, Nov.1 & Thursday, Nov.15, 2007
2008	Kurihashi Town, Ise City (2)	Thursday, Oct.30 & Thursday, Nov.13, 2008

The Town-Watching exercise was conducted once in the first and second years and twice from the third year (FY2006). It was assumed to be rather difficult for trainees to know what to look for in the first Town Watching, and thus important to provide the second opportunity so that they would have a better understanding of the significance of the exercise.

Prof. Ogawa in Ise in 2008

In the past four years from FY2004 to 2007, Professor Yujiro Ogawa of Fuji Tokoha University was invited to give a lecture and supervision on the Town-Watching exercise. Trainees' evaluation on the exercise was always high. That was probably because his instruction was to the point and easier to understand. This exercise should be used in the future if the opportunity arises.

3.2.3 Field trip

During the training period each year, field trip was conducted to give trainees opportunities to learn flood control measures taken in Japan. Also field trips help trainees to realize that the production and

dissemination of flood hazard maps itself are not enough to reduce flood damage. They should know that a certain level of structural measures, such as levees and pump stations, are also necessary.

In FY2006, annual visit to the Ninomiya Sontoku Museum started to increase trainees' understanding of disaster management in Japan. The attempt did not directly lead to knowledge in flood control but was intended to help trainees realize long-lived philosophies that underlie current disaster management in Japan. The visit was always a good opportunity for trainees to learn that Ninomiya's philosophies still provide the foundation for today's disaster management in Japan.

Ninomiya Sontoku Museum in 2007

Ise City officers greeted at the entrance hall in 2008

Visit to Ise City started in FY2005. Whenever trainees visited, they were always greeted kindly by many city officers at the entrance hall with warm cheering. Ise City Mayor also gave a welcome speech to them at every visit. This was always totally unexpected to trainees and made them feel very welcomed and thankful to the officers at the same time.

Table 3-4 lists the destinations of the field trips each year. Table 3-5 exhibits photos at each destination.

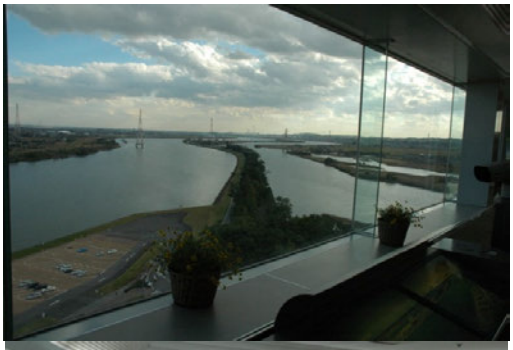
Table 3-4 Destinations of field trips

FY	Date	Destinations (cooperating office)
2004	Feb.14-15, 2005	Abukuma River (Fukushima Office of River and National Highway) Koriyama City Hall Water Management Headquarters of the Kanto Regional Development Bureau of MLIT Arakawa Super Levee (Arakawa Lower Reach River Office)
2005	Nov.21-22	Shonai River (Shonai River Office) Miya River (Mie Office of River and National Highway) Misedani Dam (Mie Prefecture) Enza & Tsujikuru Districts (Ise City)
2006	Nov.7 Nov.14-16	Geographical Survey Institute Japan Broadcasting Corporation Shonai River (Shonai River Office) Kiso Sansen Park (Kisogawa Karyu River Office) Miya River (Mie Office of River and National Highway) Misedani Dam (Mie Prefecture) Enza & Tsujikuru Districts (Ise City)
2007	Nov.13-14	Kumozu River, Miya River (Mie Office of River and National Highway) Enza & Tsujikuru Districts (Ise City)
2008	Nov.11,12 & 14	Toyo River (Toyohashi Office of River and National Highway) Kiso Sansen Park (Kisogawa Karyu River Office) Enza District (Ise City) & Tsujikuru District (Mie Office of River and National Highway), Lake Biwa Canal

Table 3-5 Photos of destinations

FY 2004	Abukuma River	Koriyama City
	Water Management Headquarters of the Kanto Regional Development Bureau of MLIT	Arakawa Super Levee

FY 2005	Shonai River 	Miya River
	Misedani Dam 	Enza District Tsujikuru District

FY 2006	GSI 	Japan Broadcasting Corp.
	Shonai River 	Kiso-sansen Park 
	Miya River 	

	Enza District Tsujikuru District 	ISe City Greeting by former mayor Mr. Morishita
2007	Open levee of Kumozu River 	Miya River

	Enza District 	Nomiya Sontoku Museum
2008	Open levee of Toyo River 	Kiso-sansen Park
	Greeting at Ise City Hall 	Enza District

	Lecture room Greeting by former mayor Mr. Morishita 	Tsujikuru District Ominato District

3.2.4 Discussions and presentations

The training course was designed to start with trainees' presentations of "Country Reports," in which they reported current situations in their countries based on reports which they had been assigned beforehand. The training ended with presentations of "Concluding Reports," in which they were required to report their training results and prospective activities they planned to execute after returning to their countries.

In FY2007, to help trainees keep or improve their motivation, the mid-term discussion session became part of the training curriculum, in which they reviewed the first half of the training.

3.3 Overall training schedule

Appendixes 3-1 to 3-5 are the training schedules of the five years.

In each schedule, lectures and exercises on basic knowledge and skills for hazard mapping were intensively conducted in the first half of the training. Reflecting feedback from trainees about the daily schedule, lectures were conducted in the morning while associated exercises in the afternoon to promote effective learning.

Field trips were set in the middle of the course period to promote trainees' further understanding of flood control measures in Japan.

Trainees produced hazard maps and action plans in the second half of the training by using knowledge and skills they learned in the training course.

Figures 3-3 and 3-4 compare the five respective years in hours spent on lectures, exercises, Town Watching, field trips, presentations and discussions, and other activities.

The figures show that more hours were specifically spent on exercises as the total hours for the technical aspect of the training increased. At the end of each training period, course evaluation was conducted, in which trainees always asked for more hours for exercises. The figures reflect the course organizers' effort to accommodate their feedback.

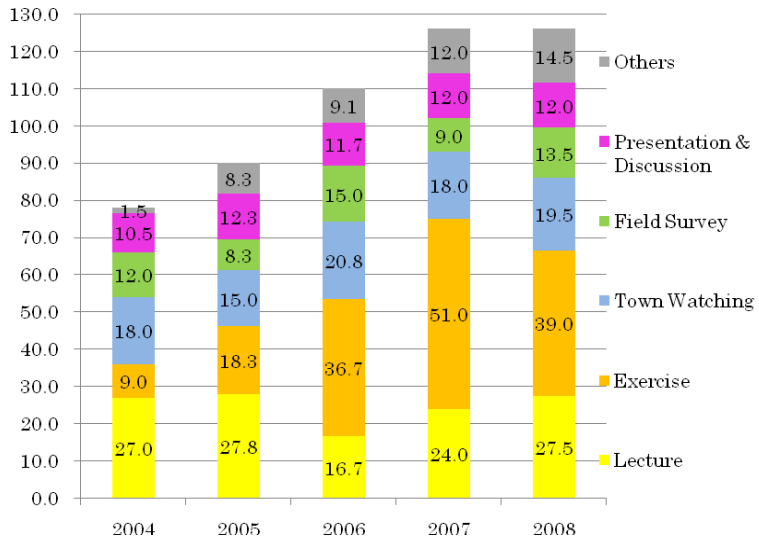


Figure 3-3 Hours spent on each activity

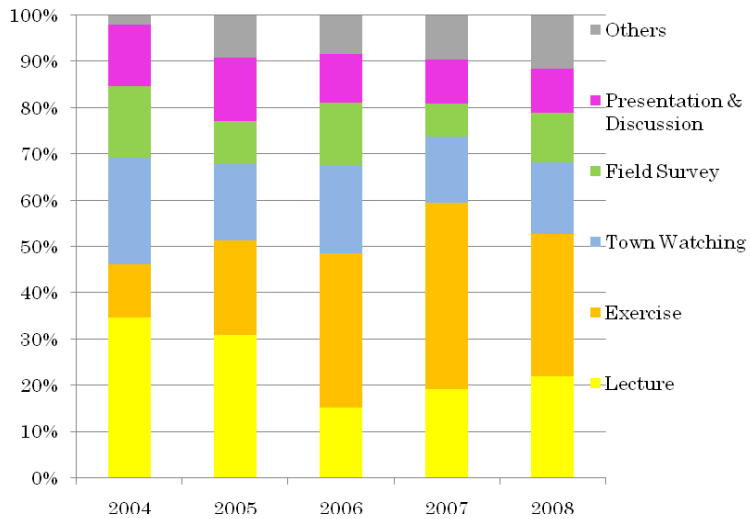


Figure 3-4 Percentage of hours spent on each activity

3.4 Trainees

The training course basically accepted about 16 trainees per year, two each from the eight target countries (China, Cambodia, Indonesia, Laos, Vietnam, Thailand, the Philippines and Malaysia), although the number fluctuates slightly over the five years. Also, in 2007, the course accepted an extra trainee each from Sri Lanka and Thailand in collaboration with the JICA Counterpart Training.

Moreover, in FY2007 and 2008, ICHARM Master's course students joined the trainees in this training course. ICHARM started a Master's course on disaster management in FY2007, and lecture on "Hazard Mapping and Evacuation Planning" are part of its curriculum. In this respect, ten students in FY2007 and nine in FY2008 participated in the training and completed the training following almost the same schedule.

Table 3-6 shows the annual number of the trainees from each target country over the five years. Appendixes 4-1 to 4-5 list the affiliations and names of the trainees. Appendix 4-6 is another list of the trainees, which provides additional information on their follow-up seminar attendance. In addition, a next few pages exhibit a photo and names of the trainees in the five respective years.

Table 3-6 Yearly number of trainees by target country

FY	Cambodia	China	Indonesia	Laos	Malaysia	Philippines	Thailand	Vietnam	**Total**
2004	2	2	2	3	2	2	2	1	**16**
2005	2	2	2	2	2	3	1	2	**16**
2006	2	2	2	2	2	2	2	2	**16**
2007	2	2	3	2	3	2	2	2	**18**
2008	1	2	0	2	2	1	1	1	**10**
Total	**9**	**10**	**9**	**11**	**11**	**10**	**8**	**8**	**76**

Appendixes 4-1 to 4-6 confirm that trainees are affiliated to flood management agencies:

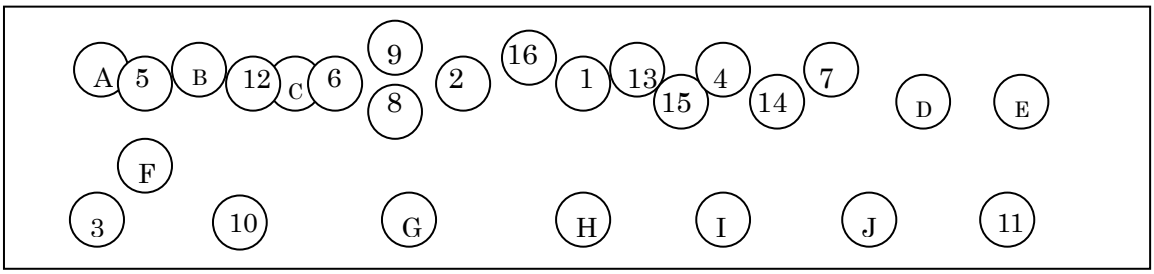
Cambodia: 8 out of 9 are from MOWRAM.
China: 8 out of 10 are from the Water Resources Ministry.
Indonesia: 4 out of 9 are the Public Works Ministry.
Laos: 5 out of 11 are the Agriculture and Forestry Ministry.
Malaysia: All 11 are from the Natural Resources and Environment Ministry.
The Philippines: 4 out of 10 are from DPWH, and 3 from PAGASA.
Thailand: 7 out of 8 are from RID of the Agricultural Cooperation Ministry.
Vietnam: 7 out of 8 are from the Agriculture and Rural Development Ministry.

Because several trainees belong to the same agency in each country, it probably helps to create an intra-agency network among themselves and promote flood hazard mapping and its associated

activities.

This kind of network worked efficiently for ICHARM when conducting field investigations in the target countries and holding follow-up seminars (see Chapter 5). Networks resulting from training of this kind are a great asset for ICHARM.

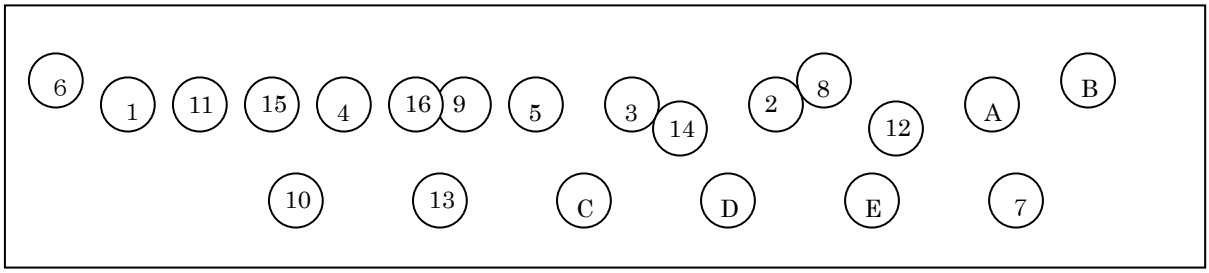
FY2004 Opening Ceremony (Jan. 31, 2005)



No.	Trainee	Country	No.	Trainee	Country
1	Mr. So Im Monichoth	Cambodia	9	Mr. Adb Jalil Hassan	Malaysia
2	Mr. Tong Sneg	Cambodia	10	Ms. Paridah Anun Binti Tahir	Malaysia
3	Ms. Yumei Deng	China	11	Mr. Grecile Christopher R. Damo	Philippines
4	Mr. Chunpeng Sun	China	12	Mr. Socrates F. Paat Jr	Philippines
5	Mr. Heru Setiawan	Indonesia	13	Mr. Yuhttana Kantong	Thailand
6	Mr. Wisnu Subarkah Dwiwibowo	Indonesia	14	Ms. Pacharee Ongchotiyakul	Thailand
7	Mr. Bounphet Phommachanh	Lao PDR	15	Ms. Pham Hong Nga	Vietnam
8	Mr. Manoloth Soukhanouvong	Lao PDR	16	Mr. Sounthaly Mountha	Lao PDR

A: Mr. Kuribayashi(PWRI)、B: Mr. Ikeda(PWRI)、C: JICA Officer、D: Mr. Nishio(JICA)、E: Mr. Sakamoto(JICA)、F: Ms. Shibata(JICA)、G:Director Nagai(JICA)、H:Chief Executive Sakamoto(PWRI)、I:Mr. Terakawa(PWRI)、J:Mr. Suzuki(JICA)

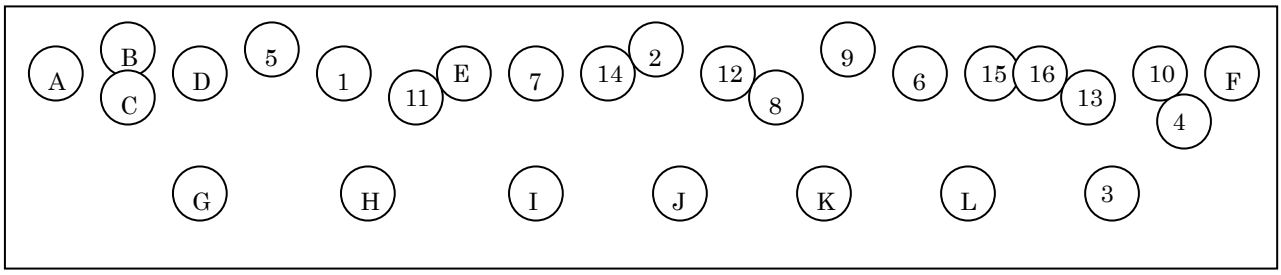
FY2005 Opening Ceremony (Nov. 7, 2005)



No.	Trainee	Country	No.	Trainee	Country
1	Mr. PREAP Sameng	Cambodia	9	Mr. Miklin Bin ATIONG	Malaysia
2	Mr. PHENG Seangmeng	Cambodia	10	Ms. HAZALIZAH Binti Hamzah	Malaysia
3	Mr. LUO Xiaoqing	China	11	Mr. FABIA Brigildo Miranda	Philippines
4	Mr. WANG Jinxing	China	12	Mr. ESPERANZA Hilario de	Philippines
5	Mr. Thomas Firdaus LAROSA	Indonesia	13	Ms. JIMENEZ Elda Gerada	Philippines
6	Mr. SUBEJO	Indonesia	14	Mr. AMNATSAN Somchit	Thailand
7	Mr. Chanthachith AMPHAYCHITH	Laos	15	Mr. Nguyen Huu Phu	Viet Nam
8	Mr. Anousone SISA-AD	Laos	16	Mr. Nguyen Thanh Phuong	Viet Nam

A: Mr. Nishio (JICA), B: Mr. Hattori (JICA), C: Mr. Terakawa (PWRI), D: Director Nagai (JICA), E: Mr. Suzuki (JICA)

FY2006 Opening Ceremony (Oct. 31, 2006)

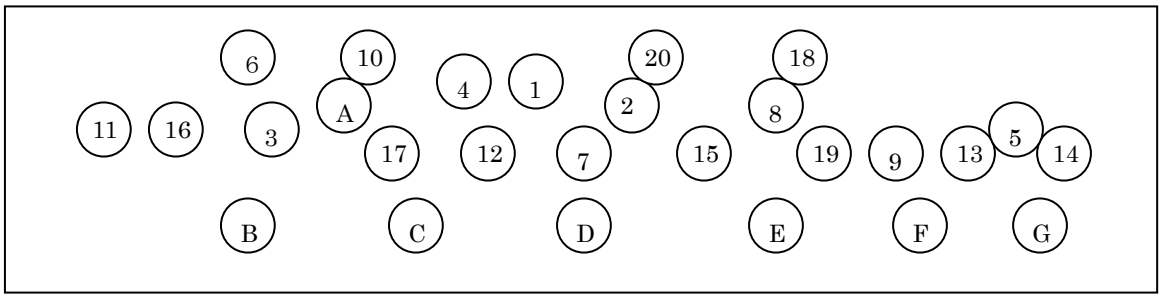


No.	Trainee	Country	No.	Trainee	Country
1	Mr. LONG Saravuth	Cambodia	9	Mr. ARIFFIN Mahamud	Malaysia
2	Mr. HORN Sovanna	Cambodia	10	Mr. ANUAR Md. Ali	Malaysia
3	Ms. XU, Jing	China	11	Ms. ABAGAO Ma.Luisa Obusan	Philippines
4	Ms. DU Xiaohe	China	12	Mr. LIM Richelieu Felipe Irisari	Philippines
5	Mr. DJUHARTONO Agung	Indonesia	13	Mr. HOMKASORN Boonchob	Thailand
6	Mr. Surendo Andi Wibowo	Indonesia	14	Mr. Kunpote Buatone	Thailand
7	Mr. VISAYSONGDETH Soulignet	Lao PDR	15	Mr. LAI Tuan Anh	Vietnam
8	Mr. THIANGTHAMMAVONG Sangkhane	Lao PDR	16	Mr. NGUYEN Hiep	Vietnam

A: Mr. Tokioka (ICHARM), B: Dr. Osti (ICHARM), C: Ms. Saito (PWRI), D: Ms. Tsuruta (JICA),

E: Mr. Sawano (WMO), F: Mr. Hattori (JICA), G: Mr. Tanaka (ICHARM), H: Mr. Terakawa (ICHARM), I: Director Takeuchi (ICHARM), J: Chief Executive Sakamoto (PWRI), K: Director Aoki (JICA), L: Mr. Suzuki (JICA)

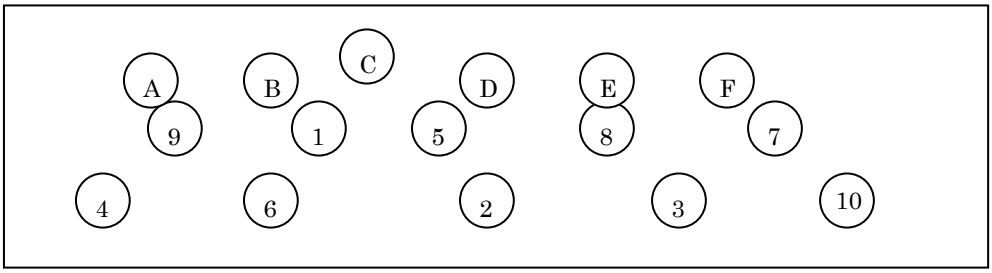
FY2007 Opening Ceremony (Oct. 30, 2007)



No.	Trainee	Country	No.	Trainee	Country
1	Mr. Sovann SUY	Cambodia	11	Mr.WAMZAH Bin Mord	Malaysia
2	Mr. Sasel LENG	Cambodia	12	Ms. SITI KHADIJAH Abd. Rashid	Malaysia
3	Mr. HUANG Xiaolong	China	13	Mr. Jayson Wong BAUSA	Philippines
4	Mr. XU Xianbiao	China	14	Mr. Glenn Villanueva. REYES	Philippines
5	Mr. Tri Djoko Srimargianto	Indonesia	15	Ms. Pilailak AKSORNRAT	Thailand
6	Mr. Dudi Gardesi ASIKIN	Indonesia	16	Mr. Phadungsak PHACHAROEN	Thailand
7	Ms. NOVI Widyastuti	Indonesia	17	Ms. DANG Tuyet Minh	Viet Nam
8	Mr. Khamphad SOURINPHOUMY	Laos	18	Mr. VU Thanh Liem	Viet Nam
9	Mr. Oudomsack PHILAVONG	Laos	19	Mr. R. M. S. A. B. RAJAPAKSE	Sri Lanka
10	Mr.WAN AZINUDDIN Bin W. Ibrahim	Malaysia	20	Mr. Paitoon NAKTAE	Thailand

A: Mr. Kaneko (JICA), B: Mr. Matsumoto (JICA), C: Director Aoki (JICA), D: Dr. Jayawardena (ICHARM), E: Chef Executive Sakamoto (PWRI), F: Mr. Tanaka (ICHARM), G: Ms. Saito (PWRI)

FY2008 Opening Ceremony (Oct. 28, 2008)



No.	Trainee	Country	No.	Trainee	Country
1	Mr. CHUM Sophy	Cambodia	9	Mr. URAIWONG Piriya	Thailand
2	Ms. LIAO,Hong-Zhi	China	10	Mr. PHAM Tien Viet	Viet Nam
3	Ms. LIN,He-Juan	China			
4	Mr. KOUMPHONH Boualaythong	Laos			
5	Mr. INTHAPATHA Bounseuk	Laos			
6	Ms. AZAH AZURA Ali Amran	Malaysia			
7	Mr. ROSLY Aman	Malaysia			
8	Mr. DE LEON Efren Mariano	Philippines			

A: Mr. Ichinose (JICE), B: Mr. Fujii (JICA), C: Executive Oishi (PWRI), D: Mr. Tanaka (ICHARM), E:Dr Jayawardena (ICHARM), F: Mr. Setoshita (PWRI)

Chapter 4: Annual Training and Evaluation Reports

This chapter reports actual trainings from FY2004 to 2008 and evaluation and feedback from the trainees' point of view.

The annual evaluation of each fiscal year in this chapter is based on the project completion report that ICHARM submitted to JICA after each training period.

4.1 FY2004

4.1.1 Training

The fiscal year 2004 was the first year when the "Flood Hazard Mapping" training course was conducted. The training was held for three weeks from Monday, 31 January to Friday, 18 February 2005.

In the first week, the trainees spent most of the time attending lectures on hydraulics, hydrology, and river engineering. In the following week, they were divided into several groups and experienced the Town Watching exercises (Photo 4-1) in Kurihashi (Saitama Prefecture) and Goka (Ibaraki Prefecture), both located the Tone River and suffered tremendous flood damage due to Typhoon Kathleen in September 1947. Each group discussed the findings from the exercises and presented the discussion results to other group, which led to further class discussion (Photo 4-2).

Photo 4-1 Town Watching exercises in Kurihashi

Photo 4-2 Group Discussion

In the final week, the trainees visited the Abukuma River basin in February 14. The basin was well known as one of the advanced basins in flood hazard mapping. They went to the MLIT Fukushima River and Highway Office and Koriyama City Office and received lectures on their current flood control efforts and effective use of flood hazard maps (Photo 4-3). On the next day, they visited the Kanto Regional Development Bureau and learned about the current flood control in Japan and the workings of information communication in the lectures by the Bureau staff in charge of disaster management and wide-area water management (Photo 4-4). The trainees also visited the Arakawa-Karyu River Office and attended a lecture on their current efforts in flood control and public participation in river management.

Photo 4-3 Lecture by Koriyama City Officer

The FY2004 training was the first installation of the five-year training program and was not yet exactly an ideal program. The training was designed so that they could experience and learn as much about flood hazard mapping as possible within three weeks. After the training, they commented that the course curriculum should reduce the content volume and provide something more practical, such as hydrological exercises, rather than lectures.

Photo 4-4 Control room for wide-area water management of the Kanto Regional Development Bureau

4.1.2 Evaluation

The first-year training was evaluated based on the results from the questionnaires conducted by JICA, reports submitted by the trainees, and evaluation sheets distributed and collected by PWRI.

(1) Overall evaluation

Based on the trainees' feedback, it was found that they were generally satisfied with the training they received.

(2) Program

Because the training curriculum was designed to extensively cover various issues related to flood hazard mapping from technological aspects to on-going efforts in Japan and the world, some trainees pointed out that the three weeks was too short to learn technological aspects of flood hazard mapping.

Others commented on the season in which the training took place. They said that it was too cold and a warmer season would be more appropriate. Also, because their typical day usually ended around 17:30, some trainees proposed a slightly shorter day schedule for future trainees.

(3) Training facilities and environment

The trainees showed overall satisfaction with the training facilities and environment. They did not make any specific request in this respect.

(4) Evaluation of training contents

At the end of the training, the trainees were asked to evaluate each lecture and exercise on a scale of one to five in terms of "Substance/Content," "Lecture/Presentation," "Text/Material," "Discussion," and "Overall."

The average in the "Substance/Content" aspect was 4.45, indicating that the lectures and exercises met the trainees' expectations and needs for the most part.

The "Lecture/Presentation" aspect received a slightly lower average of 4.27. Low evaluations were given to some lectures that were conducted in less fluent English or that were too difficult to understand within a limited period of time.

The "Text/Material" aspect was given an average of 4.45. In this sense, the texts and

other handouts were largely considered as helpful, but they should be improved so that trainees can review the knowledge and skills they have learned in the training and continue to study independently even after the training.

