Report of the
APRU-IRIDeS
Multi-Hazards Program

Campus Safety Workshop 2018

APRU

災害科学国際研究所
IRIDeS
International Research Institute of Disaster Science

APRU-IRIDeS Multi-Hazards Program
Campus Safety Workshop 2018

Building Disaster Resistant Universities: Is Your University Ready for the Next Natural Disaster?

3-5 April 2018
Tohoku University
Sendai, Japan

CONTENTS

Introduction

The Association of Pacific Rim Universities (APRU) was established in 1997 to form a premier alliance of research universities as an advisory body to international organizations, governments, and business on the development of science and innovation as well as on the broader development of higher education. Currently, the APRU network consists of 50 leading universities from 16 APEC economies.

The APRU Multi-Hazards (MH) Program was launched in April 2013 by the APRU and Tohoku University in Japan. The International Research Institute of Disaster Science (IRIDeS) at Tohoku University has provided secretariat services and has been in charge of program coordination. The main objectives of the MH Program are to harness the collective capabilities of the APRU universities for cutting-edge research on disaster risk reduction (DRR) and to contribute to international policymaking processes to steadily improve DRR. Its major activities include a campus safety program, summer school, annual symposium, collaborative survey research, data sharing, and contributions to discussions at regional and international levels.

The International Research Institute of Disaster Science (IRIDeS) at Tohoku University and the Association of Pacific Rim Universities (APRU) held the second workshop, "Building Disaster Resistant Universities: Is your university ready for the next natural disaster?" on April 3–5, 2018 at the IRIDeS. Mr. Kevin Duffy, Deputy Director, Campus Infrastructure & Services at University of Sydney, was the invited trainer and facilitator. More than 20 participants attended, including faculty, staff, and students from 11 universities / institutions in Australia, China, Indonesia, Mexico, Philippines, Singapore, Spain, and Taiwan. The workshop discussed lessons learned from other universities, common challenges and issues, and tools to develop an effective emergency plan that enhances overall university preparedness.

The first campus safety workshop was organized by IRIDeS, Tohoku University in February 2016. At the workshop, the importance of <u>developing an emergency management plan (preparedness and response plan), conducting exercises, drills or simulations using the existing plan to assess its efficacy as well as reviewing the plan every year or following any emergency event</u> to determine whether it can cope with emergencies were highlighted as the keys to campus safety.

As the outcome document of the first UNISDR Asia Science and Technology Conference for Disaster Risk Reduction (DRR), the recommended actions align with and contribute to the global 'Science and Technology Roadmap' were identified. The recommended actions under Priority 2:

Disaster Risk Governance include "Develop inter-disciplinary national science and technology plans to support implementation of the Sendai Framework. This includes actions <u>by academia/ universities to develop their own disaster risk management plans.</u>

Prior to the workshop, a campus safety survey conducted by the APRU Multi-Hazards (MH) Program in 2014 identified weaknesses and challenges with regard to implementing campus safety steps. Most universities have a disaster management and response plan, but many have not held a simulation exercise to assess the adequacy of the existing plan. Also, not all universities have carried out a thorough risk assessment, even though this is a crucial baseline step to gather data for a disaster management plan. Respondents also noted that it can be difficult to gain the necessary support and understanding, including human resources and sufficient budgets, from senior managers in order to implement campus safety measures.

The APRU and the APRU MH Program acknowledge the importance of disaster preparedness measures on campuses and the responsibility of universities to protect the lives of students, staff, and faculty as well as various institutional assets. The APRU and the MH Program intend to play a key role in promoting and advocating for necessary initiatives at the university level, and they will provide the needed support to universities for the process of developing campus safety measures.
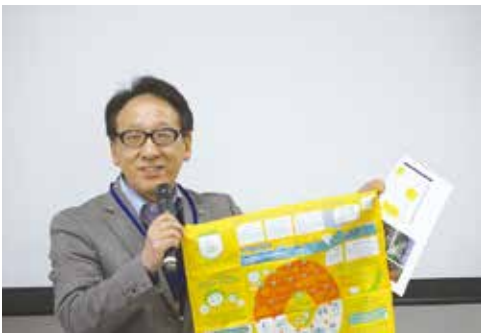
Acknowledgment

OPENING REMARKS

Opening remarks

Fumihiko Imamura
Director of IRIDeS, Tohoku University

The International Research Institute of Disaster Science (IRIDeS) was established just one year after the 2011 Tohoku Earthquake and Tsunami that directly caused more than 19,000 deaths. In its aftermath, the earthquake indirectly caused 3,000 deaths due to mental illness or public health issues in temporary houses, etc. For this reason, we have explored a new research area in disaster science involving both natural and social sciences. Now there are 60 faculty members and 40 other staff members at IRIDeS. We are working very hard to contribute toward mitigating disaster impact around the world.

My expertise is tsunami engineering, that is, providing technology for mechanical models to issue warnings and influence human behavior during evacuations. This is a very important workshop for us to contribute to the safety of our own universities. At the time of the 2011 earthquake and tsunami, three students at Tohoku University lost their lives. In addition, we suffered large-scale damages to our facilities including our laboratories and buildings. The damage amounted to around 400 million US dollars, and it took more than 2 years to recover it to its previous state. From these experiences, we learned many lessons to share with you.

