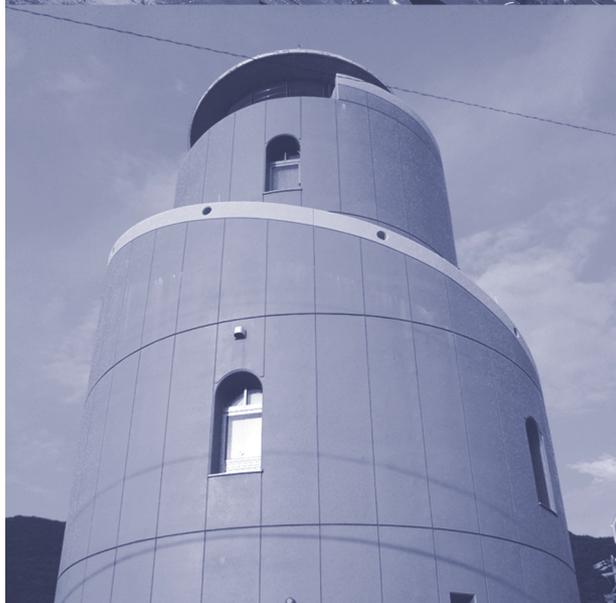


Report on
“UN/ISDR Comprehensive
Tsunami Disaster Prevention
Training Course”

November 2008



United Nations
Educational, Scientific and
Cultural Organization

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

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Report on ”UN/ISDR Comprehensive Tsunami Disaster Prevention Training Course”

by

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Synopsis:

ICHARM has conducted the “UN/ISDR Tsunami Disaster Prevention Training Course” as one of the UN/ISDR projects from 2nd June to 11th July with the support of the Japan International Cooperation Agency (JICA) to make good use of Japanese experience of tsunami countermeasures for developing countries. There were 11 course participants from four countries, including India, Indonesia, the Maldives and Sri Lanka. They were section-chief-level government administrators and responsible for promoting tsunami disaster mitigation in their home countries. During the 1st, 2nd and 4th weeks, the participants mainly had lectures and exercises on tsunamis, coastal vegetation, and other tsunami related issues. In the 3rd and 5th weeks, to learn tsunami countermeasures and the actual condition of local disaster mitigation in Japan, the participants visited two tsunami-prone areas, the Sanriku coast area and Kii peninsula, and interviewed local municipal personnel and residents. The participants were not only amazed to see gigantic structures, such as tsunami breakwaters and sea walls, but also overwhelmed by local people’s high awareness toward disaster mitigation. In the last week, they made presentations on their action plans, and the training ended successfully. This is the report of the course activities and its achievement.

Key Words: Training, Tsunami, Disaster prevention, UN/ISDR

Report on
"UN/ISDR Comprehensive Tsunami Disaster Prevention Training Course"

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- Lecture material 3 Tsunami Disaster Management based on “Local Disaster Management Plan” by Mr. Tanaka
- Lecture material 4 Improvement of local resilience to tsunami by Mr. Oshima
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- Lecture material 8 Tsunami Warning System in Japan by Japan Meteorological Agency
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- Field trip material 9 Introduction of Tsunami Disaster Countermeasures in Kii Peninsula Area
- Field trip material 10 Tsunami Countermeasures of Mie Prefecture
- Field trip material 11 Disaster Prevention Map in Ominato District
- Field trip material 12 Nishiki Tower in Taiki Town
- Field trip material 13 Tsunami Countermeasures of Owase City (in Japanese)
- Field trip material 14 Town Watching in Owase City
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- Participants’ material 1 the 1st Questionnaire
- Participants’ material 2 Country Report
- Participants’ material 3 Interim report
- Participants’ material 4 Country’s Action Plan on Tsunami Countermeasures
- Participants’ material 5 Final Report
- Participants’ material 6 the 2nd Questionnaire

Chapter 1. Background

The Indian Ocean Tsunami on 26th December 2004 caused about 230,000 casualties and enormous property damage to Indian Ocean countries. This huge loss is basically due to the lack of proper awareness and preparedness for tsunami disasters from national to local levels.

UN/ISDR is currently implementing a two-year project of the “Building Resilience to Tsunamis in the Indian Ocean” funded by the European Union to promote tsunami countermeasures in Indian Ocean countries. In those countries, it is needed to develop human resources who can manage tsunami countermeasures, such as structural measures, early warning systems and local disaster mitigation plans, etc.

Japan has a long experience with tsunami disasters, such as the 1896 Meiji Sanriku Tsunami with a casualty of 22,000, and has been making major efforts to enhance tsunami disaster prevention.

Under the circumstances, ICHARM has conducted the “UN/ISDR Tsunami Disaster Prevention Training Course” as one of the UN/ISDR projects from 2nd June to 11th July with the support of the Japan International Cooperation Agency (JICA) to make good use of Japanese experience of tsunami countermeasures for developing countries. There were 11 course participants from four countries, including India, Indonesia, the Maldives and Sri Lanka. They were section-chief-level government administrators and responsible for promoting tsunami disaster mitigation in their home countries.

This is the report of the course activities and its achievement.

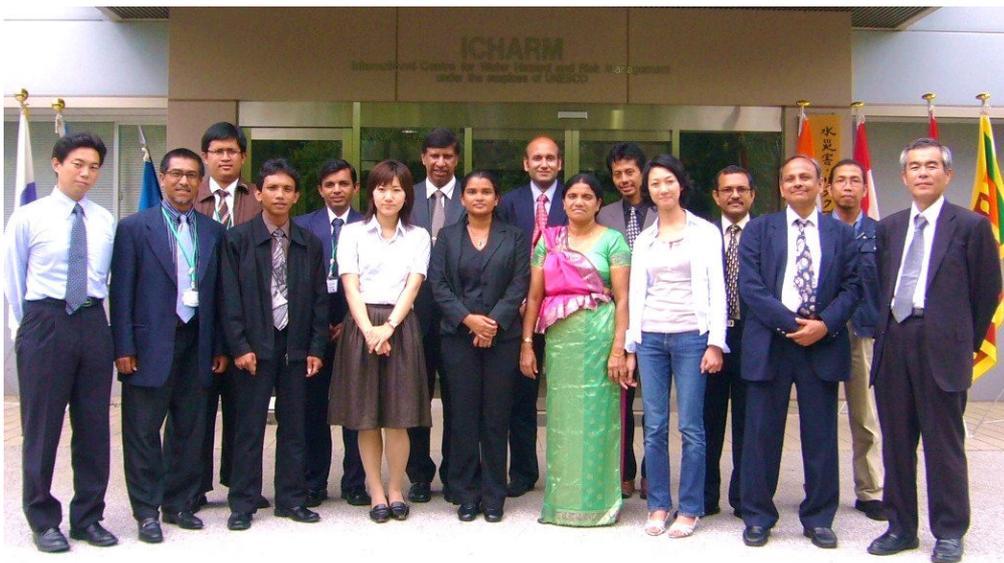


Photo 1-1 Participants and ICHARM staff in front of the ICHARM building after completing the training course

Chapter2: Preparation for the course

2. 1 Agreement between ICHARM and UN/ISDR

ICHARM submitted a “Project Proposal” to UN/ISDR for the “Building Resilience to Tsunamis in the Indian Ocean” project to conduct the training course. The proposal was adopted after evaluation. After the agreement between PWRI and UN/ISDR was concluded, ICHARM started preparation for the training course, and the course was successfully launched in June and ended in July 2008.

- Reference1 Agreement between UN/ISDR and PWRI (with Japanese translation)
- Reference2 Project Proposal (with Japanese translation)

2. 2 Deciding curriculum, lecturers and field trip destinations

Most of fiscal year 2007 was spent preparing for the course, framing curriculum, selecting and appointing lecturers, and arranging field trips.

Consulting with Prof. Fumihiko Imamura of the Disaster Control Research Center, Tohoku University, the curriculum was developed and lecturers were selected.

The contents of curriculum include not only lectures but also exercises about coastal vegetation, which would be useful for participants after going back to their country. The curriculum is shown in Table2-2-1.

To enhance the effectiveness of the course, field trips to two of the most tsunami-prone regions, the Sanriku coast area and Kii Peninsula, were scheduled to learn tsunami countermeasures in Japan. Each field trip was planned for one week, including meetings with prefectural and local municipal personnel in charge of disaster management. Main tsunami countermeasures in those areas are shown in Table 2-2-2.

- Reference3 Course Schedule
- Reference4 List of Lecturer

Table 2-2-1 Curriculum

Lectures	Lecturers (Affiliation)
Orientation	Shigenobu Tanaka (ICHARM)
Practice on “Project Cycle Management”	Shiro Tomioka (ICNet)
Basic viewpoints of disasters	Kuniyoshi Takeuchi (ICHARM)
Outline of tsunami, problem on numerical calculation	Nobuo Shuto (Nihon University)
History of tsunami forecast system in Japan	Nobuo Shuto (Nihon University)
Tsunami disasters around the world and lessons	Yoshinobu Tsuji (University of Tokyo)
Types of tsunami-induced disasters	Yoshinobu Tsuji (University of Tokyo)
Overview of tsunami countermeasures in Japan	Fumihiko Ohshima (Fire and Disaster Management Agency)
Local disaster management plan (including tsunami)	Shigenobu Tanaka (ICHARM)
Improvement of local resilience to tsunami	Yutaka Sato (Cabinet Office, Government of Japan)
Tsunami warning system in Japan	Japan Meteorological Agency
Activities for awareness raising including education	Shigenobu Tanaka (ICHARM)
Structural measures	Fuminori Kato (NILIM)
Lecture and discussion on coastal vegetation	Hideo Matsutomi (Akita University) Norio Tanaka (Saitama University)
Tsunami hazard mapping	Dinar Istiyanto (ICHARM)
Relief activities after disasters	Yoshihito Imai (International Recovery Platform)
Practice on coastal vegetation	Hideo Matsutomi (Akita University) Norio Tanaka (Saitama University) Shigenobu Tanaka (ICHARM)
Tsunami propagation mapping exercise	Dinar Istiyanto (ICHARM)
Google Earth database	Koji Fujima (National Defense Academy of Japan)
Utilization of Alos data	Takashi Moriyama (JAXA)
Town Watching	ICHARM
Country Report	
Action plan presentation	
Field Trip (Sanriku coast area , Kii Peninsula)	

Table 2-2-2 Main tsunami countermeasures
in municipalities of Sanriku coast area and Kii Peninsula

Category	Countermeasure	Location (additional information)
Structural measures	Tsunami embankment	Noda Village in Iwate, etc.
	Baymouth breakwater	Kuji City, Ohfunato City, Kamaishi City
	Sea wall	Taro in Miyako City, Hiro in Hirokawa Town (Goryo Embankment)
	Tsunami Watergate	Fudai Village in Iwate (Fudai Watergate), Iwaizumi Town (Omoto River Watergate) etc.
	Evacuation route	Taro in Miyako City, etc.
	Evacuation facility	Nishiki in Mie (“Nishiki Tower”), Kushimoto Town (Tsunami evacuation tower)
	Tsunami control forest	Taro in Miyako City, Takatamatsubara in Rikuzentakata City, Hiro in Hirokawa Town (Goryo Embankment)
	Mangrove forest	Okinawa
Non-structural measures	Tsunami forecasting /warning system	Japan Meteorological Agency
	Disaster management radio communications system	Many places in Japan
	Tsunami hazard map	Many places in Japan, including Owase City (Dynamic Tsunami Hazard Map)
	Building reinforcement	
	Land use planning	
	Group relocation	Funakoshi in Yamada Town (Before Meiji period) Touni in Kamaishi City, Osabe in Rikuzentakata City etc.
	Financial aid for block-fence removal	Kushimoto Town in Wakayama
Administrative Systems	Local disaster prevention plan	Mie Prefecture (Local Disaster Prevention Plan in March 2003) Kushimoto City (Kushimoto Tsunami Disaster Prevention Basic Plan in March 2006)
	Community organization	Nabama in Kamaishi City, Ohminato in Ise City, Ohmisaki in Kushimoto City etc.
	NPO activity	Mie Prefecture (Volunteer Information Center)

Disaster Prevention Education	Disaster prevention education / dissemination	Hirokawa Town (Tsunami Festival, “Inamura-no-hi”, Tsunami Educational Center) Taro in Miyako City (“Picture story show” by Yoshi Tabata (Born in 1925)) Kesenuma City in Miyagi (Disaster Prevention Education)
	Monument	Many locations in Sanriku coast area (After Showa Sanriku Tsunami) Aneyoshi in Miyako City (“Great Tsunami monument ”) Yuasa Town (Monument since Edo period)
	Tsunami experience	Karakuwa Town in Miyagi (Karakuwa Peninsular Visitor Center and Tsunami Experience) Hirokawa Town (Tsunami Educational Center)
	Evacuation drill	Many places in Japan
	Sign of past tsunamis	Ryori in Ohfunato City (“Tsunami height of 38.2m” on an electric pole) Taro in Miyako City (Tsunami height sign board) etc.
	Human resources development for disaster prevention	Mie Prefecture (Disaster Prevention Volunteer Coordinator), Wakayama Prefecture (“Kino-kuni Disaster Prevention School”)
	Municipal slogan	Taro in Miyako City (“The Town of Tsunami Disaster Prevention” (2003))

2.3 Selecting participants

In March 2008, “General Information,” which describes the qualification for applicants, was distributed to target countries by email, but the number of applications returned was not as many as expected. The application deadline was extended and re-announced thorough different personnel / organizations. As a result, a total of 11 participants –two from India, four from Indonesia, two from the Maldives and three from Sri Lanka— are selected.