The “Discussion” aspect earned a 4.25 average. In many lectures, the lecturers ended up with spending much more time in explaining than in discussing with the trainees. Improvements are necessary for future training.

The “Overall” resulted in an average of 4.44, which reasonably indicates that it was a successful training. Figure 4-1 shows average points given to the lectures and exercises. The Town Watching exercise is exceptionally well received. This tells us how meaningful the exercise was to the trainees. Relatively lower averages were given to the exercises in general. This may be reflecting the trainees’ perception of inadequate hours for the exercises. Because FY2004 was the first year for the training, the exercise instructors did not have a clear idea of how much time should be spent on the exercises. The trainees may have felt that they have more hours to deepen understanding of the contents. This needs to be improved for the next year.

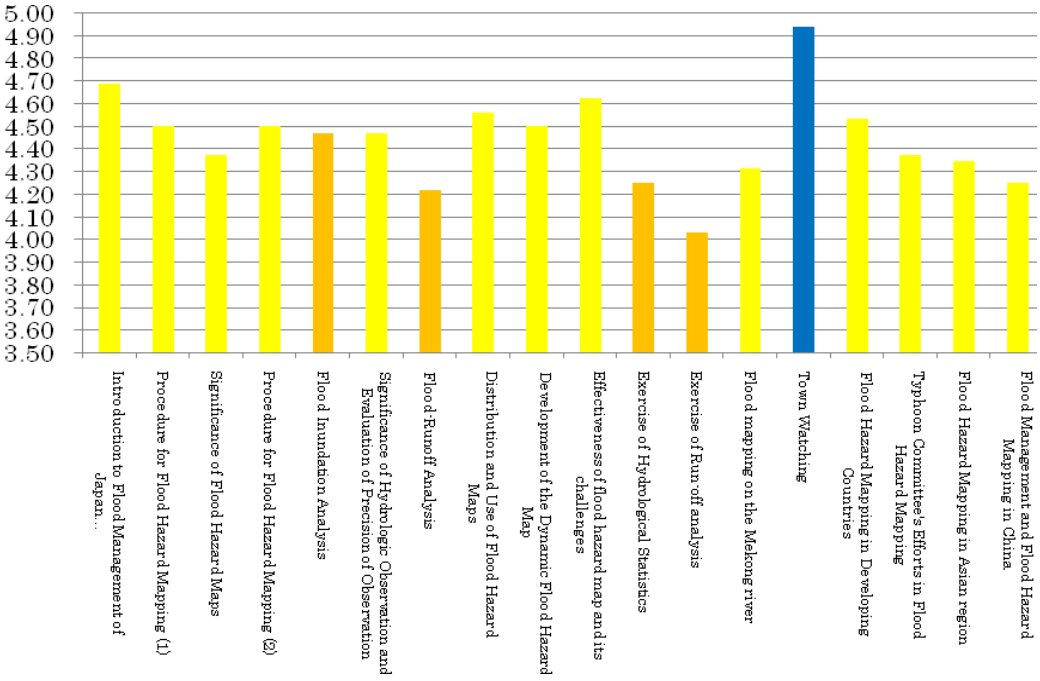


Figure 4-1 Averages of each lecture and exercise in “Overall”

Trainees also pointed out several other aspects of the training course that should be improved. They requested that improvement should be made in hydrological exercises and a simple version of flood hazard mapping. Their feedback touched various aspects of the lectures and exercises, such as: some lectures should be given more hours; for better time-efficiency, all lectures should be conducted in English; lecturers should use fewer Power

Point slides.

Still others pointed out that many of the lectures addressed general issues. They said that they were beneficial to learn basic knowledge about flood hazard mapping, but that more specific and advanced lectures and exercises should be provided to actually produce flood hazard maps.

Some trainees even proposed that the training should offer two different levels depending on trainees' experience and needs. The proposal is worth considering for restructuring the training for the future.

(5) Improvements for the next year's training

Because the training started this year, it is found necessary to be improved in many aspects. They are listed as follows:

- ✧ Time for individual study is necessary during the training to preview and review lecture contents.
- ✧ Special treatment (e.g., food, hotel rooms, etc.) for Muslims is necessary during the training, including field trips.
- ✧ Trainees should be somehow evaluated in motivation prior to the training. Is there a way? (A few of them did not ask any questions and make any comments at all during the training.)
- ✧ A method to evaluate trainees may be necessary (especially, to cope with low-motivated trainees).
- ✧ There may have been too much to learn in too short a period of time. More time might have been spent for fundamentals (e.g., hydrological exercises, etc.)
- ✧ Flood control in Japan may have been explained more in detail at the beginning of the training. (e.g., flood forecasting and warning systems, national and municipal responsibilities, kinds of warnings and their senders and receivers, etc.)
- ✧ There was some duplication between lectures.
- ✧ Information that collected previously and for the training should be organized and integrated into a global hazard map.
- ✧ More time should be spent on exercises. (e.g., hydrological exercises both on the desk and on site, hazard map production, etc.)
- ✧ Many of the trainees proposed that the training should be not three but four weeks or longer. If it can be extended by another week, it should strengthen exercise-based classes. For example:
    - ➢ -Hydrologic and hydraulic exercises (on the desk and on site, such as a PWRI experimental site at Ura-Tsukuba, etc.)
    - ➢ -Independent hazard map production
- ✧ Power Point slides should be made available for trainees in CD-ROM or other forms with the lecturers' consent.

✧ An editing committee should be organized to edit lecture scripts collected from lecturers to standardize the usage of terminology.

✧ Most of the groups for Town Watching input aerial photos, figures, and tables in their computers. In this sense, digital data rather than printed maps may be provided for the trainees. However, from a different perspective, working on the single printed map can increase group unity.

✧ In Town Watching at the Tone River, the explanation was not consistent. Town Watching may be more effective when combined with field trips, so that more time and opportunities would be given for the trainees to be provided with detailed information on local conditions. In this way, they would be better prepared for the Town Watching exercise.

The following is a sample schedule of a field trip combined with Town Watching:

-Day 1: Lecture at the Chubu Regional Development Bureau

-Day 2: Lectures at a local office and municipal office → Group discussion

-Day 3: Town Watching (including interviews with municipal offices and local communities)

Candidate sites: Ring levee in the middle reach, areas affected by the Tokai heavy rain, etc.

Trainees may be divided in four groups. Two groups can visit a study site while the other two visit another site.

-Day 4: To the destination → Group work

-Day 5: Presentation (The bureau and municipal offices may be invited.)

(6) Evaluation on the trainees

The overall level of the trainees in experience and expertise is fairly high in the first-year training. The target countries probably sent motivated and capable trainees as their first recommended students. However, some of them were not adequately fluent in English for presentation and discussion and did not have good enough expertise to participate in this training. The selection process needs to be improved to screen those candidates out.

There is another request about candidate qualifications. Some hopes that the period of a doctoral course should be counted as experience. This, too, needs to be considered.

4.2 FY2005

4.2.1 Training

The FY2005 training was extended by a week to a total of four weeks. It was conducted in the fall season, instead of winter, from Monday, 7 November to Friday, 2 December 2005.

During the first week, experts from Japan and overseas organizations, such as the Mekong River Commission (MRC), the China Institute of Water Resources and Hydropower Research (IWHR), and the University of the West Indies, gave lectures about the outline and current practices of flood hazard mapping over the world.

During the second week, the trainees were given exercises in GIS and runoff analysis and lectures on the production of anticipated inundation area maps and evacuation plans.

During the third week, with the help of the Shonaigawa River Office, the Mie River and Highway Office (both are MLIT local offices) and the Ise City Office, the trainees visited flood control facilities, such as a retarding basin and a levee, and an affected area due to a typhoon in FY2004. In Ise City, which suffered serious flood damage 30 years ago, they conducted the "Town Watching" exercise. It was planned to make them think about viewpoints required to produce flood hazard maps. As part of the exercise, they also interviewed local residents to find out the level of disaster preparedness among them.

Photo 4-5 At the Isekawasaki Shonin-kan

Photo 4-6 At Otai Retarding Basin of Shonai River

Photo 4-7 Closing Party at JICA Tsukuba

During the last week of the training, each trainee presented an "Action Plan" for flood management in their countries. The trainees completed the training and returned home with much ambition to use their trained expertise for their countries.

In FY2004, some trainees requested that the training period should be prolonged to increase hours for exercises. Responding to this request, the FY2005 training was extended by a week to a total of four weeks. Despite this longer period, some trainees commented that still more hours should be allocated for exercises in GIS and run-off analysis.

4.2.2 Evaluation

The second-year training was evaluated based on the results from the questionnaires and evaluation sheets prepared by JICA and PWRI.

(1) Training period

Because the training curriculum was designed to extensively cover various issues related to flood hazard mapping from technological aspects to on-going efforts in Japan and the world, some trainees pointed out that the four weeks was still too short to learn technological aspects of flood hazard mapping. In particular, they suggested that more hours should be spent for exercises.

(2) Training facilities and environment

The trainees showed overall satisfaction with the training facilities and environment. They did not make any specific request except that some of them asked an English-based operating system for their computers.

(3) Achievement

Achievement levels were evaluated before and after the training in terms of the five achievement goals below, which were originally listed in General Information presented to the trainees prior to the training. The results showed that the post-training achievement levels were higher in all the five goals than the pre-training levels. The table below presents the trainees' comments regarding each of the five goals.

1) Acquisition of professional knowledge on hydrology, hydraulics and river engineering necessary to produce flood hazard maps
   - Priority should be given to flood control projects based on flood hazard maps. Effective flood forecasting and warning should be implemented based on anticipated inundation area maps. (The Philippines)
   - GIS and discharge analysis are useful to assess discharge for flood forecasting. (Thailand)
2) Acquisition of general knowledge on flood hazard maps in Japan, Asian countries, and the world
   - The knowledge will be useful as basic knowledge to produce original flood hazard maps for the area of which I am in charge. (Malaysia)
   - We should strengthen collaboration with international and regional organizations in flood risk. (China)
3) Understanding of effective ways of disseminating flood hazard maps to the public and educating them about effective use of the maps
   - Floods occur every year. People are likely to use flood hazard maps if they are available. (Cambodia)
   - GIS for hydrological boundaries of river basins should be used to show evacuation routes and sites and risk to which the elderly and handicapped may be exposed. (Indonesia)
   - Flood hazard maps can help people protect themselves from disasters and mitigate flood

damage in local areas. (Vietnam)

- Raising public disaster awareness will dramatically increase the effectiveness of flood countermeasures. (The Philippines)

4) Acquisition of methods for enhancement of public coping capacity and disaster awareness in terms of flood damage mitigation

- As a fire fighter, it is my duty to increase public coping capacity and disaster awareness in terms of fire damage mitigation, and the same is true of floods. (Indonesia)
- I should use or propose Japanese ways to enhance public risk management ability, such as evacuation drills and meetings with local residents and municipal government workers. (Malaysia)

5) Understanding of methods for implementation of flood hazard mapping, particularly production and use of the hazard maps, in each trainee's country.

- As the first step, flood risk maps should be produced to show past and anticipated inundation areas. This type of maps will be used by government workers and engineers and provide basic flood data and information. The next step will be to produce flood hazard maps for the public and to explain how they can help them at flooding. (China)
- It may become easier to identify which areas should be prioritized in terms of implementation of structural measures. (The Philippines)

(4) Lecture evaluation (based on the trainees' evaluation)

At the end of the training, the trainees were asked to evaluate each lecture and exercise on a scale of one to five in terms of "Suitability for the Training Purpose," "Lecture/Presentation," "Your Understanding of the Contents," and "Overall."

The lectures were given 4.6 points on average for their suitability for the training purpose. This suggests that the lectures generally met the purpose of the training. In particular, the lectures on past and anticipated inundation mapping, GIS exercises and Town Watching were given a high average of 4.8.

The lectures were rated at an average of 4.2 for Lecturer/Presentation. In this respect, the GIS and Town Watching exercises were again highly evaluated by the trainees.

The average for "Your Understanding of the Contents" was 4.0. Figures 4-2 show each lecture's average point for "Suitability for the Training Purpose" and "Your Understanding of the Contents." The figures help clarify the gap between the two evaluation aspects; namely, the trainees do not always show a high level of understanding of the lecture content even though acknowledging its suitability for the training purpose. When the gap is too large, some kind of improvement is necessary. More hours should be allocated, or lecture contents should be simplified. Specifically, improvement is needed for lectures with a gap of 0.8 or wider between the two evaluation perspectives; that is, "Flood Disasters and Flood Control Measures in Japan," "Anticipated Inundation Mapping (lectures and exercises)," "Contributions and Challenges of

Flood Hazard Mapping," and "Dynamic Hazard Maps."

The overall evaluation of the training was 4.2 on average, suggesting that it was successful. Figure 4-3 shows the overall evaluation for each lecture. The GIS and Town Watching exercises were given an average over 4.5. These two subjects were highly rated by the trainees in 2005. On the other hand, "Inundation Area Mapping Exercise" and "Dynamic Hazard Maps" were given lower averages, calling for some improvement.

(5) Improvements for the future training

The FY2005 training was extended by one week from three to four weeks in total. The technical aspect of the training was given more hours and increased from 78 to 90 hours (Table 3-1).

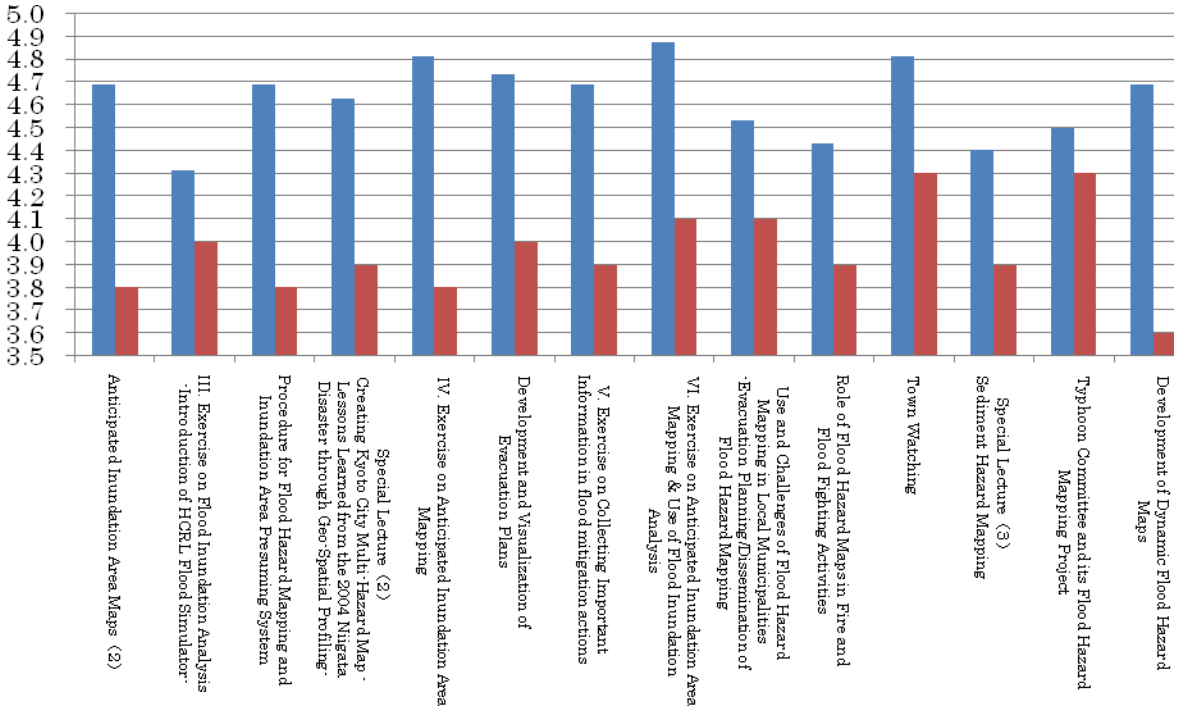
The extra hours was used for exercises. GIS, which is necessary for mapping procedures, was added to the curriculum, and exercises were conducted to practice using GIS software (Arc View 3.1). The lecture contents were even more extensive than the previous year, including overseas examples, evacuation planning, data collection and other relevant issues in addition to the outline of flood hazard mapping. Several new highly technical subjects were also added to the last year's curriculum. They probably helped the trainees have an overall image of flood hazard mapping. However, the trainees still felt that they needed more time to have a good command of technical skills learned in the training.

The lecture contents were improved in general. However, there were still duplications between lectures, and the curriculum needs more improvement. The trainees' feedback touched various aspects of the lectures and exercises: for example, "some lectures repeated the outline of flood hazard mapping," "for better time-efficiency, all lectures should be conducted in English; lecturers should use fewer Power Point slides," and so forth.

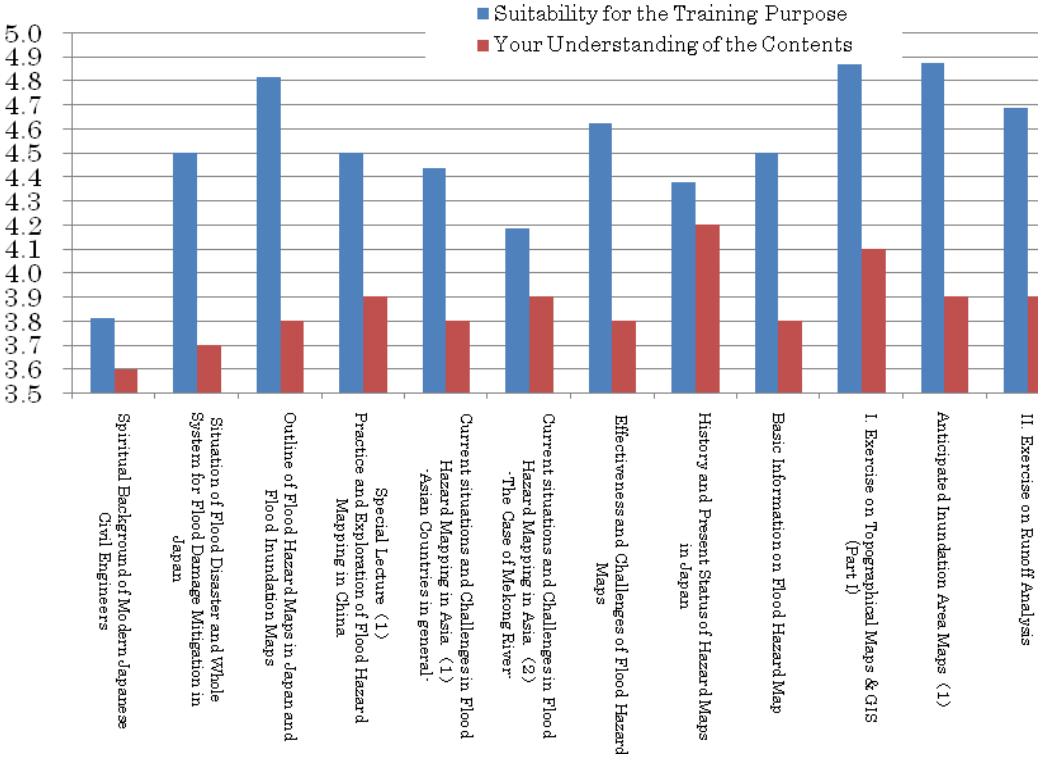
Moreover, the training course was still largely dependent on outside lecturers (Table 3-2), which caused the lectures and exercises to be less efficient, as some of the lectures overlapped each other in content.

(6) Evaluation on the trainees

The overall level of the trainees in experience and expertise is fairly high in the second-year training. However, some of them were not adequately fluent in English for presentation and discussion and did not have good enough expertise to participate in this training. The selection process needs to be reviewed to screen those candidates out.



Figures 4-2 (both top and bottom)　Averages of each lecture or exercise in "Suitability for the Training Purpose" and "Your Understanding of the Contents"



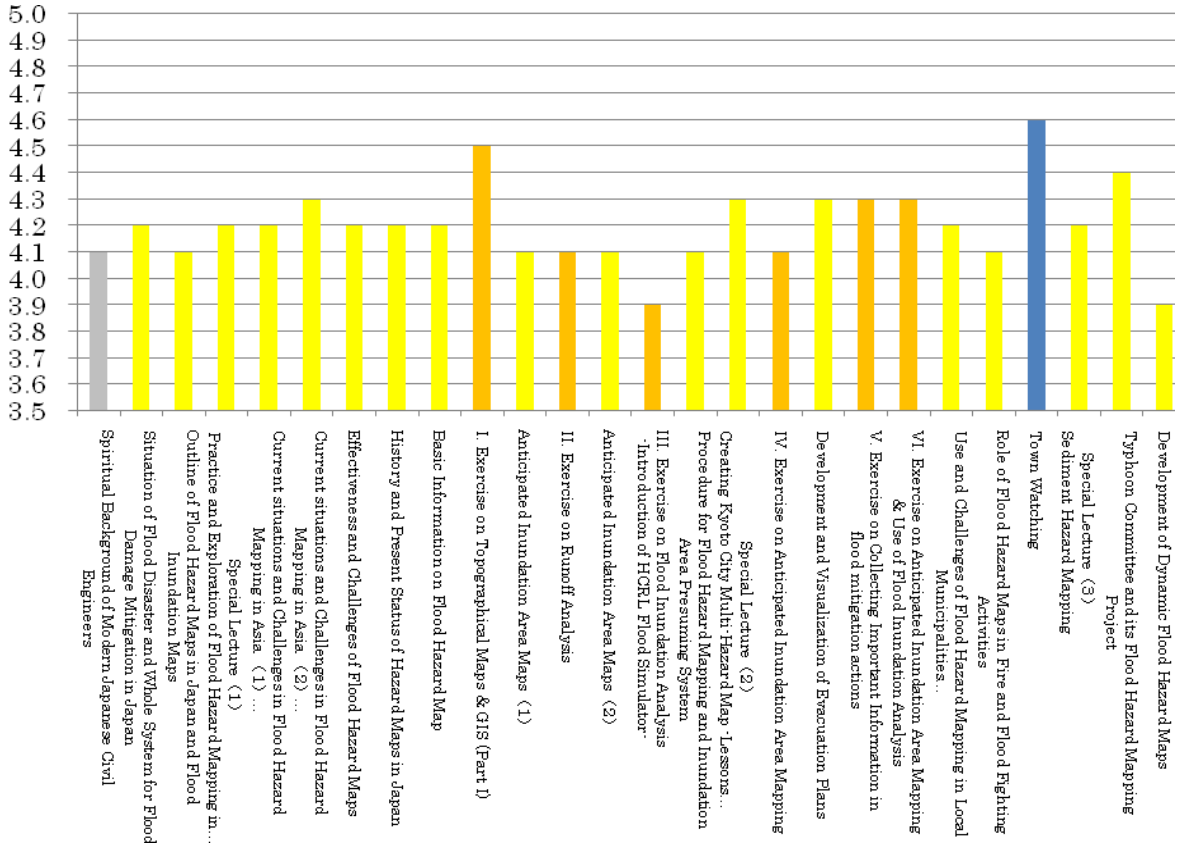


Figure 4-3 Averages of each lecture or exercise in “Overall”

4.3 FY2006

4.3.1 Training

The FY2006 training was held from 30 October to 1 December.

Lecturers were invited from research institutes and other organizations both in Japan and abroad to give lectures on flood disasters, flood hazard maps, data collection for flood hazard mapping. The training course also provided a wide range of exercises to learn run-off analysis, flood analysis and GIS technology, which are necessary for flood hazard mapping. For example, run-off analysis exercises using a tank model and the storage function method, flood analysis exercises using HEC-RAS or HEC-Geo RAS provided by the U.S. Army Corps of Engineers, and GIS exercises using Arc GIS9.1. As an independent study, each trainee produced a flood hazard map for a sample area using his/her skills and knowledge learned in those exercises.

Photo 4-8 Town Watching in Kokai River

Photo 4-9 Exercise

Photo 4-10 Presentation

On 15-17 November, the trainees went on a field trip to the Chubu Region of Japan to study the restoration progress of flood-affected areas along the Shonai River and the Miya River. The trip was supported by the Shonaigawa River Office and the Mie River and Highway Office (both are local offices of MLIT). The Town Watching exercise was also conducted in cooperation with Ise City officer. The trainees walked around the city in four groups and also interviewed local residents to find out possible dangerous sites in time of evacuation and assess the effectiveness of existing hazard maps. In fact, the trainees experienced this exercise once before in the Kokai river basin near PWRI. Participating in the Town Watching exercise both before and after training enabled them to see progress in their expertise. After the exercise in Ise City, each group discussed issues to be addressed and their solutions to be proposed.

At the end of the training, the trainees each made a presentation on their training achievements and an action plan for flood hazard mapping in their country.

4.3.2 Evaluation

The third-year training was evaluated based on the results from the questionnaires and evaluation sheets prepared by JICA and ICHARM.

(1) Training period

Because the training curriculum was designed to extensively cover various issues related to flood hazard mapping from technological aspects to on-going efforts in Japan and the world, some trainees pointed out that the five weeks was still too short to learn technological aspects of the mapping. In particular, they suggested that more hours should be spent for exercises.

(2) Training facilities and environment

During the training, the trainees' computers were infected by a computer virus, and they asked for anti-virus software. Other than that, they gave satisfactory rating on the overall training facilities and environment.

(3) Achievement

Achievement levels were evaluated before and after the training in terms of the five achievement goals below, which were originally listed in General Information presented to the trainees prior to the training. The results showed that the post-training achievement levels were higher in all the five goals than the pre-training levels. The table below presents the trainees' comments regarding each of the five goals.

