

Report of the **APRU-IRIDeS** **Multi-Hazards Program** 2015 Summer School



**Report of the APRU-IRIDeS Multi-Hazards Program
2015 Summer School**

21-24 July 2015

Tohoku University

Sendai, Japan

IRIDeS, Tohoku University

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The 3rd APRU Multi-Hazards Summer School was held at Tohoku University on 21-24 July 2015. More than 40 participants from 10 countries participated in the event to learn the lessons-learned and experience from the 2011 Great East Japan Earthquake and Tsunami and discuss the role of universities to implement the Sendai Framework for Disaster Risk Reduction adopted at the UN World Conference on Disaster Risk Reduction (UNWCDRR) held in Sendai in March 2015.

The Association of Pacific Rim Universities (APRU) and the International Research Institute of Disaster Science (IRIDeS) in Tohoku University launched the APRU-IRIDeS Multi-Hazards (MH) Program in April 2013. The Pacific Rim region has high risks to natural disasters and the universities and research institutes in the region are expected to contribute to reducing disaster vulnerability and risks and strengthening disaster management capacity to tackle these challenges. The Program aims to harness the collective capabilities of APRU universities for cutting-edge research on disaster risk reduction (DRR) as well as contribute to international policy making processes on DRR. The Summer School is one of the key activities under the MH Program.

APRU is a network of 45 premier research universities from 16 economics around the Pacific Rim. Currently, APRU members together have around two million students, 120,000 faculty members and research capabilities related to the key challenges facing the region. APRU seeks to advance the aspirations of its members and contribute to global society by: 1. Shaping Asia-Pacific Higher Education and Research; 2. Creating Asia-Pacific Global Leaders; and 3. Partnering on Solutions to Asia-Pacific Challenges.

IRIDeS in Tohoku University was established in April 2012 as a new integrated interdisciplinary research team. Together with collaborating organizations from many countries and with broad areas of specializations, IRIDeS conducts world leading research on natural disaster science and disaster mitigation learning from and building upon past lessons in disaster management from Japan and around the world. Throughout, IRIDeS will contribute to on-going recovery/reconstruction efforts in the affected areas, conducting action oriented research, and pursuing effective disaster management to build sustainable and resilient societies. IRIDeS also provides secretariat services as the regional program hub to the MH Program.

The key activities of the MH Program include:

- Organization of the annual summer school
- Organization of the annual APRU MH Symposium
- Foster collaboration in disaster research and information/data sharing between APRU universities

- Contribute to DRR discussions at international and regional levels and to a policy making process.

At the occasion of the UNWCDRR, the APRU Multi-Hazards (MH) Program organized one of the Public Forum sessions titled “Science and Practical Disaster Risk Reduction (DRR) ~ Role of Universities and Academia in DRR ~” on 17 March 2015. More than 20 speakers were invited to the session from universities, UN agencies, the private sector, NGOs as well as a government agency such as NASA and nearly 100 audience joined the session. It consisted of 3 sessions: Bridging the gap between science and practice, How can science and technology contribute to practical DRR?, and Role of social science in DRR. Furthermore, the MH Program has initiated the campus safety survey among the APRU members and addressed the challenges and strengths. As a follow-up of the survey, the MH Program plans to organize the campus safety workshop to strengthen the disaster preparedness capacity of the APRU member universities.

It has been decided that Tohoku University will host the secretariat of the MH Program for another 3 years. The MH Program will continue hosting the Summer School, advocate the need and importance of the campus safety as well as contribute to decision making and policy development processes to play an important role of science and technology in DRR.

ACKNOWLEDGEMENT

IRIDeS as the main organizer of this summer school would like to extend a sincere appreciation to the participants and speakers from different sectors who shared wonderful experiences and knowledge regarding DRR issues from different perspectives. Their involvement and participation made a great contribution to the success of this event. In addition, IRIDeS received tremendous support from the APRU secretariat based in Singapore as well as Tohoku University. The organizer is also grateful for valuable suggestions and advices provided by the faculty members of IRIDeS on the program development and planning.

Lastly but not least, this summer school was never implemented without hard works and considerable support by the International Exchange Division of Tohoku University, the Administrative Office of IRIDeS, and the International Regional Cooperation Office of IRIDeS.

OPENING REMARKS



Prof. Susumu Satomi

President of Tohoku University

It is a great pleasure for me to welcome you to Tohoku University for “APRU-IRIDeS Multi-Hazards Summer School Program”. I am pleased to meet all of you who gathered from various countries for this event.

It has been already 4 years since the Great East Japan Earthquake and Tsunami happened on March 11, 2011. It was the largest disaster event in Japan after the World War II. Due to the warm support from all over the world, the recovery efforts have greatly progressed. Tohoku University has been also playing an important role in the recovery process by providing technical support. You will visit Tagajo city and Higashi-Matsushima City on 23 July and can see their recovery works. I hope this summer school will give you an opportunity to consider and discuss what we can do to strengthen the disaster risk reduction capacity.

The establishment of the International Research Institute of Disaster Science (IRIDeS) under Tohoku University is one of our commitments to share our knowledge and experiences globally. IRIDeS also launched the Multi-Hazards Program together with APRU in April 2013. Since then, IRIDeS became the program hub and coordinates the program activities. This summer school is one of the major events under the Multi-Hazards Program.

We are living in a disaster prone region. Very recently, Nepal was hit by a large earthquake and nearly 9000 (nine thousand) people lost their lives. We are facing to various disaster risks and have to tackle these issues together. I hope that you will contribute what you have learned back to society as disaster and disaster risk reduction experts in the future.

In March 2015, the UN World Conference on Disaster Risk Reduction was held in Sendai. More than 10,000 (ten thousand) people participated in this event. Tohoku University made significant contributions to this Conference by participating in its preparation and organizing many events. At the end of the Conference, “the Sendai Framework for Disaster Risk Reduction” was adopted. It will be a guideline for the implementation of disaster risk reduction in the next 15 years. I expect that you will discuss universities’ role and contribution in its implementation process during this Summer School.

To conclude, I would like to thank the APRU secretariat for their kind support and cooperation. I wish you every success for this summer school program. Thank you.

Dr. Christopher Tremewan

Secretary General, the APRU secretariat

Good morning everybody. Greetings to President Satomi, Vice President Ueki, and other colleagues and friends from Tohoku University. Welcome to the participants, faculty, and students from around the Asia Pacific region. My privilege is Secretary General of APRU to join President Satomi and welcoming you here to this program to express my best wishes to you for a very exciting event.

For those of you who are not very familiar with APRU, allow me to offer a brief introduction. APRU was established in 1997 by four university presidents in California: the presidents of UCLA, Berkeley, Cal Tech, and USC. These presidents were observing the integration of the Asia Pacific region, the formation of APEC, and the ways in which governments come together to talk about big challenges in the region. The presidents felt that research universities should be coming together to play a role in advising governments regarding big science and significant challenges in the region, and to conduct research that may contribute to solving those challenges. Currently, APRU is comprised of 45 leading research universities all around the Pacific Rim. In addition, we have 17 out of the 24 APEC economy representatives included in our membership. In addition, we have over two million students and over 140,000 faculty members in our network. It is such a diverse one every region, and one of the things you will notice is not only the economic ties within the region, but also the collaboration and support provided, especially after the experience of the 2011 disaster. We are all on the Pacific ring of fire, and it is a very interesting place to live, albeit quite a risky one.

Acknowledging this challenge, we are very pleased to have developed a partnership with Tohoku University about three years ago by creating a program hub on multi-hazards with the International Research Institute of Disaster Science. The Multi-Hazards Program has thus far been very actively organized, and this summer program is one very good example of this collaboration. I can assure you that this is a thoroughly worthwhile program, and this will be especially evident when you observe the areas around the disaster zone and what has been happening since the disaster. The Program also developed many reports and statements, and a great amount of work has contributed to international entities and regional processes. For example, the Program recently contributed to the UN World Conference on Disaster Risk Reduction, as well as the Asian Ministerial Conference on Disaster Risk Reduction, the APEC emergency preparedness working group, and integrated research on disaster risk. These are some of the areas on which other programs active through our colleagues here.

We have also conducted a survey of safety preparedness of our own campuses or businesses through the hub program, and we look forward to developing these in

future. This is an excellent example of collaboration across our network. I must thank the Chairman of the core group, Prof. Yuichi Ono, as well as the Program Coordinator, Dr. Takako Izumi for their hard work and success.

We look forward to developing this program even more, and I encourage you all to contribute by offering up suggestions on how this program should develop. Thank you again for the hosts, and to all of you for coming to this program. I wish you all the best during your participation and discussions during this event.

Thank you so much.

Prof. Fumihiko Imamura

Director / Professor, IRIDeS, Tohoku University

Good morning everybody, and greetings to Dr. Tremewan, Secretary General of the APRU, President Satomi, and the participants. Welcome to Tohoku University and to Sendai. Thank you for joining the APRU-IRIDeS Multi-Hazards Summer School. The Summer School will start today, and you will have a three-day session and a field visit to Higashi-Matsushima City and Tagajo City, both of which were affected by the Great East Japan Earthquake and Tsunami in 2011. Through this program, you will learn the recovery process in these cities.

I am Fumihiko Imamura, Director of the International Research Institute of Disaster Science (IRIDeS), Tohoku University, and Professor of the Tsunami Engineering Laboratory. This new IRIDeS building at the new Aobayama campus was completed in November of last year. This enabled the researchers and students that were spread out across the several campuses to gather in a single place to conduct extensive research. This five-story building has been built with concrete and a seismic isolation system to reinforce against frequent earthquakes. In addition, the building is equipped with a 42-hour emergency power generator. Given these fortifications, we believe it is very safe.

Following the catastrophic earthquake and tsunami disaster of 2011, Tohoku University founded the IRIDeS in 2013. This institute is comprised of scholars from thirty-eight fields of seven divisions from the humanities and natural sciences to contribute to the multi-disciplinary and multi-layered researches and approaches in disaster management. This year's summer school has two purposes. The first is to learn from the experience and recovery process of the 2011 Great East Japan Earthquake and Tsunami. The second purpose is to understand the mechanism of the international disaster risk reduction (DRR) strategy through the Sendai framework, which was adopted at the 2015 UN World Conference on DRR held in Sendai in March. The presentations in this course include lessons learned from the 2011 Earthquake and Tsunami by the IRIDeS faculty members, recovery efforts by the private sector and local governments, lectures from guest speakers, and group works and discussions to discuss disaster education and the new international DRR framework.

The summer school program is the one of major activities for the APRU-IRIDeS Multi-Hazards Program established in April 2013. The IRIDeS of Tohoku University coordinates the Program and its activities as the regional program hub. The objectives of the Program are to harness the collaborative capacities of the IRIDeS and APRU universities for cutting-edge research on DRR and recovery, to share strategies to cope with campus disaster risk management, and to contribute to the international policy-making process on DRR. The Campus Safety Report is one of our outputs from the Program. During the

2014 summer school, participants discussed the role of universities to strengthen the disaster preparedness capacity. The first summer school was organized in July 2013, and more than thirty participants from thirteen APRU member universities participated.

I hope you enjoy the lectures, the field visit, and the discussions in the next four days.

Thank you very much.

PRESENTATION



Interdisciplinary Research in the International Research Institute of Disaster Science (IRIDeS), Tohoku University

Makoto Okumura

*Deputy Director / Professor,
IRIDeS, Tohoku University*



The IRIDeS was established in 2012, one year after the Great East Japan Earthquake and Tsunami (GEJET), in order to share the experience and lessons learnt from the disaster. In Japan, there are three disaster institutes under major universities. Such institutes are normally established after a big disaster. One of the focuses of the IRIDeS is to prepare for high-risk and low-frequency disasters. How should we manage and tackle these disasters? To address this question, it is important to understand the mechanisms and strategies regarding hazards, exposure, vulnerability, and resilience. First, to reduce vulnerability, it is crucial to build facilities that are physically strong (i.e., with an anti-seismic structure). The second strategy is to decrease exposure by utilizing land-use control. Thirdly, by increasing good preparedness capacity among communities such as through effective response mechanisms and the purchasing of disaster insurance, it is possible to significantly increase community resilience and recovery rates. The combination of these strategies is required, and can reduce disaster risks.