- Reference 5 General Information on “Comprehensive Tsunami Disaster Prevention Training Course”
- Reference 6 Participant List

2.4 Press release

Before the course started, press releases were distributed to news agencies in Tsukuba.

- Reference7 Press Release

Chapter3: Contents

The activities of this training course from 2nd June to 11th July 2008 are reported as follows;

3. 1 First and second weeks

On 3rd June, an orientation meeting, an opening ceremony (Photo3-1-1,2,3,4) and party (Photo3-1-5) were held at ICHARM, and the course participants met ICHARM staff and trainees of other training courses. But two participants, Mr. Juriono and Dr. Teuku Alvisyahrin, could not attend them because of the delay of VISA issue.

Mr. Kaneko, director of the Training and Partnership Program Division of the Japan International Cooperation Agency (JICA), was invited to the opening ceremony to represent the main supporting organizations of this course. The ceremony was attended by many others, for example, Dr. Takeuchi, director of ICHARM, Dr. Jayawardena, research and training advisor, and Mr. Terakawa, deputy director of ICHARM, Mr. Setoshita and Ms. Saito of the Planning and Management Division of the Public Works Research Institute. Mr. Tanaka, team leader of the International Technical Exchange Team of ICHARM hosted the ceremony.

During the 1st and 2nd weeks, the participants mainly listened to lectures and worked on exercises on tsunamis, coastal vegetation, and other tsunami-related issues, The lecturers included Prof. Shuto (Nihon University), Associate Prof. Tsuji (Tokyo University), Dr. Kato (National Institute of Land and Infrastructure Management; NILIM), Team Leader Tanaka (ICHARM), Mr. Ohshima (Fire and Disaster Management Agency; FDMA) and a governmental officer from Cabinet Office, Government of Japan (Photo3-1-6,7,8,9).

In one class, they worked on “Project Cycle Management” exercises to learn how to think systematically about actual tsunami-related situations and issues and logically make “action plans”.

They also had an exercise on coastal vegetation instructed by Prof. Matsutomi (Akita University), Prof. Tanaka (Saitama University) and Team Leader Tanaka (ICHARM), as well as an exercise on tsunami hazard mapping by Dr. Dinar (ICHARM) (Photo3-1-10,11,12).

The participants received a lecture on “Tsunami warning system in Japan” at the Japan Meteorological Agency and visited its forecasting room. During the visit, an earthquake occurred in Nagano Prefecture, and they had a rare opportunity to witness an actual example of earthquake information dissemination (Photo3-1-13).

They also visited an experimental facility called “Giant Geo-Wave and Tsunami Experiment Flume” at the Port and Airport Research Institute (PARI) in Yokosuka. The facility generated 3.5-meter-high waves, which easily destroyed a 10-cm-thick concrete wall. The experiment reminded the participants of how destructive tsunami energy could be (Photo3-1-14,15).

Lecture materials below are compiled in the attached DVD-ROM.

- Reference8 Agenda of Opening Ceremony
- Lecture material 1 Outline of Tsunami, Problem on Numerical Calculation, History of Tsunami Forecast System in Japan by Prof. Shuto
- Lecture material 2 Tsunami disasters around the world and Lessons, Types of tsunami-induced disasters by Ass. Prof. Tsuji
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- Lecture material 8 Tsunami Warning System in Japan by Japan Meteorological Agency
- Lecture material 9 Activities for awareness raising including education by Mr. Tanaka
- Lecture material 10 Tsunami propagation mapping exercise by Dr. Dinar



Photo 3-1-1 Participants of the opening ceremony
(Mr. Juriono and Dr. Teuku Alvisyahrin couldn't attend)



Photo3-1-2 Opening ceremony



Photo3-1-3 Mr. LALLOO PRASAD SONKAR (India) makes greeting address as the representative of the participants.



Photo 3-1-4 with the students of “Disaster management policy program”



Photo3-1-5 Opening party at ICHARM entrance hall



Photo3-1-6 Lecture by Prof. Shuto



Photo3-1-7 Lecture by Associate Prof. Tsuji



Photo3-1-8 Lecture by Mr. Ohshima (FDMA)



Photo3-1-9 Lecture by Mr. Tanaka (ICHARM)



Photo3-1-10 Lecture by Prof. Matsutomi



Photo3-1-11 Lecture by Prof. Tanaka



Photo3-1-12 Exercise on coastal vegetation



Photo3-1-13 Japan Meteorological Agency



Photo3-1-14 Meeting with Group Leader Hiraishi
at PARI



Photo3-1-15 “Giant Geo-Wave and Tsunami
Experiment Flume” at PARI

3.2 Third week (Field trip in Sanriku coast area)

During the 3rd week, the participants visited the Sanriku coast area, one of the tsunami-prone areas in Japan, to conduct on-sight surveys and interviews to local residents and municipal personnel in charge of disaster mitigation. The visit sites are shown as follows;

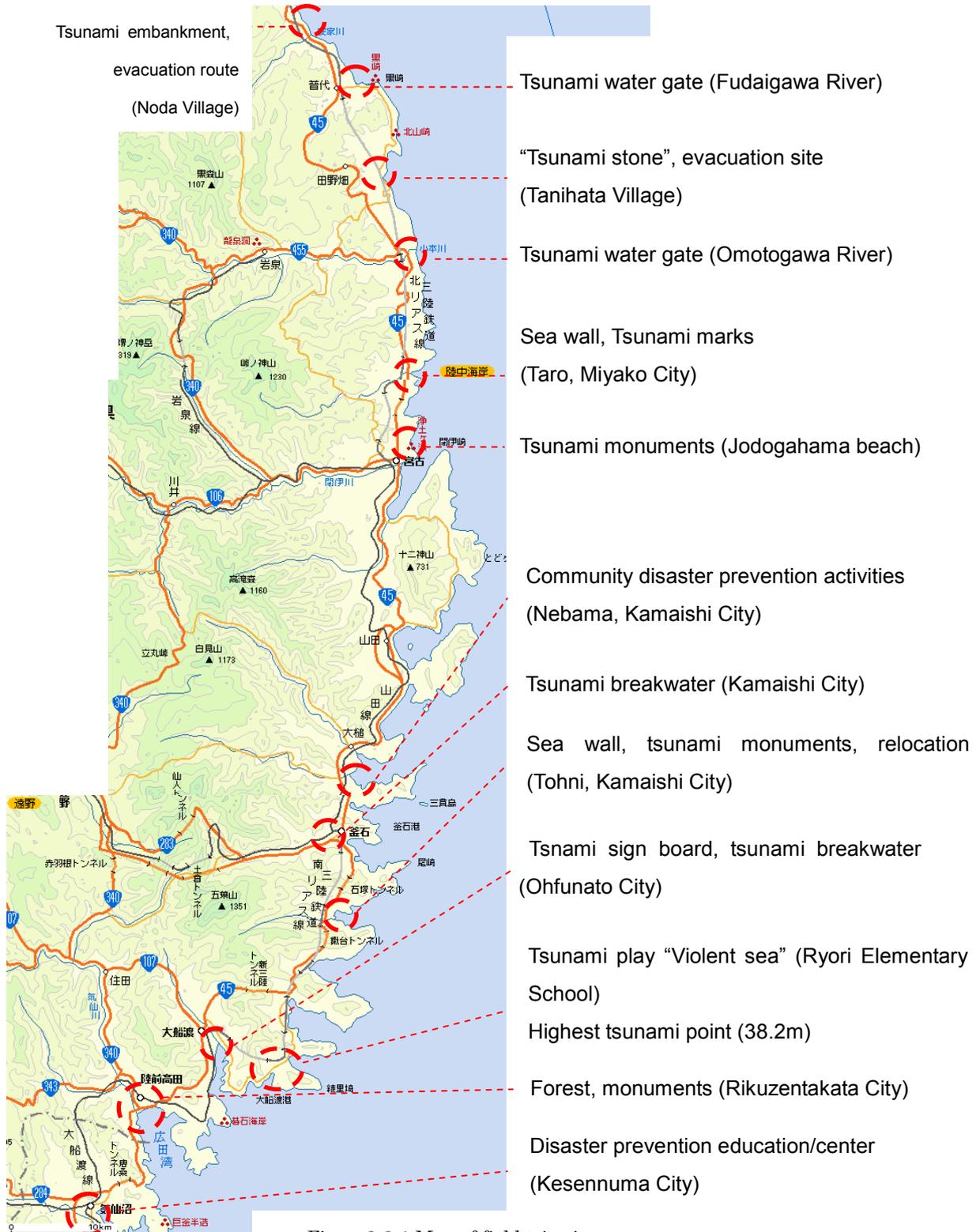


Figure3-2-1 Map of field trip sites

In Fudai Village, disaster management personnel explained the outline of the local tsunami water gate (Photo3-2-1) and kindly demonstrated the closing of the gate (Photo3-2-2). After visiting a tsunami embankment (Photo3-2-3) and evacuation route (Photo3-2-4) for workers in the fishing port in Noda Village, they visited Tanohata Village to see “Tsunami Stone” and a temporal evacuation site (Photo3-2-6). The stone was said to have been washed ashore by the Meiji-Sanriku Great Tsunami (Photo3-2-5). They were not only amazed to see gigantic tsunami structural countermeasures such as a tsunami water gate at the mouth of the Omoto River (Photo3-2-7), embankment and sea walls in Taro District (Photo3-2-8), tsunami breakwaters in Kamaishi (Photo3-2-9) and Ofunato, but also realized the importance of passing on tsunami experiences to the next generation by tsunami marks (Photo3-2-10) and building tsunami monuments (Photo3-2-11,12).

During the on-sight survey, the participants exchanged opinions with the residents and municipal personnel about disaster mitigation activities to raise public awareness. Miyako City personnel said, “Despite the fact that there is no volunteer disaster prevention organization in Taro, the awareness level is very high. The awareness level is not always correlated to the number of volunteer disaster management organizations.” (Photo3-2-13)

A community leader of Nebama, Kamaishi City, explained how hard they were working to raise awareness of residents who had no experience of tsunami disasters (Photo3-2-14). And in Touni District, Kamaishi City, an old lady told her experience of the Showa Sanriku Tsunami, after which residents had to relocate to higher ground (Photo3-2-15).