1) Understanding the effectiveness of flood hazard maps and acquiring the way to disseminate and utilize them for people

- Our office can use flood analysis to analyze past flood disasters and later to produce flood hazard maps. (Thailand)
- Floods occur annually in our country, and it is one of the most prone to flood damage. People lose their lives and property because of floods and have to endure huge socio-economic damage. We are very interested in flood hazard maps. (Cambodia)

2) Acquiring Methods to enhance people's capability and promote public awareness to mitigate flood damage

- I will tell those working at local municipalities about the importance of flood hazard maps. (Indonesia)
- Flood forecasting and warning are my main responsibility back in my country. I can use what I have learned in this training course. (Malaysia)

3) Acquiring the professional knowledge of hydrology and inundation analysis necessary to produce flood hazard maps

- Before the training, I only had basic knowledge and knew little about software related to my work. Thanks to the training, I have learned easier ways to do my job and they will help a lot. (The Philippines)

- I have learned two run-off models, storage function model and tank model. These help acquire run-off data easily based on rainfall data. I will use the models for my job and teach my colleagues about them. (Thailand)

4) Acquiring the general knowledge of flood hazard maps in Japan, Asia, Europe and the world

- It is important to produce flood hazard maps based on local needs and conditions. Flood hazard maps can be very useful and help reduce disasters effectively, but it is not a panacea. (China)
- Now that I have learned about different kinds of flood hazard maps around the world, it will help me to set goals and expected results regarding flood hazard maps for Vietnam. (Vietnam)

5) Understanding the ways of producing and applying flood hazard maps for their own countries/regions, and making the action plan (draft) along which they promote Flood Hazard Mapping after they go back to their country

- To develop a flood hazard mapping action plan is an important first step for Vietnam. After returning home, I will start working on flood hazard maps based on the action plan I have developed in the training. (Vietnam)
- To develop an action plan helped me make a schedule for flood hazard mapping and plan a mapping project. (Indonesia)

In the FY2006 training, the trainees' levels of understanding of lectures and exercises were evaluated by giving them the same test before and after the training. To be more specific, a simple test (Table 4-2) was given to each trainee before and after each lecture or exercise to objectively assess his achievement level on the five training goals listed in General Information (Table 4-1).

Examining the test results of each trainee, although the understanding levels vary among the individuals, all the trainees achieved good understanding of the lectures and exercises provided in the training. This new attempt was helpful for the trainees, as well as the training organizers, in that it helped measure individual achievement levels and encourage effective learning.

Table 4-1 Five training goals listed in General Information

Course output	**Participants are expected to produce the following outputs by the end of this course:**
(1)	*Understanding the effectiveness of flood hazard maps and acquiring the way to disseminate and utilize them for people*
(2)	*Acquiring Methods to enhance people's capability and promote public awareness to mitigate flood damage*
(3)	*Acquiring the professional knowledge of hydrology and inundation analysis necessary to produce flood hazard maps*
(4)	*Acquiring the general knowledge of flood hazard maps in the world/ in Europe/ in Asia/ in Japan*
(5)	*Understanding the ways of producing and applying flood hazard maps for their own countries/regions, and making the action plan (draft) along which they promote Flood Hazard Mapping after they go back to their country*

Table 4-2 Questions for the pre- and post-training tests

	Questions
Pre & Post Test (1)	1. What is the Flood Hazard Map? 2. Why is the Flood Hazard Map effective for flood disaster mitigation? 3. Describe the outline of how to disseminate and utilize.
Test (2)	1. Describe the method in Japan to enhance people's capability and promote public awareness. 2. What is the best way to enhance people's capability and promote public awareness in your country?
Pre & Post Test (3)	1. Describe the outline of the situation of flood disaster and outline of flood hazard map in **Europe/world** utilizing range of knowledge that you have. 2. Describe the outline of the situation of flood disaster and outline of flood hazard map in **Japan** utilizing range of knowledge that you have. 3. Describe the outline of the situation of flood disaster and outline of flood hazard map in **Asia** utilizing range of knowledge that you have.
Pre & Post Test (4)	1. Describe briefly the situation of flood disasters and flood hazard mapping in Japan utilizing range of knowledge that you have. 2. Describe briefly the situation of flood disasters and flood hazard mapping in the world utilizing range of knowledge that you have.

(4) Lecture evaluation (based on the trainees' evaluation)

At the end of the training, the trainees were asked to evaluate each lecture and exercise on a scale of one to five in terms of "Suitability for the Training Purpose," "Lecture/Presentation," "Your Understanding of the Contents," and "Overall."

The lectures were given 4.5 on average for their suitability for the training purpose. This suggests that the lectures generally met the purpose of the training. Particularly high evaluation was given to "Exercises on Topographical Mapping and GIS," "Exercises on Anticipated Inundation Area Mapping," lectures conducted by UNESCO-IHE instructors, and the Town Watching exercise.

The lectures were rated at an average of 4.4 for Lecturer/Presentation. Highly evaluated lectures and exercises for this respect were: "Situation of Flood Disaster and Outline of Flood Hazard Map in Japan" and "Exercises on Anticipated Inundation Area Mapping" by ICHARM Research Specialist Rabindra Osti, "Exercises on Topographical Maps and GIS" by ICHARM Research Specialist Prasantha Hapuarachchi, and lectures by Asso. Prof. Meulen of UNESCO-IHE, Town Watching, and "Creating Kyoto City Multi-Hazard Map" by Professor Haruo Hayashi of Kyoto University.

The average for "Your Understanding of the Contents" was 4.1 points. Figure 4-4 shows each lecture's average point for "Suitability for the Training Purpose" and "Your Understanding of the Contents." The figure helps clarify the gap between the two evaluations; the trainees do not always show a high level of understanding of the lecture content even though acknowledging its suitability for the training purpose. When the gap is too large, some kind of improvement is necessary. More hours should be allocated, or lecture contents should be simplified. Specifically, improvement is needed for lectures with a gap of 0.8 or wider between the two evaluations. In the FY2005 training, such a gap was seen in several lectures. However, few lectures show the gap in 2006, suggesting that improvement was made in lecture content.

The overall evaluation of the training was 4.2 on average, suggesting that it was successful. Figure 4-5 shows the overall evaluation for each lecture.

The exercises in FY2006 were generally rated higher than those in the previous year. This was probably because the increased training hours was mostly allocate to the exercises. About 18 more hours were given to the exercises. Further improvement was made to increase more exercise time. Up to the previous year, many hours were spent on explaining the outline, production, dissemination and case studies of flood hazard maps. However, in the FY2006 training, lectures were only given to review important points, and the rest was left to the trainees to study with textbooks. The exercises were all conducted by ICHARM researchers so that they were better tailored to the trainees' levels and needs. They were also able to ask questions to the instructors outside the class and even ask for extra lectures if possible. Towards the end of the training, the trainees produced an original flood hazard map for a sample river basin in Japan by using flood analysis and GIS technology they had learned in the training. That

was progress worth noting in the FY2006 training.

Although more hours were spent on the exercises in FY2006, some trainees commented that still more hours should be spent on them. Meanwhile, on the trainees' side, some of them did not have adequate hydrological and hydraulic knowledge required to participate in the exercises.

New lectures were also added to the training. Up to the previous fiscal year, the lectures covered technical aspects and case studies regarding flood hazard mapping. The new lectures were added to introduce fundamental philosophy underlying flood control projects in Japan. Those lectures covered achievements made by great results in flood control and traditional anecdotes and philosophy that Japanese people have applied to mitigate flood damage. The lectures were considered to help nurture an important attitude to address flood control that should be developed before considering financial and technological constraints.

"Latest Inundation Analysis Simulation" was given lower rating than other lectures or exercises. This was probably because the trainees found this type of simulation difficult to execute in their countries. In fact, the simulation requires a large set of hydrological and topographical data as well as specific computer software. Since the same subject was also rated low in the previous year probably because of the same reason, due consideration should be given to curriculum development not to include contents that are too advanced.

Furthermore, in FY2006, all the lectures and exercises, except for field trips, were conducted in English for more efficient training.

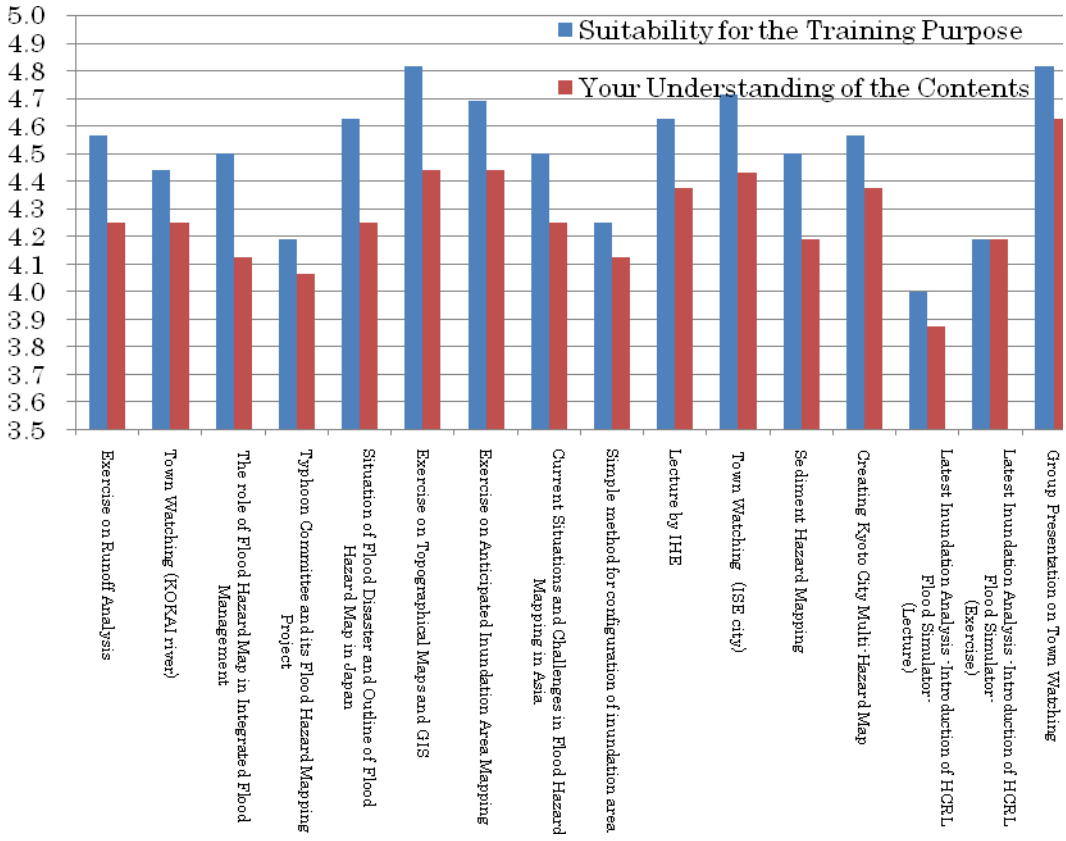


Figure 4-4 Averages of each lecture or exercise

in "Suitability for the Training Purpose" and "Your Understanding of the Contents"

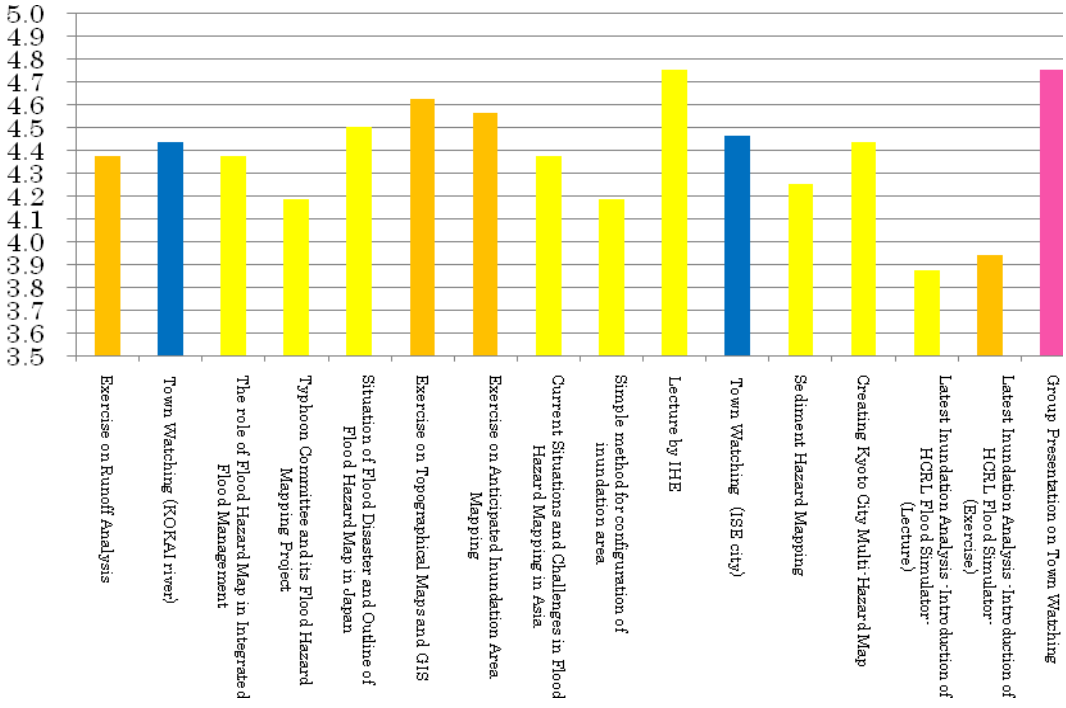


Figure 4-5 Averages of each lecture or exercise in "Overall"

(5) Improvements for the future training

The increased exercise hours helped improve the trainees' acquisition levels of flood hazard mapping knowledge and technology. However, flood hazard maps should accommodate local needs and conditions for their widespread production and use in each country. It is often inappropriate to apply the technology and case studies in Japan directly to localities in overseas countries. The training course should provide opportunities for trainees to review and discuss how to produce and efficiently disseminate flood hazard maps based on local needs and conditions.

The following lists improvements that should be made for the training next year:

[Lectures]

- Lecture contents on public awareness promotion (part of Training Goal 2) need to be increased. (Some trainees also commented.)

[Exercises]

- Run-off analysis exercises may have been too difficult for the trainees because they generally had little background knowledge in the field.
  - → For the next year, it may be helpful if textbooks and relevant information are available on the website so that trainees can study beforehand.
  - → Calculation software, for example, developed by using Excel Macro may be helpful.
- Hydrological data that the trainees brought were virtually useless.
  - → Sample data should be available on the website for reference to help trainees prepare data that can be used for their study.
- It should be easier to plan exercises if we can find out the needs for GIS beforehand through questionnaire or other means.

[Town Watching]

- The trainees were too worried about going all the check points within the designated time period and did not spend enough time discussing issues related to flood hazard mapping.
  - → No check points around the town should be designated (or one or two at most if necessary). No interview points should be designated, either, and trainees should be allowed to interview local residents anytime necessary.
  - → The Town Watching area should not be designated beforehand by the training organizers. Trainees should decide the area in reference to hazard maps or aerial photos prior to the actual exercise. They should explain why they have chosen the area and what they will look at in the area and ask for advice from the instructors.

[Country Report and Concluding Report]

- The trainees' reports were not concrete and quantitative. This was probably because they did not know how to write a proper report.

→ Sample country and concluding reports (written on a Japanese case) should be provided to trainees at the beginning of the training, so that they have a clearer idea of what and how they have to write in their reports at the end of the training.

[Other]

- The daily schedule may be extended from 10:10-16:30 to 9:00-17:30 to create more hours for study and research.
- A discussion class may be helpful. This type of class may help trainees have a clear idea of what to do with flood hazard maps in their countries through discussions with people from different countries about problems and solutions in production and dissemination of flood hazard maps.

(6) Evaluation on the trainees

The overall level of the trainees in experience and expertise was fairly high in the third-year training. However, some of them did not have adequate professional knowledge to participate in the training. The selection process needs to be reviewed to screen those candidates out.

4.4 FY2007

4.4.1 Training

The forth-year training started on 30 October and ended 29 November. Unlike the previous years, the training was jointly conducted with the ICHARM master's course, "Water-Related Disaster Management Course of Disaster Management Policy Program," which started in October 2007. With these two courses together, a total of 30 trainees from 14 different countries participated in the training at the same time. This kind of learning environment must have been very exciting and inspiring for all of them.

Photo 4-11 Classroom with 30 participants

The training course covered various issues from current flood disasters in Japan and the world to the latest data collection technology related to the flood hazard mapping. Disaster education and integrated disaster mitigation measures were also included in the training.

Photo 4-12 Lecture in Kurihashi Town

The training provided a wide range of exercises, such as run-off analysis exercises using the tank model and storage function method, inundation analysis exercises, and GIS exercises.

Photo 4-13 Town Watching exercise in Ise City (interviewing to Mr. Kanamori, community leader)

Like the previous years, the trainees conducted the Town Watching exercise, in which they walk around a target area with flood hazard maps in hand and interview local residents to find out the validity of the maps, possibly dangerous sites, and the level of public awareness. The exercise was conducted twice; once in Kurihashi Town, Saitama Prefecture, and once in Ise City, Mie Prefecture. In Kurihashi Town, which suffered serious damage due to Typhoon Kathleen in 1947, the trainees were given a lecture on Kurihashi's disaster management effort. In Ise City, each group of the trainees discussed problems and solutions in the target area. Based on the discussion results, each group made a presentation on proposals to improve the city's current disaster management and flood hazard map in front of the deputy mayor. At the end of the training, the trainees were divided into country groups, and each country group developed an action plan to produce and disseminate flood hazard maps in each country.

More hours were allocated to the exercises also in the fourth-year training. Further improvement was also made on their contents to be more effective. Each group of trainees worked on inundation simulation using sample data of Ise City and produced a flood hazard map, which was progress worth noting. This exercise helped them acquire skills they can use to produce flood hazard maps based on data collected for flood-prone areas in their countries.

Photo 4-14 Presentation to the former deputy mayor Mr. Kamei

4.4.2 Evaluation

The fourth-year training was evaluated based on the results from the questionnaires and evaluation sheets prepared by JICA and ICHARM.

The trainees were evaluated individually from the fourth-year training. The individual evaluation results were used to objectively measure their achievement levels in terms of the training goals. The personal evaluation results were not listed in this technical note but in the project completion report to JICA.

Photo 4-15 Exercise on flood hazard mapping

The achievement level for each training goal was listed in the table below:

Table 4-3 Achievement level for each training goal

Training goal	Indicator	Achievement level
1) Acquire and become able to explain general knowledge on flood hazard maps in Japan and the world	Test results	All the trainees showed good understanding of the general knowledge of flood hazard maps.
2) Acquire and become able to explain skills and expertise on run-off and flood analyses required to produce anticipated inundation area maps	Practice based on sample data during the exercises	All the trainees except a few showed good understanding of the skills and expertise taught in the training.
3) Acquire and become able to explain methods for production, dissemination and use of flood hazard maps in Japan	Contribution during the Town Watching exercise.	Town Watching was a group activity; they conducted the exercise and wrote a report as a group. The level of contribution to the exercise showed some variation among the trainees.
4) Become able to explore an effective way to produce, disseminate and use flood hazard maps and then develop a national action plan for flood hazard mapping in reference to relevant cases in Japan.	Presentation and subsequent discussion on the action plan (tentative)	Almost all the trainees understood the purpose of this training and developed action plans for their countries. However, contribution to the presentation showed some variation among the trainees.

The following are the course organizers' comments on the FY2007 training. They include factors contributing or disrupting the achievement of the expected training results, improvements and their effects, and changes made from the previous training.

(1) Training course design (training period, curriculum)

The training was conducted for five weeks, the same length as the FY2006 training. However, the number of classes per day increased from three to four by reducing the minutes per class from 100 to 90. This change increased the total class minutes per day by 20% from 300 (100 min. x 3 classes) to 360 (90 min. x 4 classes). The shortened class period helped the trainees keep their concentration level high and increased the total class hours, which contributed to more efficient and effective training.

The training curriculum was unchanged from the previous year, consisting of four principal components – lectures, exercises, field trips, and action plan development. The trainees were required to produce a flood hazard map in groups using actual topographic and hydrological data provided by Ise City, Mie Prefecture. Through this assignment, they were able to check their achievement levels of flood hazard mapping skills.

(2) Training contents (curriculum, training materials)

The increased class time was mostly allocated to exercises (Figure 3-3). The hours spent on exercises increased from about 37 in FY2006 to about 51 hours, and the increase was specifically allocated to inundation analysis exercises, which is a crucial skill in flood hazard mapping. Lectures related to disaster management, such as "Improving Local Disaster Prevention Capabilities with Versatile Subjects" and "Education for Disaster Awareness," were also added to the training curriculum.

The Town Watching exercise has been part of the training as one of the distinct features since the first year. Like in the previous years, the trainees experienced the exercise twice during the training (in Kurihashi Town of Saitama Prefecture, and Ise City of Mie Prefecture). In FY2007, the exercise process was improved and carried out as follows: Planning 1 ⇒ Discussion ⇒ Town Watching (Kurihashi) ⇒ Discussion ⇒ Improvement ⇒ Planning 2 ⇒ Discussion ⇒ Town Watching (Ise) ⇒ Discussion ⇒ Conclusion. This new process helped the trainees discuss ways to produce and disseminate flood hazard maps based on local needs and conditions, which was addressed as an issue for improvement in the previous year. Furthermore, they probably learned to plan and execute Town Watching by themselves in their countries.

Another improvement made on Town Watching was that the trainees had to decide which route to take to check around the target area. The trainees in the FY2006 training just had to follow the pre-determined route, including the starting and finishing points and check points in between. As a result, the exercise ended up like a kind of orienteering: the trainees seemed more focused on visiting every check points within the designated time period. In FY2007, an attempt was made to make the trainees more aware of the true purpose. They were divided in six groups, and each group had to discuss and decide what to check and which route to take. This new way contributed considerably to increase the trainees' understanding of the meaning

and operation of Town Watching.

(3) Trainees (Validity of qualification, expertise, comprehension, motivation)

All the trainees were qualified to the training course and fairly fluent in English. However, it was difficult in some cases to make them fully understand the intention of the training course. Although it was explained at the very beginning of the training, it seemed that a few of the trainees still did not pay much attention to it and just continued participating in the training. It may be necessary to repeatedly remind trainees of the intention of the training course not only at the beginning but also in the middle to maximize the training effect.

(4) Pre-training assignment

The trainees were given two kinds of pre-training assignment. They had to write a report on "Introduction about Policies, Activities and Progress of Flood Risk Management" and prepare data for run-off analysis exercises. The report was assigned to analyze domestic flood risk management, identify issues to be addressed, and become clearly aware of what to learn during the training. All the trainees submitted the reports, but some of them showed lack of understanding on the data preparation despite the detailed instruction given to them beforehand.

(5) Other comments

The training was joined by ten students of the ICHARM master's course, "Water-Related Disaster Management Course of Disaster Management Policy Program." This master's course is a one-year program jointly organized by JICA, GRIPS and PWRI. The students were from Bangladesh, Nepal, China, India and Japan.

As a result, a total of 30 trainees, including the ten master's course students, participated in the training. The trainees came from 14 different Asian countries – Bangladesh, Cambodia, China, Malaysia, India, Indonesia, Japan, Nepal, Laos, Malaysia, the Philippines, Thailand, Sri Lanka, and Vietnam.

This diversity of the group facilitated interactions among the trainees and heated discussions in lectures and exercises. On the other hand, because of the class size, it was sometimes difficult for a single instructor to pay attention to each trainee, and another instructor was sent to help the original one.

Ise City provided a lot of supports for the Town Watching exercise. Deputy Mayor Hideki Kamei gave a lecture on "Improving Local Disaster Prevention Capabilities with Versatile Subjects." Ise City officers accompanied the trainee groups in the exercise. The city also kindly provided a room for presentations of the exercise results. The deputy mayor even joined and listened to the presentations. Thanks to the cooperation of Ise City, the exercise ended successfully.

The following are comments made by the trainees and ICHARM staff at the evaluation meetings and other opportunities.

(1) Training period

Because the training curriculum was designed to extensively cover various issues related to flood hazard mapping from technical aspects to on-going efforts in Japan and the world, some of the trainees pointed out that the five weeks was still too short to learn technological aspects of the mapping. In particular, they suggested that more hours should be spent for exercises.

(2) Achievement

The trainees evaluated their own achievement levels before and after the training in terms of the training goals listed in GI. The results showed that the post-training achievement levels were higher in all the training goals than the pre-training levels. In particular, the average points rose from 2.6 to 4.1 in training goal No.2 ("Acquire and become able to explain skills and expertise on run-off and flood analyses required to produce anticipated inundation area maps").

(3) Lecture evaluation

At the end of the training, the trainees were asked to evaluate each lecture and exercise on a scale of one to five in terms of "Usefulness," "Lecturer & Materials," "Understanding," and "Overall."

- The lectures were given 4.3 on average for their usefulness. This suggests that the lectures generally met the purpose of the training. The points were particularly high on "Exercise on Topographical Map and GIS," "Flood Analysis Exercise," "Exercise on Flood Hazard Mapping," and "Town Watching." The trainees gave high rating on the Flood Hazard Mapping Exercise, in which they had to apply skills and knowledge they learned in the training. This kind of exercise should continue being conducted in the future.
- The lectures were given 4.0 on average in terms of "Lecturer & Materials." Lectures with high rating included "Human Behavior and Social Mentality" by Professor Hayashi of Kyoto University and "Outline of Flood Hazard Mapping" by Team Leader Tanaka of ICHARM.
- The average for "Understanding" was 3.9. Figure 4-6 show each lecture's average points for "Usefulness" and "Understanding." The figure helps clarify the gap between the two evaluation aspects; namely, trainees do not always show a high level of understanding of lecture contents even if recognizing the usefulness of the lectures. When the gap is too large, some kind of improvement is necessary. More hours should be allocated, or lecture contents should be simplified. In FY2007, greater gaps were observed for lectures such as "Exercise on Topographical Maps and GIS" and "Precipitation and Run-off Model." This may have been caused by the class size, which was a total of 30 trainees with the two different courses combined. The class was too large to provide adequate support for each trainee. "Precipitation and Run-off Model" may have been slightly too difficult for the trainees.
- The overall evaluation of the training was 3.9 on average, suggesting that it was successful. Figure 4-7 shows the evaluation rating for each lecture. The points were found to be relatively low compared with those in the previous year. As explained repeatedly, the class size was twice as large as that of the last year (increasing from 16 to 30 trainees). The

trainees may have been forced to share the instructors with so many fellow trainees, which may have resulted in less time spent per person and less satisfaction.

On the other hand, the total hours for technical training increased from 110 to 126. This was reflected on the increased exercise hours from 37 to 51, which was considered to be a plenty of time for the trainees to acquire skills and knowledge. In fact, the percentage of the hours spent on exercises to the total training hours was higher in FY2007 than any of the five years. As in the previous year, all the exercises were instructed by ICHARM researchers, and efforts were made to improve their contents. Despite that, as commonly seen in the previous years, some of the trainees lacked basic knowledge in hydrology and hydraulics, which is necessary to understand the exercise contents. For this reason, the level of understanding wasn't so high in run-off analysis.

