

Report on FY2013 JICA Training Program: Capacity Development for Flood Risk Management with IFAS

ICHARM implemented a JICA training program, “Capacity Development for Flood Risk Management with IFAS,” from July 9 to August 6 in the fiscal year of 2013 in collaboration with the Japan International Cooperation Agency (JICA).

1. Background and Purpose

Water-related disasters, such as floods, have been on the increase throughout the world. Particularly in developing countries, it is urgent to take measures for flood disasters, which cause serious damage in many cases. However, the implementation of mitigation measures mainly by the use of structures, such as levees, flood control basins and dams, is not necessarily practical in developing countries, which often lack financial and human resources. Instead, measures combining structures with non-structural means, such as flood forecasting and warning systems and flood hazard maps, should be considered. In addition, for effective use of flood forecasts, well-coordinated collaboration is indispensable among meteorologists, river administrators and disaster management officers who are in charge of residents’ evacuation. In developing countries, this is also an issue, as those three bodies of responsible personnel are unfortunately not always communicating well with one another.

In this training, specifically planned for meteorologists, river administrators and disaster management officers for public evacuation in flood-vulnerable areas of developing countries, they are expected to learn about disaster management and evacuation plans, as well as flood response cases in Japan, and to develop an action plan for local flood management of flood vulnerable areas in the participants’ countries. The training is designed to enhance individual flood-coping capacities and eventually to contribute to flood damage mitigation in their countries.

For the training to create as great synergy as possible with JICA’s current and future local flood projects, the following two conditions are considered:

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

These conditions are intended for the following effects:

- The participants will have clear visions of what they should do in their countries after

the training, and thus be able to develop a detailed action plan.

- Organizations sharing the same basin as their project target can increase collaboration among them.

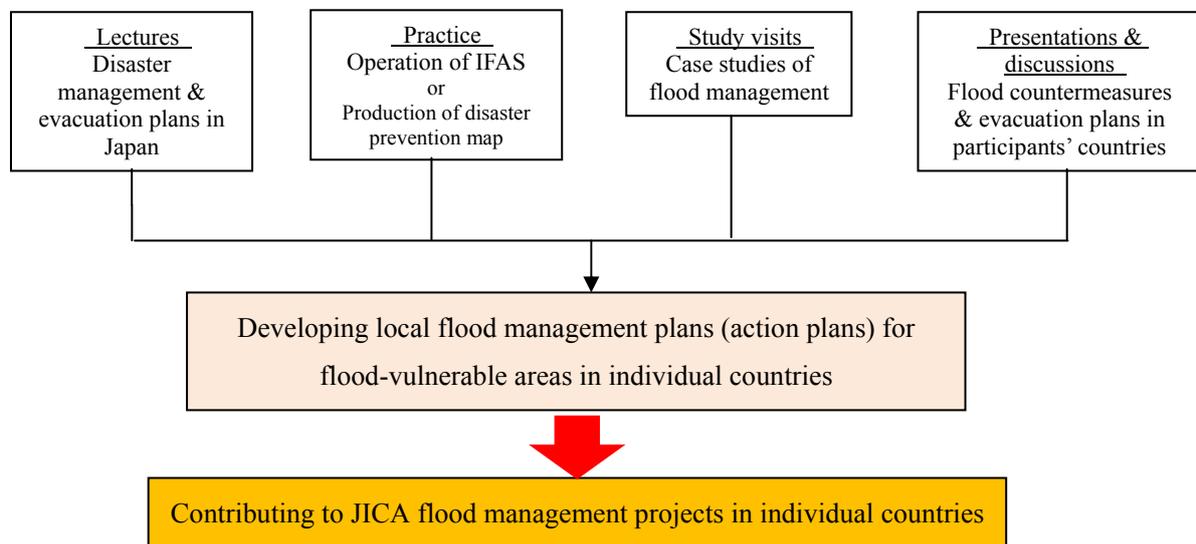
These effects are expected to increase the effectiveness of the training at ICHARM consequently.