In Ohfunato City, the participants visited the highest tsunami point marked by the Meiji-Sanriku Great Tsunami (Photo3-2-16) and also Ryori Elementary School. The principal and the former principal of the school explained about disaster prevention education at school. The participants were particularly impressed with a play entitled “Violent Sea,” written by the former principal (Photo3-2-17). The play is so educational that not only students but also parents can learn about tsunamis through the involvement in its production. Deputy Director of the Disaster Prevention Division of Ohfunato City Hall explained about their disaster management radio communications system and maps designed for sea workers and tsunami sign boards (Photo3-2-18).

After visiting Takatamatsubara, a pine-tree forest also working as tsunami control forest (Photo 3-2-19), the participants listened to personnel of Kesenuma City Hall, who emphasized the importance of disaster prevention education (Photo3-2-20). In the Kesenuma/Motoyoshi Disaster Prevention Center, fire fighting personnel talked about the importance of educating people about disaster preparedness (Photo3-2-21).

The field trip to Fudai Village was reported in a local newspaper, “Iwate Nippo,” and the field trip to Ryori in Ohfunato City was broadcasted on NHK (Japan Broadcasting Corporation) Iwate.

Tsunami countermeasures are described in detail in the attached field trip material 1 “Introduction of Tsunami Disaster Countermeasures in Sanriku Coast Area”.

All field trip materials below are compiled in the attached DVD-ROM.

- Reference 9 Schedule of the On-sight Survey on Sanriku Coast Area
- Reference 10 Article on the On-sight Survey in Fudai Village

- Field trip material 1 Introduction of Tsunami Disaster Countermeasures in Sanriku Coast Area
- Field trip material 2 Tsunami Countermeasures of Iwate Prefecture
- Field trip material 3 Tsunami Hazard Map in Fudai Village
- Field trip material 4 Restoration of a fishing village and efforts to make Miyako city tsunami-resistant
- Field trip material 5 Activities on Education for tsunami disaster mitigation in Ryori Elementary School
- Field trip material 6 Outline of Earthquake and Tsunami Disaster Countermeasures in Ofunato City
- Field trip material 7 Tsunami Hazard Map in Rikuzentakata City
- Field trip material 8 Tsunami Countermeasures in Kesenuma City



Photo3-2-1 Tsunami Watergate in Fudai village



Photo3-2-2 Demonstration of the gate closing



Photo3-2-3 Tsunami embankment being built in Noda village



Photo3-2-4 Evacuation route near Noda fishing port



Photo3-2-5 "Tsunami Stone" in Tanohata Village



Photo3-2-6 Evacuation site near Shimanokoshi St.



Photo3-2-7 Water gate at the mouth of the Omoto River



Photo3-2-8 On the Taro sea wall



Photo3-2-9 Tsunami breakwaters in Kamaishi



Photo3-2-10 In front of tsunami marks in Taro



Photo3-2-11 Tsunami monument at Jodogahama-beach in Miyako



Photo3-2-12 Three Tsunami monuments standing next to one another (Touni in Kamaishi)



Photo3-2-13 Mr. Yamazaki, Officer of Risk Management Section of Miyako city



Photo3-2-14 Opinion exchange with a community leader of Nebama, Kamaishi City (at Horaikan)



Photo3-2-15 Listening to a resident in Touni District, Kamaishi City



Photo3-2-16 Highest Tsunami point in the main land of Japan (Ryori, Sanriku town)



Photo3-2-17 Principal Suzuki of Ryori Elementary School



Photo3-2-18 Deputy Director of Disaster Prevention Division of Ohfunato City Hall



Photo3-2-19 Takatamatsubara



Photo3-2-20 Mr. Sato, Director of Risk Management
Division of Kesennuma City



Photo3-2-21 Mr. Yoshida, Fire fighting assistant
commander of Kesennuma/Motoyoshi Disaster
Prevention Center

3. 3 Fourth week

During the 4th week, the participants paid a courtesy visit to Dr. Sakamoto, chief executive of PWRI (Photo3-3-1). They also had lectures by Mr. Imai (Asian Disaster Reduction Center) about restoration assistance as well as Ms. Matsuoka (UN/ISDR) and exercise for database practices with Google Earth by Prof. Fujima (National Defense Academy of Japan) (Photo3-3-2,3). The participants visited the Japan Aerospace Exploration Agency (JAXA) and attended a lecture on the utilization of ALOS data by Dr. Moriyama (Photo3-3-4).

The participants also had a chance to enjoy a taste of the Japanese culture. ICHARM office staff gave a demonstration of Japanese tea ceremony (Photo3-3-5).



Photo3-3-1 Courtesy visit to Dr. Sakamoto,
Chief executive of PWRI



Photo3-3-2 Google Earth practice with Prof. Fujima



Photo3-3-3 Lecture by Mr. Imai



Photo3-3-4 JAXA



Photo3-3-5 Japanese tea ceremony

3. 4 Fifth week (Field trip in Kii Peninsula)

During the 5th week, the participants visited Kii Peninsula, another tsunami-prone area in Japan. In the Sanriku area, the first tsunami wave is predicted to come in several tens of minutes in case of anticipated earthquake, but in Kii Peninsula, within 10 minutes. With that prediction in mind, they conducted on-sight surveys and interviews with local residents and disaster management personnel to investigate their awareness levels and disaster prevention activities. The visit sites are shown as follows;



Figure3-4-1 Map of field trip sites

In Mie Prefecture, they also listened to a lecture on how the prefecture prepares for the anticipated earthquake and tsunamis (Photo3-4-1). In Ise City, to learn the importance of raising public awareness at the community level, the participants had a chance to listen to a community leader of Ominato District speaking about the history of the district's voluntary activities, including the production of their original disaster prevention maps (Photo 3-4-2). At Futami-Okitama Shrine, they attended another lecture on an evacuation drill which was specifically implemented for tourists in September 2008 (Photo3-4-3).

They then visited a temporary emergency shelter called "Nishiki Tower" in Nishiki District, Taiki Town. In the exhibition room of the five-story tower, an old wall clock with a trace of the 1944 Tonankai Tsunami is exhibited. The bottom half of the clock shows a different color from its top half, giving visitors an idea of how high a tsunami wave had reached at that time (Photo3-4-4,5).

In Owase city, the participants conducted a "Town Watching" exercise. They walked around the city in three groups, investigating possible problems in emergency evacuation, checking the actual conditions of disaster prevention facilities, etc (Photo 3-4-6,7,8). After discussing the findings from the exercise, they produced and presented their original maps based on the discussion results in front of Owase city personnel (Photo 3-4-9). The participants contributed to the improvement of the city's disaster mitigation plan through this "Town Watching" exercise. And during Town Watching, Mr. Yamanishi, who experienced the Tonankai Earthquake Tsunami in 1944 and now is a community leader, gave a lecture on the improvement of public awareness toward disaster prevention in his community (Photo 3-4-10).

After Owase, the participants moved to Kushimoto Town for a lecture and on-site survey on a tsunami evacuation tower (Photo3-4-11) and an evacuation route made by a voluntary disaster management group in Omisaki District (Photo-3-4-12). A Maldivian participant said that this kind of tower would be helpful in the Maldives because there was no mountain to evacuate to there.

A lecture on tsunami countermeasures for tourists was given in Shirahama Town. Three million tourists visit the famous "Shirara-hama" beach every year, so it is important to make an evacuation plan specifically designed for tourists. During discussion with disaster management personnel in Shirahama, one of the participants pointed out possible disadvantage of informing of countermeasures against tsunami as tourists may want to avoid this risky area but other gave an opinion that well-prepared countermeasures will make tourists think the area is rather safe (Photo3-4-13).

The final destination of the field trip was Hirogawa Town. The town is famous as the home of Goryo Hamaguchi. "Inamura-no-Hi," a story in which the main character, Gohei, saved people from tsunamis, was modeled after Goryo. The participants visited the town to see "Goryo Embankment" (Photo3-4-14) and attended a lecture by the director of "Inamira-no-hi Museum" on how Goryo led the response and rehabilitation efforts after the tsunami. They also had a chance to watch the 6th grade students of Hiro Elementary School read aloud the "Inamura-no-hi" story (Photo3-4-15) and the 5th grade students attend a class on disasters and disaster preparedness (Photo3-4-16). The

participants were very interested in disaster prevention education in the elementary school.

Articles about the lecture and Town Watching in Owase City appeared in several newspapers such as “Mainichi Shinbun”, “Ise Shinbun”, “Chunichi Shinbun” and “Nankai-nichinichi Shinbun” and NHK Mie also broadcasted the activities in local news.

Tsunami countermeasures are described in detail in the attached field trip material 9 “Introduction of Tsunami Disaster Countermeasures in Kii Peninsula Area”.

All field trip materials below are compiled in the attached DVD-ROM.

- Reference 11 Schedule of the On-sight Survey on Kii Peninsula Area
- Reference 12 Article on the On-sight Survey in Owase City

- Field trip material 9 Introduction of Tsunami Disaster Countermeasures in Kii Peninsula Area
- Field trip material 10 Tsunami Countermeasures of Mie Prefecture
- Field trip material 11 Disaster Prevention Map in Ominato District
- Field trip material 12 Nishiki Tower in Taiki Town
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- Field trip material 16 Activities on Education for disaster mitigation in Hiro Elementary School (in Japanese)
- Field trip material 17 “Inamura-Moyu” (Biography of Mr. Goryo Hamaguchi)



Photo3-4-1 Lecture by Officer of Mie Prefecture



Photo3-4-2 An Ominato community leader explains their original disaster prevention map.



Photo3-4-3 Participants listen to an explanation of a evacuation plan at Futami-Okitama Shrine.



Photo3-4-4 Nishiki Tower



Photo3-4-5 The old wall clock shows a trace of a tsunami which reached its bottom half



Photo3-4-6 Town Watching in Owase City



Photo3-4-7 Town Watching in Owase City



Photo3-4-8 Group discussion



Photo3-4-9 Presentation



Photo3-4-10 Lecture by Mr. Yamanishi, Community Leader

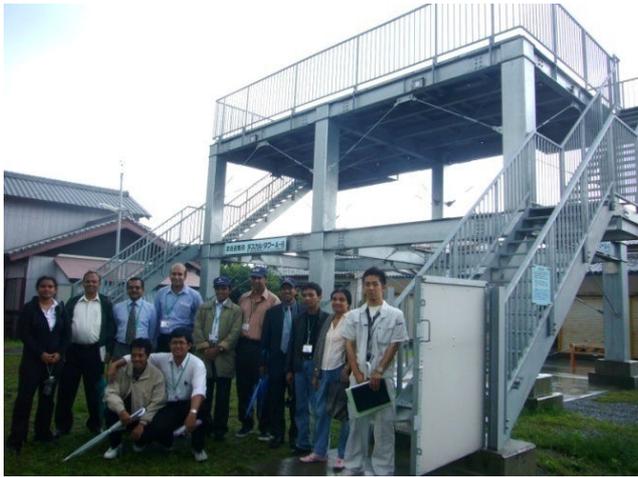


Photo3-4-11 Temporary evacuation tower in Kushimoto Town



Photo3-4-12 Evacuation route in Omisaki District, Kushimoto Town



Photo3-4-13 Shirarahama beach in Shirahama



Photo3-4-14 on "Goryo Embankment"



Photo3-4-15 6th grade students of Hiro Elementary School read aloud "Inamura-no-hi"



Photo3-4-16 Class on disaster preparedness for 5th grade students of Hiro Elementary School

3. 5 Sixth week

During the last week of the training course, the participants worked and made presentations on their action plans considering the differences between Japan and their countries (Action plans are shown next chapter).

At the night before the last day, a closing party was held with other participants of ICHARM at JICA Tskuba. Each country group sang songs of their own country, and everybody had a very good time (Photo3-5-1).

In the closing ceremony, Dr. Ono, program officer of UN/ISDR, gave a closing remark, and Dr. Takeuchi, director of ICHARM, presented the course certificates to each participant (Photo3-5-2). Then, three “ICHARM AWARDS” were given to Dr. Teuku from Indonesia for achieving the best result (“Achievement Award”), Mr. Sonkar from India for cooperating well with other people (“Cooperation Award”) and Mr. Didi from the Maldives for contributing to smooth operation of the course (“Contribution Award”).