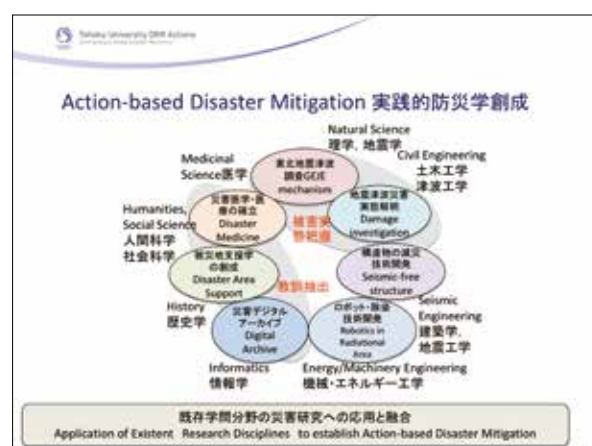
The key concept of disaster management comprises hard exposure, vulnerability, and resilience. The interaction between natural hazards and human behavior results in exposure, whereas vulnerability stems from weakness in the human social system. Further, resilience implies the speed of recovery. Engineering can decrease vulnerability and improve disaster prevention by building facilities to reduce the damage and effects of the initial impact. To decrease exposure, land-use control and temporal pre-disaster evacuation are useful tactics, and thus support from social science and urban planning is extremely crucial. To increase resilience, it is necessary to strengthen the disaster response capacity and to establish insurance and special finance arrangements.

In order to implement interdisciplinary approaches and research, IRIDeS holds seven divisions and thirty-seven research areas that cover broad areas of disaster science, including Hazards and Risk Evaluation, Disaster Information Management and Public Collaboration, Disaster Medical Science, the Endowed Research Division, Regional and Urban Reconstruction, Disaster Science, and Human and Social Response.

The projects and researches that IRIDeS have been conducting include the Michinoku Shinrokuden, a collaborative archive project made up of 120 organizations from industry, government, academia, and the private sector. Its purpose is to document images of the GEJET as it occurred. In addition, the Kakeagare Japan aims to establish and instill proper evacuation behaviors in preparation for a tsunami while tackling regional problems based on the lessons learned from GEJET. Further, tsunami evacuation drill programs are being planned and implemented in collaboration with various stakeholders.

The IRIDeS has been also contributing to higher education in disaster management. Tohoku University established the Inter-graduate School Doctoral Degree Program on Science of Global Safety with support from the Ministry of Education, Culture, Sports, Science and Technology (MEXT).

The Program collaborates with different graduate schools such as Science, Engineering and Arts, as well as the IRIDeS, and aims to train internationally prominent researchers in the field of disaster management.



Uniqueness: Multi-interdisciplinary structure

Research area	Disaster Area Support	Univ. of Tokyo E Institute	Kyoto Univ. R Institute	Nagoya Univ. R Institute	Fukuoka Univ. R Institute	D Institute
Hazard and Risk Evaluation	Earthquake, Tsunami	研究用多岐 (4部門, 48研究室) システムセン (サー)	地震・火山研究グループ	地震工学研究センター		地震・火山研究センター
	Volcanism	Related with Other Research		火山防災研究センター		火山防災研究センター
	Wind and Rain	Related with Other Research	気象研究グループ	気象防災研究センター		気象防災研究センター
	Snow Storm	Related with Other Research				気象防災研究センター
Human & Social Response	Human and Social Response		社会防災研究グループ	社会防災研究センター		社会防災研究センター
	Regional Safety					
Regional & Urban Response	Regional Safety					
	Regional Safety					
Medical Response	Medical Response					
	Medical Response					
Public Cooperation	Public Cooperation					
	Public Cooperation					
International Collaboration	International Collaboration	Yes	Yes	Yes	Yes	Yes

Multi-interdisciplinary also includes research on different types/areas of hazards, low frequency high risk disasters

New International Framework for Disaster Risk Reduction

Yuichi Ono

Professor, IRIDeS, Tohoku University



There are many ways to understand the importance of disaster risk reduction (DRR). There has been an international movement to promote DRR, because once a disaster happens, it is too late to save lives and property. Therefore, there has been a paradigm shift to reduce disaster risks since a few decades ago.

In the 1970 East Pakistan Cyclone, approximately 0.5 million people were killed. It became known as one of the world's largest disasters. Since the Pakistan/Bangladesh Tragedy was so huge, international agencies came to think seriously about disasters. The span between 1990 and 1999 was established as the International Decade of Natural Disaster Reduction (IDNDR) with a secretariat for a ten-year term. In 1994, Japan hosted the first World Conference on Disaster Reduction in Yokohama. The outcome was called the Yokohama Strategy and Plan of Action, the first internationally agreed strategy to call for disaster reduction. In 2000, the International Strategy for Disaster Reduction (ISDR) was established. In 2005, Japan hosted a second World Conference on Disaster Reduction in Kobe, which created the Hyogo Framework for Action. Japan hosted a third World Conference on Disaster Risk Reduction in 2015 in Sendai. The word "risk" was added as new concepts were brought forward, such as the reduction of potential risks by raising capacity, the implementation of early warning systems, and the establishment of education programs. The outcome, the Sendai Framework for Disaster Risk Reduction (SFDRR), refined the framework and targets of the former Hyogo Framework for Action. The SFDRR was adopted by 187 countries, and will be effective for the next 15 years. The important points are the seven targets and four priorities for action. The SFDRR mentions "new" disaster risks, referring to technological, climate change, and exposure (urbanization) components that are not included in the former framework.

Where is science in the SFDRR? In some countries, there is no dialogue between scientists and policy-makers. Science must act as a substantial basis for policy- and decision-making. Tohoku University communicated this message very strongly to the Japanese government and the international negotiating process. As a consequence, the importance of academia and the interface between policy and science has been mentioned numerous times in the SFDRR.

Finally, Tohoku University will commit to the SFDRR through establishing the Global Centre for Disaster Statistics with UNDP in April this year. The role of this organization is to collect and analyze data, and to provide feedback to governments. There is no such mechanism yet in the world, so we are committed to assisting the SFDRR in this way. Further, we also plan to organize an international forum on DRR in Sendai beginning in 2017. Working with other international organizations, we want Sendai to continue to hold this sort of multi-stakeholder forum to discuss the future of DRR.

Sendai Framework for Disaster Risk Reduction 2015-2030

Adopted by 187 countries at the World Conference on Disaster Risk Reduction, 18 March 2015

I. Preamble

II. Expected outcome and goal

Seven targets

III. Guiding principles

IV. Priorities for action

Priority 1: Understanding disaster risk
Priority 2: Strengthening disaster risk governance to manage disaster risk
Priority 3: Investing in disaster risk reduction for resilience
Priority 4: Enhancing disaster preparedness for effective response, and to "Build Back Better" in recovery, rehabilitation and reconstruction

V. Role of stakeholders

VI. International cooperation and global partnership

Targets

17. To attain the expected outcome, the following goal must be pursued:

Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience.

The pursuance of this goal requires the enhancement of the implementation capacity and capability of developing countries, in particular the least developed countries, small island developing States, landlocked developing countries and African countries, as well as middle-income countries facing specific challenges, including the mobilization of support through international cooperation for the provision of means of implementation in accordance with their national priorities.

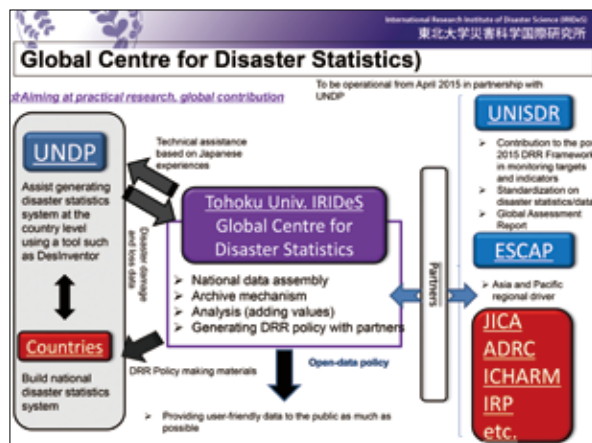
Adopted targets in the Sendai Framework for Action

18. To support the assessment of global progress in achieving the outcome and goal of this framework, seven global targets have been agreed. These targets will be measured at the global level and will be complemented by work to develop appropriate indicators.

National targets and indicators will contribute to the achievement of the outcome and goal of this framework.

The seven global targets are:

- (a) Substantially reduce global disaster mortality by 2030, aiming to lower average per 100,000 global mortality between 2020-2030 compared to 2005-2015.
- (b) Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 between 2020-2030 compared to 2005-2015.
- (c) Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030.
- (d) Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030.
- (e) Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020.
- (f) Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this framework by 2030.
- (g) Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to the people by 2030.



1. Global Centre for Disaster Statistics

Launch of the Global Centre for Disaster Statistics during the WCDRR in Sendai (15 March 2015)

運開発計画・東北大学災害科学国際
統計グローバルセンターの設

Future Actions after the UN WCDRR(2)

- World Bosai Forum (tentative)**
 - Continue discussion generated during the 1st United Nations World Conference on Disaster Risk Reduction
 - Theme: The broad setting of disaster risk reduction and recovery
 - Periodic meetings (once every two years) in Tokyo and Sendai to contribute to the efforts for disaster risk reduction in Japan and overseas while continuing the support for the recovery of Tohoku
 - Planning creative events such as plenary meetings, symposium and exhibition and think together with the government, international agencies including the United Nations, companies, academia, NGOs and citizens
 - Collaboration with INDR and Global Risk Forum (GFR)

The Roles of Archives and Memorialization in Disaster Risk Reduction

Sébastien Penmellen Boret

Assistant Professor, IRIDeS, Tohoku University



Drawing from his anthropological research and archival activities, Dr. Boret examined the potential roles of digital archives and memorials, or what he referred to as 'living memory', in Disaster Risk Reduction (DRR). Whether natural or man-made, the traumatic experiences of disasters often call for spaces, places and objects of memory. Memorial ceremonies, monuments, gardens, storytelling, and museums are all tangible and intangible forms of remembering disasters and their victims. Although less common, disaster archives which conserve the records (texts, photographs, objects and so on) of catastrophes may also greatly contribute to the ways in which societies remember disasters. Based on his research on archives and memorials of the Great East Japan Disaster (2011), Boret's presentation was a first attempt to bring these complementary elements of our living memory of disasters to start understanding their potential benefit for disaster risk reduction.

Part I – Archiving Disasters: The Michinoku Shinrokuden Project

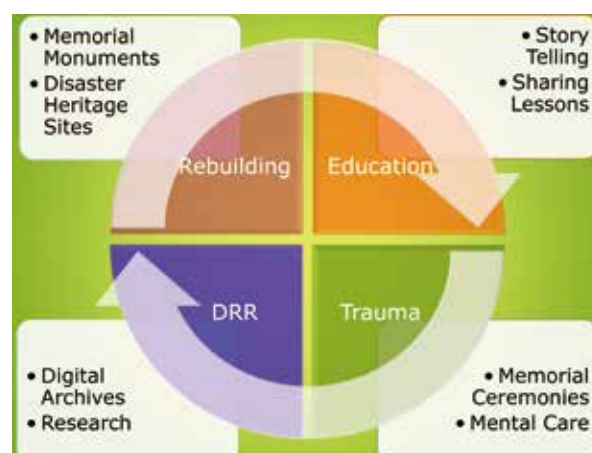
The first part of his lecture discussed the concepts held by one of the most innovative and ambitious digital archives project. Recognizing the potential value of **disaster archiving**, Tohoku University created a digital archive of the Great East Japan Disaster, namely *The Michinoku Shinrokuden Project* (2012). Currently a member of its research team, Boret explained that its multi-layered mission is, not only to collect a vast and comprehensive amount of knowledge related to the Great East Japan Disaster, but also enhance disaster prevention and mitigation within and outside Japan through knowledge exchange and educational activities, and as such contribute to DRR.

Part II – Memorializing Disasters: The Great East Japan Disaster

The second part of his presentation concerned his own object of research, the memorialization of disasters. In addition to digital archives, another component of a society's broad memory of disasters relating to disaster risk reduction (DRR) is **disaster memorialization**. Boret explained that he understands memorialization as any process that may contribute to the preservation of memory of a catastrophe and their victims through any tangible and intangible acts of remembrance, such as private and public ceremonies, secular and religious memorial monuments and sites, storytelling and informal and formal disaster education. The recording and analysis of these processes of memorialization has also become central to the activities of the Michinoku Shinrokuden Project. Its leaders believe that, together with archiving, memorialization form the necessary basis for any society to remember a disaster and its victims, appease the trauma of its survivors, contribute to the reconstruction of its communities and prepare for and protect itself and its vulnerable populations from future disasters.

To conclude his presentation, Boret emphasized that disaster memorialization, in addition to serving

the need of the affected population, must be understood in direct relationship with disaster archives in order to help sharing the memory of and the lessons learned from disasters necessary for DRR at the local and global level.



Overview of the APRU Multi-Hazards Program

Takako Izumi

Associate Professor, IRIDeS, Tohoku University / APRU Multi-Hazards Program Coordinator



The APRU Multi-Hazards (MH) Program was launched in April 2013 by the International Research Institute of Disaster Science (IRIDeS), Tohoku University, and the Association of Pacific Rim Universities (APRU). IRIDeS provides administrative services as the regional program hub for the MH Program. The Pacific Rim region is subject to a high risk of natural disasters, and the universities and research institutions in the region are expected to play a role in reducing disaster vulnerability and strengthening disaster management capacity. The main objectives of this program are to harness the collective capabilities of APRU universities for cutting-edge research on disaster risk reduction (DRR) and to contribute to international policymaking processes to steadily improve DRR.