This is the second year of this three-year training program that ICHARM has provided since the last fiscal year. To maximize the training effect, the following two subjects were prepared with an emphasis on flood forecasting and warning and public evacuation:

- Theory and practice on the use of the Integrated Flood Analysis System (IFAS) developed by ICHARM
- Town-Watching and production of a disaster prevention map

This year, a total of 16 trainees participated in the training; three each from Bangladesh, Kenya, Vietnam and the Philippines and two each from Thailand and Nigeria. The participating countries largely sent trainees from the three categories of personnel as requested.

The figure below shows the outline of the training program. It consists of four components: lectures, practice, study visits, and presentations and discussions.



Outline of the “Capacity Development for Flood Risk Management with IFAS” training program

Note: The Integrated Flood Analysis System (IFAS) has been developed by ICHARM in a joint effort with private consultant firms to forecast river discharges and water levels by using automatically collected satellite data such as geographical, land-use and rainfall data as input. Currently, IFAS ver.1.3β is available free of charge at the ICHARM homepage.

2. Training

On July 9, all participants gathered at the JICA Tsukuba Office for the opening ceremony. At the ceremony, Mr. Kimura, the director of JICA Tsukuba, and Mr. Kamoto, a senior researcher of ICHARM, made a welcome speech, and Mr. Bulanadi Maximo Fernad of the Philippines also spoke, representing the participants. After that, Mr. Nemoto of JICA Tsukuba and Mr. Kamoto led an orientation meeting, outlining the content and purpose of the training to motivate them with clear goals. The meeting was also for the participants to get to know each other.

During the first three days, the participants attended a series of lectures on the basic



Left: Mr. Kimura, the director of JICA Tsukuba welcomes the participants.
Right: Mr. Bulanadi Maximo Fernad speaks on behalf of the participants.



The participants and JICA and ICHARM staff

concepts of disaster management and evacuation planning in Japan, hydrological observation, and IFAS.

The series of lectures started with Prof. Takeuchi, the director of ICHARM, explaining about the basic concept of disaster. Mr. Kamoto lectured about structural measures for disaster mitigation and prevention in Japan. Dr. Motonaga, a research specialist of ICHARM, gave a lecture about hydrological observation currently practiced in Japan. On Day 3, Dr. Kibler, a research specialist of ICHARM, outlined the workings of IFAS. Another ICHARM research specialist, Dr. Sugimoto, lectured about early evacuation. In her lecture, the participants were grouped by country to discuss issues and solutions on early evacuation in their countries, and each group made a presentation in class.



Left: Lecture by Prof. Takeuchi, the director of ICHARM
Right: Lecture by Mr. Kamoto, a chief researcher of ICHARM



Left: Lecture by Dr. Motonaga, a research specialist of ICHARM
Right: Lecture by Dr. Kibler, a research specialist of ICHARM

On the 16th and 17th, the participants attended the PCM (Project Cycle Management) training. They learned how to analyze problems and purposes, as well as budgeting and scheduling projects, which will be useful for them when they start actual projects back in their countries.

On the morning of the 18th, an inception report was presented by each country group. The participants of each country prepared a draft inception report before coming to Japan, and finalized it after discussion with a tutor assigned to each of the six country groups. The presentation was found very productive to both the participants and ICHARM researches, for they were able to learn a lot about participating countries through questions and comments. In the afternoon, the participants visited the Chikusei City Hall and attended a lecture about a local disaster management plan including activities in normal times to prepare for disaster and activities during disaster. Some of them showed interest in the disaster management system in Japan and asked questions about how the national and municipal governments divide the responsibility in terms of flood forecasting and warning.



Left: Lecture by Dr. Sugimoto, a research specialist of ICHARM



Right: Presentation at the PCM training



Inception report presentation



Lecture by Mr. Sudo at Chikusei City Hall

On July 19, the participants visited the Japan Meteorological Agency to attend a lecture on meteorological operations and flood forecasting in Japan. They asked many questions about rainfall observation systems and other issues. After that, they also had a chance to see the weather forecasting section of the agency. Then, to learn flood management in an urban area, the group went to the Arakawa Museum of Aqua (amoa), where they learned about the

outline of the Arakawa River and its brief history as a discharge channel, which was followed by another lecture at the disaster management section. All this was possible with cooperation from the MLIT Arakawa Karyu River Office. The participants also visited a few other sites including the Ukima Disaster Management Station and the Shinden Super Levee.