At last, the representatives of the participants’ countries expressed their determinations, and the course ended successfully.

- Reference 13 Agenda of Closing Ceremony
- Reference 14 Template of Certificate



Photo3-5-1 A closing party at JICA Tsukuba



Photo3-5-2 ICHARM Director Takeuchi hands out a course certificate to a participant



Photo3-5-3 Participants and ICHARM staff smile for a picture in front of the ICHARM main entrance

Chapter 4: Report by participants

4.1 Questionnaire before starting the course

On 3rd June, the first day of the course, questionnaires were distributed to the participants during the course orientation to see each participant's understanding level. The questionnaires were collected within that week.

The following shows questions in the questionnaire:

Contents of the 1st Questionnaire

1. Why do we use "Comprehensive" for the name of training course?
2. Though a big earthquake will not occur so frequently at a place, why do we tackle tsunami countermeasure just after the big earthquake?
3. Why are there plural participants from a country?
4. What do you want to achieve in this training course?

Please consider about "Disaster Prevention" from the beginning.

1. What is important in "Disaster Prevention" so that everything goes well? In other words, what is the necessary factor in "Disaster Prevention"?
2. Who is responsible for "Disaster Prevention"?

The results of the questionnaire are discussed in Chapter 5.

The answers from the participants are compiled in the attached DVD-ROM as Participants' material 1.

4.2 Country report presentation

At the beginning of the course, on 6th June, in order to share current situations and problems of tsunami disaster prevention in the participants' countries, each of them gave a 30-minute presentation titled "Overviews and Problems about Tsunami Disaster Prevention in Our Country".

The "Project Cycle Management" practice was scheduled in the same week of the presentations so that the participants can learn to analyze problems in their countries logically to make presentation materials.

Each country's presentation materials are compiled in the attached DVD-ROM as Participants' material 2.

4.3 Interim report

After the field trip to Sanriku coast area in 3rd week, the participants were required to submit an interim report to see what they had learned since joining the course.

Contents of Interim Report

1. General impression on tsunami countermeasures in Japan
(based on lectures, hands-on practice, on-sight survey, Include the feasibility of the countermeasures in your country.) **【About 1page】**
2. Outline of your action plan for promoting tsunami countermeasures in your country after this training course**【About 1page】**
3. Your comment to improve this course (schedule, curriculum, lecturer etc.)**【0.5~1page】**

Each participant delivered a 10-minute presentation on his/her interim report on 24th June.

The contents of the reports are discussed in Chapter 5.

The interim reports submitted are compiled in the attached DVD-ROM as Participants' material 3.

4. 4 Action plan

During the last week of the course, on 9th July, the participants presented "Country's Action Plan on Tsunami Countermeasures" for 60 minutes each, which they are thinking of proposing in their country after completed the course.

The contents of the action plans are shown in the next page.

The contents of the action plans are discussed in Chapter 5.

The action plans are compiled in the attached DVD-ROM as Participants' material 4

Contents of “Country’s Action Plan on Tsunami Countermeasures”

1. **Review of tsunami countermeasures in your country** (including figures, tables and photos)
 - 1.1 Major improvement on tsunami countermeasures after 2004 Indian Ocean Tsunami 【0.5～1page】

(for example:
“There was no awareness of tsunami before the Indian Ocean Tsunami, however...”,
”They thought that the government should improve social welfare rather than disaster mitigation, however...”, etc.

Further, please describe cooperation system in emergency like self-help, mutual-support and public assistance in Japan
 - 1.2 Review of the latest tsunami countermeasures in your country on each item below. If there were any big change after the Indian Ocean Tsunami, please describe.
 - a) Legal institutions, Basic plan for disaster mitigation【1～1.5page】
 - b) Organizations, Systems including emergency response 【1～1.5 page】
 - c) Structural measures【1～1.5 page】
 - d) Non-structural measures【1～1.5 page】
 - e) Restoration【1～1.5 page】
 - f) Education and succession of disaster experience 【1～1.5 page】
2. **Impression of tsunami countermeasures in Japan** (including figures, tables and photos)
 - 2.1 What are the valuable point and the weak point in tsunami countermeasures in Japan? 【1page】
 - 2.2 What is the most impressive/interesting activities for tsunami disaster in Japan?【0.5-1page】
 - 2.3 What is the difference between activities for tsunami disaster in Japan and those in your country? 【0.5-1 page】
3. **Proposal activities for tsunami disaster mitigation in your country based on knowledge from this training course** (including figures, tables and photos)
 - 3.1 Problems of tsunami countermeasures in your country【1～1.5 page】
 - 3.2 Your proposal activities for tsunami disaster mitigation in your country (including the tree diagram made in PCM practice)【1～1.5 page】

(including activities by each participant)
 - 3.3 Time schedule of your proposal activities 【1～1.5 page】

4. 5 Final report

The participants worked on final reports to complete the course. Based on each country's action plan, they had to clarify their roles and schedule in terms of tsunami countermeasure implementation.

The final reports needed to contain the following:

Contents of "Final Report"

"Action Plan" - to improve/promote tsunami countermeasures in your country –

1.1 Please show which parts of the country's action report you are going to carry out and your concrete ideas for tsunami disaster mitigation.

(Please use the tree diagram made in PCM practice) 【1-1.5page】

1.2 Please draw your schedule of your action plan after returning to your country.

- By 30th October 2008
- Within one or two year(s) 【1-1.5page】

The final reports submitted by the participants are compiled in the attached DVD-ROM as Participants' material 5.

4. 6 Questionnaire after completing the course

On the last day of the course, 10th July, Course Evaluation was conducted to get feedbacks (opinions and requests) regarding the course from the participants. Questionnaires are also given to them to assess their achievement through the course.

The contents of the questionnaire are as follows:

Contents of the 2nd Questionnaire

1. Please answer following questions.

- 1-1. Though a big earthquake will not occur so frequently at a place, why do we tackle Tsunami countermeasure just after the big earthquake?
- 1-2. What did you learned from two on-sight surveys (Sanriku Coast Area and Kii Peninsula)? What do you think the difference between the two areas regarding Tsunami countermeasures?
- 1-3. What is the necessary factor in "Tsunami Disaster Prevention"?

- 1-4. What have you achieved in this training course?
2. Your comments/suggestions about Japanese activities for tsunami disaster mitigation including emergency response at an occurrence of disasters
3. Your comment to improve this course (Schedule, Curriculum, Lecturer etc.

The contents of the questionnaire are discussed in Chapter 5.

The answers of the questionnaire are compiled in the attached DVD-ROM as Participants' material

6.

Chapter 5: Evaluation on project achievement and further necessary activities

Generally speaking, it is hard to judge whether the purposes of this training have been achieved immediately after completion of the course. However, efforts were made to provide immediate evaluation based on several documents prepared for this purpose. Those documents include several reports and participant responses to the questionnaires that were distributed during the course. Those questionnaires and reports were compiled and provided in the previous chapters.

Three different kinds of evaluation were arranged during the course. The first one was to evaluate the participants' understanding on the course objectives and their perceptions about disaster prevention before and after the training course. The second was evaluation on the participants' action plan for the implementation of comprehensive tsunami disaster countermeasures after returning to their home countries. The last one was to evaluate perceptibility of indicators realization in each expected result.

It is hoped that the present evaluation makes positive input for the betterment of similar project in the future and for giving direction in monitoring activities of program implementation in the target countries.

5. 1 Participants' understanding before and after training course.

Participants' understanding on the course objectives and knowledge about disaster prevention before and after the training course were evaluated by using two questionnaires distributed to the course participants at the beginning and end of the course. This section discusses the participants' understanding level, quoting typical answers given by the participants on each question. The complete answers on each question are provided in the previous chapters.

5. 1. 1 Participants' understanding on the course objectives.

Two questions were given to confirm the participants' understanding about the scope of the course as well as its objectives and purposes. Those questions and their typical answers for each question are quoted below. (*Note: Q = question; A = answer*).

Q: *Why do we use "Comprehensive" for the name of training course?*

A:

- Because it covers the overall aspects of tsunami disaster management such as structural measure, early warning systems, disaster management plans, by way of a series of lecture, exercises, site visits and etc. (Mr. Ujjwal Kumar/India)
- Because it covers the entire aspects of tsunami disaster management which include tsunami early warning system, structural measures, management plans, tsunami simulation, etc. (Dr. Teuku Alvisyahrin/Indonesia)
- The word "comprehensive" means more complete and concrete and also focused training. The course

objectives and course curriculum covers key aspects of tsunami prevention and includes theory as well as practical exposure to tested tsunami countermeasures (Mrs. Rilweena Asiath/Maldives)

- Because this training course included the necessary all factors connected with tsunami disaster (e.g. disasters mitigation, pre planning, emergency operation, standard operation procedure) (Mrs. Jayasundara/Sri Lanka)

Q: Why are there plural participants from a country?

A:

- Because, to tackle hazard like tsunami, different people work at different areas, therefore it is difficult for a single person to have enough knowledge about all the activities of Tsunami relief, prevention and rehabilitation (Mr. Laloo Prasad Sonkar/India)
- Because they represent different institutions at the national and local levels who will play an important role in improving the efficiency of tsunami disaster management upon their return to their home country. (Dr. Teuku Alvisyahrin /Indonesia)
- I believe the rationale behind inviting plural participants from each country is to build in country coping capacity as well as to be able to provide & share & learn from different aspects of disaster management. Also this enables the formulation of a more feasible & realistic action plans (Mrs. Rilweena Asiath /Maldives)
- Because these participants, working in different organizations, are in a position to adopt what they learned and experienced in a better way as a group (Mr. Jayawardana/Sri Lanka)

Based on their responses, it can be concluded that in general the course participants have good understanding about the scope of the course as well as its objectives and purposes. Whether they understand the purposes of the course is very important for them to be effectively involved in the subsequent training activities.

In order to get an idea about their personal intentions of participating in the course, the following question was given to the participants:

Q: What do you want to achieve in this training course?

Regarding this question, the course participants gave diverse responses as seen in the following examples:

A:

- Understand kind activity to aspect of disaster prevention based on multi aspect of scientific study, it will also enable me to formulate activity which acceptable and applicable by community and also make me more concern to be involve in the area of community preparedness in the future (Mr. Juriono/Indonesia).
- We can make action plan to aplicate and to integrate tsunami program in my countries (Mr. Weka Mahardi/Indonesia)
- I want improve my knowledge in the field of disaster management and serve the people more effectively. Japan is the most experienced country in this field and I hope to achieve this goal. (Mr. Murthala Didi/Maldives)
- Gain and sharing of knowledge and experience from other countries specially in Japan (Mr. Palitha Bandara/Sri Lanka)

The participants' intentions can be summarized as:

- ◆ **To gain and share knowledge and experiences with other countries**

- ◆ **To learn Japanese technology and get lessons from their experiences in developing tsunami disaster prevention systems**
- ◆ **To use knowledge for better disaster management practices in their home country.**

5. 1. 2 Participants' perceptions about disaster prevention; before the training course.

In regard with their understanding about basic factors in tsunami disaster prevention, three questions were asked to the participants at the beginning of the course. The questions and their several characteristic responses are quoted as follows.

Q: What is important in "Disaster Prevention" so that everything goes well? In other words, what is the necessary factor in "Disaster Prevention"?

A:

- 1) Awareness and education of hazard, 2) Better governance, 3) Early warning system to be set up, 4) Protective measures such as soft measure like plantation of mangroves, Bio-shields and hard measures like sea wall, groynes, 5) Study for forecast of hazard are also important. (Mr. Laloo Prasad Sonkar/India)
- Main factor in disaster prevention is knowledge for community to understand about disaster, how to save themselves, etc. Next are all tools or Infrastructure that will support to decrease casualty if disaster happen. (Mr. Juriono/Indonesia)
- For developing country (Indonesia), Prevention efforts that can be done realistically are: Arising awareness of community to disaster ; Making a green protection (Mangrove, Palm tree, etc) (Mr. Wisyanto/Indonesia)
- Awareness and good governance is an important factor of disaster prevention. Softmeasures however must be matched by counteractive structural measures as well as good governance. Strong institutional structure and legal framework as well as a political will to be committed to disaster prevention play a critical role. However, prior to disaster early warning and awareness are the most important facts. (Ms. Rilweena Asiath/Maldives)
- Increase of coping capacity, vulnerability reduction, and exposure reduction (Mr. Palitha Bandara/Sri Lanka)

Q: Who is responsible for "Disaster Prevention"?