Activities of the MH Program include the following:

- An annual Multi-Hazards Summer School, to share the lessons learned from severe disasters and to contribute to the development of regional disaster experts;
- Supporting the organization of the annual Research Symposium on Multi-Hazards;
- Conducting collaborative research and sharing results and data among the APRU institutions;
- Contributing to discussions and to international and regional DRR decision-making processes; and
- Promoting natural disaster preparedness capacity on university campuses by conducting a survey on campus safety and publishing the outcomes.

The summer school, one of the major activities of the MH program, started in 2013 and has been held for the last three years. It aims to share the experiences and lessons learned from the Great East Japan Earthquake and Tsunami and to foster discussions on the challenges and issues that scholars are facing in DRR research and implementation. More than 40 students and faculty members, mainly from the APRU member universities, participate each year.

In 2014, the MH Program conducted a survey of the APRU member universities to identify the current status of and the challenges involved in implementing campus safety. The results not only revealed that the universities have developed many good campus safety initiatives but also that various elements still need to be strengthened. To support the universities in developing and implementing campus safety plans, the MH Program intends to organize a workshop to discuss the relevant challenges and how to overcome them, share implementation experiences, and learn more about how to develop tools and systems. The MH Program considers strengthening preparedness capacity to be a leading responsibility of the universities so that they can protect the lives of students, faculty, and staff, the universities' assets, and their accumulated

knowledge.

In March 2015, the UN World Conference on Disaster Risk Reduction (UNWCDRR) was held in Sendai, Japan. The MH program organized a public forum, "Practical DRR and Science: The Role of Universities and Academia in DRR" at UNWCDRR, and more than 100 people attended. It included three sessions: "Bridging the Gap between Science and Practice," "How Can Science and Technology Contribute to Practical DRR?" and "The Role of Social Science in DRR." The participants engaged actively in the discussions.

Furthermore, APRU was invited by UN Office for Disaster Risk Reduction (UNISDR) to the Asia Science, Technology and Academia Stakeholder Group in May 2015. The objectives of this group are to enhance and strengthen the capacities of the academic science and technology communities in terms of disaster risk reduction, to assist governments in science-based decision making to implement the Sendai Framework for Disaster Risk Reduction (SFDRR), and to enhance networking for better utilization of scientific innovations and higher education resources. Through this platform, the MH Program aims to address important issues at a high level and influence policy and decision-making processes as well as to contribute to the implementation of a disaster-resilient society.

2013 Summer School Program

"Lessons-learned from the Great East Japan Earthquake and Tsunami, and Future Disaster Risk Reduction"

Dates:
23-24 July 2013: 2-day seminar
25 July 2013: Field trip to the affected sites

Participants: 31 participants from 9 countries

Main objectives:

- Share lessons and experiences on effective disaster preparedness from the Great East Japan Earthquake and Tsunami;
- Discuss the roles of universities/research institutes in DRR and their challenges;

Feedback:

- 95% of the participants answered they were satisfied or very satisfied with the course contents.



2014 Summer School Program

"Prepare for high-impact disasters: towards the UN World Conference on Disaster Risk Reduction"

Dates:
22, 23, 25 July 2014: 3-day seminar
24 July 2014: Field trip to Kesennuma city

Participants: 47 participants from 7 countries

Main objectives:

- Share lessons and experiences from the Great East Japan Earthquake and Tsunami;
- Discuss 1) the roles of universities/research institutes in disaster risk reduction (campus safety) and 2) the regional focus in disaster risk reduction (climate change, local action, resilience, early warning etc)





Campus safety

Survey on current status of disaster preparedness on campus among the APRU institutes

Purposes of the survey:

- Develop a minimum standard and checklist for disaster preparedness on campus.
- Promote the need of campus safety and share the best practices at international and regional levels.

Suggestions from the summer school:

- Universities should ensure all staff and student are aware of the university's disaster management mechanism and procedures.
- Conduct a regular drill and simulation exercise as well as a disaster preparedness guidance.
- Conduct a vulnerability and risk assessment and share the results
- Post-event data collection to use them as data and materials for future research




UNWCDRR Public Forum

Practical DRR and Science
 ~ Role of Universities and Academia in DRR ~

Session 1: "Bridging the gap between science and practice"

Session 2: "How can science and technology contribute to practical DRR?"

Session 3: "Role of social science in DRR"

21 disaster related experts and scholars were invited to this session as speakers from government, academia, NGO, the private sector, and research institute such as NASA.






How to make a healthy resilient community

Shinichi Egawa

Professor, IRIDeS, Tohoku University

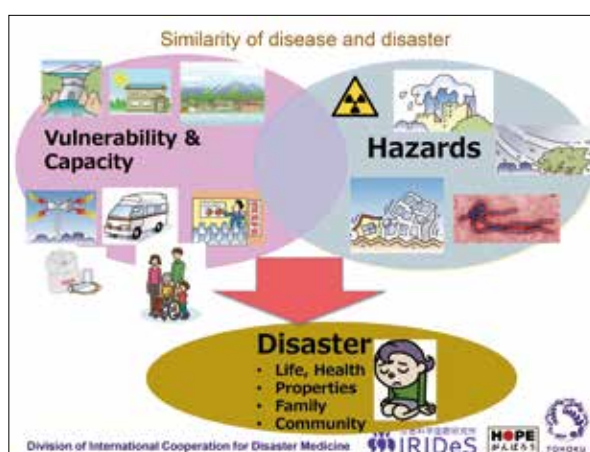
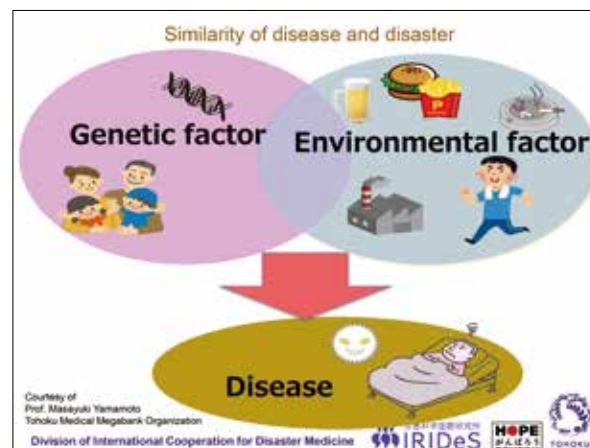
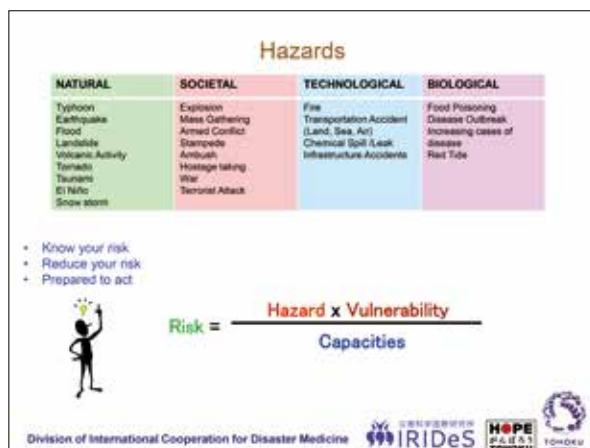


Disaster and Disease have many common features. Disaster is defined as an emergency in which the humanitarian needs are beyond local capacity to meet those needs i.e. the response and recovery operation must be managed at the national and/or international level. Disaster risk is calculated by the following equation: $\text{Risk} = \text{Hazard} \times \text{Vulnerability} / \text{Capacity}$. Similar approach to decrease the disease risk can be applied to disaster risk reduction. International commitment for disaster risk reduction (DRR) was crystalized into the Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR) in the World Conference for DRR in Sendai March 2015, in which “health” was greatly incorporated.

On Mar. 11, 2011, Great East Japan Earthquake (M9.0) and Tsunami attacked the Tohoku Area, North-east part of Japan and killed more than 18,000 people. Even after 4 years, more than 120,000 people are forced to relocate due to the Nuclear Power Plant accident. Japanese health professionals had prepared for large scale disaster by establishing Disaster Base Hospitals (DBH), Disaster Medical Assistant Teams (DMAT), Staging Care Unit (SCU) and Wide Area Transportation System, Emergency Medical Information System (EMIS) and Disaster Medical and Public Health Coordinator. These system was managed by the Ministry of Health, Labour and Welfare after experiencing the number of crush syndromes and preventable deaths at Hanshin-Awaji Great Earthquake in 1995. The medical needs of the affected people in 2011 was very different from that in 1995 because of the strengthening of building cords, huge population relocation due to Tsunami and NPP accident. The needs for non-trauma, non-communicable disease and mental health overwhelmed. The vulnerability of the hospitals in the affected area revealed that every hospital and health professional should be prepared for disaster to receive support and provide the local health care in disaster.

Disaster always exceeds the expectations, but the pre-disaster assessment and improvement of resilience of the health-care system can save the life and the quality of life of people both mentally and physically.

It is important to understand the notion of SFDRR and implement it. But, at the same time, we also have to think about what the life is and how we can manage our community to have a better, healthier life. Collaboration, coordination and transdisciplinary approach is a key to promote mutual understanding of countries, clusters and each individual.



A Case Study of KAKEAGARE! Japan & Dentsu's DRR-Related Business

Shunsuke Matsushima

Dentsu, Inc.



Dentsu has been continuing the “KAKEAGARE! JAPAN” project since the Great East Japan Earthquake and Tsunami. “KAKEAGARE!” means “run up to a higher ground.” Launched in 2012, the project aimed to use the experience and lessons learned from the major disaster to develop a program of tsunami evacuation drills and to create “a culture of evacuation” that can be practiced on an everyday basis. We work with IRIDeS and Kahoku Shimpō Publishing Co., a local newspaper in the Tohoku area. The project provides programs which vary according to the local conditions. Training topics can be chosen by local governments and communities.

Another DRR-related project developed by Dentsu is the “Plus SONAE Project,” which means “add preparation.” We will study, analyze, and develop solutions to DRR, and we will provide services to customers in DRR-related business. Our objective is to act as a social solution. We have just recently launched this concept, so all our DRR-related businesses will be gathered.

What KAKEAGARE! offers

Variable drill programs are being proposed, that local residents can freely select and combine to meet the evacuation issues they face, due to the characteristics of their area, such as **terrain, population, and location of residential districts**.

Our objectives are to foster **culture of evacuation**.

Case 02 | Yamamoto, Miyagi Pref. (Aug. 11, 2013)

- After the drill was over, a **disaster prevention event** was held at a junior high school gymnasium, and a civic group exhibited a disaster prevention booth.
- The local “**car evacuation**” rule gained widespread attention and was reported in newspapers and on TV nationwide.

■ No. of participants: approx. 3,000 (600 cars)

Training Topics in Tsunami Evacuation

Topic A: To Evacuate Without Losing Time	Topic B: Methods to Encourage Evacuation Spontaneously	Topic C: Information Transmission and Collection
1. Persons needing assistance to evacuate	11. Create festival—incorporate into regular event	21. Transmit information—training to reach out to people
2. Shortcuts/obstacles (on way to/from school)	14. Create school event—strengthen ties between school and community	22. Gather information—training through disaster prevention drill
3. Terrain, topography, etc.	17. Create order/season—Make into fun event at school	
4. Persons with pets		Topic D: Transmission Line
5. Company/business site (BOP)	Topic E: Methods to Encourage Evacuation Spontaneously (continued)	23. Evacuation corner—training to set up a center and related facilities
6. Isolated community (remote island, etc.)	16. Raise awareness of evacuation—hand down from generation to generation	24. Check on safety—prepare for loss of needed
7. By Car	17. Raise awareness of evacuation—creating something	25. Check on safety—Disaster message board, etc.
8. By Other vehicle (bicycle, cart, etc.)	18. Adapting to the “unfamiliar”—revitalize evacuation drill	
9. Evacuate evacuation buses, etc.	19. Train people—community disaster prevention training	Topic F: Disabled
10. High ground/substitute (highland, etc.)	20. Train people—volunteers to take initiative	26. For drill organizers
11. Righttime drill, etc.		27. For drill participants
12. Evacuation with rescue on ground, etc.		

The concept of <plus SONAE> is;
To **add “awareness of preparation”** into ordinary life

◆ **Objective**
To contribute to a resilient and peaceful society, **by popularizing preparation for natural disasters and by creating and expanding disaster risk reduction business.**

◆ **Activities**

- Study and analyze, and **develop solutions** to disaster risk reduction.
- Provide services** to customers in disaster risk reduction business.
Consultations from an ordinary citizens’ stand point, Product development, Business development, Project management, Communication planning, etc.