(4) Improvements for the future training

The increased exercise hours contributed to the trainees' improved levels of understanding exercise contents and acquiring skills. However, the trainees' understanding did not reach the expected levels in several training subjects. There are a wide range of knowledge and skills needed for the production and dissemination of flood hazard maps. If all of them have to be incorporated in the training curriculum, trainees will probably return to their countries without understanding any of them adequately. It is sometimes necessary to dare to cut even important study subjects and concentrate the limited resources, especially time, on several selected ones (in this case, for instance, textbooks should be provided for subjects taken out from the curriculum, and trainees are expected to study them independently.)

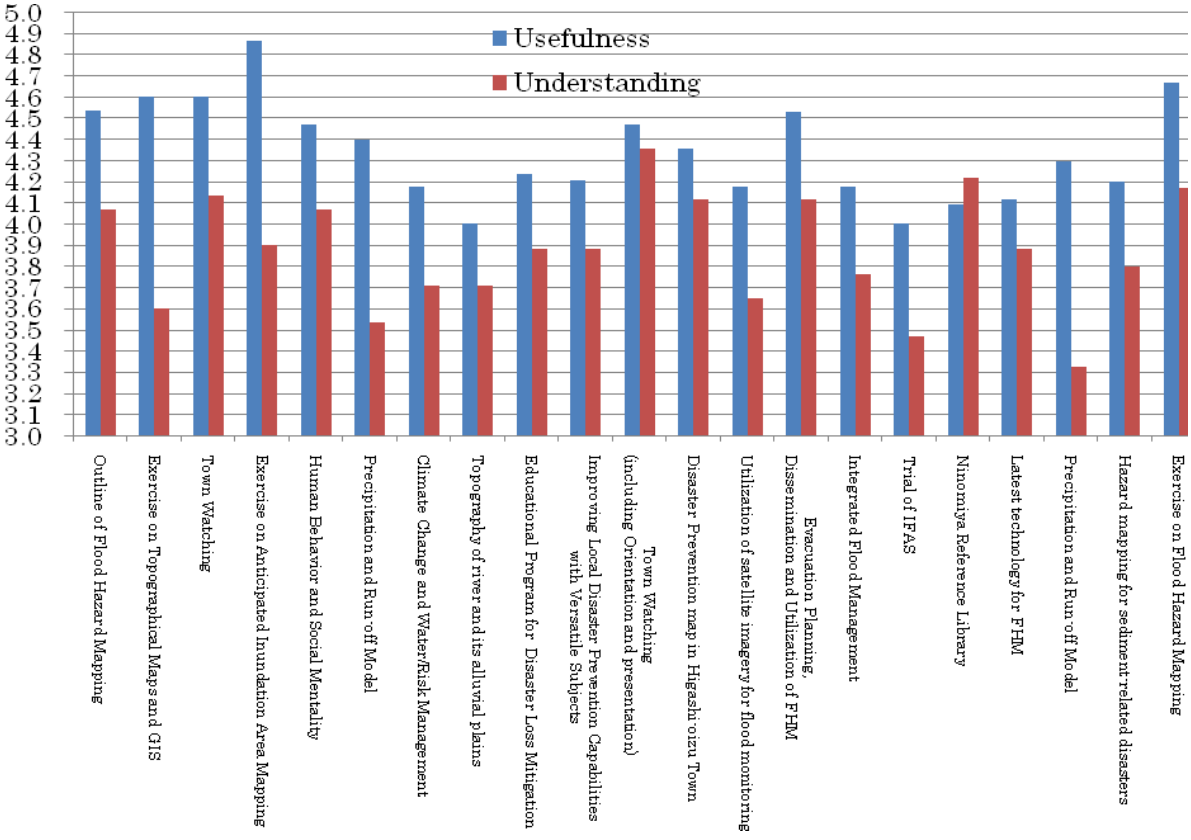


Figure 4-6 Averages of each lecture or exercise in “Usefulness” and “Understanding”

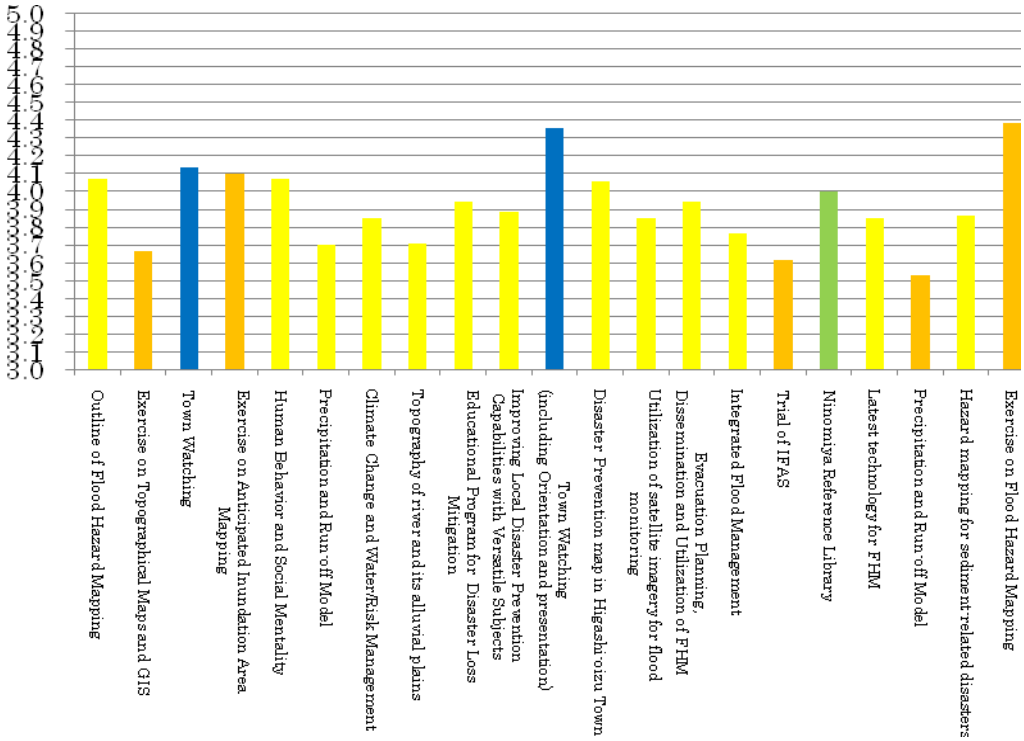


Figure 4-7 Averages of each lecture or exercise in “Overall”

4.5 FY2008

4.5.1 Training

The FY2008 training was conducted from 28 October to 28 November in 2008, the final year of this five-year training program.

The training was joined by 18 students including 9 students of the ICHARM master's course, "Water-Related Disaster Management Course of Disaster Management Policy Program."

The training started with a series of lectures on Japan's legal framework concerning flood hazard maps, local disaster management plans, disaster education, the latest satellite data technology, and human behavior during disasters. Those lectures were delivered by ICHARM researchers, university professors, and other experts invited from external organizations, such as UNESCO-IHE and the Japan Aerospace Explore Agency (JAXA). The trainees also learned GIS and inundation analysis as part of the prerequisites for flood hazard mapping. In addition, they visited Ise City, Mie Prefecture, where they attended a lecture by Ise Deputy Mayor Hideki Kamei on the enhancement of local disaster management. They also visited Ohminato District in Ise City and had a chance to listen to the vice principal of Ohminato Elementary School and the community leader of the district, Mr. Kanamori, speaking about the local efforts to improve disaster preparedness. The trainees were surprised that the local civil groups had a good understanding of "self-help," "mutual support," and "public assistance," the set of fundamental concepts that underlie Japan's disaster management.

Photo 4-16 Exercise by Dr. Osti

Photo 4-17 Lecture in Ohtone Town

Photo 4-18 Tower indicating current water level of Tone River (at Kurihashi town office)

The "Town Watching" exercise was also conducted this year in Kurihashi Town of Saitama Prefecture, and Ise City of Mie Prefecture. The trainees walked around target areas with local hazard maps in hand and interviewed local residents to find out possibly dangerous sites, the effectiveness of the maps, and the level of the public disaster awareness. Ise City supported this exercise a great deal by providing city personnel to accompany each group of trainees.

The trainees took field trips to additional places to learn more about flood management in Japan. They went Ohtone Town, Saitama Prefecture, which had serious damage due to Kathleen Typhoon in 1947, to attend a lecture on the current disaster management. They also visited other places to have a close look at flood control facilities and structures with help from the Toyohashi River Office, Kisogawa-karyu River Office, and Mie River and High Way Office of the MLIT. More specifically, they looked on "*kasumi-tei*" open levees along the Toyo River, the confluence of the Kiso, Ibi and Nagara Rivers, and a flood control project in the Miya River. At Enza District, Ise City, located along the Miya River, the trainees were given a chance to listen to the community leader, Mr.Ueda, speaking about how the community acted in time of the 2004 flood and other insights into local disaster management.

Photo 4-19　Flood mark in Kurihashi town (Blue line on the pole)

Photo 4-20　Lecture on open levee of Toyo River

Photo 4-21　Lecture at Kiso-sansen Park

Photo 4-22　Mr. Ueda speaks on the community activities in Enza disatrict

Photo 4-23　Participants listen to the explanation

Photo 4-24　Lecture by Mr. Tanaka on flood countermeasure in Miya River

Photo 4-25　Town Watching in Ohminato district, Ise City

Photo 4-26　Mr. Kanamori speaks on the community activities in Ohminato district

After that, each group of trainees discussed and presented what they learned from Town Watching in Ise and the production and use of flood hazard maps.

As in the previous year, the trainees practiced flood hazard mapping by using actual hydrological and topographical data to integrate what they had learned in the training. The trainees were provided with sample data of Ise City, but they were also required to produce another flood hazard map based on hydrological and topographical data they brought with them from their countries. Unlike the last year's trainees, who worked on this exercise in groups, they each had to produce the two kinds of map by themselves. It may not have been an easy task, but they gained confidence a great deal in their improved knowledge and skills.

To conclude the training, the trainees developed and presented action plans for their countries to promote flood management using flood hazard maps.

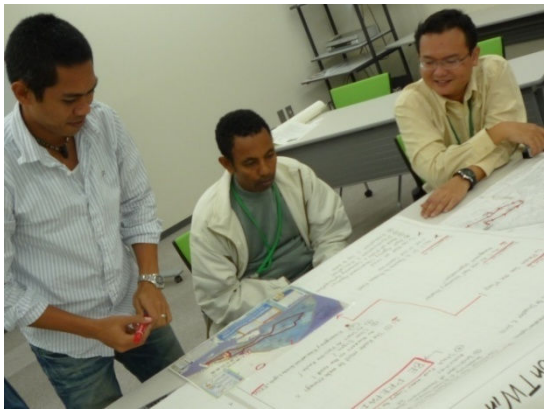


Photo 4-27-30　Group Discussion and Presentation

4.5.2　Evaluation

The fifth-year training was evaluated based on the results from the questionnaires and evaluation sheets prepared by JICA and ICHARM.

The trainees were also evaluated individually just as in the fourth year. The individual evaluation results were used to objectively measure their achievement levels in terms of the training goals. The personal evaluation results were not listed in this technical note but in the project completion report submitted to JICA.

The achievement level for each training goal was listed in Table 4-4.

The following are the course organizers' comments on the FY2008 training. They include factors contributing or disrupting the achievement of the expected training results, improvements and their effects, and changes made from the previous training.

(1) Training course design (training period, curriculum)

The training was conducted for five weeks, the same length as the FY2007 training. It consists of lectures, exercises, field trips and presentations and discussions. Adequate hours was

intensively allocated for exercises for GIS, inundation analysis and technical subjects in the first half of the training, as a response to the frequent request for more exercise hours from trainees every year.

The "Town Watching" exercise was conducted twice in the first and third weeks of the training. This way, the trainees were able to understand the meaning of the exercise and practice conducting a Town Watching exercise in their countries.

Table 4-4 Achievement level for each training goal

Training goal	Indicator	Achievement level
1) Acquire a broad knowledge of flood hazard maps in Japan and overseas and develop the ability to explain information such maps carry.	-Test results before and after study	All of the trainees improved their test results and showed good understanding of the general knowledge of flood hazard maps.
2) Acquire knowledge and skills in runoff analysis, GIS and flood analysis to be able to produce anticipated inundation area maps and develop the ability to explain such knowledge and skills.	-Production of a flood hazard map based on sample data provided by Ise City -Production of a flood hazard map for a basin in the home country	All of the trainees except for a few showed good understanding of the lectures and exercises in this area of study. Some trainees were not able to bring an adequate amount of data for training from their countries.
3) Acquire knowledge in production, dissemination and use of flood hazard maps in Japan and develop the ability to explain such knowledge.	-Individual contribution to the Town Watching exercises.	The trainees participated in the Town Watching exercises in groups. The level of contribution to the exercises varied from individual to individual.
4) Produce an action plan including an individual work plan after returning to the home countries based on knowledge in production, dissemination and use of flood hazard maps in Japan.	-Contents of the draft proposal report	Almost all the trainees understood the purpose of the training and completed a proposal report for the target basins in the home countries.

(2) Training contents (curriculum, training materials)

The FY2008 was composed of various activities, including lectures by experts, exercises by ICHARM researchers, and field trips in cooperation with local governments and branch offices of national agencies.

Lectures covering a wide range of topics were provided to help the trainees achieve the first training goal. ICHARM researchers lectured on the legal framework of flood hazard maps and flood management. Experts were invited from universities and other organizations to lecture on the latest status of river- and sediment-related disasters, hydrological and topographical data, and hazard maps around the world. The lectures provided the trainees with the latest, in-depth information and were very helpful to gain a broad knowledge related to flood hazard mapping.

However, some trainees commented on the difficulty in understanding the relation between lecture contents and hazard mapping. In this respect, they should be sufficiently instructed about lectures before the training starts, so that they can be motivated to learn and proactively participate in each lecture.

As for training goal 2, based on past experience, substantial time was allocated for exercises to help the trainees acquire knowledge and skills required for hazard mapping. In

particular, experts in GIS and inundation analysis were able to spend many hours teaching those subjects. It worked very well for the trainees to learn how to command those skills although many of them were actually unfamiliar with computer skills in general. The trainees of FY 2007 were required to produce an anticipated inundation area map of the Miya River basin in Ise City. This year, in addition to that, each trainee was required to an anticipated inundation area map of a river basin in the home county. That was a great progress from the last year. The knowledge and skills acquired through these exercises were effectively put into practical use when they conducted the Town Watching exercise in Ise City and developed proposal reports.

A possible drawback may be whether the trainees will be able to set up the same computer environment by themselves at their work places. At ICHARM, everything had been already set for them in advance to start the training immediately. Also, because the training was jointly conducted with the master's course students, the class size was quite large. Sometimes lecturers had to give each trainee a step-by-step instruction about how to use computer software and consumed a considerable amount of time. Such classes would have been conducted more efficiently if the groups had consisted of trainees with different skill levels because in that way, those with poor skills could have learned from skillful ones. Further improvement may be possible on teaching GIS and inundation analysis exercise classes.

To achieve training goal 3, several trips to local governments and MLIT offices were arranged. Those organizations are responsible for production and distribution of flood hazard maps. The trainees attended lectures on issues and problems about flood hazard maps that they are currently facing. They also visited several rivers in the Chubu region of Japan and met local disaster management personnel and residents at each place. They had opportunities to learn about local disaster management and past disasters and how they coped with them. In particular, the community leader of the Ohminato, Mr. Kanamori, explained the importance of voluntary disaster management without being dependent on public organizations.

The "Town Watching" exercise had been conducted every year for four past years and was also conducted this year in Ohminato District of Ise City with full support from the Ise City office. Disaster awareness is very high among Ohminato residents. Elevation signs have been posted on electric poles around the district. The trainees learned the essence of community-based disaster management from an actual case.

However, some trainees were preoccupied with locating themselves in the area and disaster prevention facilities and structures, such as sirens and fire cisterns, although they should have checked the area from other viewpoints, e.g., what places can possibly be

dangerous during evacuation, whether designated evacuation sites are at appropriate locations, and what route should be taken for evacuation. Improvement is necessary to conduct Town Watching because it is generally very difficult for trainees to walk around an unfamiliar area while looking at a map and constantly checking where they are. Simplified Town Watching can be conducted first to confirm which route they will take to check the area, so that they can focus on what they should be checking for. If it is possible to allocate adequate time for Town Watching, the trainees may be able to walk twice on the same route in the target area. Actually, Ise Town Watching was cut shorter because the lecture before the exercise lasted longer than scheduled. It is also important to avoid such a situation.

The trainees were asked to answer a questionnaire asking what type of flood hazard map is possible to produce at this stage and what type should be produced in the future based on needs and conditions in their countries. This questionnaire survey was useful to clarify the current situations about flood hazard maps.

The trainees worked on training goal 4 by developing an action plan for production and dissemination of flood hazard maps as one of the outcomes of this training. This year, they were told to work on the task while considering making a proposal to budget managers in their governments. The requirement was intended to make a plan as practical as possible. The trainees each completed a practical action plan using the flood hazard map they each produced and presented it at the final presentation.

(3) Trainees (Validity of qualification, expertise, comprehension, motivation)

The trainees participated in the training with good understanding of the training purposes. However, some of them had difficulty in communicating in English. They varied in comprehension of the training contents, but in general, they all improved in knowledge and skills related to flood hazard mapping. They were all motivated to learn and focused in every lecture and exercise.

(4) Pre-training assignment

The trainees were given three kinds of assignment to complete before participating in the training; 1) Format of Preparatory Questionnaire and Report (basic information on the trainee's current position, work, affiliation, target basins, etc.), 2) Data for Run-off Exercise (run-off and rainfall data to be used during the training), and 3) Country Report (a report on policies and efforts in flood damage management). They made a presentation on the Country Report in the first half of the training.

(5) Other comments

The training was joined by the students of the ICHARM master's course, "Water-Related Disaster Management Course of Disaster Management Policy Program," as in the FY2007 training. The joint training counted a total of 19 trainees from 11 countries (Bangladesh, China, Ethiopia, Indonesia, Nepal, Thailand, Cambodia, Laos, Malaysia, the Philippines, and Vietnam). The diversity of the joint group facilitated interactions among them and further enhanced their

motivation for the training.

Until the FY2007 training, ICHARM staff was in charge of discussions and presentations as facilitator and time keeper. But this year, the trainees were told to take those roles. This change positively affected their performance. They were more active in discussions, and discussions were more interesting and informative. They were more aware of cooperating with each other, for example, trying to finish a presentation within a given time. Overall, the training was managed more efficiently.

In addition, the "*nicchoku*" system was introduced to encourage the trainees to take care of class chores by themselves. The chores included cleaning the white boards for a next lecturer, locking the windows when leaving the room, greeting lecturers, making sure no trainee is missing when on a field trip and so forth. The trainees' involvement in the daily class management affected positively the overall atmosphere of the training.

FY2008 was the final year of the five-year training program. However, the following comments will contribute to planning and executing new training programs in the future.

(1) Results of a questionnaire survey by JICA

JICA conducted a questionnaire survey to evaluate the FY2008 training in terms of achievement of the training goals, importance of each training content group, quality of lectures and exercises, and teaching materials.

Questionnaire results (Rating: 1 to 4)

	Achievement of training goal	Importance of training content group	Quality of lectures and exercises	Teaching materials
Average	3.2	3.7	3.6	3.4

The questionnaire results show an average of over three points in all the four areas, indicating that the trainees highly evaluated the training in general. The following are comments and advice from the trainees answering the questionnaire.

<GIS and inundation analysis>

-GIS and inundation analysis were part of the curriculum, but not run-off analysis. I thought I could design a river channel capacity by calculating run-off with HEC RAS. Run-off analysis should be included in the curriculum.

-It would be better if simple operation manuals for GIS and HEC RAS were available. Such manuals would help us a lot to speed up the production process of anticipated inundation maps and flood hazard maps by using flood analysis.

-I understand exercises to learn GIS and other software are important to get familiar with those computer programs and produce flood hazard maps by myself, but they are so time-consuming

for people like me who have had no experience in using them.

<Other comments>

-I don't think it's necessary for those who have learned principles of hydraulics to re-learn them in the training. On the other hand, several hours are not enough for those who have not to understand them.

<Proposal of new subjects>

"Alternative financial sources"

In some cases, local governments cannot carry out disaster management plans due to financial constraints. They need to know what other ways are available to protect human lives and property.

"Alternative measures"

Flood hazard maps mainly aim to save human lives and are not intended to prevent economic losses, which should be taken into consideration in terms of disaster management. Relocation of houses and review of the current land-use practice may be necessary. It is impossible to cope with flood disasters through structural measures like super levees.

"Early warning systems and flood hazard maps"

Combined with early warning systems, flood hazard maps can increase its effectiveness in disaster management.

"Disaster management in developed countries"

Learning about current disaster-management efforts will contribute to the enhancement of disaster management capacity in developing countries.

"How to produce land-use maps and DEM"

Land-use maps and DEM are necessary for inundation analysis.

"Entire production process of flood hazard maps"

In the training, we learned how to produce flood hazard maps based on a hydraulic model derived from several GIS layers, including land use. However, we need to know how to do it from the scratch; otherwise, we cannot do it when we return home.

The trainees' comments and advice listed above show that they are fully aware of the importance of the training exercises. However, there are also some issues to be addressed for future trainings. Such issues include how it is possible to efficiently teach trainees with different knowledge and skill levels. Some are already skillful at a certain technology while others have no experience in the same technology. Another issue is whether trainees become able to produce flood hazard maps by themselves from the beginning after completing the training.

In addition, some trainees pointed out that training exercises should be conducted more efficiently. The development of a complete manual for flood hazard mapping is still another

issue. Such a manual is expected to include the initial setting and installment of computers and software and the preparation of hydrological and topographical data.

The five-year training has also revealed the trainees' needs for non-structural measures, such as early warning systems and land-use reformation besides flood hazard mapping. It is effective to learn about flood management through the production of flood hazard maps, which should be integrated into a new training program starting next fiscal year.

(2) Results of a questionnaire survey by ICHARM

ICHARM conducted a questionnaire survey to evaluate lectures, exercises and field trips in the FY2008 training on a scale of one to five in terms of "Lecturer & Material," "Understanding," and "Overall." Figure 4-8 shows the results.

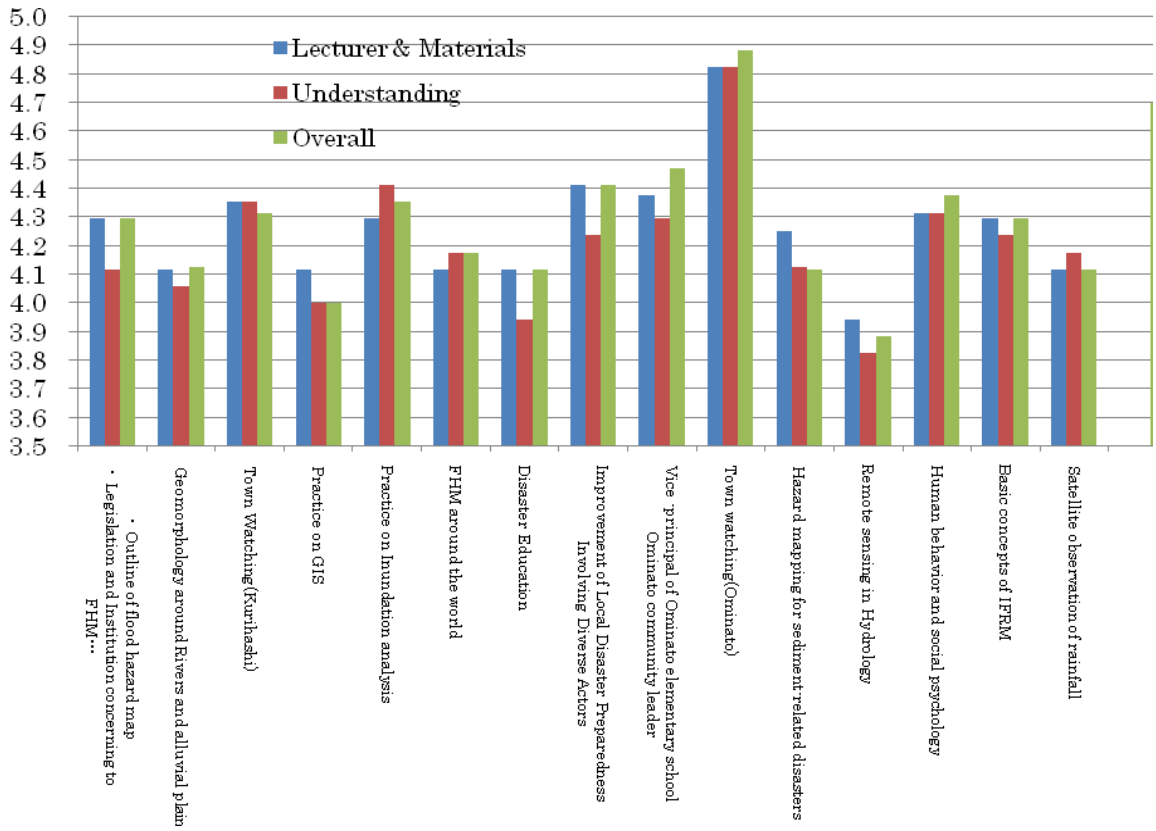


Figure 4-8 Averages of each lecture or exercise
in "Lecturer & Material," "Understanding," and "Overall"

The lecturers and teaching materials are given an average of 4.3 points. In addition to Town Watching and inundation analysis, which are highly evaluated every year, the lectures in local disaster management by Ise Deputy Mayor, the community leader of the Ohminato, and a vice principal of a local elementary school are also given a high rating.

The average for "Understanding" is 4.2 points and shows a similar trend to that of

"Lecturer & Material."

The overall evaluation of the FY2008 training is 4.3 points. Among the highly rated is Town Watching in Ohminato, the lecture in local disaster management by Ise Deputy Mayor, and the interviews with residents of Enza District in Ise City. The results show that the intentions of the training organizers are well understood. "Human Behavior and Social Mentality" by Professor Hayashi of Kyoto University and "Integrated Flood Management" by ICHARM Director Takeuchi were also given high rating. This implies that the trainees are motivated to learn about flood management including flood hazard mapping as its part.

The trainees visited the Ninomiya Sontoku Memorial Museum during the final week of the training. This trip was rated highly, too. Visiting the museum seems to have no relation to flood hazard mapping. However, one of Sontoku's lessons emphasizes the importance of devoting oneself to others, which leads to "mutual support," one of the fundamental concepts in disaster management. Without the spirit of "mutual support," flood hazard maps do not necessarily promise effective reduction of flood damage. The trip was planned to provide an opportunity for the trainees to understand the significance of this spirit. The high rating given to the trip suggests that they understood the intention.