A:

- "Government" is mainly responsible for disaster prevention. However, the role and attitude of people likely in the disasters prone area is also equally important. Once the disaster prevention measures are in place, it is the people who have to be really vigilant in case of occurrence of disaster. (Mr. Ujjwal Kumar/India)
- Government have main responsibility for all activity for disaster prevention, they have duty to protect their people live in save, but, others component in community should help and support government to participate in disaster prevention (Mr. Juriono/Indonesia)
- Every member of the community, from country leaders, policy makers down to a single individual in the community. Disaster prevention needs an integrated effort with stakeholders clearly understanding their respective roles. (Dr. Teuku/Indonesia)
- All components of Nation, that is government and community that lives in the disaster prone area. (Mr. Wisyanto/Indonesia)
- Disaster prevention is not responsibility of one person or one institution. On individual level, people should try to educate themselves and prepare themselves for possible disasters. At the state level governments are responsible to make the provide safer homes, make better provision of relief efforts and in a more coordinated way. Government's responsibility is more in disaster prevention as they often have access to the resources and manpower. (Mrs. Rilweena Asiath/Maldives)
- Everyone collectively including government and people (Mr. Murthala Didi/Maldives)

- All of us, specially people has to be alert to the disasters. Also governs has to take proper action for prevent disasters. (Mrs. Jayasundara/Sri Lanka)
- Specially the government of the country is responsible for Disaster Prevention. As citizens people in the country also have a responsibility to participate actively in Disaster Prevention. (Mr. Jayawardhana/Sri Lanka)

Based on the answers to the two questions, it is clear that the participants' understanding on the important factors of disaster prevention were considerably diverse. However, there were two commonly emphasized factors: awareness and availability of defense or protection structures. For the question on "who is responsible for disaster prevention?" all the participants mentioned the governments as the core in disaster management as well as active participation of the community. These understandings are of great help to achieve the objective of the course.

The third question and their all answers are quoted as follows.

Q: Though a big earthquake will not occur so frequently at a place, why do we tackle Tsunami countermeasure just after the big earthquake?

A:

- Big earthquake causes loss of human lives, loss of property, impact the economy of the country, therefore tsunami countermeasures are taken to avoid the occurrence of such situation / event. (Mr. Laloo Prasad Sonkar/India)
- Before the Indian Ocean Tsunami, 2007 (2004?), the terminology "Tsunami" was not heard or understood frequently. It was the disaster of 2007 (2004?) that woke up people and the government alike to tackle this deadly natural hazard. (Mr. Ujjwal Kumar/India)
- Before this, we don't know what is earthquake or tsunami is, and we don't have any experiences how to countermeasures earthquake or tsunami, after this training we have knowledge what should we do or prepare to decrease damages caused by earthquake or tsunami (Mr. Juriono/Indonesia)
- Because a big earthquake has a high potential for tsunami to occur and be destructive (Dr. Teuku Alvisyahrin/Indonesia)
- Interval period of a big tsunami in a same place occurs in a long time (pass >1 generation). So for generation that is not suffered the disaster, they don't care with it. But it would not happen nowadays, because all information can be access easily. So every generation will be reminded by disasters that occur in other place (country). (Mr. Wisyanto/Indonesia)
- Cause of usually the big earthquake (mainly source on the bottom of sea) can generate a huge tsunami. Countermeasure is necessary to decrease victim (Mr. Weka Mahardi/ Indonesia)
- Due to the remoteness / and distant between large and destructive tsunamis government often tend to give more priority to other urgent matters as tsunami countermeasures can be costly & time consuming. In countries which are more prone to disasters and disasters occur more frequently, disaster preparedness as well as tsunami countermeasures are given more priority.(Mrs. Rilweena Asiath/Maldives)
- This is to reduce damage to lives and property when disaster is happened in the future. Also losses are felt more just after the tsunami when previous efforts are exposed and destroyed. (Mr. Murthala Didi/Maldives)
- There is a possibility to occur a tsunami after a big earthquake. (Mrs. Jayasundara/Sri Lanka)
- Possibility is high to occur a tsunami after a big earthquake, therefore tsunami countermeasures are necessary. (Mr. Jayawardhana/Sri Lanka)
- There is a possibility to occur a tsunami just after a big earthquake (Mr. Palitha Bandara/ Sri Lanka)

The above question of "Though a big earthquake will not occur so frequently at a place, why do we tackle tsunami countermeasure just after the big earthquake?" contains two crucial points. The

first is the importance of taking countermeasures even if the tsunami disaster recurrence is low (long-term preparedness). The second is the importance of conducting disaster identification immediately after an event. Accurate identification of the disaster situation, especially the causes of damages and calamities enables appropriate formulation of disaster mitigation in the future. This identification and information collection must be conducted as soon as possible before the field facts disappear and the memories of the witnesses fade away along with the passing of time. Complete and accurate information on the previous disaster situation are very valuable to educate communities and improve their understanding about the importance of taking countermeasures to reduce disaster risk at present and in the future. This understanding will also increase the individual as well as community awareness levels.

Unfortunately, the participants' answers show that they did not fully understand the intention of the question. Only about 30% of the participants mention the importance of taking long-term countermeasures for tsunami disaster: no one mention anything about the importance of conducting disaster identification immediately after an event.

5. 1. 3 Participants' perceptions about disaster prevention; after training course.

The second questionnaires were distributed at the end of the course to evaluate if there are any changes on the participants' perception regarding disaster prevention or if they were benefited in any way from this training course. The related questions are listed as follows:

- Though a big earthquake will not occur so frequently at a place, why do we tackle Tsunami countermeasure just after the big earthquake?
- What did you learned from two on-site surveys (Sanriku Coast Area and Kii Peninsula)? What do you think the difference between the two areas regarding Tsunami countermeasures?
- What is the necessary factor in "Tsunami Disaster Prevention"?
- What have you achieved in this training course?

The first question was asked in the first questionnaire, too. For this question of "*Though a big earthquake will not occur so frequently at a place, why do we tackle Tsunami countermeasure just after the big earthquake?*", about 80% of the participants clearly indicated the importance of long-term preparedness and awareness. They know that there is no time for negligence and that it is important to develop countermeasures continuously and consistently without taking a risk. However, still no participant mentioned the importance of conducting disaster identification immediately after an event. Due consideration should be paid to this fact to find better ways to communicate the true intentions of activities.

The complete responses of the participants to this question are listed below:

- Normally the big earthquakes are followed by tsunami. Due to its nature, tsunami is more destructive than other kind of disasters. In order to save the damage of lives and properties, the countermeasures have to be taken even if the big earthquake is not occurred but There is always possibility of tsunami's occurrence (Mr.

Laloo Prasad Sonkar/ India)

- Tsunami, due to its shear force and intensity, has the potential to wipe out the life and property not only in and around the generation area but also the areas far off. We have glaring examples of some of the transoceanic tsunamis such as the Chilean tsunami and the Indian Ocean tsunami. In order to save the mankind from the devastating nature of the tsunami, countermeasures have to be taken even if the big earthquake followed by tsunami will occur only after a long time. Otherwise, the areas prone to tsunamis will be ruined again and again and they will have to rise from the ashes which will take a lot of effort and money. So, it is better to take countermeasures and make the area safe so as to avoid taking rebuilding process again and again (Mr. Ujjwal Kumar/India)
- It is very important to always remind people that earthquake will occur any time, and no one technology can predict about that. After tsunami Indian Ocean occur Banda Aceh 2004, we learned that we have long history about tsunami in Indonesia, but we didn't disseminate this information each others, if we don't disseminate information for one generation to when tsunami come they don't know understand what happen and what to do, this may caused we will loss one generation (Mr. Juriono/Indonesia)
- Actually, tsunami countermeasures should be tackled prior to the occurrence of a big earthquake. However, after the big earthquake, there is a great possibility for a forceful tsunami to occur, and the window of time available for evacuation is very small, in most cases, less than 5 minutes. (Dr. Teuku Alvisyahrin/Indonesia)
- Usually, disaster which strikes with small scale, it will be considered as a common natural phenomenon and all this thing is considered as a risk of human life. But when a big (tsunami) disaster strikes, usually peoples start to realize and would begin to do some prevention efforts. When we meet some choices of problem, usually we make a priority scaling. In the developing countries, a disaster with long recurrence period will be neglected. (Mr. Wisyanto/Indonesia)
- Tsunami can be generated by the big earthquake and will attack shore coast several minutes after. To decrease a victim, it is important to develop mechanism of tsunami prevention and countermeasure that includes early warning system, tsunami hazard map and inundation map, evacuation route and evacuation place, and structural construction on coast. The other things, nonetheless are how to increase awareness of society for tsunami attack because society will evacuated immediately just after the earthquake (Mr. Weka Mahardi/Indonesia)
- Due to the longer recurrence period of tsunamis and major earthquakes, national priorities to tsunami countermeasures are often overridden by other urgent development activities. However these priorities are refocused on countermeasures and mitigation, especially in developed countries after life is lost, and development infrastructures collapse following major earthquakes. The close relationship between tsunami and earthquakes reminds nations and it's people that natural hazards cannot be avoided although risk can be mitigated by reducing the exposure to risk and vulnerability as well as enhancing the coping capacities. Rehabilitation and recovery processes are costly and time consuming, and is crucial to reduce the vulnerability and exposure to risks. If rehabilitation efforts do not include mitigation against all possible hazards, especially destructive ones such as tsunami's and earthquakes, infrastructure development cannot be sustained. As such tsunami countermeasures measures should be part of all development activities, and in the case of Japan, learning from experiences, their entire disaster management system has been evolving and developing based on past experiences of destructive earthquakes and tsunamis (Mrs. Rilweena Asiath/Maldives)
- Even a small earthquake can create a tsunami and in realizing the danger of the tsunami people take countermeasures to avoid loss of life and damage to properties. Tsunami travels at very high speed and people may not be able to escape from tsunami waves if they are not on high grounds (Mr. Murthala Didi/Maldives)
- Tsunami can occur after a big earth quake. But a tsunami can occur after a small earth quake also sometimes. Those are called tsunami earth quakes. As there is a high possibility of occurring a tsunami after a big earth quake, counter measures must be implemented without taking a risk (Mr. Jayawardhana/Sri Lanka)
- Tsunami can occur after an earthquake. Even the earthquake is not larger, still a Tsunami can occur. Those earthquakes are tsunami earthquake. There for we apply countermeasures just after the big earthquake (Mrs. Jayasundara/Sri Lanka)
- There is a tendency to occur tsunami if the big earthquake happens in Sea (Mr. Palitha Bandara/Sri Lanka)

Regarding the questions of “*What did you learned from two on-site surveys (Sanriku Coast Area and Kii Peninsula)?*” and “*What do you think the difference between the two areas regarding Tsunami countermeasures?*”, all the participants include in their answer that they learned about

the importance of taking both structural and non-structural measures. The Sanriku as well as Kii Peninsula Coasts are good examples using both measures in tsunami countermeasures.