Earthquake Reconstruction Operations in Ofunato

Masaaki Miyamoto

Pacific Consultants CO., LTD



Three major differences have been observed between earthquake reconstruction projects and normal projects. First, in the earthquake reconstruction setting, several projects proceeded simultaneously. Second, the planning requirements were not immediately implemented. Third, there was a gap between the residents' wishes and what the project could accomplish as it progressed.

The earthquake reconstruction project in which I was involved, the "Project of Relocation to Uplands" in Ofunato City, Iwate Prefecture, faced considerable hardship, as it took a very long time to make various adjustments. Because Ofunato has a steep terrain, there was very little land available to secure residential sites on a hill. In addition, due to the fragile infrastructure and hard soil, any large-scale construction work was extremely expensive. Under these conditions and taking into consideration the demands of the residents, development of the open area around the already existing houses was recommended. In this way, it was easier to maintain a community intact, spend less money, and complete the project in a shorter time.

Based on the experiences in Ofunato, two proposals can be made with regard to bridging the gap between science and practice. First, the commitment shown to the areas affected by the Great East Japan Earthquake must be continued. Thus far, because the government has provided huge amounts of funding to the affected areas, people and resources have gathered in this area. However, the budget is projected to be vastly reduced in upcoming years, causing many people and resources to leave, although various issues remain unresolved and projects are not yet completed. Thus, universities will need to become more actively involved in the future.

The second recommendation concerns preparation for future disasters. A framework for all parties involved in reconstruction planning must be created, and it should be handed down to others before the acquired experience is forgotten. In addition, it is important to improve communication between academics and consultants, so that members of both groups can interact on a daily basis as equal partners. Such collaboration would make it possible to bridge the gap between science and practice, as academics and consultants would be in a position to complement each other.

Difference between the Earthquake Reconstruction projects to normal projects

- ① Proceeding verification of **various projects at the same time**.
- ② The enactment of the law, "Great East Japan Earthquake Reconstruction Special Zones Act", was taken 9 months after the earthquake, and special provisions were announced one after another.
Therefore, **the requirements for planning were not confirmed easily**.
- ③ **How to fill the gap between intention of the residents and business on the feasible contents**, we went forward by trial and error because there was no precedent.

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Characteristic estates in Ofunato (Insertion type residential site)

■ Features

- Close to the existing settlements and easy to maintain the community.
- Requires less operating expenses
- Needs shorter construction period



- Struggle Point** "Because the residential lands existed in the neighborhood, various demands had been generated from local people in implementing the design.
"It has taken a great deal of time to adjust their requests resulting in delays of construction."
- Devised Points** "Adjustment focused on the key person (detailed demand, etc., were coordinated by the local organizations)
"Conducted community based design that takes into account the opinions of the detailed level."

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Situation of current Ofunato

Photographed November 2014

Normal type residential site



Insertion type residential site

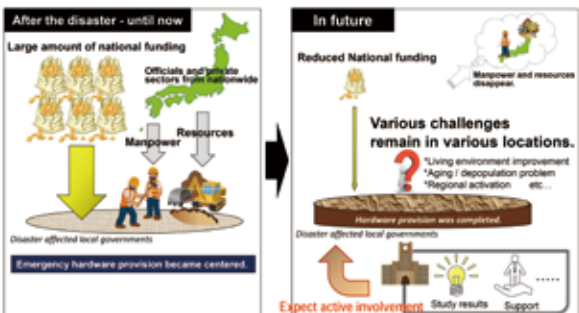


※ The land forming has been sequentially completed and housing construction started.
Relocation to the new houses has been completed in some locations.

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Proposal 1: Commitment to the affected areas must be continued

- The disaster areas will **require more academic involvement** in the future.



Proposal 2: Preparations for future disaster

Part1: Planning of the framework on Reconstruction Town Planning in the Event of a Disaster

<Background>

- Disaster municipality must take action toward the victims immediately after the disaster. The municipality ran about in confusion while not knowing how to take advantage of external support (Universities/Academia, Consultants, etc.).
- On the other hand, disaster residents increased the distrust and dissatisfaction against the government that do not announce reconstruction policies. We experienced residents, who at first, were cooperative becoming uncooperative as time elapsed.

<Proposal>

- We need the framework of the initial system mechanism on reconstruction town planning when the disaster occurred.
- We should hand down the framework before the acquired experience is forgotten.

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Proposal 2: Preparations for future disaster

Part2 : Communication Gap Improvement Between Academia and Consultants

<Background>

- Because each party did not know "what is possible / what is not possible", each party requested excessive expectation to the other and it produced excessive disappointment. (It was particularly evident with the verification speed required reconstruction projects.)
- Academia and consultants must understand that their position and work are different. Academia are not almighty. Consultants cannot solve by themselves.
 - The purpose of academia ...the pursuit of ideals and universalization and generalization of academic knowledge
 - The purpose of consultants ...Realization of contents requested by site (customer)

<Proposal>

- A platform where academia and consultants can discuss equally on a daily basis is desired.



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Overview of JICA Reconstruction Assistance for the Great East Japan Earthquake

Midori Kamada

Japan International Cooperation Agency-JICA Tohoku



The Japan International Cooperation Agency (JICA) was established in 1954, and its main activities involve assistance for developing countries. Most of JICA's Great East Japan Earthquake reconstruction assistance has been done in Miyagi Prefecture. The basic concept is "resilience through resonance among diversified societies." We conducted two researches aiming to investigate various assistance approaches that have been undertaken in the disaster-affected areas in Tohoku for the purpose of considering effective reconstruction assistance and community support.

JICA partnership programs support and jointly implement cooperation projects for developing countries based on the experiences and technologies accumulated by NGOs, local governments, or universities. Further, Banda Aceh, Indonesia, and the Higashimatsushima Organization for Progress and Economy, Education, Energy are all collaborating. This project aims to promote collaborative work through reconstruction outcomes of Banda Aceh City and Higashimatsushima City to create a model for collaborative assistance among countries and regions that have suffered natural disasters. Our international cooperation trend is shifting from vertical to horizontal, and this project represents the idea of learning from and sharing with each other. We have also sent two Regional Reconstruction Facilitators to Higashimatsushima City to help revitalize the society.

Finally, we are considering the development of human resources for reconstruction assistance. In the wake of the Great East Japan Earthquake and Tsunami, those who were working in the field of international cooperation came back to Japan to provide community support in the disaster-affected areas. We feel it is important to support human resources because they can work domestically and internationally.

1. Basic Concept

• Resilience through Resonance among diversified societies

- Rediscovery of need for sustainable societies in the wake of the Great East Japan Earthquake
- Search for spiritual richness, not monetary and physical richness
- Provision of horizontal assistance instead of vertical assistance
- "Co-creation"

"Reconstruction × Regional Economic Development × International Cooperation" Workshop (Jan. 2015)

Present topic	No. of participants
Reconstruction assistance (with experience in international cooperation)	11
Reconstruction assistance (without experience in international cooperation)	2
Regional economic development assistance (with experience in international cooperation)	13
Regional economic development assistance (without experience in international cooperation)	1
Total	27

The 3rd UN World Conference on Disaster Risk Reduction- Overview and Results of the Conference

Akira Takahashi

Director, Disaster-Resilient and Environmentally Progressive City Promotion Office, City Planning Policy Bureau, Sendai City



Background of the UN World Conference on Disaster Risk Reduction

There has been growing international concern on disaster risk reduction in the past 15 years before this conference since many large-scale disasters have occurred throughout the world. Disaster risk reduction is essential to realize sustainable development. The 3rd conference held in Sendai City aimed to review the implementation of the Hyogo Framework for Action and its priority actions, which were mapped out at the 1st conference held in Yokohama in 1994 and developed at the 2nd conference held in Hyogo in 2005. It also aimed to discuss a post-2015 framework.

Why the conference was hosted by Sendai City

Our objectives of hosting the conference are as follows:

- To contribute to disaster risk reduction around the world by transmitting the experiences and lessons learned from many disasters, including the Great East Japan Earthquake.
- To develop the city as a world-leading disaster-resilient city with advanced disaster management policies, drawing global attention to its policies, as a city that had experienced disasters and the recovery process
- To be recognized as an international convention city by hosting the largest-ever international conference in the city, thereby securing more visitors, especially foreign visitors, because the number of visitors had considerably decreased since the 2011 earthquake.

What is the UN World Conference on Disaster Risk Reduction?

The 3rd UN World Conference on Disaster Risk Reduction was held from March 14 to 18 in Sendai City. The main conference was attended by 6,593 people, including representatives from 185 UN member states, international organizations, NGOs, and the media. The conference ended with the adoption of two outcome documents: the “Sendai Framework for Disaster Risk Reduction 2015-2030,” which is an international guiding principle for disaster risk reduction for the next 15 years, and the “Sendai Declaration.”

Outline of the conference

1) Main conference

- ◆ **Organizer:**
United Nations
- ◆ **Schedule:**
March 14 (Sat.) to 18 (Wed.), 2015 in Sendai City
- ◆ **Venue:**
Sendai International Center (Conference Building, Exhibition Building, etc.)
- ◆ **Purposes:**
 - This is a UN-hosted conference to formulate international strategies for DRR. Both the 1st conference (Yokohama City, 1994) and the 2nd conference (Hyogo Prefecture, 2005) were held in Japan.
 - The Hyogo Framework for Action (HFA), an international guiding principle for DRR from 2005 to 2015, was developed at the 2nd UN World Conference on Disaster Reduction.
 - Aiming to review the implementation of the HFA and adopt an international framework for DRR after 2015 (Post-HFA) at the 3rd conference
- ◆ **Participants:**
UN member states, international organizations, international NGOs, etc.

UN World Conference on Disaster Risk Reduction
2015 Sendai

Outline of the conference

2) Related events / Public Forum

Public Forum

Great East Japan Earthquake Forum

- ◆ **Organizer:** Government of Japan (Sendai Committee)
- ◆ **Venue:** Centennial Hall (Kawauchi Hagi Hall), Tohoku University
- ◆ **Contents:**
With "Global Knowledge Sharing of Experiences and Lessons Learned from the Great East Japan Earthquake" as the theme, a total of nine symposiums will be held, five of which are hosted by the Government of Japan and four of which by the Sendai Committee, as core events of the Public Forum.
- ◆ **Participants:**
Pre-registration required. Participants in the main conference and many residents will join this forum.

Symposium / Seminar

- ◆ **Organizer:** Sendai City and other local governments, ministries and agencies, universities, NGOs, NPOs, companies, community groups, etc.
- ◆ **Venue:** Sendai Civic Auditorium, and other venues in the Tohoku region
- ◆ **Contents:** Organizations from home and abroad will for DRR and their reconstruction activities.
- Symposiums "Civil Society Collaboration and DRR" and "Disaster and DRR" will be held in the Thematic Pavilions.**

Exhibitions

- **International Exhibition on Disaster Risk Reduction**
◆ **Organizer:** Sendai Committee
- ◆ **Venue:** 1F Sendai Metropolitan Museum
- **Outdoor Exhibitions**
◆ **Organizer:** Sendai Committee, Sendai City
- ◆ **Venue:** Miyatake Park, northeast of the Sendai City Hall
- **Exhibition of DRR Industry in Sendai**
◆ **Organizer:** Cabinet Office, Miyagi Prefecture, Nakano-Kogyo, Shimizu, Ltd.
- ◆ **Venue:** Yama Messe Miyagi

◆ **Tohoku Reconstruction & DRR Pavilion**
◆ **Organizer:** Sendai Committee- ◆ **Venue:** 1F Sendai Metropolitan Museum
- ◆ **Organizer:** Sendai Committee, Sendai City
- ◆ **Venue:** Miyatake Park, northeast of the Sendai City Hall
- ◆ **Exhibition of DRR Industry in Sendai**
◆ **Organizer:** Cabinet Office, Miyagi Prefecture, Nakano-Kogyo, Shimizu, Ltd.
- ◆ **Venue:** Yama Messe Miyagi

Overview of the conference held in Sendai City

The main conference consisted of three segments, the Inter-Governmental Segment, in which discussions were conducted mainly between UN member states, Multi-Stakeholder Segment, in which many stakeholders participated to discuss various topics, and the Public Forum, in which some side events were held by UN-related organizations. As for the Public Forum, nearly 400 side events and indoor and outdoor exhibitions were held during the conference, which were attended by approximately 150,000 participants.

Results and evaluation of the conference

In the Sendai Framework for Disaster Risk Reduction 2015-2030, ideas suggested by Japan, such as the importance of investment in disaster risk reduction, commitment by various stakeholders, and the concept of “Build Back Better,” were included. At the same time, it was capped with the name of Sendai. We believe that the conference will serve as a starting point for Sendai City to be recognized as a disaster-resistant city.