Meanwhile, hydrological remote sensing was given relatively low rating. It should be improved in content if provided again in future training.

(3) Evaluation of Trainees

The trainees all met the requirements of this training course. They were all motivated to learn every content prepared in the curriculum and cooperative with course management. However, in class discussions, only certain trainees spoke up. Actually, some of them had some difficulty communicating in English.

This year, the trainees were given simple tests before and after the training to check their knowledge level on issues related to flood hazard mapping. This kind of testing was first conducted in the FY 2006 training. Table 4-5 lists the test questions. The full mark was 30 points with each question given 10 points each. The test results are shown in Figures 4-9 and 4-10.

Table 4-5 Test questions for pre- and post-training tests

	Points
What is FHM?	10
How is FHM useful?	10
How do you use FHM effectively for better Flood Management?	10

The trainees scored a class average of 6.8 points on the pre-training test. The score doubled up to 13.2 points on the post-training test. Although the level of understanding varies individually, the improvement of the test score indicates that they increased knowledge on flood

hazard maps after the training. However, their score improved less on “How is FHM useful?” than the other two questions. Future training should be designed also to improve trainees’ understanding of this area.

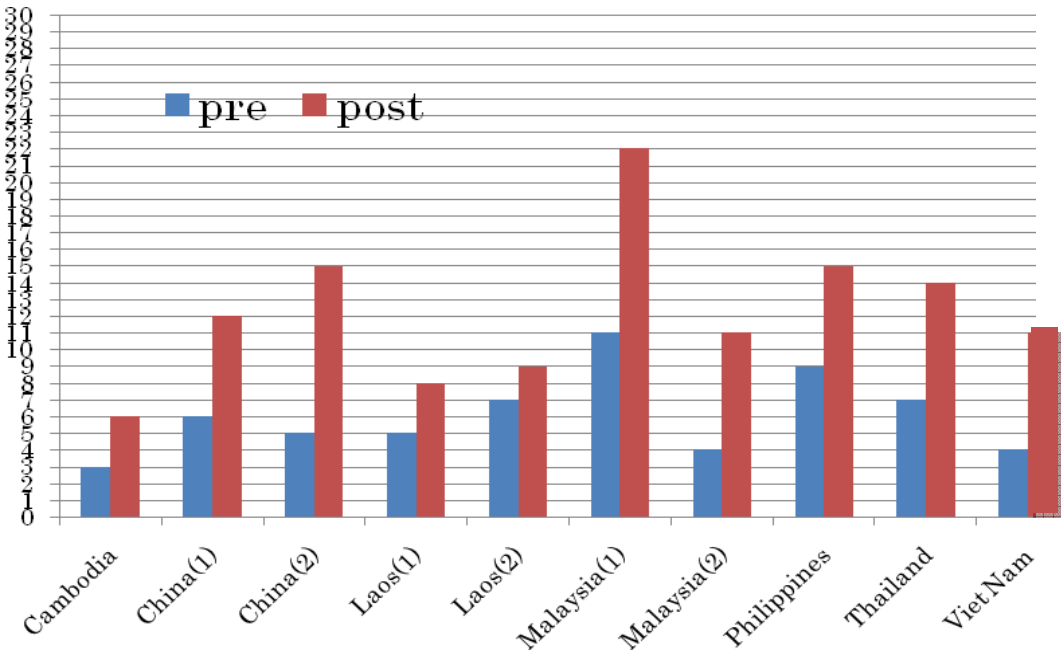


Figure 4-9 Test results before and after the training

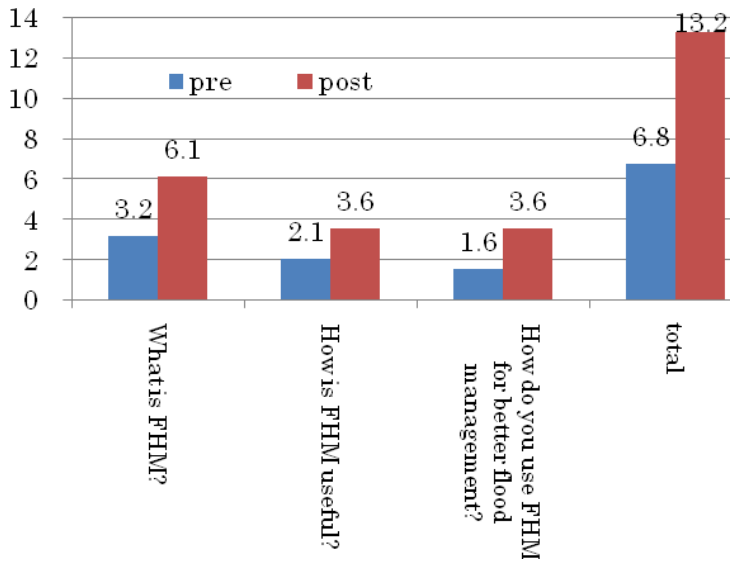


Figure 4-10 Test results before and after the training (average of 10 trainees)

(4) Improvements for future training

This five-year training program on flood hazard mapping ended this year. A new program,

"Local Emergency Operation Plan with Flood Hazard Maps," is scheduled to start from 2009FY. Based on the outcomes and experience from this training, the new program aims to assist not only the Asian regions but also all flood-prone regions on the globe in building the capacity to develop local disaster management plans. Combining structural measures, flood hazard maps and flood forecasting and warning systems, local disaster management plans should help such regions increase preparedness in disaster prevention and emergency response.

Flood hazard maps are effective to show areas exposed to flood risk but do not provide information about "when" they will be at such risk. For that reason, there is some concern that they do not necessarily facilitate evacuation of the general public. The new training program is designed to enhance the flood management capacity of communities and responsible organizations through the development of local disaster management plans, based on which they can start to develop practical disaster management systems by using flood hazard maps and early forecasting and warning systems.

4.6 Improvements made during the five-year training program

This training course was held five times in total, every year for five years. After each training, comments and suggestions on the training were collected from the trainees and reflected in the subsequent year's training. The followings are improvements made during the five-year training program.

1) Change and extension of the training period

As explained in the reports of each training, the first-year training was held for three weeks in February, but from the second year on, it was held in November based on trainees' suggestions. The training period was also prolonged from three to four weeks in 2005 to five weeks in 2006. This, in addition to the rearrangement of the daily class schedule, contributed to the increase in class hours (78 hours in 2004, 90 in 2005, 110 in 2006, 126 in 2007). The increase was mostly devoted to ensuring more exercise hours to acquire various skills, which many trainees requested each year.

2) Increase in lectures and exercises by ICHARM researchers

For the first two years, most of the training depended on outside instructors. In particular, 90% of the lectures and exercises were conducted by them in the second year. Because of that, it was difficult to flexibly rearrange the training schedule once the course started. It was difficult to accommodate sudden changes of instructors' schedules. Planning extra exercises for trainees were not easy, either. From the third year on, when ICHARM was officially established, class scheduling became much easier by assigning ICHARM researchers to teach fundamental knowledge and application exercises in flood hazard mapping. This also worked better to make flexible changes by accommodating trainees' abilities and needs.

Another advantage was avoidance of duplication in content. With high dependence on outside instructors, it was difficult to avoid duplication in teaching content. However, with ICHARM researchers conducting classes, they became more consistent with little duplication.

3) Quality and quantity improvements in exercises

During the first two years, the training course was capable only to provide application exercises for GIS and inundation analysis, which are necessary for flood hazard mapping. From the FY2006 training, the course was dramatically improved both in quality and quantity.

In addition to the curriculum in the previous two years, the trainees in the FY2006 training were divided into groups, given a sample data set of Ise City, and produced an Ise City flood hazard map. In FY2008, the flood hazard mapping exercise was further upgraded. The trainees were required to individually produce an Ise City flood hazard map and also another map based on data of a river basin that they brought from their home countries. The flood hazard maps that the trainees produced for their countries are not immediately effective due to size and accuracy of their original data. However, the production of such maps is of great significance because one of the original training goals is to produce a flood hazard map for a river basin based on local data.

Table 4-6 lists improvements made during the five-year training program.

4) Towards the ideal training course on flood hazard mapping

FY2008 was the final year of the five-year training program on flood hazard mapping. Still further improvement were made to conduct the training efficiently and effectively and to develop the trainees' capabilities as much as possible.

Most of the lectures on fundamental subjects were conducted by ICHARM researchers. Outside instructors were invited to teach only advanced subjects.

Most of the exercise-based classes are given by ICHARM researchers. The trainees were required to individually produce a flood hazard map for a river basin in their home countries based on hydrological and topographical data they brought with them. This helped them check their understanding of the training contents. It was also useful for them to find what kind of data is lacking for flood hazard mapping, which must have given them a clear idea of what should be done after the training.

To make an objective evaluation on the training, the same test was given to the trainees before and after the training. Test results showed that the point increased less in the question of "How is FHM useful?" than the other two. This may suggest that more hours should have spent on dissemination of flood hazard maps rather than focusing mostly on their production.

Although more improvements are necessary, the flood hazard mapping training course has developed drastically and come very close to what it should be like as an ideal flood hazard mapping training. In this respect, ICHARM is confident in fulfilling overall responsibilities, including training management, as the implementing organization.

Table 4-6 Improvements made during the five-year training program

Fiscal year	Improvement	Exercise hours / Total hours	Percentage of exercise hours to total hours (%)
2004	(First year)	9.0 / 78.0	**= 11.5**
2005	-Improved the class quality and quantity through use of outside instructors (Percentage of the class hours by outside instructors was a five-year high.)	18.3 / 90.0	**= 20.3**
2006	-Drastic increase in exercise hours through use of ICHARM researchers (All the exercise classes were conducted by ICHARM researchers, and their hours doubled.) -The flood hazard mapping exercise started by using Ise City's sample data.	36.7 / 110.0	**= 33.4**
2007	-Further increase in exercise hours. (Percentage of the exercise hours was a five-year high at 40.5%.) - The flood hazard mapping exercise continued by using Ise City's sample data.	51.0 / 126.0	**= 40.5**
2008	- The flood hazard mapping exercise continued by using Ise City's sample data. - Another flood hazard mapping exercise was conducted by using data of the trainees' countries.	39.0 / 126.0	**= 31.0**

Chapter 5 Follow-up Activities

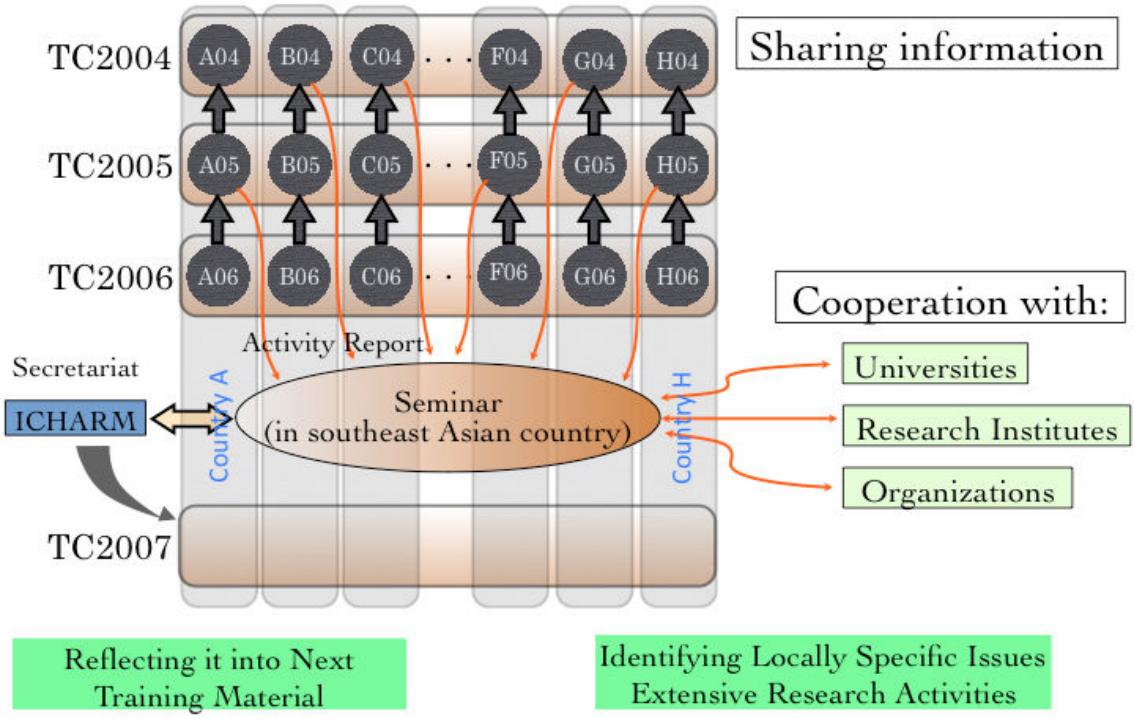


Figure 5-1 Relation between the training and follow-up seminars

One of the ultimate objectives of this training program is to reduce damage in flood-prone areas in the participating countries. The program is designed to achieve this objective by requiring the trainees to develop action plans for their countries as the final training project. They are expected to implement such action plans and thereby promote production and dissemination of flood hazard maps in their countries.

Despite such expectations, it is easily predicted that the trainees will face a number of challenges in the process of producing and disseminating flood hazard maps in their countries. They need to develop plans to produce efficient, effective flood hazard maps. They have to make difficult decisions in selecting knowledge and technologies suited for their countries' needs and conditions and still modify them if necessary. They need to come up with systems to gain public support for and participation in flood hazard mapping projects. To address such challenges, discussion and information sharing with other experts facing similar challenges are very effective.

An average of 16 trainees participated in each training. If they continue maintain their network, it can help them exchange information, overcome challenges they face, and effectively promote efforts related to flood hazard maps. If trainees can build networks between others of different years, it will help them even more.

The concept of "Follow-up seminars" was devised to facilitate such opportunities as shown in Figure 5-1. Former trainees and other experts working in relevant areas to flood hazard mapping are

invited to participate in the seminars, where they make presentations and discussions about successful cases and new challenges. The seminars are expected to be opportunities for former trainees to enhance knowledge and skills related to flood hazard mapping and strengthen the network between former trainees as well as between them and ICHARM.

The follow-up seminar was held three times (Table 5-1).

Table 5-1 Venues and dates of the past follow-up seminars

	Venue	Date
First seminar	Kuala Lumper (Malaysia)	2007.2.7-9
Second seminar	Guangzhou (China)	2008.1.30-2.1
Third seminar	Manila (the Philippines)	2009.2.17-19

The outlines and results of the three follow-up seminars are reported in another PWRI Technical Note.

Chapter 6 Conclusion

6.1 Results of this training program

Training is one of the three priority activities at ICHARM along with research and information networking. This training program on flood hazard mapping is the first one that ICHARM independently implemented (strictly speaking, the program was planned and implemented by the Secretariat for Preparatory Activities of UNESCO-PWRI Centre, which became ICHARM in 2003). In the beginning, the training program was not so efficiently managed because it was quite a new attempt for us. However, the program was constantly improved every year by the staff and other people involved, and after five years in 2008, it was finally completed as a nearly ideal training program.

The following are results achieved in this training program:

1) Results benefiting the trainees

The trainees were benefited from the following in addition to acquisition of knowledge and skills necessary for flood hazard mapping:

- Both domestic and international top experts were invited to lecture on flood hazard mapping.
- Each trainee developed an action plan for flood damage mitigation to carry out after returning to his/her home country as the program required.
- The trainees had opportunities to discuss current flood conditions and countermeasures with top experts invited as lecturers.
- A network was developed among the trainees.

After the training, the trainees are expected to share knowledge and skills for flood hazard mapping with people in their organizations and also to make use of them to produce and promote flood hazard maps. In addition, even if there is no legal foundation for flood hazard mapping, they should understand the significance of flood hazard maps and start promoting them in their countries.

2) Results benefiting ICHARM

It is of great significance for ICHARM to have accumulated know-how as a training organizer through the management of this training program. Networks among trainees and also between them and ICHARM are a great asset for ICHARM and expected to make a tremendous contribution to ICHARM's research activities and information networking. The network has already been helpful in field investigations conducted at other occasions. The follow-up seminars held three times in the past has strengthened the ties among the trainees and between them and ICHARM.

6.2 Previous trainees response survey

On the occasion of ending the five-year training program, a response survey was conducted to see how many ex-trainees are still reachable. The survey was conducted by sending e-mail to each ex-trainee on 28 January 2009 and waiting for a reply from them.

Table 6-1 shows the survey results.

Table 6-1 Results of previous trainees response survey

Total no. of ex-trainees (Including trainees in the 2007 counterpart training.)	No. of ex- trainees who received e-mail	No. of ex- trainees who replied
78	70	21 (Response rate: 27%)

The results of this response survey show that only less than 30% of the ex-trainees replied to the e-mail sent by ICHARM. However, when adding those who participated in the first two seminars but did not reply this time, the number went up to 34 (34/78＝44%), showing that over 40% of them have gotten in touch with ICHARM in some way after completing the training. A positive influence on ICHARM's activities should be expected if a close contact is kept with them by providing useful information from time to time.

6.3 Improvements for future training programs

In fiscal 2009, ICHARM will start a new training program, "Local Emergency Operation Plan with Flood Hazard Map," for the previous five-year training program on flood hazard mapping, which ended in 2008. The new program, improved based on experience with the previous program, should make a further contribution to disaster damage reduction in flood-prone areas. It is a three-year training program that aims to train participants to become able to set a direction and develop a schedule to formulate a "local disaster management plan" incorporating flood hazard maps and flood forecasting and warning systems. The program is uniquely designed to set a specific target on flood disaster management organizations in Asian countries and enhance their institutional disaster management capacity as well as that of individual trainees. Considering the results of the third follow-up seminar, the launch of the new training program is extremely timely. It needs thorough preparation to meet the expectations of developing countries.

To make the training successful, it is necessary to have good understanding of conditions of each country in advance. The trainee selection system by JICA local offices should also be improved so that those who want to participate in the training will be selected. To further improve the selection process, training organizers such as ICHARM should be part of it, and adequate time should also be secured.

6.4 Conclusion

"Flood hazard map" is the general term for maps conveying information on flood hazards. In fact,

they vary widely among countries depending on flood characteristics and historical and social backgrounds.

Aware of those differences, we at ICHARM do not intend to hold training programs and follow-up seminars to show a single, universal way of producing and using flood hazard maps. We only hope that such training programs and seminars can provide ideas to improve flood hazard mapping projects in the participating countries by discussing differences in how others are working on such projects.

At emergencies such as disasters, people often cannot count on national and local governments for protection. They will have only themselves to protect themselves from disasters. However, what each individual can do is limited. That is why the role of community is emphasized in disaster management. We at ICHARM will continue research on community-based flood hazard mapping and apply research findings to the new training course, "Local Emergency Operation Plan with Flood Hazard Map," and development of a "Flood Hazard Mapping Guidelines," which should be useful even in developing countries.

- Acknowledgements -

ICHARM is greatly indebted to many people and organizations for the successful operation of this training program. Lecturers arranged their busy schedules to spare considerable time for giving lectures and instructing exercises. MLIT local offices, municipal offices and residents were very cooperative for trainees' visits and Town Watching exercises in field trips.

We would like to give special thanks to Ise City in Mie Prefecture for their tremendous efforts and cooperation dedicated to the program. Deputy Mayor Kamei himself spoke to trainees about the city's disaster management. City personnel accompanied groups of trainees in Town Watching. They even let us use a meeting space for presentations after Town Watching. We could never thank Ise City enough for all it did for the training program.

Appendix 2-1～5

Curriculum from FY2004 to FY2008

Flood Hazard Mapping Training Course 2004 Curriculum

	(Minute)	Lecture Title	Lecturer	Organization
Basic knowledge on FHM	120	Introduction to Flood Management of Japan and New PWRI's Planning	Mr. Tetsuya Ikeda	Researcher, PWRI
	60	Significance of Hydrologic Observation and Evaluation of Precision of Observation	Mr. Kazuhiko Fukami	Team Leader, PWRI
	120	Significance of Flood Hazard Maps	Mr. Ichiro Narita	Vice Section Chief, River Improvement and Management Division, Ministry of Land, Infrastructure and Transport (MLIT)
	360	Procedure for Flood Hazard Mapping	Mr. Tetsuya Nakamura/ Mr. Koichi Mizukusa	Team Leader/Researcher, National Institute for Land and Infrastructure Management (NILIM)
	120	Distribution and Use of Flood Hazard Maps	Mr. Tetsuya Nakamura/ Mr. Koichi Mizukusa	Team Leader/Researcher, National Institute for Land and Infrastructure Management (NILIM)
	240	Effectiveness of Flood Hazard Map and its Challenges	Asso. Prof. Toshitaka Katada	Gunma University
Application of FHM	120	Development of the Dynamic Flood Hazard Map	Mr. Shohshi Yokotsuka	Executive, Foundation of River and Basin Integrated Communications (FRICS)
	120	Flood Mapping on the Mekong River	Ms. Manithaphone MEHAXAY	Image Interpretation and Mapping Specialist, Technical Support Division, Mekong River Commission (MRC)
	120	Flood Hazard Mapping in Developing Countries	Dr. Tadanori Kitamura	Pacific Consultant International (PCI)
	60	Typhoon Committee's Efforts in Flood Hazard Mapping	Mr. Kazuo Umeda	Group Leader, Infrastructure Development Institute (IDI)
	60	Flood Hazard Mapping in Asian Region	Dr. Tomohiko Hatori	Senior Researcher, Asian Disaster Reduction Center (ADRC)
	60	Flood Management and Flood Hazard Mapping in China	Prof. Yicheng WANG	China Institute of Water Resources and Hydrolopower Research
	60	Other Flood Hazard Mapping of the World and Guidance of Concluding Report	Mr. IKEDA/ Mr. KURIBAYASHI	Researcher, PWRI
Exercise	60	Hydrological Statistics	Mr. Daisuke Kuribayashi	Researcher, PWRI
	120	Exercise on Hydrological Statistics	Mr. Daisuke Kuribayashi	Researcher, PWRI
	120	Flood-runoff Analysis	Dr. Tsuyoshi Kinouchi	Researcher, PWRI
	120	Exercise on Run-off Analysis	Dr. Tsuyoshi Kinouchi	Researcher, PWRI
	120	Flood Inundation Analysis	Mr. Tetsuya Nakamura/ Mr. Koichi Mizukusa	Team Leader/ Researcher, NILIM
Town Watching		Town Watching in Kurihashi Town	Prof. Yujiro Ogawa/ Mr. Ikeda/Mr. Kuribayashi/ Ms. Manithaphone MEHAXAY	Fuji-Tokoha University/ PWRI/ MRC
Field Trip		Abukuma River/ Koriyama City	Fukushima River and National Highway Work Office/ Koriyama City Office	Ministry of Land, Infrastructure and Transport (MLIT)
		River administration/ Ara river	Kanto Regional Development Bureau/ Arakawa River Downstream Work Office	Ministry of Land, Infrastructure and Transport (MLIT)
Presentation		Country Report "Flood Situation"		
		Concluding Report		

Flood Hazard Mapping Training Course 2005 Curriculum

	(Minute)	Lecture Title	Lecturer	Organization
Basic knowledge on FHM	100	Situation of Flood Disaster and Whole System for Flood Damage Mitigation in Japan	Mr. Yoshio Suwa	Senior Researcher, PWRI
	100	Outline of Flood Hazard Maps in Japan and Flood Inundation Maps	Dr. Takekazu Akagiri	KIMOTO
	100	History and Present Status of Hazard Maps in Japan	Dr. Tadahiko Nakao	Executive, Foundation of River and Basin Integrated Communications (FRICS)
	100	Basic Information on Flood Hazard Map	Mr. Hiroyuki Takamatsu	Pacific Consultant International (PCI)
	100	Anticipated Inundation Area Maps（1） ・Design Flood Hydrograph（Precipitation Analysis・Runoff Analysis）	Mr. Hiroyuki Takamatsu	Pacific Consultant International (PCI)
	100	Anticipated Inundation Area Maps（2） ・Flood Analysis（Evaluation on Current Facilities・Flood Simulations）	Dr. Ryoji Hirakawa	Pacific Consultant International (PCI)
	100	Procedure for Flood Hazard Mapping and Inundation Area Presuming System	Mr. Seiichi Tanioka	Group Leader, Foundation of River and Basin Integrated Communications (FRICS)
	100	Development and Visualization of Evacuation Plans	Mr. Hiroto Saeki	KOKUSAI KOGYO
	40	Use and Challenges of Flood Hazard Mapping in Local Municipalities	Ise City Officer	Ise City
	200	Effectiveness and Challenges of Flood Hazard Maps	Mr. Nonaka	Researcher, National Institute for Land and Infrastructure Management (NILIM)
Application of FHM	50	Current situations and Challenges in Flood Hazard Mapping in Asia（1） -Asian Countries in general-	Dr. Tomohiko HATORI	PASCO
	50	Current situations and Challenges in Flood Hazard Mapping in Asia（2） -The Case of Mekong River-	Dr. Chusit Apirumanekul	River Forecasting Expert, Mekong River Commission
	80	Special Lecture（1） Practice and Exploration of Flood Hazard Mapping in China	Prof. Yicheng WANG	China Institute of Water Resources and Hydrolopower Research
	100	Special Lecture（2） Creating Kyoto City Multi-Hazard Map -Lessons Learned from the 2004 Niigata Disaster through Geo-Spatial Profiling-	Prof. Haruo Hayashi	Disaster Prevention Research Institute, Kyoto University
	110	Special Lecture（3） Sediment Hazard Mapping	Dr. Hideaki Mizuno	NILIM
	30	Energency response to flood in Enza District	Community Leader	-
	60	Role of Flood Hazard Maps in Fire and Flood Fighting Activities, Current situation and Issues on Residents' use of Flood Maps	Flood fighting corp of Ise City	-
	60	Typhoon Committee and its Flood Hazard Mapping Project	Mr. Katsuhito Miyake	Director, Water Resources Environment Technology Center (WEC)
	100	Development of Dynamic Flood Hazard Maps	Mr. Shohshi YOKOTSUKA	Executive, Foundation of River and Basin Integrated Communications (FRICS)
Exercise	200	I. Exercise on Topographical Maps & GIS	Dr. Jacob Opadeyi	Lecturer, Univ. of West Indies
	100	II. Exercise on Runoff Analysis	Mr. Hironori Inomata	Researcher, PWRI
	200	III. Exercise on Flood Inundation Analysis -Introduction of HCRL Flood Simulator-	Mr. Hiroshi Momose/ Mr. Satoshi Yamaguchi	Japan Weather Assosiation/ HITACHI
	100	IV. Exercise on Anticipated Inundation Area Mapping	Dr. Ryoji Hirakawa	Pacific Consultant International (PCI)
	200	V. Exercise on Collecting Important Information in flood mitigation actions	Mr. Nobuo Arai	Japan Weather Assosiation
	300	VI. Exercise on Anticipated Inundation Area Mapping & Use of Flood Inundation Analysis	Dr. Shirou Makita	Senior Researcher, Foundation of River and Basin Integrated Communications (FRICS)
Town Watching		Town Watching in Ise City	Prof. Yujiro Ogawa	Fuji-Tokoha University
Field Trip		Shonai River	Shonai River Work Office	Ministry of Land, Infrastructure and Transport (MLIT)
		Miya River	Mie River and National Highway Office	Ministry of Land, Infrastructure and Transport (MLIT)
		PWRI Labolatory		
Presentation		Country Report		
		Concluding Report		
Others	50	Outline of Training Course "Flood Hazard Mapping"	Mr. Daisuke Kuribayashi	Researcher, PWRI
	90	Spiritual Background of Modern Japanese Civil Engineers	Mr.Tetsuro Takasaki	Guest researcher, PWRI
	50	Activities of ICHARM in Water-related Disaster Mitigation	Mr. Shigenobu Tanaka	Team Leader, PWRI