Below are answers representing the participants' responses on the question:

- I witnessed a very resilient community ably supported by the structural, non-structural measures and an extremely efficient local government in both Sanriku coastal area and Kii peninsula. However, while Sanriku area has witnessed three devastating tsunamis in the past with run up height as high as 38 m in Ryori village, Kii peninsula is known more for its very less tsunami arrival time (5 minutes to 10 minutes) rather than height. Due to this reason, while we witnessed fairly high embankments, sea walls and breakwaters in Sanriku area, in case of Kii Peninsula, these structures were missing to some extent. Even the existing structures did not have much height. However, one thing which was common in both the areas was the efficient local administration and the resilient community. (Mr. Ujjwal Kumar/India)
- I learned how the Japanese government both at the central and local levels manages tsunami disaster in terms of both structural and non-structural measures. Disaster management is an important part of the local government operation and they invest a great amount of time and resources to protect the life and property of the Japanese people. Sanriku Coast has more established tsunami structures compared those of the Kii Peninsula. Also, efforts in tsunami education are more obvious in Kii area (Dr. Teuku Alvisyahrin/Indonesia)
- The lectures, discussion with prefectural, local and community level disaster management officials and the on-site surveys along both coastal areas in Sanriku and Kii Peninsula provided invaluable exposure of the tsunami countermeasures in Japan. While both areas have taken immense measures in tsunami countermeasures, the level of awareness and the presence of community participation is felt more strongly in the Kii Peninsula, where as community's reliance on the structural measures and reluctance of younger generation's participate in drills were expressed in the Sanriku Coast. Tsunami education at the school systems were strong in both regions (in schools visited) although through different approaches. In the Sanriku area tsunami education in school is out of the formal curriculum and in the Kii peninsula was within the school curriculum. This, together with the tsunami mitigation history of the two areas might be the reason for the different levels of awareness and education in these two areas. Structural coastal mitigation measures were more prominent in the Sanriku Coast than in Kii Peninsula (Mrs. Rilweena Asiath/Maldives)
- People always concern to earthquakes. Town, Cities and Prefectures and Government are alert for the prevent disasters. We have seen self help, mutual support and participatory approaches. Well planned. All the activities are progressing from generation to generation. Mitigation activities and training programmes, GIS Planning (structural measures and non structural meas.) perfect. Awareness in Kii Peninsula is very advanced than the Sanriku Coast (Mrs. Jayasundara/Sri Lanka)

The question of “*What is the necessary factor in tsunami disaster prevention?*” was also asked in the first questionnaire. By comparing the participant responses on this question at the beginning and the end of the course, it is clear that at the end of the course, the participants became capable of describing tsunami disaster prevention from a more holistic viewpoint. See Table 5-1 for the list of participant responses on this question given at the beginning and the end of the course.

At the end of the course, the participants in general emphasized two points as the most significant for Japan to reach the present successful level of disaster risk reduction. One is the implementation of the concept of “self help, mutual support and public assistance” in disaster management in all areas that they have visited during the course. The other one is the integration of mitigation measures into development efforts at all administrative levels, and thus disaster mitigation and prevention have become part of the daily life of communities.

Table 5-1
The list of participants responses on the question of
“*What is the necessary factor in tsunami disaster prevention?*”
given at the beginning and the end of the course

Response given at the beginning of the Course	Response given at the end of the Course
1) Awareness and education of hazard, 2) Better governance, 3) Early warning system to be set up, 4) Protective measures such as soft measure like plantation of mangroves, Bio-shields and hard measures like sea wall, groynes, 5) Study for forecast of hazard are also important. (Mr. Laloo Prasad Sonkar/India)	Careful selection of structural as well as non-structural measures combined with awareness among the communities can be an ideal factor for tsunami disaster prevention. While the structural measures such as sea walls, embankments, breakwaters etc. and non-structural measures such as coastal vegetation can dissipate the tsunami force, awareness programmes such as preparation of hazard maps, disaster education in schools and mock drills can help in quick evacuation and in saving the precious lives of the people. (Mr. Laloo Prasad Sonkar/India)
Proper planning is the most important factor in “Disaster Prevention”, followed by effective implementation. If planning is perfect, execution becomes easy. However, after planning and execution, it all depends on the personnel who are maintaining the system and the people who are the beneficiaries. (Mr. Ujjwal Kumar/India)	Integration of mitigation measures into development efforts of the Government at all levels and making the mitigation and prevention a part of normal day-to-day life of the communities are the most important factors in tsunami disaster prevention. Due to this, the Governments at all the levels will undertake all the necessary measures to safeguard the tsunami prone areas and the communities, at the same time, will also learn to make the disaster prevention activity a part of their daily life. (Mr. Ujjwal Kumar/India)
Main factor in disaster prevention is knowledge for community to understand about disaster, how to save themselves, etc. Next are all tools or Infrastructure that will support to decrease casualty if disaster happen. (Mr. Juriono/Indonesia)	Basic concepts for general disaster prevention are Self-help, mutual support, and public assistance. It is importance for people to understand that limited help would be available in time of emergency, people should save them self if tsunami come (Tsunami Tendenco), go to save place such high ground or high building, after tsunami people survive then help each other because it will take time until support arrives to the site. (Mr. Juriono/Indonesia)
A good disaster management plan or strategy (Dr. Teuku Alvisyahrin/Indonesia)	Awareness and preparedness (Dr. Teuku Alvisyahrin/Indonesia)
For developing country (Indonesia), Prevention efforts that can be done realistically are: Arising awareness of community to disaster; Making a green protection (Mangrove, Palm tree, etc) (Mr. Wisyanto/ Indonesia)	Involvement of community in making and implementing any kind of tsunami disaster prevention efforts. Because the recurrence time of tsunami disaster is very long, the most important thing is don't ever forget tsunami disaster. For this thing, we need some reminder tools, such as handing on disaster information to next generation, tsunami monument, tsunami drill, etc. (Mr. Wisyanto/Indonesia)
With disaster prevention we can manage disaster risk for decrease a victim. The necessary factors are basic vulnerability/management and manage disaster risk to anticipation hazard. And to control social vulnerability we must manage exposure and coping capacity. (Mr. Weka Mahardi/Indonesia)	There have 3 things about necessary factor, that is basic vulnerability, exposure, and coping capacity. Basic vulnerability connected with society weakness to natural hazard like poverty, discipline, governance system etc. Exposure connected with number of people, volume of properties and livelihood. Coping capacity connected with structural measure, nonstructural measure, and institutional (Mr. Weka Mahardi/ Indonesia)
Awareness and good governance is an important factor of disaster prevention. Softmeasures however must be matched by counteractive structural measures as well as good governance. Strong institutional structure and legal framework as well as a political will to be	The effectiveness of structural measures depends heavily on the size of tsunami waves and arrival times, which are difficult to estimate prior to the earthquake, as such efficient and effective measures to warn and evacuate to higher places is the only way to save lives. As such education and awareness of the community to tsunami danger, and there is no one way solution

committed to disaster prevention play a critical role. However, prior to disaster early warning and awareness are the most important facts. (Mrs. Rilweena Asiath/Maldives)	to educate people (Mrs. Rilweena Asiath/Maldives)
Educating people, increasing coping capacity and reducing exposure to risk is most important in disaster prevention. (Mr. Murthala Didi/Maldives)	It is to raise awareness of people to evacuate to high grounds to save lives. It is possible to minimize the damages to lives and properties if we can take tsunami countermeasures in advance (Mr. Murthala Didi/Maldives)
Identifying vulnerability, coping capacity, exposure reduction (Mrs. Jayasundara/Sri Lanka)	Planning and response, Early warning, Training, Emergency operation and Mitigation activities. Awareness and quick response (Jayasundara/Sri Lanka)
Following are the main factors necessary in disaster prevention: 1) Exposure reduction, 2) Increasing coping capacity, 3) Vulnerability reduction. If we manage the above three factors suitably disasters due to natural hazards can be prevented considerably. (Mr. Jayawardana/Sri Lanka)	To my thinking awareness is the most important factor in tsunami disaster prevention (Mr. Jayawardhana/Sri Lanka)
Increase of coping capacity, vulnerability reduction, and exposure reduction (Mr. Palitha Bandara/Sri Lanka)	Awareness and quick response (Mr. Palitha Bandara/Sri Lanka)

Responding to the questions of “*What have you achieved in this training course?*” some answers were very encouraging and showed some evidence that they had learned the fundamental concept of disaster management in Japan. The following are some typical answer quoted from their responses.

- Most important was the awareness among the people about the disasters which is something we can implement in our country through campaigning. (Mr. Lalloo Prasad Sonkar, India)
- I was also able to witness a strong will both on the part of the Government and the community to make themselves resilient to disasters by way of putting combined efforts. (Mr. Ujjwal Kumar, India)
- I learned the philosophy behind the great efforts in disaster management in Japan. I think, the strength in disaster countermeasures in Japan lies on the collaborative efforts shared by both the formal and informal disaster management organizations/groups with a particular note on the active participation of community members in the process. (Mr. Teuku Alvisyahrin, Indonesia)
- We can adopt basic concepts for general disaster prevention of self-help, mutual support, and public assistance to increase community awareness and to remind people of what they should do if a disaster occurs.(Mr. Juriono, Indonesia)
- The progamme has provided us with an invaluable learning experience on a personal level too. The dedication and aspirations of individuals and volunteer groups at all levels, and the discipline of the Japanese people and their resilience to withstand and revive back after disasters has touched me and given me hope that together we too will be resilient to future hazards and is able to reduce the impact of tsunamis and other natural hazards. (Mrs. Rilweena Asiath, Maldives)
- Most of the things that Japan has implemented as tsunami counter measures cannot be implemented in Sri Lanka, as it is a developing country. But there are many things which can be implemented. For example making aware the people, growing coastal forest, etc., (Mr. Sooriya Arachchige Ranjan Jayawardana, Sri Lanka)

Also, by comparing the response of the participants on the questions of “What do you want to achieve in this training course?” (1st Questionnaire) with their response on the questions of “What have you achieved in this training course?” (2nd Questionnaire), it is clear that the participants have enhanced their knowledge and understanding on comprehensive tsunami disaster prevention as they had expected to before the training. See Table 5-2 for this comparison.

Table 5-2

Comparison of the participants' response on the questions of "What do you want to achieve in this training course?" (at the beginning of the course) with their response on the questions of "What have you achieved in this training course?" (at the end of the course)

Response on the questions of "What do you want to achieve in this training course?" (at the beginning of the course)	Response on the questions of "What have you achieved in this training course?" (at the end of the course)
1) comprehensive management menu, 2) To find out the solution of the weak area of implementation, 3) Methods of prevention (Mr. Lalloo Prasad Sonkar/India)	The training course has enabled us to see some very impressive measures both structural (sea walls breakwaters, embankments, tsunami gates etc) and the non-structural measures (coastal vegetation, awareness programmes) prevailing in Japan. The simulation system to predict the inundation area as well as the likely casualties with or without the countermeasures was also very impressive. Most important of them was the awareness among the people about the disasters which is something which we can implement in our country through campaigning. Disaster education in schools at elementary level is another area which can be prioritized for implementation. (Mr. Lalloo Prasad Sonkar/India)Mr.
In the first two days of the course, I have achieved more than what I had expected. The lectures combined with field visits would make me more focused in my approach towards disaster mitigation projects (Mr. Ujjwal Kumar/India)	The training course has given me an opportunity to learn the best practices available in a country like Japan which has such a vast experience in dealing with disasters that over a period of time, it has been able to develop an extremely effective medium to deal with them. I was also able to witness a strong will both on the part of the Government and the community to make themselves resilient to disasters by way of putting combined effort. The training also exposed me to basic as well as advance concepts of tsunami disasters besides giving me an opportunity to see how to make the countermeasures effective (in the field trips) and everlasting (by making the community aware of the disasters). (Mr. Ujjwal Kumar/India)
Understand kind activity to aspect of disaster prevention based on multi aspect of scientific study, it will also enable me to formulate activity which acceptable and applicable by community and also make me more concern to be involve in the area of community preparedness in the future (Mr. Juriono/Indonesia).	We learned so many things from Japan experiences how to minimize casualty from disaster based on structural measure and non-structural measure. How Japan develop tsunami countermeasure from all aspect and all level community. We got many information based on scientific reason and also practical side. Those things help us to generated activity in our country. And we can adopt basic concept for general disaster prevention are Self-help, mutual support, and public assistance to increase community awareness and realize what they should do if disaster occur. (Mr. Juriono/Indonesia)
Sound knowledge with hands-on experience in tsunami disaster management with basic principles of disaster management that can be adapted to multi-hazard scenarios (Dr. Teuku Alvisyahrin/Indonesia)	More than the technical aspect of the tsunami countermeasures, I learned the philosophy behind the great efforts in the disaster management in Japan, particularly in terms of tsunami. I think, the strength in the disaster countermeasures in Japan lies on the collaborative efforts shared by both the formal and informal disaster management organizations / groups with a particular note on the active participation of community members in the process (Dr. Teuku Alvisyahrin/Indonesia)
To have more knowledge / experiences about tsunami disaster risk analysis; Knowing better how to make a hazard map; Knowing a comprehensive disaster risk management (Mr. Wisyanto/Indonesia)	We have known much more about and the function of Watergate, embankment, seawall, tsunami monument, vegetation protection, intensity scale, J-Alert, communication technique, museum related to disaster and many kinds of non structural countermeasures, such as formal and also non formal disaster education, community participation to disaster prevention efforts, respecting to leader's merits and others thing. Besides thus experiences, we also have known about theory of tsunami, cooperation systems (self_help etc.) in Japan, how to determine / select project using PCM, how to calculate the