Evaluation of the conference / Evaluation as Sendai city
(Summary)

- 1 A variety of information on DRR and management, and on reconstruction of affected areas, was transmitted at the popular level. This was highly appreciated by participants. It also increased the self-belief of individual residents and enhanced their willingness to continue DRR efforts.
- 2 Two outcome documents, “Sendai Framework for Disaster Risk Reduction 2015-2030” and “Sendai Declaration,” were adopted. This was a great honor for the city, and at the same time, we took on the responsibility to further enhance our efforts in the future.
- 3 We will work to build a more resilient city than ever to realize the concept of “Build Back Better,” aiming to set an example to the world as the host city of the conference and a role model city in the UN World Disaster Reduction Campaign.
- 4 We will pass on efforts for DRR and management to the next generation, and continue to transmit information on our efforts to the world, making use of domestic and international networks formed through the holding of the conference.

Future of Sendai as a disaster-resistant city

- 1 As the host city of the conference, we will incorporate the results of the conference, which are reflected in the Sendai Framework for Disaster Risk Reduction, into various administrative areas of the city.
- 2 We will promote our efforts, in cooperation with residents and organizations that demonstrated their willingness to actively participate in our efforts in the Public Forum, and transmit information on our activities.
- 3 To continue to transmit information on disaster prevention efforts from Sendai, we will pay attention to discussion about DRR at home and abroad after the conference. We will also hold various events, such as symposiums, in cooperation with the UN and relevant organizations.
- 4 We will identify the issues on how to host conferences through questionnaire and hearing surveys and use the survey results in hosting future conventions, and compile a complete report on the conference by the autumn of this year.

Towards disaster risk reduction city: A disaster-resilient Tagajo City

Manabu Suzuki

Chief, Bureau of Reconstruction Promotion, Office of Mayor, Tagajo City



Tagajo City is located in the eastern region of Miyagi Prefecture near Sendai City, about 12 kilometers away from central Sendai. The population is 62,873 as of June 2015. Tagajo City was greatly damaged by the Great East Japan Earthquake and Tsunami in 2011. The tsunami hit the city approximately one hour after the earthquake. The highest wave reached 4.6 meters. One-third (662 ha) of the city was inundated by water, and about 12,000 people fled to evacuation sites such as schools.

A severe and inconvenient evacuation life started. As a result of the tsunami, a total of 188 precious lives were lost, and over 11,000 houses were destroyed in the city. Factories and offices in the industrial area were almost totally destroyed. Before the Great East Japan Earthquake and Tsunami, it was estimated that there was a 99% probability of an earthquake within 30 years off the coast of Miyagi Prefecture. Therefore, citizens were relatively prepared for earthquakes, and most were aware of how terrifying tsunamis were. At the same time, however, most people knew that Tagajo City was never affected by tsunamis in the past, and thus adopted the mentality that Tagajo would be unaffected even after the large-scale tsunami warning was issued. As a result, some people did not evacuate quickly, and others who evacuated by cars were caught in traffic jams, causing many injuries and casualties.

There are four major points in the DRR city strategy.

1. "Developing a disaster-resilient city." Four strategies have been drawn up, centering on the construction of infrastructure.
2. "Increasing DRR capability based on self-help and mutual help." Two strategies have been implemented so that citizens and local communities can cope with disasters by themselves, rather than depending fully on local administrations.
3. "Sharing disaster experience." The aim of this strategy is to pass on the experience of disasters accurately to future generations so that they are not forgotten.
4. "DRR technology." This is a strategy that enables companies to maximize their strength and be involved in projects that only regions damaged by the disaster can engage in, enabling these areas to turn the disaster experience into something productive and positive.

Under the four goals, eight implementation strategies were established.

Strategy 1: "Building multiple barriers for tsunami."

Although sea walls will be constructed along the coast as a result of the damages seen in the 2011 disaster, these are only sufficient to cope with tsunamis that will strike once in 100 years. Therefore, when a huge tsunami that occurs once in 1,000 years strikes, overflow and flooding will result. This strategy aims to overcome this situation by considering evacuation as the basic policy, even though multiple barriers will be built. Specifically, main projects include the development of

evacuation announcement facilities to send information accurately and swiftly, the construction of evacuation roads, the designation of temporary escape buildings to rescue people who are unable to evacuate, and the building of barriers to reduce the force and speed of tsunamis.

Strategy 2: “Developing earthquake-resilient city.”

This strategy aims to increase earthquake-resistant roads and bridges, and to promote the retrofit of wooden buildings to make them earthquake-resistant.

Strategy 3: “Minimizing flood damage.”

There is a higher risk of flooding due to the fact that the ground has sunk after the Great East Japan Earthquake and Tsunami, and due to a recent trend of heavy rain in a short period of time. To overcome this problem, projects such as the development of a rainwater-draining system and the construction of new rainwater drain pumps have been planned.

Strategy 4: “Developing a disaster response system.”

During the Great East Japan Earthquake and Tsunami, the number of people who evacuated was far greater than previously estimated. Thus, evacuation support was insufficient. By reflecting on that experience, we have reviewed our disaster response system.

Strategy 5: “Enhancing self-help ability.”

The aim of this strategy is to enable citizens themselves to prepare for disasters. Paired with Tohoku University’s International Research Institute of Disaster Science, we have developed the DRR handbook that outlines measures on how to cope with and prepare for disasters. We have been holding classes for citizens making use of this handbook.

Strategy 6: “Strengthening community DRR capacity.”

This strategy aims for the improvement of the DRR capacity, as well as the mitigation of local communities by such tactics as voluntary emergency drills.

Strategy 7: “Sharing the disaster experience.”

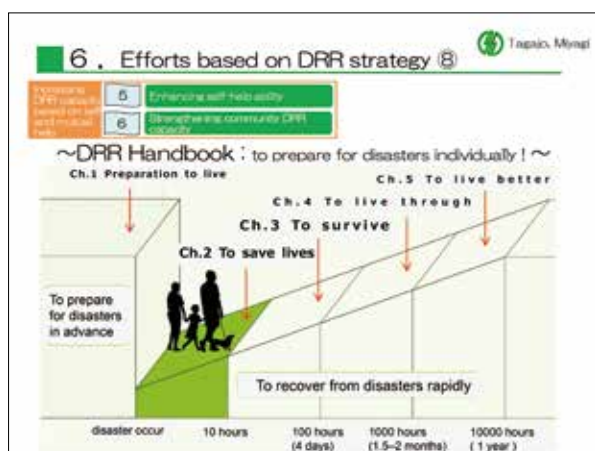
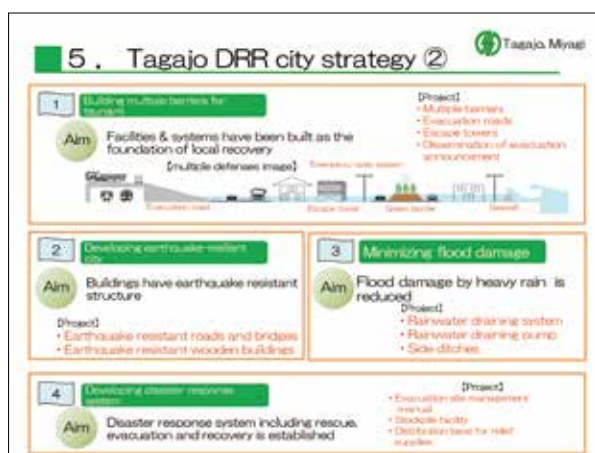
Many pictures of the 2011 disaster were taken, and it is crucial to preserve and compile those records carefully and to share it with future generations.

Strategy 8: “DRR Research Park Program.”

This strategy seeks to promote DRR technology development as well as the accumulation and

creation of industries using DRR technology by utilizing space created from factories damaged by the earthquake.

Tagajo City experienced tremendous loss due to the tsunami. However, people in Tagajo City also learned valuable wisdom and survival skills through the experience. In addition, the city received significant support from all over the world. Consequently, strong determination has been developed in order to initiate the DRR measures, and to change perceptions from negative to positive through the process of reconstruction.



To enhance regional capacity for disaster prevention -Future outlook of educational actives for disaster prevention-

Mari Yasuda

Research Associate, IRIDeS, Tohoku University



During large-scale natural disasters, vulnerable groups, such as children and senior citizens, frequently constitute a high percentage of the deaths and/or injuries that occur. To survive these disasters and recover adequately, it is imperative that organizations train for and develop disaster prevention initiatives. The International Research Institute of Disaster Science (IRIDeS) of Tohoku University deployed a disaster education team to enhance local community resilience and reduce the impact of disasters among elementary students not only in Japan but also in the Philippines after the destruction of Typhoon Haiyan. This educational program consisted of several workshops for children in the highergrade levels of elementary school due to their strong backgrounds and interest in science. We conducted disaster education workshops at 70schools 4,000students in Japan. And four elementary schools in areas affected by Typhoon Haiyan. Approximately 200 students participated in these disaster education workshops and practical drills. After the lectures, positive attitudes about disaster education at the three schools increased. Because large-scale disasters can be accompanied by potentially diminished government assistance, this educational program seeks to improve disaster-related self-resiliency through the development of survival capabilities.

Keywords: practical education, disaster adaptation, decision making, evacuation risk communication



Automated Operational Earthquake Risk Assessment: Challenges and Promise

John B Rundle

Distinguished Professor and Senior Advisor to APRU MH Program,
Departments of Physics and Geology, University of California Davis
According to statistics compiled by the California Earthquake



Authority, only 10% of California homeowners carry earthquake insurance, presumably due to the cost and limited options available. A recent CEA proposal (dated 10/23/2014) to dramatically expand the options available for homeowners would replace the current limited rate structure of 10% or 15% deductibles with a much larger range.

This raises an important question: How is the homeowner to know what rate and deductible to choose? Since earthquake insurance is typically sold for yearly intervals, frequent changes in seismic risk will have a real-time impact on the decision of whether to purchase earthquake insurance, and if so, how much.

An automated system for evaluating and managing personal risk from seismic activity is one solution to the problem of how to choose an appropriate level of earthquake insurance. Such a system needs to compute an earthquake forecast, to propagate the ground motion from the earthquake source to the structure, and finally to evaluate the structural integrity of a residence when subjected to seismic shaking. Since earthquake hazard can change rapidly in time, the earthquake forecast must be updated on demand or at least daily using a real-time catalog.

In this talk we describe a system of this type that has been operating for over 4 years at <http://www.openhazards.com> and via the iOS mobile app Quakeworks. The tools used to compute this type of automated personal earthquake risk assessment are built using the best science taken from the peer reviewed literature. An operational system must also take account of challenges relating to the expected capabilities of the user base, which place strong constraints on the nature and functions of the system. The tradeoffs we have considered in designing the system will be discussed here, and the result can be seen at the URL listed previously.



Disaster Risk Reduction, Resilience and Sustainability

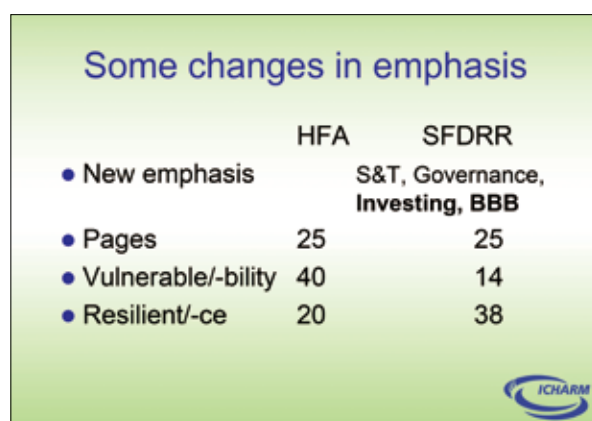
Kuniyoshi Takeuchi

Advisor, International Centre for Water Hazard and Risk Management under the auspices of UNESCO (ICHARM)



During the decade from Hyogo Framework for Action to Sendai Framework for Disaster Risk Reduction, a considerable shift of emphasis on resilience seems taken place. The frequency of usage of resilient or resilience in the Sendai Framework document increased from 20 to 38 times from the Hyogo's and that of vulnerable or vulnerability from 40 to 14 times. Such differences would not be just a matter of personal preference of writers but a conceptual shift. The shift is from vulnerability reduction to resilience building which would have a considerable implication in practice. Namely, disaster risk reduction should aim not only to make communities less affected by hazards, but accepting time to time being affected badly, make them capable to quickly recover by the affected communities themselves or a nation or surrounding communities that are prepared to help quick recovery.

Resilience may be defined as a product of resistibility against hazards and capacity of quick recovery from the disaster. The Sendai Framework emphasizes the building back better which can be accelerated by resistibility and capacity of quick recovery as both save the cost of recovery till the original order before build back better takes place. This poses a question on the different approaches taken in Tohoku and Banda Aceh: Under what conditions which approach becomes better towards final goal: sustainability?