Flood Hazard Mapping Training Course 2006 Curriculum

	(Minute)	Lecture Title	Lecturer	Organization
Basic knowledge on FHM	100	The role of Flood Hazard Map in Integrated Flood Management	Dr.Hisaya Sawano	World Meteorological Organization (WMO)
	100	Situation of Flood Disaster and Outline of Flood Hazard Map in Japan	Dr.Rabindra Osti	Researcher, ICHARM, PWRI
	100	・The remote sensing and ALOS for Flood disaster	Dr. Hiroki Kai	Japan Aerospace Exploration Agency (JAXA)
Application of FHM	100	Typhoon Committee and its Flood Hazard Mapping Project	Mr. Katsuhito Miyake	Director, Water Resources Environment Technology Center (WEC)
	100	Current Situations and Challenges in Flood Hazard Mapping in Asia	Dr. Tomohiko Hatori	PASCO
	30	Energency Response to Flood in Enza District	(Community Leader)	-
	100	Sediment Hazard Mapping	Dr. Hideaki Mizuno	Researcher, National Institute for Land and Infrastructure Management (NILIM)
	100	Creating Kyoto City Multi-Hazard Map	Prof. Haruo Hayashi	Disaster Prevention Research Institute, Kyoto University
	100	Latest Inundation Analysis -Introduction of HCRL Flood Simulator-	Mr. Yasuhiro Murai	Japan Weather Assosiation
	100	Simple Method for Configuration of Inundation Area	Prof. Masatomo Umitsu	Nagoya University
	100	FHM in Europe, Future Flood Management in the Netherlands	Dr.KLAASJAN Douben	UNESCO-IHE
Exercise	500	Exercise on Runoff Analysis	Mr. Hironori Inomata	Researcher, ICHARM, PWRI
	400	Exercise on Topographical Maps and GIS	Dr.Hapu	Researcher, ICHARM, PWRI
	600	Exercise on Anticipated Inundation Area Mapping	Dr.Rabindra Osti	Researcher, ICHARM, PWRI
	200	Latest Inundation Analysis -Introduction of HCRL Flood Simulator-	Mr.Satoshi Yamaguchi	HITACHI
	500	Exercise on Flood Hazard Mapping on Ise City	Dr.Rabindra Osti	Researcher, ICHARM, PWRI
Town Watching		Short Lecture of FHM and Orientation of Town Watching	Mr.Shigenobu Tanaka/ Mr.Toshikazu Tokioka	Researcher, ICHARM, PWRI
		Town Watching around Kokai river	ICHARM staff	
		Town Watching in Ise city	ICHARM staff/ Ise City Office/ Prof. Yujiro Ogawa	Fuji-Tokoha University
Field Trip		Geographical Survey Institute		
		NHK		
		Syonai river	Syonai River Work Office	Ministry of Land, Infrastructure and Transport (MLIT)
		Miya river	Mie River and National Highway Work Office	Ministry of Land, Infrastructure and Transport (MLIT)
		PWRI Labolatory		
Presentation		Country Report	ICHARM	
		Concluding Report	ICHARM	
Others		Outline of Training Cource ICHARM Orientation		

Flood Hazard Mapping Training Course 2007 Curriculum

	(Minute)	Lecture Title	Lecturer	Organization
Basic knowledge on FHM	90	Outline of Flood Hazard Mapping	Mr. Shigenobu Tanaka	Team Leader, ICHARM, PWRI
	360	Precipitation and Run-off Model	Dr. Jayawardena Amithirigala	Research & Training Advisor, ICHARM, PWRI
	90	Topography of River and Flood Plain	Prof. Masatomo Umitsu	Nagoya University
	90	Dissemination of Flood Hazard Map	Mr. Shigenobu Tanaka	Team Leader, ICHARM, PWRI
	90	Utilization of ALOS Data for Flood Hazard Mapping	Dr. Hiroki Kai	Japan Aerospace Exploration Agency (JAXA)
	90	Evacuation Plan	Mr. Shigenobu Tanaka	Team Leader, ICHARM, PWRI
Application of FHM	90	Integrated Flood Management	Dr. Hisaya Sawano	Sub manager, Japan Institute of Construction Engineering
	90	Education of Disaster Prevention	Dr. Atsushi Yoshii	Group Leader, Civil Engineerring Research Institute for Cold Region (CERI), PWRI
	90	Crisis management of municiparity	Mr. Hideki Kamei	Vice Mayor, Ise City
	30	Energency response to flood in Enza District	(Community Leader)	-
	90	International Activity on Flood Hazard Mapping	Prof. Frank van der Meulen	UNESCO-IHE
	90	Human Behavior and Social Mentality	Prof. Haruo Hayashi	Disaster Prevention Research Institute, Kyoto University
	90	Debris Flow Hazard Map	Mr. Kazuyuki Takanashi	Executive, Sabo Frontier Foundation
	90	Latest Inundation Analysis (Lecture)	Mr. Yasuhiro Murai	Japan Weather Assosiation
Exercise	540	Exercise on Topographical Maps and GIS	Dr.Hapu	Researcher, ICHARM, PWRI
	990	Exercise on Anticipated Inundation Area Mapping	Dr.Rabindra Osti	Researcher, ICHARM, PWRI
	450	Exercise on Precipitation and Run-off Model	Dr. Jayawardena Amithirigala	Research & Training Advisor, ICHARM, PWRI
	630	Exercise on Flood Hazard Mapping	Dr.Rabindra Osti/ Mr. Toshikazu Tokioka	Researcher, ICHARM, PWRI
	270	Latest Inundation Analysis (Exercise)	Mr.Satoshi Yamaguchi	HITACHI
	180	Trial of IFAS	Mr. Tomonobu Sugiura	Researcher, ICHARM, PWRI
Town Watching		Town Watching in Kurihashi Town	ICHARM staff	
		Town Watching in Ise city	ICHARM staff/ Ise City Office/ Prof. Yujiro Ogawa	Fuji-Tokoha University
Field Trip		Kumozu River, Miya River	Mie River and National Highway Work Office	Ministry of Land, Infrastructure and Transport (MLIT)
		Ninomiya Reference Library	Mr. Shigenobu Tanaka	Team Leader, ICHARM, PWRI
		PWRI Labolatory		
Discussion		General Discussion	ICHARM	
Presentation		Country Report	ICHARM	
		Proposal Report	ICHARM	
Others	90	Orientation	ICHARM	

Flood Hazard Mapping Training Course 2008 Curriculum

	(Minute)	Lecture Title	Lecturer	Organization
Basic knowledge on FHM	90	Outline of flood hazard map	Mr. Shigenobu Tanaka	Team Leader, ICHARM, PWRI
	180	Geomorphology around Rivers and alluvial plain	Prof. Masatomo Umitsu	Nagoya University
	90	Legislation and Institution concerning to FHM	Mr. Shigenobu Tanaka	Team Leader, ICHARM, PWRI
	90	Disaster management in adminiatration and organization	Mr. Shigenobu Tanaka	Team Leader, ICHARM, PWRI
	90	Local disaster management plan and evacuation planning	Mr. Shigenobu Tanaka	Team Leader, ICHARM, PWRI
Application of FHM	90	International activity on flood hazard mapping	Prof. Frank van der Meulen	UNESCO-IHE
	90	Basic concept of IFRM	Dr. Kuniyoshi Takeuchi	Director, ICHARM, PWRI
	90	Education of disaster prevention	Dr. Atsushi Yoshii	Group Leader, Civil Engineerring Research Institute for Cold Region (CERI), PWRI
	90	Emergency operation and rehabilitation	Mr. Hideki Kamei	Vice Mayor, Ise City
	30	Energency response to flood in Enza District	(Community Leader)	-
	90	Disaster prevention activities in Ominato District	Vice principal, Community leader	
	90	Hazard mapping for sediment-related disasters	Mr. Kazuyuki Takanashi	Executive, Sabo Frontier Foundation
	90	Remote sensing in hydrology	Mr. Kazuhiko Fukami	Team Leader, ICHARM, PWRI
	180	Satellite observation of rainfall	Mr. Shinya Tanaka & Mr. Masato Ohki	Japan Aerospace Exploration Agency (JAXA)
	90	Human Behavior and Social Mentality	Prof. Haruo Hayashi	Disaster Prevention Research Institute, Kyoto University
	90	Spccial lecture - Flood management in the Netherlands-	Prof. Frank van der Meulen	UNESCO-IHE
	90	Spccial Lecture - Hazard map in developing countries-	Dr.Rabindra Osti	Researcher, ICHARM, PWRI
Exercise	630	Exercise on GIS	Dr. Jun Magome	Researcher, ICHARM, PWRI
	990	Lecture & Exercise on inundation analysis	Dr.Rabindra Osti	Researcher, ICHARM, PWRI
	720	Exercise on Flood Hazard Mapping	Dr.Rabindra Osti	Researcher, ICHARM, PWRI
Town Watching		Town Watching in Kurihashi Town	ICHARM staff	
		Town Watching in Ominato District	ICHARM staff/ Ise City Office	
Field Trip		Toyo River	Toyohashi River Work Office	Ministry of Land, Infrastructure and Transport (MLIT)
		Kiso River	Kiso River Downstream Work Office	Ministry of Land, Infrastructure and Transport (MLIT)
		Miya River	Mie River and National Highway Work Office	Ministry of Land, Infrastructure and Transport (MLIT)
		Lake Biwa	Aqua Biwa Museum	
		Ninomiya Reference Library	Mr. Shigenobu Tanaka	Team Leader, ICHARM, PWRI
		PWRI laboratory	ICHARM	
Presentation & Discussion		Country report	ICHARM	
		Proposal report	ICHARM	
		Discussion on how to make FHM	Mr. Shigenobu Tanaka	Team Leader, ICHARM, PWRI
		Discussion on how to use FHM	Mr. Shigenobu Tanaka	Team Leader, ICHARM, PWRI
Others		Orientation	ICHARM	

Appendix 3-1～5

Training schedule from FY2004 to FY2008

Flood Hazard Mapping Training Course 2004 Schedule

Date		Time	Room	Curriculum	Lecturer	Organization
31-Jan	Mon	10:00～11:00	JICA Tsukuba	Opening	Dr. Tadahiko Sakamoto	Public Works Research Institute (PWRI)/ JICA
		13:00～15:00	International Conference Room/ PWRI	Introduction to Flood Management of Japan and New PWRI's Planning	Mr. Tetsuya Ikeda	PWRI
		15:30～17:30		Procedure for Flood Hazard Mapping (1)	Mr. Tetsuya Nakamura/ Mr. Koichi Mizukusa	National Institute for Land and Infrastructure Management (NILIM)
1-Feb	Tue.	10:00～12:00	International Conference Room/ PWRI	Presentation on "Flood Situation"	Participants	
		13:00～15:00				
		15:30～17:30		Significance of Flood Hazard Maps	Mr. Ichiro Narita	River Improvement and Management Division, Ministry of Land, Infrastructure and Transport (MLIT)
2-Feb	Wed.	10:00～12:00	International Conference Room/ PWRI	Procedure for Flood Hazard Mapping (2)	Mr. Tetsuya Nakamura/ Mr. Koichi Mizukusa	NILIM
		13:00～15:00				
		15:30～17:30		Distribution and Use of Flood Hazard Maps		
3-Feb	Thu.	10:00～11:00	International Conference Room/ PWRI	Significance of Hydrologic Observation and Evaluation of Precision of Observation	Mr. Kazuhiko Fukami	PWRI
		11:00～12:00		Hydrological Statistics	Mr. Daisuke Kuribayashi	PWRI
		13:00～15:00		Flood-runoff Analysis	Dr. Tsuyoshi Kinouchi	PWRI
		15:30～17:30		Flood Inundation Analysis	Mr. Tetsuya Nakamura/ Mr. Koichi Mizukusa	NILIM
4-Feb	Fri.	10:00～12:00	International Conference Room/ PWRI	Development of the Dynamic Flood Hazard Map	Mr. Shohshi Yokotsuka	Foundation of River and Basin Integrated Communications (FRICS)
		13:00～15:00		Effectiveness of Flood Hazard Map and its Challenges	Asso. Prof. Toshitaka Katada	Gunma University
		15:30～17:30				

7-Feb	Mon.	10:00～12:00	International Conference Room/ PWRI	Exercise of Hydrological Statistics	Mr. Daisuke Kuribayashi	PWRI
		13:00～15:00		Exercise of Run-off Analysis	Dr. Tsuyoshi Kinouchi	PWRI
		15:30～17:30		Flood Mapping on the Mekong River	Ms. Manithaphone MEHAXAY	Mekong River Commission (MRC)
8-Feb	Tue.	08:00～10:00	International Conference Room/ PWRI	Orientation for Town Watching	Prof. Yujiro Ogawa/ Mr. Ikeda/Mr. Kuribayashi/ Ms. Manithaphone MEHAXAY	Fuji-Tokoha University/ PWRI/ MRC
		10:00～17:00	Field (Kurihashi Town, Goka Town)	Town Watching		
9-Feb	Wed.	10:00～17:30	International Conference Room/ PWRI	Grouped preparation for presentation	Mr. Ikeda/Mr. Kuribayashi	PWRI
10-Feb	Thu.	10:00～15:00	International Conference Room/ PWRI	Grouped preparation and discussion	Prof. Yujiro Ogawa/ Mr. Ikeda/Mr. Kuribayashi/Ms. Manithaphone MEHAXAY	Fuji-Tokoha University/ PWRI/ MRC
		15:00～17:00		Conclusion and remarks		
14-Feb	Mon.	10:00～17:00	Field (Fukushima City, Koriyama City)	Field Trip on Flood Hazard Mapping	Fukushima River and National Highway Work Office/ Koriyama City Office	
15-Feb	Tue.	10:00～17:00	Field (Tokyo etc.)	Field Trip on River Management	Kanto Regional Development Bureau/ Arakawa River Downstream Work Office	
16-Feb	Wed.	10:00～12:00	International Conference Room/ PWRI	Flood Hazard Mapping in Developing Countries	Dr. Tadanori Kitamura	Pacific Consultant International (PCI)
		13:00～14:00		Typhoon Committee's Efforts in Flood Hazard Mapping	Mr. Kazuo Umeda	Infrastructure Development Institute (IDI)
		14:15～15:15		Flood Hazard Mapping in Asian Region	Dr. Tomohiko Hatori	Asian Disaster Reduction Center (ADRC)
		15:30～16:30		Flood Management and Flood Hazard Mapping in China	Prof. Yicheng WANG	China Institute of Water Resources and Hydrolopower Research
		16:30～17:30		Other Flood Hazard Mapping of the World and Guidance of Concluding Report	Mr. Ikeda/ Mr. Kuribayashi	PWRI
17-Feb	Thu.	10:00～17:30	International Conference Room/ PWRI	Presentation and Discussion	Participants	
18-Feb	Fri.	10:00～12:00	International Conference Room/ PWRI	Evaluation Meeting	JICA staff	
		15:30～17:30	JICA Tsukuba	Closing Ceremony		

Flood Hazard Mapping Training Course 2005 Schedule

	Room	Time		Curriculum	Lecturer
07-Nov (Mon)	[JICA Tsukuba]	10:00～10:30		Opening ceremony	JICA concerned PWRI concerned
	[Seminar Room Centre bldg. 2F]	13:00～13:50	1	Orientation	Mr. Kuribayashi PWRI
		14:00～15:30	2	Spiritual background of modern Japanese civil engineers	Mr.Takasaki PWRI
		15:40～16:30	3	Activities of ICHARM in water-related disaster mitigation	Mr. Tanaka PWRI
08-Nov (Tue)	[Seminar Room Centre bldg. 2F]	10:10～11:50 13:00～14:40		Country report presentations by trainees/discussion（1） （10min. presentation/person, 20min. Q&A/country）	
		14:50～16:30	4	Situation of Flood Disaster and Whole System for Flood Damage Mitigation in Japan	Mr. Suwa PWRI
09-Nov (Wed)	[Seminar Room Centre bldg. 2F]	10:10～11:50	5	Outline of Flood Hazard Maps in Japan and Flood Inundation Maps	Dr. Akagiri KIMOTO
		13:00～15:00		Country report presentations by trainees/discussion（1） （10min. presentation/person, 20min. Q&A/country）	
		15:10～16:30	6	Special Lecture（1） Practice and exploration of flood hazard mapping in China	Prof. Cheng IWHR
10-Nov (Thu)	[Seminar Room Centre bldg. 2F]	10:10～11:00	7	Current situations and Challenges in Flood Hazard Mapping in Asia（1） -Asian Countries in general-	Dr. Hatori PASCO
		11:10～12:00	8	Current situations and Challenges in Flood Hazard Mapping in Asia（2） -The Case of Mekong River-	Dr. Apirumanekul Mekong River Commission
		13:00～16:30	9	Effectiveness and Challenges of Flood Hazard Maps	Mr. Nonaka NILIM
11-Nov (Fri)	[Seminar Room Centre bldg. 2F]	10:10～11:50	10	History and Present Status of Hazard Maps in Japan	Dr. Nakao FRICS
		13:00～14:40	11	Basic Information on Flood Hazard Map	Mr. Takamatsu PCI
		14:50～16:30	12	I. Exercise on Topographical Maps & GIS (Part I)	Dr. Opadeyi Univ. of West Indies
14-Nov (Mon)	[Seminar Room Centre bldg. 2F]	10:10～11:50		I. Exercise on Topographical Maps & GIS (Part II)	Dr. Opadeyi Univ. of West Indies
		13:00～14:40	13	Anticipated Inundation Area Maps（1） ・Design Flood Hydrograph（Precipitation Analysis・Runoff Analysis）	Mr. Takamatsu PCI
		14:50～16:30	14	II. Exercise on Runoff Analysis	Mr. Inomata PWRI
15-Nov (Tue)	[Seminar Room Centre bldg. 2F]	10:10～11:50	15	Anticipated Inundation Area Maps（2） ・Flood Analysis（Evaluation on Current Facilities・Flood Simulations）	Dr. Hirakawa PCI
		13:00～16:30	16	III. Exercise on Flood Inundation Analysis -Introduction of HCRL Flood Simulator-	Mr. Momose, JWA Mr. Yamaguchi, HITACHI
16-Nov (Wed)	[Seminar Room Centre bldg. 2F]	10:10～11:50	17	Procedure for Flood Hazard Mapping and Inundation Area Presuming System	Mr. Tanioka FRICS
		13:00～14:40	18	Special Lecture（2） Creating Kyoto City Multi-Hazard Map -Lessons Learned from the 2004 Niigata Disaster through Geo-Spatial Profiling-	Porf. Hayashi DPRI Kyoto University
		14:50～16:30	19	IV. Exercise on Anticipated Inundation Area Mapping	Mr. Hirakawa PCI
17-Nov (Thu)	[Seminar Room Centre bldg. 2F]	10:10～11:50	20	Development and Visualization of Evacuation Plans	Mr. Saeki KOKUSAI KOGYO
		13:00～16:30	21	V. Exercise on Collecting Important Information in flood mitigation actions	Mr. Arai JWA
18-Nov (Fri)	[Seminar Room Centre bldg. 2F]	10:10～11:50 13:00～16:30	22	VI. Exercise on Anticipated Inundation Area Mapping & Use of Flood Inundation Analysis	Dr. Makita FRICS

21-Nov (Mon)	Meeting Room/Shonai River Work Office	11:30～12:30	23	Outline of Shonai River Basin（Topography, Environment, Flood History etc.）	Shonai River Work Office
	Nagoya City etc.	13:15～16:30		Field Trip（Shonai River） → Move to Tsu City	
22-Nov (Tue)	Meeting Room/Mie River and National Highway Office	9:00～10:00	24	Outline of Miyagawa River Basin（Topography, Environment, Flood History etc.）	Mie River and National Highway Office
	Miyagawa Town	11:20～11:40		Field Trip (Miyagawa Town was seriously damaged by typhoon No.21 in 2004.)	
	Miyagawa Town	13:00～15:00		Field Trip → Move to Ise, visiting several flooded areas on the way.	
	Meeting Room/ Ise City Hall	15:10～15:50	25	Use and Challenges of Flood Hazard Mapping in Local Municipalities -Evacuation Planning/Dissemination of Flood Hazard Mapping	Ise City Officer
		16:00～17:00	26	Role of Flood Hazard Maps in Fire and Flood Fighting Activities Current situation and Issues on Residents' use of Flood Maps	Flood fighting corp of Ise City
24-Nov (Thu)	Meeting Room/ Ise City Hall	9:00～10:00	27	Orientation for Town Watching	Prof. Ogawa Fuji-Tokoha University
		10:00～10:30		Move to the Start Point of Town Watching	
	Ise City	10:30～16:00		Town Watching（The participants will be divided into 4 Groups.）	
25-Nov (Fri)	[Lecture Hall/PWRI]	10:00～16:30		Preparation for group presentations on Town Watching（self-directed work）	
28-Nov (Mon)	[Lecture Hall/PWRI]	10:10～14:40		Group presentation on Town Watching（45min./group）	Prof. Ogawa Fuji-Tokoha University
		14:50～16:30		Evaluation Discussion	
29-Nov (Tue)	[Seminar Room Centre bldg. 2F]	10:10～12:00	28	Special Lecture（3） Sediment Hazard Mapping	Dr. Mizuno NILIM
		13:00～14:00	29	Typhoon Committee and its Flood Hazard Mapping Project	Mr. Miyake WEC
		14:00～16:30		Preparation for Concluding Reports（self-directed work）	
30-Nov (Wed)	PWRI, NILIM	10:10～11:50		Tour in PWRI and NILIM	PWRI, NILIM
	[Seminar Room Centre bldg. 2F]	13:00～14:40	30	Development of Dynamic Flood Hazard Maps	Dr. Yokotsuka FRICS
		14:50～16:30		Presentation of Concluding Reports （25min./person: 20min. presentation+5min. Q&A）4 persons	PWRI
01-Dec (Thu)	[Seminar Room Centre bldg. 2F]	10:10～16:30		Presentation of Concluding Reports （25min./person: 20min. presentation+5min. Q&A）12 persons	PWRI
02-Dec (Fri)	[JICA Tsukuba]	10:00～11:30		Evaluation Meeting	JICA staff
		11:30～12:00		Closing Ceremony	JICA staff PWRI staff

Flood Hazard Mapping Training Course 2006 Schedule

	Place	Time	Title	Lecturer
10/30 (Mon)	JICA		JICA Orientation	JICA
	ICHARM Conference Room	PM3	Outline of Training Course/ ICHARM Orientation	ICHARM
10/31 (Tue)		AM2	Exercise on Runoff Analysis (1) 【11:00-12:40】	Mr.Inomata, ICHARM
		PM1	Exercise on Runoff Analysis (2) 【13:50-15:30】	Mr.Inomata, ICHARM
11/1 (Wed)		AM	Country Report Presentations (1)	ICHARM
		PM1	Country Report Presentations (2)	ICHARM
		PM2	Exercise on Runoff Analysis (3)	Mr.Inomata, ICHARM
11/2 (Thu)		AM1	Exercise on Runoff Analysis (4)	Mr.Inomata, ICHARM
		AM2	Short Lecture of FHM and Orientation of Town Watching	Mr.Tanaka, ICHARM
	Kokai River	PM1	Town Watching (around KOKAI river)	ICHARM
		PM2	Field Tour in Ninomiya Reference Library	ICHARM
11/6 (Mon)	ICHARM Conference Room	AM	The role of Flood Hazard Map in Integrated Flood Management	Dr.Sawano, WMO
		PM1	・The remote sensing and ALOS for Flood disaster ・Introduction of Sentinel Asia and	Dr. Kai, JAXA
		PM2	Typhoon Committee and its Flood Hazard Mapping Project	Mr. Miyake, WEC
11/7 (Tue)	GSI	AM	Tour in Geographical Survey Institute 【9:00-11:50】	GSI
	ICHARM Conference Room	PM1	Situation of Flood Disaster and Outline of Flood Hazard Map in Japan	Dr. Osti, ICHARM
		PM2	Exercise on Topographical Maps and GIS (1)	Dr. Hapu, ICHARM
11/8 (Wed)		AM	Exercise on Topographical Maps and GIS (2)	Dr. Hapu, ICHARM
		PM1	Exercise on Topographical Maps and GIS (3)	Dr. Hapu, ICHARM
		PM2	Exercise on Topographical Maps and GIS (4)	Dr. Hapu, ICHARM
11/9 (Thu)		AM	Exercise on Anticipated Inundation Area Mapping (1)	Dr. Osti, ICHARM
		PM1	Exercise on Anticipated Inundation Area Mapping (2)	Dr. Osti, ICHARM
		PM2	Current Situations and Challenges in Flood Hazard Mapping in Asia	Dr. Hatori, PASCO
11/10 (Fri)		AM	Exercise on Anticipated Inundation Area Mapping (3)	Dr. Osti, ICHARM
		PM1	Simple method for configuration of inundation area - In case of Thailand, Hatyai-	Prof. Umitsu, Nagoya University
		PM2	Exercise on Anticipated Inundation Area Mapping (4)	Dr. Osti, ICHARM
11/13 (Mon)		AM	Exercise on Anticipated Inundation Area Mapping (5)	Dr. Osti, ICHARM
		PM1	FHM in Europe, Future Flood Management in the Netherlands	Dr.Douben, UNESCO-IHE
		PM2	Exercise on Anticipated Inundation Area Mapping (6)	Dr. Osti, ICHARM
11/14 (Tue)		AM	Exercise on Runoff Analysis (5)	Mr.Inomata, ICHARM
	NHK Tokyo	PM1	Tour in NHK 【15:00-16:00】 (Look around Flood Warning System of NHK)	NHK
		PM2		