	effectiveness of vegetation protection (Mr. Wisyanto/Indonesia)
We can make action plan to apply and to integrate tsunami program in my countries (Mr. Weka Mahardi/Indonesia)	I get knowledge about Japan has develop tsunami prevention in Sanriku Coasts and Kii Peninsula. Japanese culture face tsunami, it was included tsunami history in Japan. I know how to make tsunami hazard map and evacuation map. (Mr. Weka Mahardi/ Indonesia)
After this training program, I expect my knowledge of tsunami in particular and disaster in general to be more. Further through sharing experiences with participants and borrowing knowledge from sector specialists, I expect the training to broaden our understanding & ability to develop and contribute to tsunami countermeasures / prevention in our country (Mrs. Rilweena Asiath/Maldives)	During the course of the past 6 weeks, our understanding of tsunami generation, its danger and tsunami countermeasures have been greatly enhanced. We have seen that the national priority from the top to disaster management, established legal systems and frameworks, research and development efforts, structural and non structural measures all play very critical roles in tsunami prevention. Further we have been able to share our experiences with other participants and experts in the fields and have very clearly understood the need to move from disaster response to disaster mitigation efforts to reduce damage from future calamities. In addition to our knowledge on tsunami countermeasures the structure of the progamme has provided us with an invaluable learning experience on a personal level too. The dedication and aspirations of individuals and volunteer groups at all levels, and the discipline of the Japanese people and their resilience to withstand and revive back after disasters has touched me and given me hope that together we too will be resilient to future hazards and is able to reduce the impact of tsunamis and other natural hazards (Mrs. Rilweena Asiath/ Maldives)
I want improve my knowledge in the field of disaster management and serve the people more effectively. Japan is the most experienced country in this field and I hope to achieve this goal. (Mr. Murthala Didi/Maldives)	I have learned the type of measures Japan has taken to reduce damages that can be caused by tsunami waves. I have also learned about the early warning systems, evacuation buildings, evacuation places, costal protection measures, education and awareness programmes that are carried out by the authorities and volunteers. I have also experienced the town watching to identify safe evacuation routes (Mr. Murthala Didi /Maldives)
Sharing experience and knowledge from Japan and other countries. (Mrs. Jayasundara/Sri Lanka)	Gained Knowledge, Atitude and Skills experiences on tsunami counter measures. Successfully completed the the course on project management cycle (participatory approach). (Mrs. Jayasundara/Sri Lanka)
To learn the new technology connected with tsunami disaster prevention and also to share the experience I had, with other participants. And also to learn history and the general introductions about Japan (Mr. Jayawardhana/Sri Lanka)	Most of the things that Japan had implemented as tsunami counter measures cannot be implemented in Sri Lanka, as it is a developing country. But there are many things which can be implemented. For example making aware the people, growing coastal forest, etc (Mr. Jayawardhana/Sri Lanka)
Gain and sharing of knowledge and experience from other countries specially in Japan (Mr. Palitha Bandara/ Sri Lanka)	Gained Knowledge and experiences on tsunami counter measures (Mr. Palitha Bandara/Sri Lanka)

5. 1. 4 Participants' comments about Japanese tsunami disaster mitigation as well as opinions on the course contents

The second questionnaire also asked for comments on the participant's comments about Japanese tsunami disaster mitigation and on the course contents. The comments requested are:

- Your comments/suggestions about Japanese activities for tsunami disaster mitigation including emergency response at an occurrence of disasters
- Your comment to improve this course (Schedule, Curriculum, Lecturer etc.)

All the participants admire the Japanese advanced and comprehensive measures for tsunami disaster risk reduction. Some comments and suggestions are listed below to show the participants' comments and suggestions about activities for tsunami disaster mitigation in Japan.

- The Japanese activities relating to tsunami mitigation are simply outstanding and comparable to the best in the business. More than that, the Japanese way of keeping disasters alive in the minds of the people is even more remarkable. From the presentations as well as the site visits, I have noted that Japan has reached a stage where not only the Government but the people also have shown extremely vigilant character at the time of occurrence of disasters. I was able to see a very good example of emergency response by the JMA after the occurrence of an earthquake. Even in Owase city, the officials were quick to respond even when some presentation was going on, when some kind of warning was issued due to heavy rains. The legal/institutional, structural and non-structural measures are quite impressive. Due to various types of awareness measures taken by the Government, the community has reached such a level that they believe more on their abilities rather than remaining dependent on the Government. This kind of situation is ideal for any country. (Ujjwal/India)
- Basically, Japan has a very well developed tsunami disaster mitigation plan. There are only a few minor things perhaps that could be improved such as, the standardization of tsunami information / escape route signboards, construction of sufficient embankments in some coastal areas, improvement of electric power line network on streets, and retrofitting of older building to meet current building codes particularly those buildings that can be designated as escape buildings. (Teuku/Indonesia)
- The level of education and eventual response of residents to warning message is not even across the country. Strong structural measures may lead to false sense of 100% security from a tsunami. Nevertheless the efforts of city and town disaster officials, volunteer groups and community leaders are very remarkable and should be sustained. The early warning system in Japan is very comprehensive, and the quality of existing tsunami evacuation information can be enhanced by using common signboards with clear directions and information, coastal areas often attract local and international tourism. Further the capacity of businesses (hotels, restaurants and other popular spots) to guide and assist tourists to safe evacuation sites should be considered. Efforts to provide sufficient safe shelters for all the residents can be scaled up with appropriate facilities for water and sanitation (Asiath/Maldives)
- Vast experience in dealing with disasters. Putting in place a very effective warning system. But the evacuation signs and sign board must be improved (Jayasundara/Sri Lanka)
- Emergency response system is excellent. But the evacuation signs and sign board must be improved (Palitha/Sri Lanka)

In regard with the course contents, the participants' suggestions can be summarized as follows:

- Repetition of the same lecture contents should be avoided.
- Lectures involving advanced knowledge on tsunami should be given more time.
- The participants should be given more time for preparation for reports, action plans etc.
- More time allocation for discussion during the lecture is necessary.
- Additional lectures are necessary for earthquake mechanism, coastal forest habitation, tsunami disaster risk analysis, response, relief efforts and recovery management, and design and stability of the structure countermeasure.

- Additional practice sessions on developing a tsunami hazard map are necessary rather than sophisticated simulations.
- It was hard to understand lectures through interpreters.
- Classes should be shortened from 90 to 45 minutes.
- More time should be allocated for discussions with local administrators and residents.
- More lectures on structural measures should be added to the course.

5.2 Evaluation on lectures and exercises

The participants evaluated each lecture and exercise based on 1-5 grades.

The total average of the evaluation results showed that the course contents met their expectations and needs as each lecture and exercise was given more than four points. In particular, the highest point given to the coastal vegetation lecture and exercise showed their strong interest and motivation to learn feasible tsunami countermeasures for their countries. The “Project Cycle Management” exercise was also highly rated, revealing that the participants understood the effectiveness of the systematical method for analyzing problems and presenting solutions.

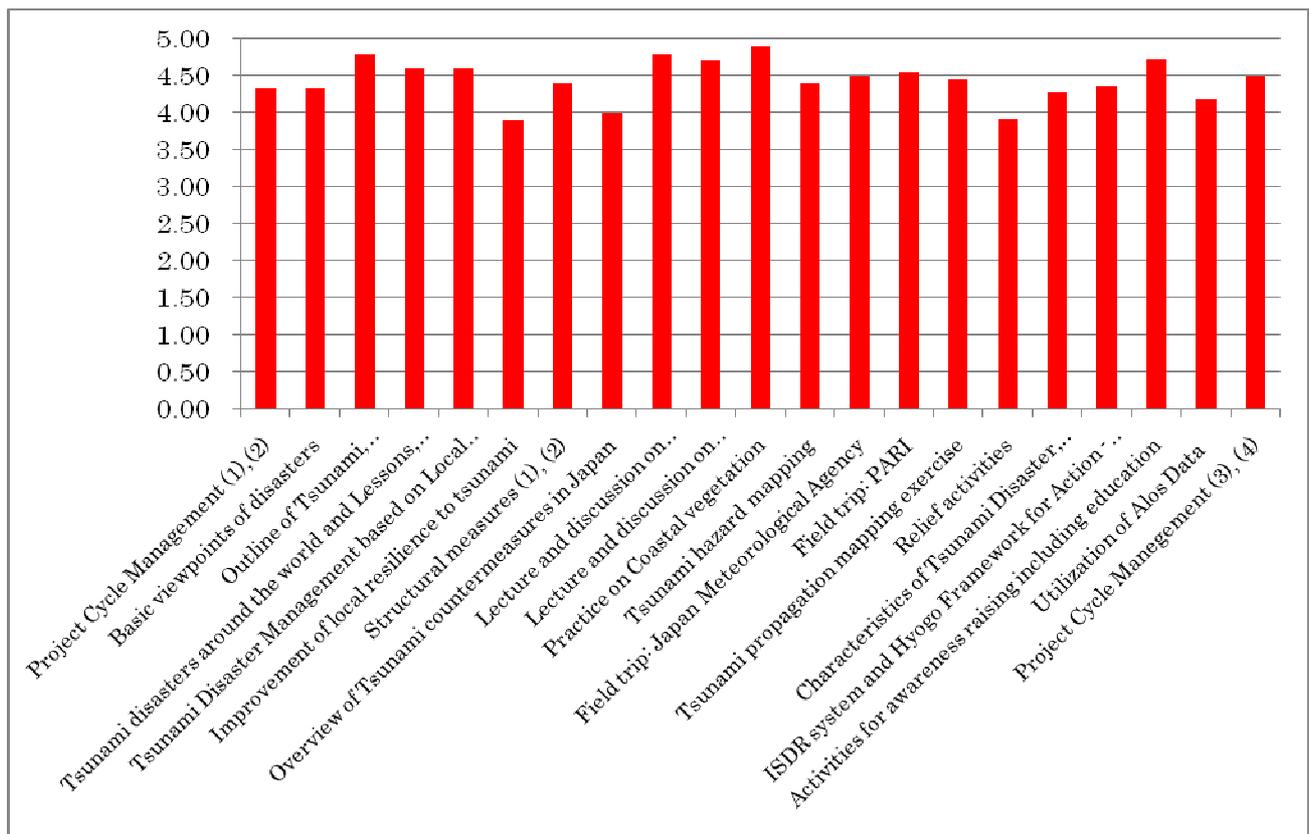


Figure 5-1 Total average of the evaluation on lectures & exercises

5. 3 Participants' action plans

The true success of this training course depends on the implementation of comprehensive tsunami disaster prevention principles in the target countries. In order to know the participants' ideas on how they will proceed in disseminating the principles of comprehensive tsunami disaster prevention, they were assigned to formulate a three-year activity plan started after returning to their home countries. This is actually equivalent to an individual action plan, which is suggested to be in line with the main activities in their institutions. Each action plan was discussed and supervised in the Project Management Cycle class throughout the course.