- ### Conclusions
- Disaster triggered by natural hazards are the major threat to sustainability.
 - Sustainability needs risk reduction and resilience building
 - Resilience is a capacity of **resistibility** against hazards and **quick recovery** from disasters.
 - Both resistibility and quick recovery are the key to **build back better**.
 - In order to break the disaster risk-poverty nexus and take off economic development, **prevention** against frequent small to medium scale hazards and **build back better** are indispensable.
-

People Centered Housing Recovery.... and Relocation?

Liz Maly

Assistant Professor, IRIDeS, Tohoku University



People centered housing recovery is based on the goal of housing recovery that supports life recovery. Towards that aim, people (the inhabitants) must be put at the center of a process that creates housing with appropriate: use/functionality; size/shape; structure; cost; location; and other needs for daily life. Within the housing recovery process, from 1) evacuation, to 2) temporary housing, and finally 3) permanent housing, there have been ongoing debates for decades about which is the better approach: minimize expenditure on temporary housing and focus on permanent housing; acknowledge the need for temporary housing and focus on improving it; or more recently, the use of an incremental transitional housing solution.

In Japan, the 3 phases are clearly separated, with different framework, policies, and responsible agencies for each level. This was also the case after the 1995 Hanshin Awaji Earthquake, where problems resulting from the use of massive numbers of prefabricated temporary housing, and subsequent high-rise public housing for disaster survivors, are well known.

Issues after the 2011 Great East Japan Earthquake are even more complicated for housing recovery, because: the huge scale and varied condition of the damaged area and many different municipalities and multiple prefectures; and pre-existing demographic crisis of aging and rural depopulation in coastal areas. In addition, the issues for recovery faced by towns and communities contaminated by nuclear radiation caused by the meltdown of the Daiichi nuclear power plant are unprecedented.

In cases where housing recovery involved relocating communities, it becomes much more difficult to carry out a people-centered recovery, especially in regards to the locational aspect of housing. By comparing experiences from Japan with the cases of housing relocation after the 2010 volcanic eruption of Mt. Merapi in Indonesia, 2012 Superstorm Sandy in the U.S., and 2013 Typhoon Yolanda in the Philippines, some similarities and shared challenges can be identified.

The role of relocation in the overall housing recovery varies between these cases, as does the degree to which the projects are actually reducing future disaster risk for affected communities. The four cases take different approaches to: the designation of hazardous land, the degree that residents can opt in or out of relocation, and what kind of housing/land is provided. To consider post-disaster relocation as people-centered housing recovery, the factors of benefits to residents' daily life needs need to be balanced with the positive impact on increasing individual and household safety in the face of future disasters.

People-Centered Housing

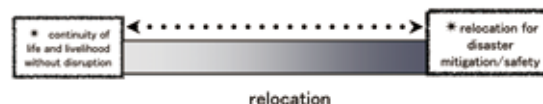


goal: housing recovery that supports life recovery

Relocation for DRR

Post-disaster Housing Relocation towards Disaster Mitigation can also be seen as Disaster Risk Reduction as the Basis for Recovery Planning

Relocation is a balance between:



Note: Residential relocation tends to focus on homeowners, leaving out renters.

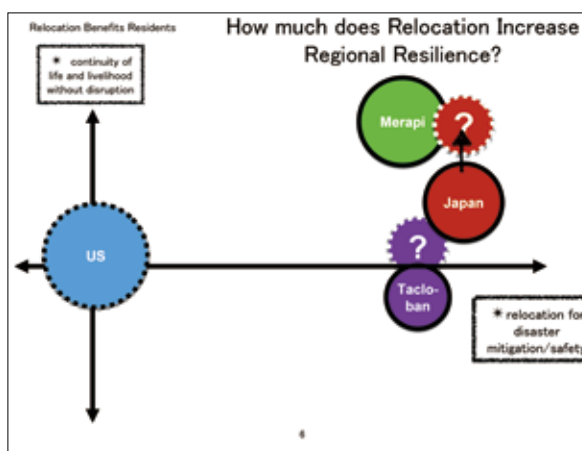
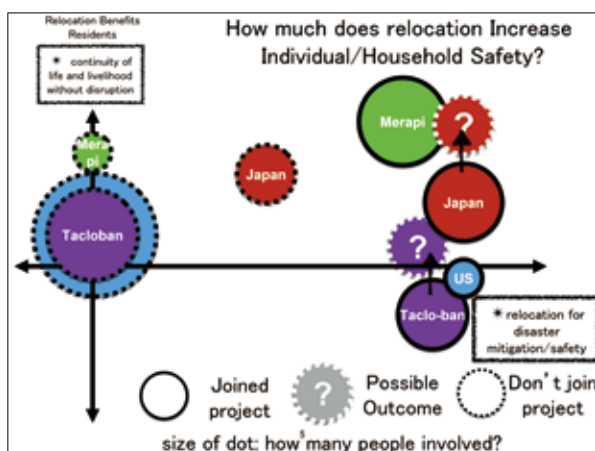
Disaster Recovery Public Housing— multi-family and single family



Only 4,543, (15 %) of 29,517 planned units of public housing are complete as of March 2015

Relocation related to overall recovery

	Merapi	New York	Philippines	Tohoku
Use designation of hazardous area (land use approach)	Yes	No	Yes, "no-build" or "danger zone"	Yes
Do residents have the choice to stay or move?	Officially no, in actuality, yes.	Yes. All relocation buyouts voluntary	Not clear yet.	No. Can not stay in an area designated as hazardous
Housing or land provided in a resettlement area	Yes (house and land provided for free)	No	Yes. Land and house provided. Most residents will have to pay small amount in future	Yes (land prepared for sale or rent), public housing in relocation area
Build public housing or new houses?	Yes, new housing provided	No	Yes, some new housing provided in relocation areas	Yes, public housing
Reducing future risk: for participating households?	Yes, for some.	Yes, for those who participate	Yes, for those who participate	Yes
Reducing future risk: for region?	Yes, depending on long term outcome.	No, very small impact area	Yes, in a small area	Yes



GROUP WORK DISCUSSIONS

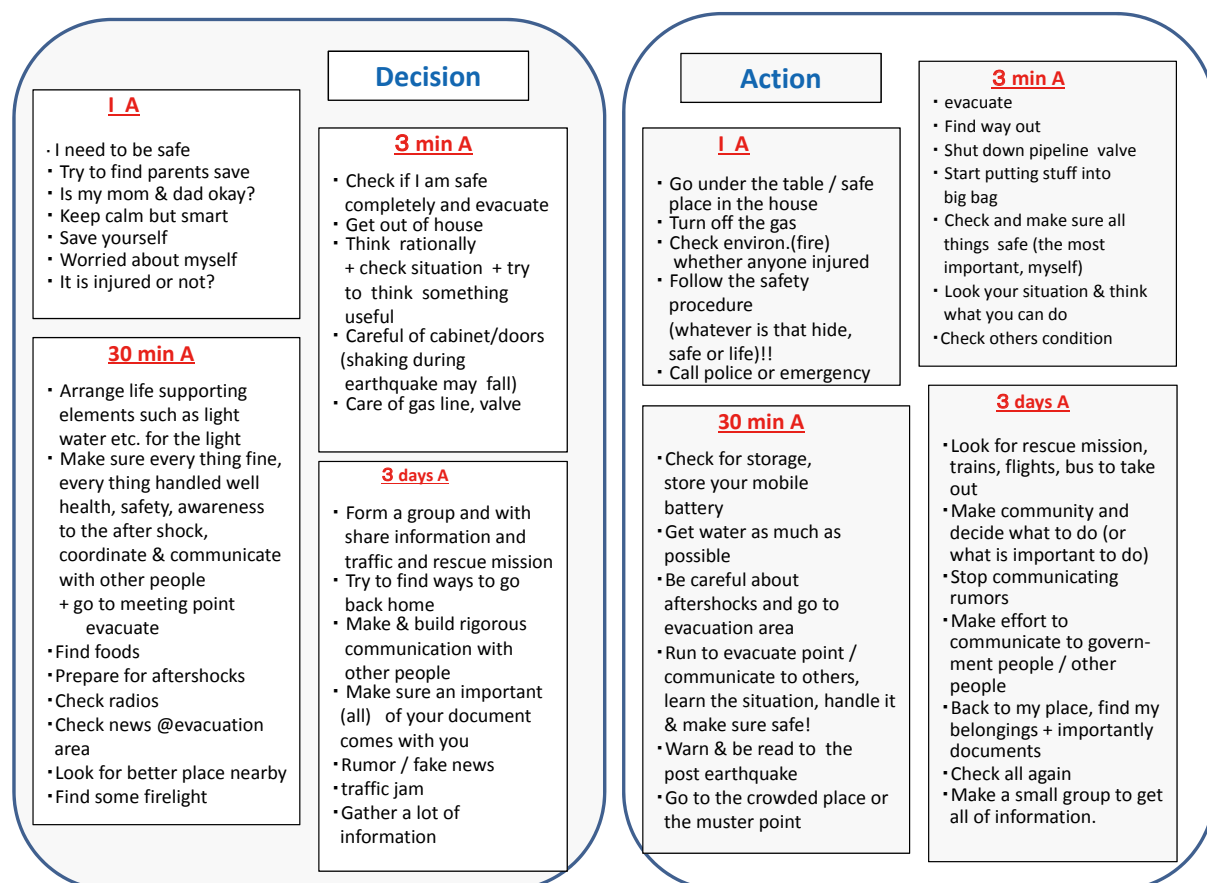


Group work 1: Disaster education

The participants were divided into four groups and asked to discuss the actions to be taken after a disaster occurs. This exercise is normally conducted for school children to have them think about, understand, and discuss what will happen in a disaster situation and what actions they should take as a group.

The questions were what decisions should be made and what actions could be taken immediately upon the occurrence of a disaster event (power failure), three minutes later (mobile phones not functioning), three hours later (getting dark), and three days later (assistance needed from government, NGOs, etc.). All groups emphasized the importance of collecting various information such as details of the situation, location of evacuation centers, availability of relief items, and others at all phases. The discussions highlighted the critical need for local governments, offices, schools, and organizations to ensure that emergency communication can take place in disaster situations and that information can be disseminated in various ways. At the same time, people need to learn in advance how to access and obtain relevant information in a disaster situation.

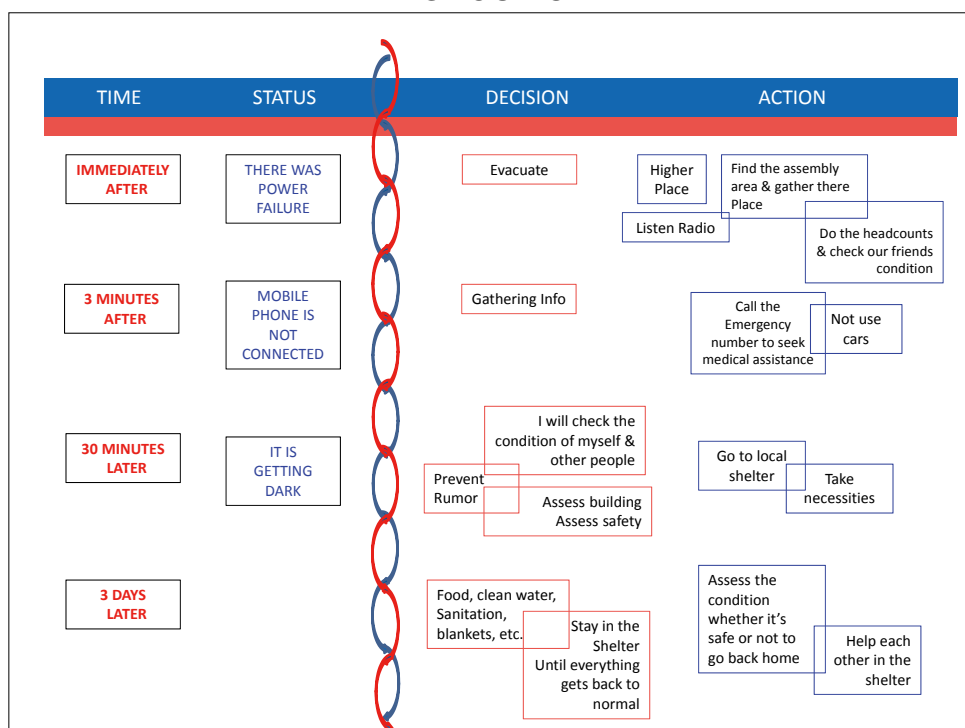
GROUP A



GROUP B

Time	Status	Decision	Action
<u>Immediately After</u>	It was power failure	<ul style="list-style-type: none"> Leaving the room Find the safe place Protect myself Take hand phone Send text back home 	<ul style="list-style-type: none"> Go to out side, free area ,meeting point Pick up cell-phone and leave indoor Hide underneath table, text sending If it's safe, move! Hide yourself in the safe place Cover my head with something (hide under the desk, cover my head with bag) Try to visualize where I am Try to find safe places to evacuate
<u>3 mins after</u>	Mobile phone not functioning	<ul style="list-style-type: none"> Try to imagine the extent of damages Put it down Try to get information Remain calm Wait for next warning & Announcement 	<ul style="list-style-type: none"> Follow the instruction from HSE/Crew/ Go to upward ground Access any information source Find a friend Still under the table Try to find and use a communication devise Try to find people who we can communicate Stay with locals!! Don't separated!
<u>30 mins after</u>	It's getting dark	<ul style="list-style-type: none"> What should I do next? Follow/stay (depending on the magnitude of the disaster) (2nd/3rd tremor) Move to evacuation area Move to safer place I need the shelter Try to communicate with neighbors and relatives 	<ul style="list-style-type: none"> Get to safe place (shelters?) Be safe Ask someone for the shelter Informing my family about the status Look for people who need support Help others!!! Look for something to start fire Look for a flash light or something equivalent
<u>3 days after</u>	Food/H ₂ O/ Help/assistance From the NGO/NPO/GOV	<ul style="list-style-type: none"> Get embassy help Familiarize with other people Give help/offer help if I'm not injured Go home Want to get stable evacuate life Try to follow the orders and be not panic 	<ul style="list-style-type: none"> To move forwards safer area Follow other people (Japanese) Carry out Find the way to go home Try to help others and survive myself Move to a base shelter I can get support