Weather forecasting room



Briefing on the rooftop at MLIT office



Ukima Disaster Management Station



Shinden Super Levee

From the 21st to 23rd, the participants visited Niigata Prefecture to see flood countermeasures around the downstream Shinanogawa River. The prefecture suffered from serious flood disasters in July 2004 and July 2010. The purpose of this study trip was for the participants to learn knowledge and lessons about flood countermeasures in Japan and compare them with countermeasures back home to analyze. To this end, they listened to lectures by local management officers and visited local flood management facilities and structures to examine the damage reduction effects of countermeasures implemented after July 2004, as well as issues still left unsolved.

On the 21st, the group visited the Shinano River Ohkouzu Museum. They were given a lecture about the outline of the lower Shinanogawa River and learned about the key role of

the Ohkouzu discharge channel in flood management over the lower Shinanogawa area. The next destination after the museum was the Toki Messe, a convention complex, where they overviewed Downtown Niigata City, which spreads in the lower Shinanogawa River.

On the 22nd, the participants visited the MLIT Hokuriku Regional Development Bureau located in Niigata City. They listened to disaster management officers of the bureau's river department, the Shinanogawa Karyu River Office, and the Niigata Prefectural Office explaining about flood countermeasures in the lower Shinanogawa River, including structural and non-structural measures. On the afternoon of the same day, the participants were led by officers for a short tour to study different types of facilities and structures along the Shinanogawa River, travelling upstream from the Niigata Large Weir, located the furthest downstream, to the confluence with the Igarashigawa River. Studious participants asked a variety of questions about flood control structures such as levee size as well as hydrological facilities, for example, for rainfall observation.



Left: Lecture by Mr. Suzuki at Hokuriku Regional Development Bureau
Right: Lecture by Mr. Naito at Shinanogawa Karyu River Office



Left: At Sekiya Diversion Channel (Niigata Ozeki Weir)
Right: At Toyano Drainage Pump Station

On the 23rd, the participants visited the Sanjo City Hall, where they learned about the city's initiative in disaster management after the July 2004 flood disaster. They also had chance to listen to the chief of the local fire fighting corps, ask questions and have discussion about flood fighting. They were interested in differences in flood fighting system between Japan and their countries and asked many questions about it, such as the relationship between flood fighting corps and the fire fighting headquarters.



Left: Lecture by Mr. Ishizuka at Sanjo City Hall

Right: Discussion with the chief of the Sanjo Fire Fighting Corps



Left: along the Igarashigawa River

Right: Rice fields as temporary reservoirs in Mitsuke City

In the afternoon, local disaster management officers of the prefectural civil engineering department took the participants on a local study trip along the Igarashigawa and Kariyatagawa Rivers, both of which are under the prefectural management. The officers explained about the embankment part of the levee along Igarashigawa and about the role of rice fields as reservoirs in the Kariyatagawa basin. The participants learned that rice fields are used to temporarily store rainwater when it rains heavily.

The Niigata study tour was very effective for the participants to understand flood

management in Japan. Despite the short trip only for three days, they had chance to observe various flood countermeasures firsthand ranging from municipal to prefectural to national levels.

From the 25th to the 31st, the participants parted into two groups, nine and seven members each: One group for IFAS training and the other for Town Watching (TW) training. For the first two days of the IFAS training, the group was instructed by Dr. Kibler of ICHARM. They learned the fundamentals of IFAS operation by practicing runoff calculation for the Solo River basin in Indonesia. For the last three days from the 29th to the 31st, supervised by three ICHARM researchers, Dr. Kibler, Dr. Shrestha and Dr. Kamimera, each IFAS group



IFAS training



member practiced applying IFAS to a selected river basin in his/her country to calculate runoff. During the practice, some difficulties arose because each participant worked on a different basin; for example, some modifications were necessary to use local data for the IFAS system. However, because the practice was conducted in conditions similar to actual ones, it will be found useful when they apply the system to an actual basin back home.