Participants from the same country were expected to communicate with each other and coordinate their activities to maximize synergy. At the same time ICHARM has concern to get informed on the implementation of that Action Plans to monitor the long term effects given by this training course to the target countries.

In this training course, the participants were asked not to think about direct application of Japanese tsunami countermeasures to their countries, but to recognize the difference between Japanese tsunami countermeasures and those in their countries and consider what should be done in their countries. As a result, they made various action plans for their home countries.

The Indian participants emphasized three points as follows:

- (i) Disaster mitigation and preparedness are as important as response, relief and rehabilitation
- (ii) Awareness among the citizens, particularly those in the vulnerable section of society, is most important and should be promoted on a priority basis
- (iii) Effective participation of residents in the planning and implementation of disaster-related activities should be ensured.

For these purposes, they said that the government should be asked to:

- Strengthen awareness programs and information dissemination systems
- Review the existing legal framework for disaster management and to amend the act for tsunami countermeasures in line with the 'Disaster Countermeasure Basic Act' prevailing in Japan, if needed
- Review the existing structural and non-structural measures and to take up suitable location-wise measures, based on research.

The Indonesian participants claimed that tsunami-related problems in Indonesia are rooted in the lack of coordination among disaster-related organizations, the lack of coastal structural countermeasures including vegetation, and the lack of operational training of tsunami warning systems.

To solve those problems they pointed out that the following activities should be done:

- Trainings and Workshops should be held for residents and teachers

- Community education groups should be established.
- Comprehensive tsunami drills should be conducted.
- Disaster education curriculum for school should be developed.
- Local hazard maps should be developed.

The Maldives is a low-lying land country and troubled with coastal erosion, lack of coastal vegetation, industrial dependency on fishery and tourism, and limited transportation. Therefore, the Maldivian participants claimed that the government should be asked to;

- Promote and mobilize funds for policy development to build safe evacuation centres, and identify strong buildings suitable for evacuation in coordination with the Ministry of Construction and Infrastructure Development.
- Encourage resort owners to put in place tsunami countermeasures such as coastal forestation, construction of multipurpose evacuation buildings and take measures to protect their lifelines and communication systems around tourist resorts by coordinating with the relevant agencies
- Propose an early warning system in every house and install early warning towers to alert people working along the coast.

The topographical conditions in the coastal areas of Sri Lanka are completely different from those of Japan. For example, the entire coastal areas are flat with very few bays and openings, and the mouths of bays are much wider. The population is spread unevenly along the entire coastal belt. However, high capital investments will be a problem for this country. Further, there is a proposal to establish tsunami breakwaters at Galle Harbor with the assistance of the Japanese government.

The Sri Lankan participants proposed activities as follows:

- Awareness programs should be conducted in highly vulnerable districts with the consent of the DMC officials.
- Multi-language sign boards should be established based on the necessity. The existing sign boards have to be modified with luminous colors or solar panel boards. Several tsunami monuments should be established in vulnerable areas to convey the message to future generation.
- Awareness programs, for the vulnerable communities of the selected districts, should be conducted to motivate community residents, to establish coastal forests along the coast, and also to establish tree crops in their home gardens and to improve the existing coconut plantations.
- Awareness programs, for the school children of the vulnerable areas, should be conducted through different modes. The aim is to motivate the students to establish and maintain coastal forests along the coastal belt, introduce tree species in their home gardens, and serve as volunteer for their areas.

5. 4 Evaluation on the perceptibility of expected results

The expected results of the project are shown in Table 5-3 related to the project objectives, indicators, and activities. Blank cells in the table means no activities related to this course. This table is part of the project framework in the project document.

As it is shown in Table 5-3, the expected results of the projects include strengthened national institutional capacity in disaster risk reduction, increased public awareness and knowledge on tsunami risk and disaster risk reduction towards an enhanced culture of safety, strengthened disaster risk reduction (preparedness, mitigation, and response) capacities of local communities, and research and analysis on the risk and impact of tsunamis and other related natural hazards advanced.

This brief evaluation is based on the participants' reports (country report, interim report, action plan), their responses to the distributed questionnaires, and observation of the course execution

Table 5-3
Project objectives, expected results, indicators, and activities related to
Comprehensive Tsunami Disaster Prevention Training Course

Objective 1: Strengthened national institutional capacity in disaster risk reduction		
Expected Results	Indicators	Activities
1.1. The capacities of national platforms and institutions for disaster risk reduction strengthened.	1.1.1 Institutional capacity assessments and targeted capacity building undertaken in at least 3 countries	Capacity training on the comprehensive tsunami disaster countermeasure and project cycle management
	1.1.2 Technical support for national policy development on disaster risk reduction provided to 2 countries at least	Capacity training(lectures) on the disaster management system and comprehensive tsunami disaster prevention in Japan
	1.1.3 Technical support for the planning and development of national tsunami early warning centers provided in 2 countries	
1.2. Integrated disaster risk reduction in environmental coastal zone management implemented.	1.2.1 Integration of disaster risk reduction in coastal zone management implemented in at least 3 countries	Lectures, exercise and discussion on tsunami disaster risk reduction using coastal forest
1.3. Coordination, information exchange and learning among targeted countries facilitated	1.3.1 Number of forums for enhancing regional cooperation, information sharing and knowledge exchange provided	Country report and action plan discussion among target countries' participants

and enhanced.	1.3.2 Mechanisms for exchange of experiences among the targeted countries strengthened	Country report and action plan discussion among target countries' participants
Objective 2: Increased public awareness and knowledge on tsunami risk and disaster risk reduction towards an enhanced culture of safety		
Expected Results	Indicators	Activities
2.1 Public awareness on tsunami and disaster risk increased.	2.1.1 Awareness-raising media campaigns through the media and public events	Technical visit to tsunami frequently hit area including participation to a tsunami disaster management drill
	2.1.2 Public information material tailored to local cultures and languages	Technical visit to tsunami frequently hit area including lectures by local government and interviews Distribution of sample of publication materials related to tsunami disaster preparedness and countermeasures during training
2.2 The role of education in early warning and disaster reduction advocated and strengthened.	2.2.1 Integration of natural hazards components and disaster risk reduction into school curricula in at least 3 countries	visiting a primary school which has carried out an education program on tsunami disaster mitigation
	2.2.2 Number of school teachers at primary schools trained on disaster risk reduction	
Objective 3: Strengthened disaster risk reduction (preparedness, mitigation, and response) capacities of local communities		
Expected Results	Indicators	Activities
3.1 Capacities and mechanisms for disaster risk reduction at the community level strengthened.	3.1.1 Assessments of community preparedness measures in coastal zones undertaken	
	3.1.2 Number and quality of community tools and methods for effective disaster risk reduction further developed and strengthened	
	3.1.3 Number of local volunteers (existing community capacity) mobilized	

	and trained in disaster risk reduction to support community actions	
3.2 Community resilience strengthened through integrated disaster risk reduction.	3.2.1 Effective chain of communication between the community and local authorities established and strengthened.	Technical visit to tsunami frequently hit area including lectures by local government and interviews to residents and officials
	3.2.2 Disaster risk reduction integrated into a number of post-tsunami recovery projects at the community level.	Technical visit to tsunami frequently hit area including lectures by local government
Objective 4: Research and analysis on the risk and impact of tsunamis and other related natural hazard advanced		
Expected Results	Indicators	Activities
4.1 Field research and comparative studies on the risks and socio-economic impacts of disasters carried out in high risk areas.	4.1.1 Number of field research studies on tsunami risk assessment	
	4.1.2 Number of analysis of tsunami historical records as well as identification of future tsunami prone areas	
	4.1.3 Number of cost-benefit analysis of disaster risk reduction	

5. 4. 1 Strengthened national institutional capacity in disaster risk reduction.

- Currently, all the target countries, except the Maldives, have developed their national act on disaster management, which regulates the complete cycle of disaster management (preparedness, mitigation, response, and recovery and rehabilitation). This situation will help implement comprehensive tsunami disaster prevention more easily.
- Comprehensive lectures, which cover management and engineering aspects and also include technical visits, have enhanced participant's knowledge and understanding on the comprehensive tsunami disaster prevention.

- Lectures on engineering aspect of coastal forest in mitigating tsunami disasters and its actual implementation in the system of tsunami disaster countermeasures in Japan have given orientation on the importance and possibility of integrating disaster risk reduction planning into environment and coastal zone management planning.
- Communication and information exchange among the participants were active during the course. This is a significant starting point of international networking for dissemination of comprehensive tsunami disaster prevention in the future.

5. 4. 2 Increased public awareness and knowledge on tsunami risk and disaster risk reduction towards an enhanced culture of safety

- During the technical visits to Sanriku Coast and Kii Peninsula Coast areas in Japan, the course participants saw many defense structures and evacuation facilities constructed along tsunami-prone areas. In some cases, part of the budget for those structures' construction came from the citizens. This high self-participation of communities in the disaster countermeasures has given deep impression to the participants.
- The course participants heard directly from residents about their involvement in the voluntary disaster management groups' activities and their participation in maintaining disaster prevention facilities. They also visited elementary schools to learn how the schools educate students about nature and disasters to increase their disaster awareness since the early stage of their age. These all gave high impression to the participant and encouraging its adoption to their own countries.

5. 4. 3 Strengthened disaster risk reduction (preparedness, mitigation, and response) capacities of local communities

- Technical visits to tsunami-prone areas in Japan, including attending lectures given by local governments and interviews to the residents, have enabled the participants to witness the existence of a strong will on both the government and the community sides, which makes Japan resilient to disasters by way of putting combined efforts.
- According to the responses of the course participants to the questionnaire, they concluded that the strength in disaster countermeasures in Japan lies on the collaborative efforts shared by both formal and informal disaster management organizations with a particular note on the active participation of community members in the process.

5. 4. 4 Research and analysis on the risk and impact of tsunamis and other related natural hazards advanced

- Although the present training course has no direct research activities, lectures on the basic knowledge of tsunami generation and propagation, the role of coastal forest in mitigating tsunami disaster, and the protection structures against tsunami disaster have open the vision of the participants on the importance of enhancing research activities related to tsunami disaster prevention. Especially for the participants come from research institutions, they are greatly encouraged by the lectures. This is a good result for the advancement of research activities in the targeted countries as one of important point in the development of a comprehensive disaster risk reduction chain.

5. 5 Further necessary activities

The presented results are based on careful evaluation conducted immediately after the course work within the limited time of the training course.

To evaluate what is truly beneficial to the participants, further data should be collected from continuous monitoring of implementation activities by the participants after returning to their home countries.

ICHARM will keep communicating with the participants and monitor the progress of each country's implementation process based on the action plans developed and submitted at the end of the course by each participant.

In order to facilitate communication between ICHARM and the participants, a special window in ICHARM's website will be provided for discussion and consultation related to comprehensive tsunami disaster prevention.

Chapter 6: Conclusion

In the field trips to the Sanriku coastal area and Kii Peninsula, the participants were not only amazed to see gigantic structures, such as tsunami breakwaters and sea walls, but also overwhelmed by local people's high awareness toward disaster mitigation.

There is a Chinese proverb, saying, "In peace, prepare for war." It is very important for residents to raise awareness and prepare for disasters even in normal times.

In particular, tsunamis may cause so devastating damage in a wide range of areas at the same time that it is almost impossible even for trained disaster-management organizations to deal with everything. So in Japan "self-help" and "mutual-support" are the basic shared concepts for disaster mitigation. It is difficult to apply these concepts directly to other countries due to the differences of topological, climate, social, historical and other conditions, but if these Japanese concepts are remembered by the participants and became a hint for disaster management in their countries, this training course can be considered successful.

Despite the fact that this was the first attempt for ICHARM to conduct tsunami-related training, the course was managed smoothly and produced satisfactory results. Last but not least, we at ICHARM sincerely appreciate every lecturer, officer, resident and the Japan International Cooperation Agency for helping ICHARM to conduct this fruitful training course.



Photo 6-1 With students of the Disaster Management Program at the closing party