GROUP C



GROUP D

	Decision	Action
⌚ Immediately after	<ul style="list-style-type: none"> • Move to safe location • Be sure you are safe • Making sure we are safe • Surrounded environment is safe or not • Where I am • Be sure our family are safe • Make sure ourselves are safe • Make sure where we are safe as outside & building or inside • Sit or lay down beside a bed or a counter • Calm down 	<ul style="list-style-type: none"> • Going to beside of bed • Going to open place • Staying the room • Turn off the gas • Trying to rescue people • Find generators • Check open area ,check electricity ,gas • Don't use elevator • Call family & relatives
⌚ 3min after	<ul style="list-style-type: none"> • Look for alternative communication ways • Replace any important lost functions 	<ul style="list-style-type: none"> • Using radio to get information • Going to shelter ,higher ground • Report yourself • Use radio or public address • Stay against furniture or wall or high open ground • Look for flash light & radio
⌚ 30min after	<ul style="list-style-type: none"> • Look for alternative light resource • Find shelter • Look for food • You should evacuate • Connect with other people 	<ul style="list-style-type: none"> • Prepare evacuate yourself • Go to grocery store • Go to farm (corps & fruit) • Look for authorities or people who need help • Use candle, flashlight & ask for help • Try to find out injured people to help • Using candle, hand light
⌚ 3days after	<ul style="list-style-type: none"> • Staying safe place • Finding friend, family • Survival & resilience • Make sure all need are taken care of • Help other people 	<ul style="list-style-type: none"> • Put detail information • Report detailed information to rescuers • Report detailed information to specialists • Go to embassy • To help people in need(volunteer, help take care of injured, help distribute supplies) • Report problems and status to authorities • Work with community together



Group work 2: How can academia contribute to the implementation of the four SFDRR priorities?

- Various assessments have already been conducted, but they have not been effectively presented by researchers. Academics could contribute more to Priorities 1 and 4 than to Priorities 2 and 3 of the Sendai Framework for Disaster Risk Reduction. How can we contribute, and what are the existing challenges? First, academia possesses technical expertise that enables us to understand risks. Another strength is that academics are generally unbiased. For instance, the reports developed by NGOs and governments often include differing data and perspectives, which can lead to a bias in reports. Additionally, academics traditionally are strong in their ability to collect and maintain relevant data and information. On the other hand, academics are often more interested in writing and publishing papers than in how to apply their research output practically. Innovation and research are important, but the responsibilities of academics should transcend that. Governments are interested in outputs. For instance, simple, one-page recommendations to governments are useful. It is also necessary to have “promoters” who can collaborate with academics and help to promote their works and capacities.
- Academia can provide technical knowledge for various assessments, such as assessments of Multi-Hazards, Vulnerability, Exposure, Risk, Damage, and Potential, which contribute to priority 1. These risks need to be identified and communicated to policymakers, so it is important to strengthen the links between academia and policymakers, which is related to priority 2. Various stakeholders need to get involved in reducing identified risks, such as NGOs, governments, the private sector, academia, and communities (priority 3). Then, all these efforts can contribute to priority 4, which is to strengthen preparedness and response capacities as well as to improve recovery processes.
- For priority 1, academia can play a role in education and raising awareness through educational materials such as videos, textbooks, and posters, both inside and outside the classroom. In addition, evacuation drills must be conducted regularly at schools. For priority 2, it is important to establish and strengthen collaboration with different stakeholders through workshops, trainings, etc. In particular, communication and links among various stakeholders in governments, academia, and other sectors is necessary to achieve a fully prepared DRR society. This goal cannot be achieved by academia alone.
- Academia has various capacities and roles in DRR: communications, sharing data, securing funds, assessing risks, translating technology, and organizing workshops with communities. Scholars and researchers who fill these roles are very useful and important in building social and cultural resilience. In addition, it is possible to develop education and awareness-building materials such as movies to disseminate knowledge on the nature of disasters and other topics of concern. Through such materials, people can better understand the risks and what disasters are. Communication between scientists and governments is highly important.

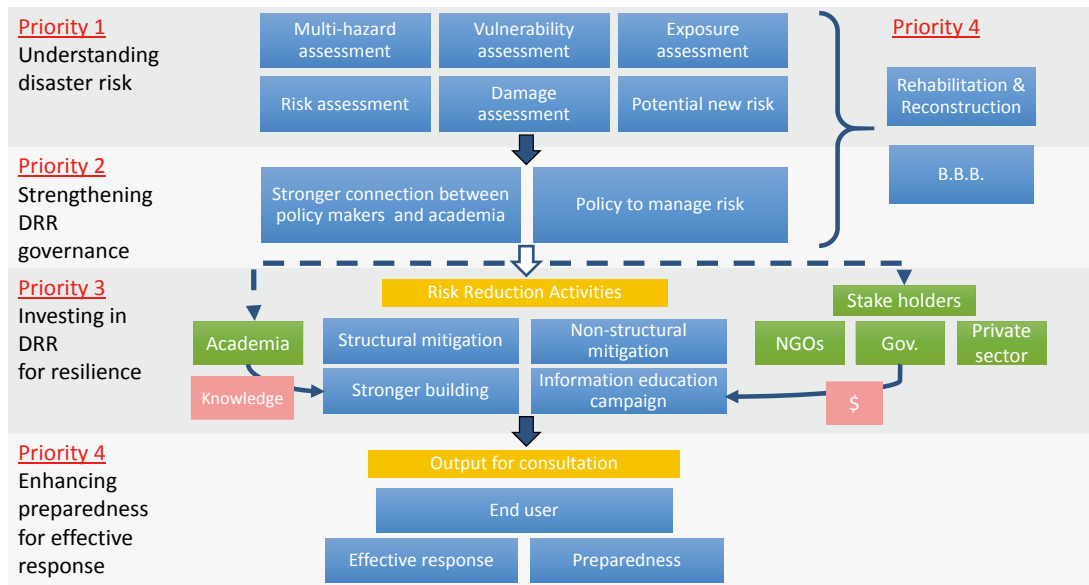
GROUP A



①	<u>Priority I</u> Understanding risk (Traditional input)	Main Stake
③	<u>Priority II</u> Risk gov.	Minor Stake
③	<u>Priority III</u> Invest in DRR	Minor Stake
②	<u>Priority IV</u> Disaster preparedness	Main / Sub Stake

<u>Opp.</u> <ul style="list-style-type: none"> • Communication in general language • SFDRR framework (International) bodies (IRDR, IDRC, etc.) * Baseline (Generate / Methods) 	<u>Challenges</u> <ul style="list-style-type: none"> • Data (??) → Ac. → Rel. → Res. • Self-promotion (Forum) • No boarder / Collaboration
<u>Strength</u> <ul style="list-style-type: none"> • Expertise • Unbiased / (Forceful??) open-minded • <u>Innovation</u> 	<u>Weakness</u> <ul style="list-style-type: none"> • We want to be unique! • Fund / Money / Incentives

GROUP B



GROUP C

Priority 1 Understanding disaster risk	Priority 2 Governance and manage	Priority 3 Investing	Priority 4 Preparedness for effective response / Build back better
<ul style="list-style-type: none"> Strengthen the university network → Academia, Gov., Industry, Expert, Lay people, etc. "in various way", "before & after" Build a rigorous communication between various type & level of stakeholders "Preparedness & responses" Education completely for all the people about the "disaster" in any kind of ways "Power of communication" Local – national – Intl. Sharing information 	<ul style="list-style-type: none"> Strong community Response – react mechanism Coop. → Gov., Industry, Expert, NGO, NPO, etc. and Academia Agreement "before & after" disaster 	<ul style="list-style-type: none"> Evaluation for the whole program Build strong governance → Community trust! Law and policy should be set up before the disaster 	<ul style="list-style-type: none"> Drills for all the people Research about build back better Make students think about build back better
<ul style="list-style-type: none"> Education & Dissemination – video, text book, posters Add compulsory class in primary / middle school to directly teach children knowledge of disasters Holding a meeting for parents about "How dangerous Tsunami", "How to save your children" Using internet Use open source / social media / enhanced the education / library facilities to the people Making class at school, emergency drills started from elementary schools Holding workshop about DRR at school or children's house 	<ul style="list-style-type: none"> Make a strong cooperation between stakeholders → Make an event to discuss DRR between stakeholders Quantifying / assessing the risk Reveal the potential risk Build a strong publication (research, conference, etc.), international journal Hold on open public workshop / seminar/ training, coop. with academic, gov., industry, NGO, advertising, NPO and UN Share & learn successful case studies Strong relationship between consultant and government, supervise – report mechanism Collaboration, research, implementation & dissemination 	<ul style="list-style-type: none"> Scenario-based proposal to show how effective the investment Setting up the indicators of the effectiveness of the program Determining campus facilities to be used for shelters Clear info. for shelter / assemble point → signs The improvement of IT implementation → Diffusion to the society Advertisement → campaigns Gov. + Academia → NGO, NPO → Meeting, seminar, etc. → Round table, public class Develop evacuation guidance Cooperative research with companies Cooperation with Gov. + academia / dept., research, etc. Better explanation of study 	<ul style="list-style-type: none"> Evacuation guidance Having a good relationship with your neighborhood Support making various plan Develop new effective DRR education way Help evacuating the drills

GROUP D

What we need (to do)?	What we could do?	What we want to do?	
<ul style="list-style-type: none"> Secure funding... Matching / setting on at least common ground Gov. + Academia / Academia+ Society Be listened to 	<ul style="list-style-type: none"> Share data! Employ ground up approach Improve communication with / govt. / private sectors / other academia Multiple perspectives Collect data To tell the truth Better communication! Sharing information Accumulate experience Contribute in the improvement of disaster preparedness (interactive tech.) 	<ul style="list-style-type: none"> Spread the knowledge & the importance of DRR – so someone gonna invest / govt. Theory – practice balance Translate knowledge into “understandable language” →government →society Workshop for community Platform for multidisciplinary to gather & discuss Gather with / govt. / private sector → action plan and agreement Arise the awareness of government to pay attention Build trust 	<ul style="list-style-type: none"> Sustainability / action research Movies, Media, “Apps” Give suggestions about / DRR implementation / disaster education →build better resilience community Be flexible! Compromise “Tsunami Run” “Fun Run” events Joint event – drill, education, program Multidisciplinary research & implementation about disaster tech, ideas, info Exercises, practice More postdocs, more opportunity IRIDeS



FIELD TRIP



Field trip to Higashi-Matsushima City and Tagajo City on 23 July 2015

The participants joined the field trip to the areas affected by the Great East Japan Earthquake and Tsunami. The places include Tsukihama beach, Okumatsushima “kizuna” solar park, Nobiru station, disaster public housing, Tagajo civil center and Tagajo High School.

Diocel Harold M. Aquino

Assistant Professor, University of the Philippines Diliman

I dream to see the day when people will fear the threat of disasters no more. Participating in the APRU Multi-Hazards Summer School 2015, engaging with experts and young people with the same vision, gave me a pocketful of hope to live in pursuit of that dream.

The summer school was very conducive to a fruitful exchange of ideas. The resource persons are experts in various fields (natural science, engineering, information technology, medicine, social science and humanities) applied to disaster risk management. As an engineer, I have gained a lot of new insights and my perspective has greatly broadened. The talks were complemented by discussions with fellow summer school participants who are all passionate and knowledgeable about the topic and enthusiastic in sharing their thoughts on the matter.