The TW group worked on the production of a disaster prevention map. On the 25th, after Mr. Kuribayashi, a senior researcher of ICHARM, outlined the TW training, the group went to Chikusei City in the afternoon to look around the city. On the 26th, the group parted into

two smaller groups and took a more detailed TW tour around the city to collect information for the production of a disaster prevention map. On the 29th, the TW participants practiced producing a disaster prevention map based on collected information, and on the next day, they visited Chikusei City again and held a presentation meeting with city officers of the section of fire fighting and disaster management. In the presentation, the group members pointed out strengths and weaknesses of TW and discussed how TW should be used to increase disaster preparedness. These series of activities helped them a great deal to have good understanding of TW. In the afternoon, they visited the Kurihashi district of Kuki City. The district has been practicing the “Marugoto-machigoto hazard map” project, in which signs are posted on power poles around the area to show water levels during the 1949 flood disaster by Typhoon Kathleen. They also took a look at a tall tower that shows the current water level of the Tonegawa River at the Kurihashi Branch Office and a display panel to show river information at Kurihashi Station.

On August 2, the IFAS and TW groups gathered for a presentation session to share training results with each other.



TW training in Chikusei City



Production of a disaster prevention map



Presentation at Chikusei City Hall



Water level tower of Tone River



Presentation session

On August 1, the participants finally started developing action plans. On the final training day of August 6, they presented their action plans in front of fellow participants. They each explained how they analyzed issues in their target basins by means of the PCM method and how they can possibly solve them by incorporating what they observed and learned in this training program. They are expected to continue revising the action plans at their organizations with colleagues and superiors through discussions and presentations, and finally submit the revised version by mid-November.

The training program ended with the closing ceremony. After congratulatory remarks by Mr. Kimura, the director of JICA Tsukuba, and Dr. Uomoto, the chief executive of PWRI, each participant was given a training certificate by Mr. Kimura. Mr. Hossain Mohammad Mahtab of Bangladesh was selected for the *Sontoku* Award this time, an award that is given the most distinguished participant selected by the fellow participants.

Finally, Mr. Osse Obiwe Francis of Nigeria expressed gratitude for the program and staff on behalf of the participants, which ended the closing ceremony.



Left: Congratulatory speech by Dr. Uomoto, the director of PWRI



Right: A participant receives a training certificate from Mr. Kimura



Left: Mr. Mahtab receives the Sontoku Award.



Right: Mr. Osse Obiwe Francis thanks for the program on behalf of the participants

As stated in the introduction, this training program started last year. For the second installment of this training, we had made improvements for each participant to maximize results from the training. One of them was to divide the participants into two groups: one for IFAS and the other for TW. Some participants are, in fact, not used to runoff analysis with computer software like IFAS or are not in positions that require the knowledge to conduct such analysis. To assign these people to the TW group was an effective way for them to learn a simple method for raising public awareness.

Another change was made in the IFAS training. To practice how to operate IFAS, the participants applied the system to a local river basin in their countries. The practice was found to be more meaningful for the participants by trying it on an actual basin. We also continued the tutor system from the first year, in which an ICHARM researcher is assigned to each country group to give advice on the development of an action plan or other activities. This time, some tutors accompanied the participants on the study trip to the Shinanogawa River basin and helped them better understand flood control measures in Japan by providing them with additional explanation.

Post-training questionnaire to the participants found the following activities particularly useful: a lecture on a river information system used in Japan, application practices of PCM, IFAS and TW, and a study trip to the Shinanogawa River basin. In particular, PCM, IFAS and TW require cooperation from fellow engineers and administrators when the participants try to put them in practice. Therefore, they are expected to share knowledge and experience they acquired in this training with others at their respective organizations through lectures and workshops.

Last but not least, the program organizers would like to express gratitude for the great cooperation to the governmental and municipal offices, namely, Chikusei City Hall, the Japan Meteorological Agency, the MLIT Hokuriku Regional Development Bureau, the Arakawa Karyu River Office, the Shinanogawa Karyu River Office, the Niigata Prefecture Civil Engineering Department, Sanjo City Hall, and Sanjo City Fire Fighting Headquarters.



The participants with a training certificate