AM 10:10-11:50

PM1 13:00-14:40

PM2 14:50-16:30

- Presentation & Discussion
- Lecture
- Exercise
- Town Watching
- Field Trip, Field Survey
- Others

11/15 (Wed)	Syonai River	AM	Field Trip (Syonai river)	Syonai River Work Office
		PM1		
		PM2	Outline of Miya river	Mie River and National Highway Work Office
11/16 (Thu)	Miya River	AM	Field Trip (Miya river)	Mie River and National Highway Work Office
		PM1		
		PM2		
11/17 (Fri)	Ise City	AM	Orientation of Town Watching	ICHARM
		PM1	Town Watching （Ise city）	ICHARM staff/ Ise City Officer Dr. Ogawa, Fuji-Tokoha University
		PM2		
11/20 (Mon)	ICHARM Conference Room	AM	Sediment Hazard Mapping	Dr. Mizuno, NILIM
		PM1	Discussion and Prepare of Presentation on Town Watching	Trainees
		PM2	Discussion and Prepare of Presentation on Town Watching	Trainees
11/21 (Tue)		AM	Discussion and Prepare of Presentation on Town Watching	Trainees
		PM1	Creating Kyoto City Multi-Hazard Map	Dr.Hayashi, DPRI Kyoto University
		PM2	Discussion and Prepare of Presentation on Town Watching	Trainees
11/22 (Wed)		AM	Latest Inundation Analysis -Introduction of HCRL Flood Simulator-	Mr. Murai, JWA
		PM1	Latest Inundation Analysis -Introduction of HCRL Flood Simulator-	Mr.Yamaguchi, HITACHI
		PM2		
11/24 (Fri)	ICHARM Conference Room	AM	Group Presentation on Town Watching	Dr. Ogawa, Fuji-Tokoha University
		PM1		
		PM2		
11/27 (Mon)		AM	Exercise on Flood Hazard Mapping on Ise City (1)	Dr. Osti, ICHARM
		PM1	Exercise on Flood Hazard Mapping on Ise City (2)	Dr. Osti, ICHARM
		PM2	Exercise on Flood Hazard Mapping on Ise City (3)	Dr. Osti, ICHARM
11/28 (Tue)		AM	Exercise on Flood Hazard Mapping on Ise City (4)	Dr. Osti, ICHARM
		PM1	Exercise on Flood Hazard Mapping on Ise City (5)	Dr. Osti, ICHARM
		PM2	Making Concluding Report	
11/29 (Wed)		AM	Tour in PWRI and NILIM	Mr. Tokioka, ICHARM
		PM1	Presentation of Concluding Report	ICHARM
		PM2		
11/30 (Thu)	ICHARM Conference Room	AM	Presentation of Concluding Report	ICHARM
		PM1		
		PM2		
12/1 (Fri)	JICA	AM	Evaluation Meeting	JICA
		PM1	Closing Ceremony	JICA , ICHARM

Flood Hazard Mapping Training Course 2007 Schedule

		time	title	lecturer
29-Oct	Mon		JICA Orientation	JICA
		PM2	ICHARM Orientation	ICHARM
30-Oct	Tue	AM1	Outline of Flood Hazard Mapping	Mr. Tanaka ICHARM
		AM2	Exercise on Topographical Maps and GIS	Dr. Hapu ICHARM
		PM1	Exercise on Topographical Maps and GIS	Dr. Hapu ICHARM
		PM2	Exercise on Topographical Maps and GIS	Dr. Hapu ICHARM
		16:30-	Opening Celemony and Opening Party	
31-Oct	Wed	AM1	Exercise on Topographical Maps and GIS	Dr. Hapu ICHARM
		AM2	Exercise on Topographical Maps and GIS	Dr. Hapu ICHARM
		PM1	Presentation of Country Report	ICHARM
		PM2		
1-Nov	Thu	AM1	Orientation for 1st Town Watching	Mr. Tokioka ICHARM
		AM2	Move to Kurihashi Town	-
		PM1	1st Town Watching in Kurihashi Town	ICHARM
		PM2		
2-Nov	Fri	AM1	Group Discussion of 1st Town Watching	ICHARM
		AM2	Exercise on Topographical Maps and GIS	Dr. Hapu ICHARM
		PM1	Exercise on Anticipated Inundation Area Mapping	Dr. Osti ICHARM
		PM2	Exercise on Anticipated Inundation Area Mapping	Dr. Osti ICHARM
5-Nov	Mon	AM1	Exercise on Anticipated Inundation Area Mapping	Dr. Osti ICHARM
		AM2	Exercise on Anticipated Inundation Area Mapping	Dr. Osti ICHARM
		PM1	Exercise on Anticipated Inundation Area Mapping	Dr. Osti ICHARM
		PM2	Exercise on Anticipated Inundation Area Mapping	Dr. Osti ICHARM
6-Nov	Tue		ICHARM Symposium	-
7-Nov	Wed	AM1	Exercise on Anticipated Inundation Area Mapping	Dr. Osti ICHARM
		AM2	Exercise on Anticipated Inundation Area Mapping	Dr. Osti ICHARM
		PM1	Exercise on Anticipated Inundation Area Mapping	Dr. Osti ICHARM
		PM2	Exercise on Anticipated Inundation Area Mapping	Dr. Osti ICHARM
8-Nov	Thu	AM1	Exercise on Anticipated Inundation Area Mapping	Dr. Osti ICHARM
		AM2	Human Behavior and Social Mentality	Dr. Hayashi DPRI Kyoto University
		PM1	Precipitation and Run-off Model	Dr. Jaya ICHARM
		PM2	Precipitation and Run-off Model	Dr. Jaya ICHARM
9-Nov	Fri	AM1	Exercise on Precipitation and Run-off Model	Dr. Jaya ICHARM
		AM2	Exercise on Precipitation and Run-off Model	Dr. Jaya ICHARM
		PM1	Precipitation and Run-off Model	Dr. Jaya ICHARM
		PM2	Precipitation and Run-off Model	Dr. Jaya ICHARM
12-Nov	Mon	AM1	International Activity on Flood Hazard Mapping	Dr. Meulen UNESCO-IHE
		AM2	Topography of River and Flood Plain	Prof. Umitsu Nagoya University
		PM1	Tour in PWRI	Mr. Tokioka ICHARM
		PM2	Education of Disaster Prevention	Dr. Yoshii CERI
13-Nov	Tue	AM1	Move to Ise city	-
		AM2		
		PM1	Field Tour in Mie Prefecture	-
		PM2		

AM1	9:00-10:30
AM2	10:45-12:15
Lunch	12:15-13:15
PM1	13:15-14:45
PM2	15:00-16:30

- Presentation & Discussion
- Lecture
- Exercise
- Town Watching
- Field Trip, Field Survey
- Others

14-Nov	Wed	AM1	Field Tour in Ise city	-
		AM2		
		PM1	Crisis management of municiparity	Mr. Kamei Ise city
		PM2	Discussion and Presentation for 2nd Town Waching	ICHARM
15-Nov	Thu	AM1	2nd Town Watching in Ise city	Dr. Ogawa Huji Tokoha Univercity
		AM2		
		PM1		
		PM2		
16-Nov	Fri	AM1	Discussion from 2nd Town Watching	Dr. Ogawa Huji Tokoha Univercity
		AM2	Presentation of 2nd Town Watching	
		PM1	Move to Tsukuba	-
		PM2		
19-Nov	Mon	AM1	Preparation for General Discussion	-
		AM2	General Discussion	ICHARM
		PM1	Utilization of ALOS Data for Flood Hazard Mapping	Mr. Kai and Isoguchi JAXA
		PM2	Evacuation Plan	Mr. Tanaka ICHARM
20-Nov	Tue	AM1	Exercise on Flood Hazard Mapping	Dr. Osti and Mr. Tokioka ICHARM
		AM2	Exercise on Flood Hazard Mapping	Dr. Osti and Mr. Tokioka ICHARM
		PM1	Exercise on Flood Hazard Mapping	Dr. Osti and Mr. Tokioka ICHARM
		PM2	Integlated Flood Management	Dr. Sawano
21-Nov	Wed	AM1	Trial of IFAS	Mr. Sugiura ICHARM
		AM2		
		PM1	Field Tour in Ninomiya Reference Library	Mr. Tanaka ICHARM
		PM2		
22-Nov	Thu	AM1	Latest Inundation Analysis (Lecture)	Mr. Murai and Yamaguchi HITACHI
		AM2	Latest Inundation Analysis (Exercise)	
		PM1		
		PM2		
26-Nov	Mon	AM1	Exercise on Precipitation and Run-off Model	Dr. Jaya ICHARM
		AM2	Exercise on Precipitation and Run-off Model	Dr. Jaya ICHARM
		PM1	Exercise on Precipitation and Run-off Model	Dr. Jaya ICHARM
		PM2	Prepareing Proposal Report	-
27-Nov	Tue	AM1	Exercise on Flood Hazard Mapping	Dr. Osti and Mr. Tokioka ICHARM
		AM2	Exercise on Flood Hazard Mapping	Dr. Osti and Mr. Tokioka ICHARM
		PM1	Exercise on Flood Hazard Mapping	Dr. Osti and Mr. Tokioka ICHARM
		PM2	Exercise on Flood Hazard Mapping	Dr. Osti and Mr. Tokioka ICHARM
28-Nov	Wed	AM1	Prepareing Proposal Report	-
		AM2	Prepareing Proposal Report	-
		PM1	Debris Flow Hazard Map	Mr. Takanashi Sabo Frontier
		PM2	Dissemination of Flood Hazard Map	Mr. Tanaka ICHARM
29-Nov	Thu	AM1	Presentaion of Proposal Report	ICHARM
		AM2		ICHARM
		PM1		ICHARM
		PM2		ICHARM
30-Nov	Fri	AM1	Evaluation Meeting	-
		AM2		
		PM1	Closing Celemony and Party	-
		PM2		

Flood Hazard Mapping Training Course 2008 Schedule

		time	title	lecturer
27-Oct	Mon		JICA Orientation	JICA
28-Oct	Tue	AM1	Orientation	ICHARM
		AM2	Outline of flood hazard map	Mr. Tanaka,ICHARM
		PM1	Geomorphology around Rivers and alluvial plain(1)	Prof. Umitsu, Nagoya University
		PM2	Geomorphology around Rivers and alluvial plain(2)	Prof. Umitsu, Nagoya University
29-Oct	Wed	AM1	(for preparation of report)	
		AM2		
		PM1	Legislation and Institution concerning to FHM	Mr. Tanaka,ICHARM
		PM2	Disaster management in adminiatration and organization	Mr. Tanaka,ICHARM
30-Oct	Thu	AM1	Orientation for 1st town watching	ICHARM
		AM2	Move to Kurihashi Town	
		PM1	1st town watching in Kurihashi Town	ICHARM
		PM2		
31-Oct	Fri	AM1	(for preparation of report)	
		AM2	Group discussion on town watching	ICHARM
		PM1	Exercise on GIS(1)	Dr. Magome, ICHARM
		PM2	Exercise on GIS(2)	Dr. Magome, ICHARM
4-Nov	Tue	AM1	Presentation of country report	ICHARM
		AM2		
		PM1	Exercise on GIS(3)	Dr. Magome, ICHARM
		PM2	Exercise on GIS(4)	Dr. Magome, ICHARM
5-Nov	Wed	AM1	Inundation analysis(1)	Dr. Osti ICHARM
		AM2	Exercise on inundation analysis(1)	Dr. Osti ICHARM
		PM1	Exercise on inundation analysis(2)	Dr. Osti ICHARM
		PM2	Tour in PWRI laboratory	
6-Nov	Thu	AM1	Inundation analysis(2)	Dr. Osti ICHARM
		AM2	Inundation analysis(3)	Dr. Osti ICHARM
		PM1	Exercise on inundation analysis(3)	Dr. Osti ICHARM
		PM2	Exercise on inundation analysis(4)	Dr. Osti ICHARM
7-Nov	Fri	AM1	Local disaster management plan and evacuation planning	Mr. Tanaka, ICHARM
		AM2	Exercise on inundation analysis(5)	Dr. Osti ICHARM
		PM1	Exercise on inundation analysis(6)	Dr. Osti ICHARM
		PM2	Orientation of field trip	ICHARM
10-Nov	Mon	AM1	Exercise on GIS(5)	Dr. Magome, ICHARM
		AM2	International activity on flood hazard mapping	Dr. Meulen UNESCO-IHE
		PM1	Education of disaster prevention	Dr. Yoshii CERI
		PM2	Spccial lecture - Flood management in the Netherlands-	Dr. Meulen UNESCO-IHE
11-Nov	Tue	AM1		
		AM2	Field Trip in Toyo River, Kiso River	
		PM1		
		PM2		

AM1	9:00-10:30
AM2	10:45-12:15
Lunch	12:15-13:15
PM1	13:15-14:45
PM2	15:00-16:30

- Presentation & Discussion
- Lecture
- Exercise
- Field Trip
- Town watching
- Others

12-Nov	Wed	AM1	Interview at Enza District	
		AM2	Levee construction site (Tsujikuru District)	
		PM1	Group Discussion on Town watching	
		PM2	Emergency operation and rehabilitation	Mr. Kamei Ise city
13-Nov	Thu	AM1	Disaster prevention activities in Ominato District	Vice principal, Community leader
		AM2		
		PM1	2nd Town Watching in Ominato District	
		PM2		
14-Nov	Fri	AM1	Field Tour in Biwa-Lake Museum	
		AM2		
		PM1	Field Tour in Kyoto	
		PM2		
17-Nov	Mon	AM1	Preparation & Discussion on 2nd Town Watching	ICHARM
		AM2		
		PM1		
		PM2		
18-Nov	Tue	AM1	Hazard mapping for sediment-related disasters	Mr. Takanashi Sabo Frontier
		AM2	Exercise on inundation analysis	Dr. Osti, ICHARM
		PM1	Discussion on Town watching	ICHARM
		PM2	Exercise on inundation analysis	Dr. Osti, ICHARM
19-Nov	Wed	AM1	Remote sensing in hydrology	Mr. Fukami, ICHARM
		AM2	Human Behavior and Social Mentality	Prof. Hayashi, Kyoto Univ.
		PM1	Spccial Lecture - Hazard map in developing countries-	Dr. Osti , ICHARM
		PM2	Basic concept of IFRM	Dr. Takeuchi, ICHARM
20-Nov	Thu	AM1	Exercise on GIS(6)	Dr. Magome, ICHARM
		AM2	Exercise on GIS(7)	Dr. Magome, ICHARM
		PM1	Satellite observation of rainfall (1)	Mr, Tanaka & Mr. Ohki, Jaxa
		PM2	Satellite observation of rainfall (2)	Mr, Tanaka & Mr. Ohki, Jaxa
21-Nov	Fri	AM1	Exercise on Flood Hazard Mapping	Dr. Osti, ICHARM
		AM2	Exercise on Flood Hazard Mapping	Dr. Osti , ICHARM
		PM1	Exercise on Flood Hazard Mapping	Dr. Osti, ICHARM
		PM2	Exercise on Flood Hazard Mapping	Dr. Osti, ICHARM
25-Nov	Tue	AM1	Exercise on Flood Hazard Mapping	Dr. Osti, ICHARM
		AM2	Exercise on Flood Hazard Mapping	Dr. Osti , ICHARM
		PM1	Exercise on Flood Hazard Mapping	Dr. Osti, ICHARM
		PM2	Exercise on Flood Hazard Mapping	Dr. Osti, ICHARM
26-Nov	Wed	AM1	Discussion on how to make FHM	Mr. Tanaka,ICHARM
		AM2	Discussion on how to use FHM	Mr. Tanaka,ICHARM
		PM1	Field Tour in Ninomiya Reference Library	Mr. Tanaka, ICHARM
		PM2		
27-Nov	Thu	AM1	Presentaion of proposal report	ICHARM
		AM2		ICHARM
		PM1		ICHARM
		PM2		ICHARM
28-Nov	Fri	PM1	Evaluation Meeting	
		PM2	Closing Celemony and Party	

Appendix 4-1～5

Participant List from FY2004 to FY2008

LIST OF PARTICIPANTS IN "REGION-FOCUSED TRAINING ON FLOOD HAZARD MAPPING"
2004年度　地域別研修：洪水ハザードマップ作成コース　研修員リスト

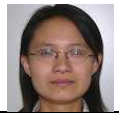
No.	Country （国名）	Photo (写真)	Name （名前）	Present Post (現職・所属先)	Official Address (勤務先住所)
1	Cambodia カンボジア		Mr.SO IM Monichoth ソ・イム・**モニチョト** D-04-10385	Chief, Research and Flood Forecasting Office, Department of Hydrology and River Works, Ministry of Water Resources and Meteorology 水資源気象省水文河川工事局研究・洪水予報室主任	#576 National Road No.2, Sangkat Chakangre Krom, Phnom Penh, Cambodia
2	Cambodia カンボジア		Mr.TONG Seng **トン**・セン D-04-11123	Vice Chief, Research and Flood Forecasting Office, Department of Hydrology and River Works, Ministry of Water Resources and Meteorology 水資源気象省水文河川工事局研究・洪水予報室副主任	#576 National Road No.2, Sangkat Chakangre Krom, Phnom Penh, Cambodia
3	China 中国		Mr.SUN Chunpeng スン・チュンペン D-04-10387	The Hydrological Information and Forecasting, Bureau of Hydrology, Ministry of Water Resources Ministry of Water Resources 水資源省水文局水文情報・予報室	No.2 Lane 2 BaiGuang Rd, Xuanwu District, Beijing, P.R.China
4	China 中国		Ms.DENG Yumei **トゥン**・ユメイ D-04-10390	Deputy Director of Yellow River and Taihu Department, Office of State Flood Control and Drought Relief Headquarters Ministry of Water Resources 水資源省国家治水救援本部黄河及び太湖司次長	No.2 Lane 2 BaiGuang Rd, Xuanwu District, Beijing, P.R.China
5	Indonesia インドネシア		Mr.Heru SETIAWAN **ヘル**・セティアワン D-04-11124	Technical Staff of Sub Directorate Hydrology, Directorate of Water Resources Management and Planning, Directorate General of Water Resources,Ministry of Public Works 公共事業省水資源総局水源管理計画局水文課技術スタッフ	JL. Pattimura No.20, Kebayoran Baru Jakarta Selatan, Indonesia
6	Indonesia インドネシア		Mr.Wisnu Subarkah DWIWIBOWO **ウィスヌ**・スバルカ・ドゥウィウィボウォ D-04-11127	System Software Developer, Water Resources Data Center, Sub-Directorate Evaluation, Directorate Technical Guidance Directorate General of Water Resources,Ministry of Public Works 水資源総局技術指導局評価課水資源データセンターシステムソフト開発係	JL. PattimuraNo.20, Jakarta Selatan Indonesia
7	Laos ラオス		Mr.PHOMMACHANH Bounphet フォマチャン・**ブンフェト** D-04-10365	Deputy Director, Waterways Administration Division, Department of Roads, Ministry of Communication, Transport, Post and Construction 通信運輸郵政建設省道路局水路管理課次長	That Luang Road, Vientiane Lao PDR
8	Laos ラオス		Mr.MOUNTHA Sounthaly **モンタ**・ソンサリ D-04-10377	Data Collection & Mapping-GIS Operation and Management Department of Meteorology and Hydrology, Ministry of Agriculture and Forestry, 農林省気象・水文局データ収集・地図作成GIS実施管理担当	Luang Prabang Road, Sikhottabong District, Vientiane Capital City, Lao PDR
9	Malaysia マレーシア		Ms.PARIDAH ANUN Bt. Tahir **パリダ**・アヌン・ビンティ・ タヒール D-04-10068	Senior Assistant Director, Flood Mitigation Section, Department of Irrigation and Drainage Ministry of Natural Resources and Environment, 天然資源環境省灌漑排水局治水課主席課長補佐	Jalan Sultan Salahuddin 50626 Kuala Lumpur Malaysia
10	Malaysia マレーシア		Mr.ABD JALIL Bin Hassan アブドゥール・**ジャリル**・ビン・ ハッサン D-04-10071	Senior Researcher, National Hydraulic Research Institute Malaysia Ministry of Natural Resources and Environment, 国立水理研究所主任研究官	LOT 5377, Jalan Putra Permai 43300 Seri Kembangan Selangor, Malaysia
11	Philippines フィリピン		Mr.PAAT Socrates Jr. FERIDO パート・ソクラテス・ジュニア ・フェリド(**ジュン**) D-04-10378	Hydrologist/Weather Specialist I, PAGASA(Philippine Atmospheric Geophysical & Astronomical Services-Weather Bureau) Department of Science and Technology 科学・技術省地球物理・天文研究所水文気象専門官I	FFB- PAGASA, Agham Road, Diliman Quezon City, Philippines
12	Philippines フィリピン		Mr. DAMO Grecile Christopher Rigodon ダモ・グレシル・クリストファー・リゴドン （**トト**）　D-04-11112	Engineer III, Flood Control & Sabo Engineering Center, Project Management Office, Department of Public Works and Highways 公共事業・道路省事業管理局治水砂防技術センター土木技師	Napindan Hydraulic Control Structure Compound, Lopez Jaena St. cor. E.Santos Av. Brgy. Sta. Rosa, Pasig City
13	Thailand タイ		Ms.ONGCHOTIYAKUL Pacharee オンチョティヤクル・パチャリー （**パ**）　D-04-10484	Civil Engineer, Level 5, Department of Drainage and Sewerage, Bangkok Metropolitan Administration バンコク市庁排水下水道局土木技師	BMA Hall 2, Mitmitre Road, Dindaeng, Bangkok, 10400 Thailand
14	Thailand タイ		Mr.KANTONG Yuhttana カントン・**ユタツナ** D-04-10490	Irrigation Engineer, 191 Regional Irrigation Office Royal Irrigation Department, Ministry of Agriculture and Cooperatives, 農業・協同組合省灌漑局191地域灌漑事務所灌漑技師	191 Petchkasaem Road, Kuanlang Subdistrict, Hat Yai District., Songkhla, 90110,　Thailand
15	Vietnam ベトナム		Ms.PHAM Hong Nga ファム・ホン・**ナ** D-04-09575	Lecturer/Researcher, Hydrological & Environmental Department, Hanoi Water Resources University, Ministry of Agriculture and Rural Development, 農業農村開発省ハノイ水資源大学水文環境学部講師・研究官	175 Tay Son Street, Dong Da, Hanoi, Vietnam
16	Laos ラオス		Mr.SOUKHANOUVONG Manoloth ソウカノウヴォン・**マノロット** D-04-10369	Deputy Chief of Hydrological Division Department of Meteorology and Hydrology, Ministry of Agriculture and Forestry 農林省気象・水文局水文課課長補佐	Luang Prabang Road, Sikhottabong District, Vienetiane Capital City, Lao PDR

List of Participants for Resional-Focused Training Course on Flood Hazard Mapping

2005年度地域別「洪水ハザードマップ作成」コース　研修員リスト

	Photo(写真)	Country(国名)	Name(名前)	Present Post(現職)
1		Cambodia カンボジア	Mr. PREAP Sameng プリープ D-05-07592	Official of Research and Flood Forecasting Office, Department of Hydrology and River Works(DHRW), Ministry of Water Resources and Meteorology(MOWRAM) 水資源気象省水文河川工事局研究・洪水予報室職員
2		Cambodia カンボジア	Mr. PHENG Seangmeng ペイン D-05-07594	Official of Research and Flood Forecasting Office, Department of Hydrology and River Works(DHRW), Ministry of Water Resources and Meteorology(MOWRAM) 水資源気象省水文河川工事局研究・洪水予報室職員
3		China 中国	Mr. LUO Xiaoqing ルオ D-05-07445	Civil Servant, Office of State Flood Control and Drought Relief Headquarters Ministry of Water Resources 水資源省国家治水旱魃救援本部行政官
4		China 中国	Mr. WANG Jinxing ワン D-05-07447	The Hydrological Information and Forecasting, Bureau of Hydrology, Ministry of Water Resources 水資源省水文局水文情報･予報室
5		Indonesia インドネシア	Mr. Thomas Firdaus LAROSA ラロサ D-05-07502	Researcher, Hydrology and Water Resources Laboratory, Research Institute for Water Resources, Agency for Research and Development, Ministry of Public Works 公共事業省研究開発庁水資源研究所水文水源研究室研究員
6		Indonesia インドネシア	Mr. SUBEJO スベジョ D-05-07710	Fire Inspector/Instructor, Fire Training Center, Jakarta Fire Department ジャカルタ消防局消防訓練センター消防検査指導官
7		Laos ラオス	Mr. Chanthachith AMPHAYCHITH チャンタチ D-05-07372	Chief of Division, Water Resources Development Division, Lao National Mekong Committee ラオスメコン河委員会水資源開発部次長
8		Laos ラオス	Mr. Anousone SISA-AD アノソン D-05-07685	Head of Planning Unit, P;anning and Technical Division, Department of Roads, Ministry of Communication, Transport, Post and Construction 通信運輸郵政建設省道路局企画技術課企画係長
9		Malaysia マレーシア	Mr. Miklin Bin ATIONG ミクリン D-05-07545	Engineer, Water Resources Management Section, Department of Irrigation and Drainage, Sabah Ministry of Natural Resources and Environment 天然資源環境省灌漑排水局水源管理課技師
10		Malaysia マレーシア	Ms. HAZALIZAH Binti Hamzah リザ D-05-08037	Civil Engineer, Hydrology and Water Resources Division, Department of Irrigation and Drainage, Malaysia Ministry of Natural Resources and Environment 天然資源環境省灌漑排水局水文･水源部技師
11		Philippines フィリピン	Mr. FABIA Brigildo Miranda ヒル D-05-07374	Engineer II, Regional Office No.5, Planning and Design Division, Department of Public Works and Highways(DPWH) 公共事業･道路省企画設計部第五地方局二級技師
12		Philippines フィリピン	Mr. ESPERANZA Hilario de Guzman ラリ D-05-07376	Weather Specialist I, Philippine Atmospheric Geophysical and Astronomical Services Administration(PAGASA), Department of Science and Technology 科学技術省地球物理･天文研究所気象専門官
13		Philippines フィリピン	Ms. JIMENEZ Elda Gerada エルダ D-05-07378	Municipal Engneer/Building Officer, Engineering Department, Local Government of the Municipality of Pateros パテロス市役所技術部技師･建設官
14		Thailand タイ	Mr. AMNATSAN Somchit ソムチット D-05-07706	Chief of Water Planning and Solution Branch, Regional Irrigation Office 2, Royal Irrigation Department, Ministry of Agriculture and Cooperatives 農業･協同組合省灌漑局地方灌漑第二事務所水計画対策支所長
15		Viet nam ベトナム	Mr. Nguyen Huu Phu フー D-05-07385	Specialist, Department of Water Resources, Ministry of Agriculture and Rural Development(MARD) 農業･農村開発省水源部専門官
16		Viet nam ベトナム	Mr. Nguyen Thanh Phuong タン D-05-07386	Flood Control Engineer/Specialist Department of Dike Management and Flood Control, Ministry of Agriculture and Rural Development(MARD) 農業･農村開発省堤防管理･治水部治水専門官