One that really got stuck in my head is the topic on memorializing disasters. Disasters are always a painful experience. The pain and grief from a disaster would be futile if we don't pick up the lessons from it. This is why it is important to gather these lessons, share these to other people, and preserve them for the sake of the future generations. I am deeply amazed at the passion of the high school students in Tagajo City in sharing learnings about the GEJE tsunami and their project on marking the 311 tsunami levels in key areas of the city. I am also glad that Japan is serving as a catalyst in the exchange of experiences and learnings from previous disasters, such as the Great East Japan Earthquake, the Banda Aceh tsunami in Indonesia and Typhoon Haiyan devastation in the Philippines.

During the fieldtrip, we visited a solar farm built in an area that was stricken by the GEJE tsunami. This engraved stone caught my eye. I asked what the word is and I found out that it's kizuna, which means bond. I believe that it's such a strong word. For people and communities to be resilient, there must be strong bond and work together for the common good

All in all, I've gotten so much from APRU Multi-Hazards Summer School, more than what I have



expected. Not only was my head filled with new learnings, my heart was also filled with inspiration from the people I've come to know at the summer school and the field trips. I highly recommend this summer school to all researchers working in the field of multi-hazards resilience and disaster risk reduction.



In Tagajo City



Roozbeh Hasanzadeh Nafari

PhD Student, University of Melbourne

In July 2015 I was funded by the University of Melbourne for participating in the APRU-IRIDeS Multi-Hazards program. This program was held in Tohoku University and includes three days seminar and one day site visiting. In the context of seminars, we became more familiar with the natural hazards of earthquake and tsunami, specific to Japan. Also, it was a good chance for us in regard of understanding the practice of Japan in terms of decreasing the different aspects of vulnerability; archiving and learning from the past; implementing the risk mitigation measures in an optimal manner; building a resilient society; prioritizing the disaster risk reduction matter; and minimizing the adverse effects of natural hazards. It is notable that these important issues were analyzed and discussed toward the implementation of the Sendai framework for Disaster Risk Reduction (DRR).

On the other hand, we had a field trip to the affected areas by the 2011 disasters in the third day of this program. For me it was very interesting that how the involved organizations are trying to build back the society better by implementing some structural and non-structural mitigation measures. To be more detailed, reconstruction in Tsukihama Beach, relocation plan of Nobiru Station and construction of a redundant solar park in Okumatsushima "kizuna" were some examples of this important matter.

Subsequently, we had a visit from the city of Tagajo for understanding the strategy of this city in regard of disaster risk reduction. In this context, we visited a disaster public housing in the Sakuragi area. The indoor architect of this building was very interesting to me because some facilities such as: childcare

centre; facility for the elderly; meeting place; connection bridge between the second floors; and tsunami evacuation stairs, for a better performance in the time of disaster, were designed and placed in this building. Afterwards, we had a meeting with the mayor of this city and then we went for visiting the Tagajo high school. In this school I was totally impressed by the efforts that have been made for educating the young generation with the aim of coping with the impacts of future natural hazards. Also, memorizing the past events and archiving them were other activities that have been accomplished by the company of these students. Considering such a long term strategy is admirable and could be very beneficial for the disaster risk reduction purposes.

All in all, participating in this program and visiting the city of Sendai were not only technically beneficial, but also it became as a memorable time and experience that I can highly recommend it to all.



Okumatsushima "kizuna" solar park



Nobiru Station

Alwina Fitria Maulidiani

Research Assistant, University of Indonesia

As one of APRU-IRIDes Multi-Hazards Summer School's students this year, I was very lucky to get wonderful experiences and new knowledge about disaster, especially regarding earthquake and tsunami, directly from the country that already had experienced and managed to overcome those disasters. I also live in a disaster high risk country, but I have never experienced massive disasters such as tsunami before. Jakarta, the city where I live, which also the capital city of Indonesia, only has flood problem every year. One of the biggest tsunami in Indonesia happened in Banda Aceh, Sumatra Island on 2004 and I realized how awful the disaster could be and how bad the impact for community just from the news, videos, and reports about it. However, directly visiting the disaster affected areas was a new experience for me and I would like to thank APRU-IRIDes for giving me that chance by conducting the field trip to Higashimatsushima and Tagajo City on July 23rd, 2015.

Starting from the video played on the bus during our way to Higashimatsushima City, I was able to visualize the enormous wave that once destroyed coastal areas of Miyagi Prefecture during Great East Japan Earthquake (GEJE) disaster. After we arrived and I saw directly with my own eyes the vast areas covered with weeds and pebbles that once had been a lively place, I realized the real power of natural disaster that can create such damage to a city. Once again, it emphasized the importance of education and early warning system to prepare the community in evacuation when a disaster happens to save more lives. I was also impressed to see how fast the reconstruction had been done in Higashimatsushima City. Just in four years, they already had reconstructed the train station, elevating lands, building temporary and public houses, and many things to make Higashimatsushima a more resilient city. One of my favorite parts of this field trip was when we were asked to write down our messages to Higashimatsushima on a brick that will be used for constructing a new building. It felt like I am also contributing in rebuilding the city into a better one. After that, we went to a restaurant near the Matsushima Bay. I really enjoyed the view of Matsushima Bay, the hospitality given by APRU-IRIDes and the local people, and also the traditional Japanese meal served by the restaurant. In my opinion, this field trip gave me not only a new knowledge and experience on-site but also a new sight of Japanese culture and tourism.

After we finished eating, we went to another affected area, Tagajo City, and surprisingly the facilitators who explained the past disaster to us were students from Tagajo High School. They even created evacuation mapping zone of Tagajo, installed tsunami signs at strategic places all over the city, and also contributed at UN World Conference on Disaster Risk Reduction in Sendai. Once again I was impressed by the real evidence of the good education system in Japan which had already made disaster as a concern to school students. By raising awareness of young generation about the disaster, Japan will become a resilient country in the future. I wish that Indonesia could also become a disaster resilient country like Japan and I cannot wait to share what I have got from this summer school to my family, colleagues, and friends in Indonesia.



Writing messages on bricks



Nafesa Ismail

PhD Student, Kyoto University

I am really grateful for the opportunity to be selected to attend APRU program in Tohoku as it was my first time to the region. Upon reaching the Sendai city, it was hard to imagine that some parts of this region were devastated by the 2011 disaster until the Field Trip day.

The seminars provided were very useful as most of the topic were very much of my interest and I really learnt a lot. For example, in the Archiving and Memorising lecture was one of my favorites. The lecture emphasized on the significant of collecting and preserving those memories and experiences of disaster victims. I am very amazed at the Japanese's culture of sustaining their disaster histories and hope to introduce and develop the culture back home. I also managed to have a short discussion with the speaker on how to collect and carry out disaster experiences which to be conducted in Malaysia as one of my works later.

Additionally, I also was exposed to the mechanism of earthquake prediction from the United States. This was also another highlight of the seminar as many participants showed much interest on the topic. For me, this is a good information that I will be sharing during my field trip to SEADPRI-UKM Malaysia with the earthquake department. The timing of the APRU falls nicely into my calendar as after the program, I am heading to Malaysia for my field trip which also helps me to share my experiences and knowledge for the incoming discussions as well as exploring disaster management in Malaysia.

The experience of visiting the devastated areas as well as being guided by high school students who were previously victims of the tsunami disaster helped me to understand and be aware of how precious life is and the importance of preparedness against disaster and knowing what to do in case of disaster. I also got the opportunity to be interviewed and featured in the local newspaper after the field trip with the high school students. I am fortunate to be able to hear from the younger generation of their disaster experiences and their aspiration of transferring those experiences to their future generations.

What makes the program interesting and wonderful was the international participants from multi-disciplinary fields with vast knowledge. These people from all over the world have come together to share, teach and discuss on a topic which were looked from various perspective.

Overall, the knowledge sharing was a plus for me as being in this kind of program helped me to understand better of my research topic and focusing on what is my interest. I strongly recommend those who are new to the disaster management area as well experts to be given chance to participate as the diverse background contributes to the interesting discussions during the lectures which helps many to see a different side of the problem.



Nobiru Station



Tsukihama Beach



Matsushima



Tagajo High School



ANNEX I : APRU-IRIDeS Summer School Program

21-22 and 24 July: Seminar at the IRIDeS building on the Aobayama New Campus, Tohoku University

23 July: Field trip to Higashi-Matsushima City and Tagajo City

July 21

09 : 00 — 09 : 30 Opening ceremony

Opening remarks by Prof. Susumu Satomi (President, Tohoku University)

Opening remarks by Dr. Christopher Tremewan

(Secretary General, the APRU secretariat)

Opening remarks by Prof. Fumihiko Imamura (Director of IRIDeS)

Group photo

09 : 30 — 10 : 15 “Interdisciplinary Research in IRIDeS”

(Prof. Makoto Okumura, Deputy Director, IRIDeS)

10 : 15 — 11 : 00 “New International Framework for Disaster Risk Reduction”

(Prof. Yuichi Ono, IRIDeS)

11 : 00 — 11 : 30 Coffee break/ Moving to the Lecture room

11 : 30 — 12 : 30 “Roles of Archives and Memories in Disaster Risk Reduction”

(Dr. Sebastian Boret, IRIDeS)

12 : 30 — 14 : 00 Lunch/ Lunch session about APRU activities (Dr. Takako Izumi, IRIDeS)

14 : 00 — 15 : 00 “How to Develop Healthy Resilient Community”

(Prof. Shinichi Egawa, IRIDeS)

15 : 00 — 16 : 00 “A Case Study of KAKEAGARE! Japan and Dentsu’s DRR Related Business” (Mr. Shunsuke Matsushima, Dentsu)

16 : 00 — 16 : 15 Coffee break

16 : 15 — 17 : 15 “Earthquake Reconstruction Operations in Ofunato”

(Mr. Masaaki Miyamoto, Pacific Consultants CO., LTD)

July 22

09 : 00 — 10 : 00 “JICA’s Recovery Efforts in Tohoku” (Ms. Midori Kamada, Japan International Cooperation Agency – JICA Tohoku)

10 : 00 — 11 : 00 “The 3rd UN World Conference on Disaster Risk Reduction – Overview and Results of the Conference” (Mr. Akira Takahashi, Sendai City)

- 11 : 00 — 11 : 30 Coffee break
- 11 : 30 — 12 : 30 “Towards Disaster Risk Reduction City: Tagajo ~ Disaster Resilient City” Mr. Manabu Suzuki, Tagajo City)
- 12 : 30 — 14 : 00 Lunch/ Lunch session: experience sharing by the participants
- 14 : 00 — 14 : 30 “Effective Evacuation Behavior with Knowledge on Natural Disasters” (Ms. Mari Yasuda, IRIDeS)
- 14 : 30 — 16 : 00 Group work 1: Disaster Education
- 16 : 00 — 16 : 15 Coffee break
- 16 : 15 — 17 : 00 Group presentation and discussion

July 23: Field trip

Higashi-Matsushima City and Tagajo City

July 24

- 09 : 30 — 10 : 30 “Automated Operational Earthquake and Hazard Risk Assessment”
(Prof. John Rundle, University of California, Davis)
- 10 : 30 — 11 : 30 “Disaster Risk Reduction, Resilience and Sustainability”
(Prof. Kuniyoshi Takeuchi, Advisor to ICHARM)
- 11 : 30 — 11 : 45 Coffee break
- 11 : 45 — 12 : 45 “People Centered Housing Reconstruction”
(Dr. Elizabeth Maly, IRIDeS)
- 12 : 45 — 14 : 00 Lunch/ Lunch session: experience sharing by the participants
- 14 : 00 — 15 : 30 Group work 2: What can academia do to implement the Sendai Framework for Disaster Risk Reduction?
- 15 : 30 — 15 : 45 Coffee break
- 15 : 45 — 16 : 15 Group presentation and discussion
- 16 : 15 — 16 : 30 Closing

ANNEX II : List of Participants

	Name	Status	Country	University
1	Citra Satria Ongkowijoyo	Ph.D. Student	Australia	University of Melbourne
2	Roozbeh Hasanzadeh Nafari	Ph.D. Student	Australia	University of Melbourne
3	Jie Yu	Ph.D.Student	Canada	Queen's University
4	Zhaohao MAO	M.A. Student	China	Fudan University
5	Reza Syahputra	Lecturer	Indonesia	University of Indonesia
6	Agus Riyanto	M.A. Student	Indonesia	University of Indonesia
7	Alwina Fitria Maulidiani	Research Assistant	Indonesia	University of Indonesia
8	InYoung Bae	M.A. Student	Japan	Kobe University
9	Rajarshi DasGupta	Ph.D.Student	Japan	Kyoto University
10	Nafesa Ismail	Ph.D.Student	Japan	Kyoto University
11	Kensuke Otsuyama	M.A. Student	Japan	Kyoto University
12	Moeko Kato	Undergraduate	Japan	Miyagi Gakuin Women's University
13	Chiaki Kikuchi	Undergraduate	Japan	Miyagi Gakuin Women's University
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