List of Participants for Regional-Focused Training Course on Flood Hazard Mapping
2006年度地域別「洪水ハザードマップ作成」コース　研修員リスト

	Photo(写真)	Country(国名)	Name(名前)	Present Post(現職)
1		Cambodia カンボジア	Mr. LONG Saravuth サラブ	Deputy Director, Department of Hydrology and River Works (DHRW), Ministry of Water Resourses and Meteology(MOWRAM) 水資源気象省水文河川工事局副局長
2		Cambodia カンボジア	Mr. HORN Sovanna ソワナ	Chief Office, Department Hydrology and River Works (DHRW), Ministry of Water Resourses and Meteology(MOWRAM) 水資源気象省水文河川工事局室長
3		China 中国	Ms. XU, Jing シュ	Engineer, Division of Disaster Mitigation, Office of State Flood Control and Drought Relief Headquater, Ministry of Water Resources 水資源省災害緩和局国家治水旱魃救援本部技師
4		China 中国	Ms. DU Xiaohe ドゥ	Engineer, Department of Water Hazard Research, China Institute of Water Resource and Hydropower Research (IWHR) 中国水利水申研究院防洪減災研究所技師
5		Indonesia インドネシア	Mr. DJUHARTONO Agung アグン	Engineer, Ciliwung-Cisadane River Basin Development チリウン-チサダネ河川流域開発事務所技師
6		Indonesia インドネシア	Mr. Surendo Andi Wibowo レンドゥルー	Engineer, Directorate River, Lake and Dam, Ministry of Public Work 公共事業省河川湖沼ダム理事会技師
7		Lao PDR ラオス	Mr. VISAYSONGDETH Soulignet スリ	Head of Technical Unit, Planning and Technical Division (PTD), Department of Roads, Ministry of Communication Transport Post and Construction 通信運輸郵政建設省道路局企画技術課技術ユニット長
8		Lao PDR ラオス	Mr. THIANGTHAMMA VONG Sangkhane サンカン	Director of Secretariat Office, Lao National Mekong Committee Secretariat (LNMCS), Prime Minister's Office 首相府ラオスメコン河委員会事務局長
9		Malaysia マレーシア	Mr. ARIFFIN Mahamud アルフィン	Assistant Director (Engineer), Flood Monitoring Unit, Hydrogy and Water Resources Division, Department of Irrigation and Drainage Malaysia 天然資源環境省灌漑排水局水文・水源部洪水監視課課長補佐(技師)
10		Malaysia マレーシア	Mr. ANUAR Md. Ali アヌア	Civil Engineer, Flood Mitigation Division, Department of Irrigation and Drainage 天然資源環境省灌漑排水局洪水緩和課土木技師
11		Philippines フィリピン	Ms. ABAGAO Ma.Luisa Obusan リサ	Assistance Chief, Engineer II, Planning & Design Division, Flood Control Management Service, Metropolitan Manila Development Authority マニラ首都圏開発局治水管理事業部企画設計課課長補佐、二級技師
12		Philippines フィリピン	Mr. LIM Richelieu Felipe Irisari ボビー	Engineer III, Surveys and Investigation Division, Bureau of Design, Department of Public Works and Highways 公共事業・道路省設計局測量調査課三級技師
13		Thailand タイ	Mr. HOMKASORN Boonchob ブーンチョブ	Irrigation Engineer, Chief, Water Management Branch, Regional Irrigation Office 11, Royal Irrigation Department 灌漑第11事務所水管理支所灌漑技師
14		Thailand タイ	Mr. Kunpote Buatone ブトネ	Senior Civil Engineer, Department of Water Resources 水資源局上席土木技師
15		Vietnam ベトナム	Mr. LAI Tuan Anh アン	Hanoi Water Resources University, Ministry of Agriculture and Rural Development 農業農村開発省ハノイ水資源大学講師
16		Vietnam ベトナム	Mr. NGUYEN Hiep ヒャップ	Specialist/Disaster Management, Department of Dike Management and Flood Control, Ministry of Agriculture and Rural Development 農業農村開発省堤防管理・治水部災害対策専門家

List of Participants for Regional-Focused Training Course on Flood Hazard Mapping
2007年度地域別「洪水ハザードマップ作成」コース　研修員リスト

	Photo(写真)	Country(国名)	Name(名前)	Present Post(現職)
1		Cambodia カンボジア	Mr .Sovann SUY ソヴァン	Chief Office, Department of Hydrology and River Works, Ministry of Water Resources and Meteorology 水資源気象省　水文工事局
2		Cambodia カンボジア	Mr. Sasel LENG サセル	Chief, Chief Office, Department of Hydrology and River Works, Ministry of Water Resources and Meteorology 水資源気象省　水文工事局
3		China 中国	Mr. HUANG Xiaolong ホワン	Engineer, Office of State Flood Control and Drought Relief Headquater, Ministry of Water Resources 水資源省国家治水旱魃救援本部
4		China 中国	Mr. XU Xianbiao シュー	Senior Engineer, Office of State Flood Control and Drought Relief Headquater, Ministry of Water Resources 水資源省国家治水旱魃救援本部
5		Indonesia インドネシア	Mr. Tri Djoko Srimargianto トゥリージョコ	Chief, Department of Public Works, Government of Special Capitol Territory of Jakarta Province ジャカルタ地域行政府　公共事業局
6		Indonesia インドネシア	Mr. Dudi Gardesi ASIKIN ドゥディ	Department of Public Works, Government of Special Capitol Territory of Jakarta Province ジャカルタ地域行政府　公共事業局
7		Indonesia インドネシア	Ms. NOVI Widyastuti ノヴィ	Agriculture and Plantation Sub Division, Bappeda Musi Rawas District Planning and Development Agency ムシラワス地域行政府　農業局
8		Lao PDR ラオス	Mr. Khamphad SOURINPHOUMY カンパット	Director General, Department of Irrigation, Ministry of Agriculture and Forestry 農林省　灌漑局
9		Lao PDR ラオス	Mr. Oudomsack PHILAVONG ウド	Deputy chief, Modeling unit, Lao National Mekong Committee Secretariat メコン委員会　モデリングチーム
10		Malaysia マレーシア	Mr.WAN AZINUDDIN Bin W. Ibrahim ワン	Senior Assistance Director, Department of Irrigation and Drainage, Ministry of Natural Resources and Environment 天然資源環境省　灌漑排水局
11		Malaysia マレーシア	Mr.WAMZAH Bin Mord ワンザ	Senior Assistant Director, Department of Irrigation and Drainage, Ministry of Natural Resources and Environment 天然資源環境省　灌漑排水局
12		Malaysia マレーシア	Ms. SITI KHADIJAH Abd. Rashid シティ	Assistant Director, Department of Irrigation and Drainage, Ministry of Natural Resources and Environment 天然資源環境省　灌漑排水局
13		Philippines フィリピン	Mr. Jayson Wong BAUSA ジェイ	Assistance Chief, Department of Science & Technology, Philippine Atmospheric Geophysical and Astronominal Services Administration 地形天文科学管理局
14		Philippines フィリピン	Mr. Glenn Villanueva. REYES グレン	Engineer II, Department of Public Works and Highways 公共事業道路局
15		Thailand タイ	Ms. Pilailak AKSORNRAT パウ	Civil Engineer, The Royal Irrigation Department 王立灌漑局
16		Thailand タイ	Mr. Phadungsak PHACHAROEN ドイ	Irrigation Engineer, The Royal Irrigation Department 王立灌漑局
17		Vienam ベトナム	Ms. DANG Tuyet Minh ミン	Lecturer, Hanoi Water Resources University, Ministry of Agriculture and Rural Development 農業地方振興省　ハノイ水資源大学
18		Vienam ベトナム	Mr. VU Thanh Liem リエム	Expert, Department of Dike Management and Flood Control, Ministry of Agriculture and Rural Development 農業地方振興省　堤防洪水管理局
19		Sri Lanka スリランカ	Mr. R. M. S. A. B. RAJAPAKSE ラジャ	Senior Engineer 8, Water Resources and Project Planning Branch, Irrigation Department, Head Office 灌漑局　水資源事業企画課
20		Thailand タイ	Mr. Paitoon NAKTAE パイトゥーン	Senior Engineer 8, Safety Standards Sub-Bureau, Disaster Prevention Measures Bureau, Department of Disaster Prevention and Mitigation, Ministry of Interior 内務省　防災局

Participants List of Flood Hazard Mapping Training Course 2008

2008年度　地域別研修：洪水ハザードマップ作成コース　研修員リスト

国		名前	現職
CAMBODIA カンボジア		Mr. CHUM Sophy ソフィ	Deputy Director Department Water Resourcesand Meteorology ('05) 課長代理：水資源・気象課
CHINA 中国		Ms. LIAO,Hong-Zhi リャオ	Engineer/Changjiang Water Resources Commission ('06) 技師：水資源省 Changjiang水資源委員会
CHINA 中国		Ms. LIN,He-Juan リン	Deputy Division Chief/Taihu Basin Authority, MWR, P.R.C ('06) 部局主任代理：水資源省Taihu流域公社
LAOS ラオス		Mr. KOUMPHONH Boualaythong ボーアレイトン	Deputy Director of Climate Division / Department of Meteorology and Hydrology, Water Resources and Environmet Administration, PMO ('07) 気候課課長代理：気象・水文局　水資源・環境部
LAOS ラオス		Mr. INTHAPATHA Bounseuk ブンセク	Chief of Hydorological Division / Department of Meteorology and Hydrology, Water Resources and Environment Administration, PMO ('99) 水文部門主任：気象・水文局　水資源・環境部
MALAYSIA マレーシア		Ms. AZAH AZURA Ali Amran アザ	Assistant Director/ Flood Migitation Division, Department of Irrigation & Drainage (DID)('05) 課長補佐：灌漑排水局洪水防災課
MALAYSIA マレーシア		Mr. ROSLY Aman ロスリー	Assistant Director/ Hydrological & Water Resources Division, Department of Irrigation & Drainage (DID)('05) 課長補佐：灌漑排水局水文・水資源課
PHILIPPINES フィリピン		Mr. DE LEON Efren Mariano エフレン	Engineer IV / LGU – City Government of San Fernando Pampanga('04) 技官Ⅳ：ﾊﾟﾊﾟﾝｶﾞ県ｻﾝ･ﾌｪﾙﾅﾝﾄﾞ市LGU
THAILAND タイ		Mr. URAIWONG Piriya ピリヤ	Civil Engineer/ Bureau of Water Resources Development, The Department of Water Resources('98) 土木技官：水資源省水資源開発局
VIET NAM ベトナム		Mr. PHAM Tien Viet ティエン	Head / Technology Development Division, Center for Application of Hydro-meteorological Technology, National Hydro-meteorological Service, Ministry of Natural Resources and Environment ('06) 課長：水資源・環境省国立水・気象庁水・気象技術応用ｾﾝﾀｰ開発課

Appendix 4-6

Participant List categorized by countries

Participant List of Flood Hazard Mapping Training Course

No.	Country	year	Name of participant	Position	Address/Organization	Participant of the 1st Seminar	Participant of the 2nd Seminar	Participant of the 3rd Seminar	Response	Out of touch	Remarks
1	Cambodia	2004	Mr. So Im Monichoth	Chief	Department of Hydrology and River Works, Ministry of Water Resources and Meteorology (MOWRAM)						
2	Cambodia	2004	Mr. Tong Sneg	Vice Chief	Department of Hydrology and River Works, Ministry of Water Resources and Meteorology (MOWRAM)	○	○				
3	Cambodia	2005	Mr. PREAP Sameng	Official	Department of Hydrology and River Works, Ministry of Water Resources and Meteorology (MOWRAM)		○		2009/1/29 13:51 メール送信1日後		
4	Cambodia	2005	Mr. PHENG Seangmeng	Official	Department of Hydrology and River Works, Ministry of Water Resources and Meteorology (MOWRAM)	○				○	
5	Cambodia	2006	Mr. LONG Saravuth	Deputy Director	Department of Hydrology and River Works, Ministry of Water Resources and Meteorology (MOWRAM)						
6	Cambodia	2006	Mr. HORN Sovanna	Chief Officer	Department of Hydrology and River Works, Ministry of Water Resources and Meteorology (MOWRAM)						
7	Cambodia	2007	Mr .Sovann SUY	Chief	Department of Hydrology and River Works, Ministry of Water Resources and Meteorology (MOWRAM)						
8	Cambodia	2007	Mr. Sasel LENG	Chief	Department of Hydrology and River Works, Ministry of Water Resources and Meteorology (MOWRAM)						
9	Cambodia	2008	Mr. CHUM Sophy	Deputy Director	Department Water Resources and Meteorology, Prey Veng Province						
10	China	2004	Ms. Yumei Deng	Deputy Director	Office of State Flood Control and Drought Relief Headquater, Ministry of Water Resources	○					
11	China	2004	Mr. Chunpeng Sun	Technical Staff	Department of Water Resources, Ministry of Public Works						
12	China	2005	Mr. LUO Xiaoqing	Civil Servant	Office of State Flood Control and Drought Relief Headquater, Ministry of Water Resources	○					
13	China	2005	Mr. WANG Jinxing		Bureau of Hydrology, Ministry of Water Resources						
14	China	2006	Ms. XU, Jing	Engineer	Office of State Flood Control and Drought Relief Headquater, Ministry of Water Resources		○	○			
15	China	2006	Ms. DU Xiaohe	Engineer	Department of Water Hazard Research, China Institute of Water Resource and Hydropower Research (IWHR)						
16	China	2007	Mr. HUANG Xiaolong	Engineer	Office of State Flood Control and Drought Relief Headquater, Ministry of Water Resources					○	
17	China	2007	Mr. XU Xianbiao	Senior Engineer	Office of State Flood Control and Drought Relief Headquarter, Ministry of Water Resources						
18	China	2008	Ms. LIAO,Hong-Zhi	Engineer	Changjiang Water Resources Commission, River Management Bureau, Ministry of Water Resourses						
19	China	2008	Ms. LIN,He-Juan	Deputy Division Chief	Flood Control and Drought Relief Office, Taihu Basin Authority, Ministry of Water Resourses						

No.	Country	year	Name of participant	Position	Address/Organization	Participant of the 1st Seminar	Participant of the 2nd Seminar	Participant of the 3rd Seminar	Response	Out of touch	Remarks
20	Indonesia	2004	Mr. Heru Setiawan	Technical Staff	Department of Water Resources, Ministry of Public Works						
21	Indonesia	2004	Mr. Wisnu Subarkah Dwiwibowo	System Software Developer	Department of Water Resources, Ministry of Public Works						
22	Indonesia	2005	Mr. Thomas Firdaus LAROSA	Researcher	Agency for Research and Development, Ministry of Public Works				2009/1/29 17:19 メール送信1日後		
23	Indonesia	2005	Mr. SUBEJO	Fire Inspector/Instructor	Fire Training Center, Jakarta Fire Department	○					
24	Indonesia	2006	Mr. DJUHARTONO Agung	Engineer	Ciliwung-Cisadane River Basin Development						
25	Indonesia	2006	Mr. Surendo Andi Wibowo	Engineer	Directorate River, Lake and Dam, Ministry of Public Work						
26	Indonesia	2007	Mr. Tri Djoko Srimargianto	Chief	Department of Public Works, Government of Special Capitol Territory of Jakarta Province					○	
27	Indonesia	2007	Mr. Dudi Gardesi ASIKIN	Head of Section	Department of Public Works, Government of Special Capitol Territory of Jakarta Province		○	○			
28	Indonesia	2007	Ms. NOVI Widyastuti		Agriculture and Plantation Sub Division, Bappeda Musi Rawas District Planning and Development Agency						
29	Lao PDR	2004	Mr. Bounphet Phommachanh	Deputy Director	Department of Roads, Ministry of Communication, Transport, Post and Construction						
30	Lao PDR	2004	Mr. Manoloth Soukhanouvong	Deputy Chief	Department of Meteorology and Hydrology, Ministry of Agriculture and Forestry					○	
31	Lao PDR	2004	Mr. Sounthaly Mountha	Expert	Department of Meteorology and Hydrology, Ministry of Agriculture and Forestry						
32	Lao PDR	2005	Mr. Chanthachith AMPHAYCHITH	Chief	Water Resources Development Division, Lao National Mekong Committee	○					
33	Lao PDR	2005	Mr. Anousone SISA-AD	Head of Unit	Department of Roads, Ministry of Communication, Transport, Post and Construction						
34	Lao PDR	2006	Mr. VISAYSONGDETH Soulignet	Head of Unit	Department of Roads, Ministry of Communication, Transport, Post and Construction						
35	Lao PDR	2006	Mr. THIANGTHAMMAVONG Sangkha	Director of Secretariat	Lao National Mekong Committee Secretariat (LNMCS), Prime Minister's Office		○				
36	Lao PDR	2007	Mr. Khamphad SOURINPHOUMY	Director General	Department of Irrigation, Ministry of Agriculture and Forestry						
37	Lao PDR	2007	Mr. Oudomsack PHILAVONG	Deputy chief	Modeling unit, Lao National Mekong Committee Secretariat			○			
38	Lao PDR	2008	Mr. KOUMPHONH Boualaythong	Deputy Director	Water Resources and Environmet Administration, Department of Meteorology and Hydrlogy, Ministry of Agriculture and Forestry				2009/1/28 15:51 メール送信2時間25分後		ニュースレター記事掲載に関心
39	Lao PDR	2008	Mr. INTHAPATHA Bounseuk	Chief of Hydorological Division	Water Resources and Environment Administration Department of Meteorology and Hydrology, Ministry of Agriculture and Forestry				2009/2/3 16:37 メール送信6日後		

No.	Country	year	Name of participant	Position	Address/Organization	Participant of the 1st Seminar	Participant of the 2nd Seminar	Participant of the 3rd Seminar	Response	Out of touch	Remarks
40	Malaysia	2004	Mr. Adb Jalil Hassan	Senior Researcher	National Hydraulic Research Institute, Ministry of Natural Resources and Environment	○					
41	Malaysia	2004	Ms. Paridah Anun Binti Tahir	Senior Assistant Director	Department of Irrigation and Drainage, Ministry of Natural Resources and Environment	○	○	○			
42	Malaysia	2005	Mr. Miklin Bin ATIONG	Engineer	Department of Irrigation and Drainage, Ministry of Natural Resources and Environment	○					
43	Malaysia	2005	Mr. HAZALIZAH Binti Hamzah	Civil Engineer	Department of Irrigation and Drainage, Ministry of Natural Resources and Environment	○					
44	Malaysia	2006	Mr. ARIFFIN Mahamud	Assistant Director	Hydrogy and Water Resources Division, Department of Irrigation and Drainage, Ministry of Natural Resources and Environment	○					
45	Malaysia	2006	Mr. ANUAR Md. Ali	Civil Engineer	Flood Mitigation Division, Department of Irrigation and Drainage, Ministry of Natural Resources and Environment	○	○	○ (cancel)			
46	Malaysia	2007	Mr. WAN AZINUDDIN Bin W. Ibrahim	Senior Assistant Director	Department of Irrigation and Drainage, Ministry of Natural Resources and Environment						
47	Malaysia	2007	Mr. WAMZAH Bin Mord	Senior Assistant Director	Department of Irrigation and Drainage, Ministry of Natural Resources and Environment						
48	Malaysia	2007	Ms. SITI KHADIJAH Abd. Rashid	Assistant Director	Department of Irrigation and Drainage, Ministry of Natural Resources and Environment						
49	Malaysia	2008	Ms. AZAH AZURA Ali Amran	Assistant Director	Flood Migitation Division, Department of Irrigation and Drainage, Ministry of Natural Resources and Environment				2009/1/28 15:45 メール送信2時間19分後		
50	Malaysia	2008	Mr. ROSLY Aman	Assistant Director	Hydrological & Water Resources Division, Department of Irrigation and Drainage Ministry of Natural Resources and Environment						
51	Philippines	2004	Mr. Grecile Christopher R. Damo	Engineer III	Project Management Office, Department of Public Works and Highways	○	○	○	2009/1/28 13:48 メール送信22分後		
52	Philippines	2004	Mr. Socrates F. Paat Jr	Hydrologist/ Weather Specialist I	Department of Science & Technology, Philippine Atmospheric Geophysical and Astronominal Services Administration (PAGASA), Department of Science and Technology	○		○	2009/1/28 13:59 メール送信33分後		
53	Philippines	2005	Mr. FABIA Brigildo Miranda	Engineer II	Regional Office No.5, Planning and Design Division, Department of Public Works and Highways						
54	Philippines	2005	Mr. ESPERANZA Hilario de Guzman	Weather Specialist I	Philippine Atmospheric Geophysical and Astronominal Services Administration (PAGASA), Department of Science & Technology	○	○	○	2009/1/28 17:12 メール送信3時間36分		
55	Philippines	2005	Ms. JIMENEZ Elda Gerada	Municipal Engneer/ Building Officer	Engineering Department, Local Government of the Municipality of Pateros		○	○	2009/1/28 17:31 メール送信3時間55分後		
56	Philippines	2006	Ms. ABAGAO Ma.Luisa Obusan	Assistance Chief	Engineer II, Planning & Design Division, Flood Control Management Service, Metropolitan Manila Development Authority				2009/2/6 10:48 メール送信9日後		
57	Philippines	2006	Mr. LIM Richelieu Felipe Irisari	Engineer III	Surveys and Investigation Division, Bureau of Design, Department of Public Works and Highways				2009/2/10 16:30 メール送信13日後		
58	Philippines	2007	Mr. Jayson Wong BAUSA	Assistant Chief	Department of Science & Technology, Philippine Atmospheric Geophysical and Astronominal Services Administration (PAGASA), Department of Science & Technology					○	
59	Philippines	2007	Mr. Glenn Villanueva. REYES	Engineer II	Department of Public Works and Highways					○	
60	Philippines	2008	Mr. DE LEON Efren Mariano	Engineer IV	Construction & Maintenance Division, City Engineer's Office, LGU - City Government of San Fernando, Pampanga				2009/1/29 13:33 メール送信1日後		

No.	Country	year	Name of participant	Position	Address/Organization	Participant of the 1st Seminar	Participant of the 2nd Seminar	Participant of the 3rd Seminar	Response	Out of touch	Remarks
61	Thailand	2004	Mr. Yuhttana Kantong	Irrigation Engineer	Royal Irrigation Department, Ministry of Agriculture and Cooperatives						
62	Thailand	2004	Ms. Pacharee Ongchotiyakul	Civil Engineer	Department of Drainage and Sewerage, Bangkok Metropolitan Administration						
63	Thailand	2005	Mr. AMNATSAN Somchit	Chief	Water Planning and Solution Branch, Regional Irrigation Office 2, Royal Irrigation Department, Ministry of Agriculture and Cooperatives	○	○	○	2009/1/29 10:22 メール送信1日後		
64	Thailand	2006	Mr. HOMKASORN Boonchob	Irrigation Engineer	Water Management Branch, Regional Irrigation Office 11, Royal Irrigation Department, Ministry of Agriculture and Cooperatives						
65	Thailand	2006	Mr. Kunpote Buatone	Senior Civil Engineer	Department of Water Resources, Royal Irrigation Department, Ministry of Agriculture and Cooperatives						
66	Thailand	2007	Mr. Paitoon Naktae	Senior Engineering, Chief of Safe	Safety standard sub-bureau, Disaster Prevention Measure bureau Department of Disaster prevention and mitigation, Ministry of Interior			○			
67	Thailand	2007	Ms. Pilailak AKSORNRAT	Civil Engineer	Royal Irrigation Department, Ministry of Agriculture and Cooperatives						
68	Thailand	2007	Mr. Phadungsak PHACHAROEN	Irrigation Engineer	Royal Irrigation Department, Ministry of Agriculture and Cooperatives						
69	Thailand	2008	Mr. URAIWONG Piriya	Civil Engineer	Department of Water Resources Royal Irrigation Department, Ministry of Agriculture and Cooperatives				2009/1/29 12:56 メール送信1日後		レポート送付
70	Vietnam	2004	Ms. Pham Hong Nga	Lecturer/Researcher	Hanoi Water Resources University, Ministry of Agriculture and Rural Development	○					
71	Vietnam	2005	Mr. Nguyen Huu Phu	Specialist	Department of Water Resources, Ministry of Agriculture and Rural Development						
72	Vietnam	2005	Mr. Nguyen Thanh Phuong	Flood Control Engineer/ Specialist	Department of Dike Management and Flood Control, Ministry of Agriculture and Rural Development				2009/1/31 2:34 メール送信3日後		
73	Vietnam	2006	Mr. LAI Tuan Anh	Lecturer	Hanoi Water Resources University, Ministry of Agriculture and Rural Development						
74	Vietnam	2006	Mr. NGUYEN Hiep	Specialist	Department of Dike Management and Flood Control, Ministry of Agriculture and Rural Development			○			
75	Vietnam	2007	Ms. DANG Tuyet Minh	Lecturer	Hanoi Water Resources University, Ministry of Agriculture and Rural Development						
76	Vietnam	2007	Mr. VU Thanh Liem	Expert	Department of Dike Management and Flood Control, Ministry of Agriculture and Rural Development						
77	Vietnam	2008	Mr. PHAM Tien Viet	Head	Technology Development Division, Center for Application of Hydro-meteorological Technology, National Hydro-meteorological Service, Ministry of Natural Resources and Environment						
78	Sri Lanka	2007	Mr. R. M. S. A. B. RAJAPAKSE	Senior Engineer 8	Water Resources and Project Planning Branch, Irrigation Department, Head Office					○	No information of e-mail address