I have a present for you. First one is a handkerchief called "Gensai Pocket Information" that is one of the educational tools for children. "Gensai" means disaster mitigation. By using this handkerchief, children will become familiar with the readiness and safety instructions at school and at home. On the top of the handkerchief, there is information about different types of hazards. In the middle, you find the information on the items we should have prepared at all times. Then, there are messages on what disaster risk reduction means, how to prepare for disasters at home, and how to evacuate. This is to encourage children to communicate with others after disaster classes and lectures in schools. This is one of our contributions to the society. If you have some advice on this, please let me know.

Second is a leaflet on a national designated university in Japan. Last year Tohoku University was selected as a very special national university. In Japan, there are 90 national universities but only 3 were selected as "National Designated University." Tohoku University has identified four core research fields: material science, spintronics, medical science, and disaster science. It shows that Tohoku University puts a great focus on disaster studies.

We hope you share your experiences in your countries and discuss common concerns and solutions actively. Thank you very much.

PRESENTATIONS

APRU Multi-Hazards Program and Results of APRU Campus Safety Survey

Takako Izumi
Associate Professor, IRIDeS, Tohoku University

The campus safety initiative under the Association of Pacific Rim Universities (APRU) Multi-Hazards Program aims to promote a culture of campus safety, provide related learning opportunities among the APRU member universities, support efforts to strengthen disaster preparedness capacity on campuses, share experiences with non-APRU member universities, and contribute to overall improvement of disaster preparedness capacity in the region.

As a source of baseline data, the campus safety survey was conducted to understand the current disaster preparedness capacity of the APRU member universities and to identify challenges and recommendations for the development of a disaster/emergency preparedness and management plan. The results showed that the area of risk assessment requires greater attention and effort. In addition, early warning and alert systems have not been installed widely. Moreover, further support and consideration of foreign students is required. In addition, many universities seeking to develop preparedness capacity have encountered financial constraints, human resource challenges, difficulties in understanding risks and safety issues, and a lack of participation by faculty and staff.

To improve the situation and expand their current capacity, many universities have requested assistance from peer institutions, in the form of sharing tools and best practices, and have asked the APRU to provide a learning opportunity such as a workshop on campus safety. This campus safety program has been initiated in response to enable sharing of experiences and knowledge about campus safety among the APRU universities.

The recommendations and key messages from the first workshop were to develop an emergency management plan, conduct exercises, drills, or simulations using the existing plan to assess its efficacy, and review the plan every year or following any emergency event. At the same time, several weaknesses were also identified: a lack of permanent staff and managers who have expertise in risk and emergency management and inadequate financial resources to develop necessary plans and equip universities with emergency tools and facilities. This APRU Multi-Hazards campus safety program will continue supporting the member universities to raise the common concerns, share the experience as well as advocate the importance of disaster preparedness on campus globally.

Campus Safety Program

Objectives:
- Strengthen the disaster preparedness capacity on campus
- Promote its importance at the international and regional levels

Activities:
- A survey on the current disaster preparedness status was conducted among the APRU universities
- The Campus Safety Workshop was held at IRIDeS, Tohoku University in February 2016 to share their experience and discuss how to overcome the challenges

> Universities need to develop an adequate *disaster management plan* for responding to and recovering from any damage

One of the recommended actions in the outcome document from the UNISDR Asia Science & Technology Conference on DRR

TOHOKU UNIVERSITY

http://irides.tohoku.ac.jp/

IRIDeS

Area	Strength	Potential
Governance Action	• Countermeasure office • Response plan	• Simulation exercise of countermeasure office • Information sharing and early warning
Risk Assessment	None	• Risk assessment • Strategies and action based on risk assessment • Assessment result to be shared
Disaster Preparedness Mechanism and Capacity	• Emergency communication system • Disaster-resistant structure • Awareness-raising activities	• Guidance for foreign students • Safety confirmation • Response handbook and its distribution
Response Capacity	• Emergency stockpile • Building inspection implementation and capacity	• Mutual agreement with neighboring universities • Volunteers list
Support System	• Policies for support to students • Support for psychosocial assistance needs	• Support system for foreign students • Support system for faculty members, and staff, as well as their families
Data Preservation	• Data and information gathering after disasters	• Archival system for preservation of records and information

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Campus Safety Survey - Background

United Nations Office of Disaster Risk Reduction (UNISDR)
"Disaster risk reduction begins at school" in 2006-2007.

Sendai Framework for Disaster Risk Reduction
"Promote the resilience of new and existing critical infrastructure, including water, transportation and telecommunications infrastructure, educational facilities, hospitals and other health facilities, to ensure that they remain safe, effective and operational during and after disasters in order to provide live-saving and essential services."

Campus Safety Survey was conducted among the APRU member universities to understand the current status of disaster preparedness on campus. Questionnaire was distributed among 45 APRU member universities. 22 universities filled in the form and sent back to us.

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Keys to campus safety

1) Involving a policy group consisting of the executive leadership of the university to make crucial policy decisions
2) Developing an disaster/emergency management/preparedness plan
3) Conducting exercises, drills, or simulations using the existing plan to assess its efficacy
4) Reviewing the plan every year or following any emergency event to determine whether it can cope with emergencies and whether it suits the current university structure.

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IRIDeS

Case Study 1:
Tohoku University, Japan

Hiroaki Maruya

Professor, IRIDeS, Tohoku University

Damage of Tohoku University by the Great East Japan Earthquake (GEJE) in 2011 was severe. Although no students or staff was not killed in our campus, some buildings were strongly damaged and we had to delay the beginning of first term in fiscal year 2011 about one month.
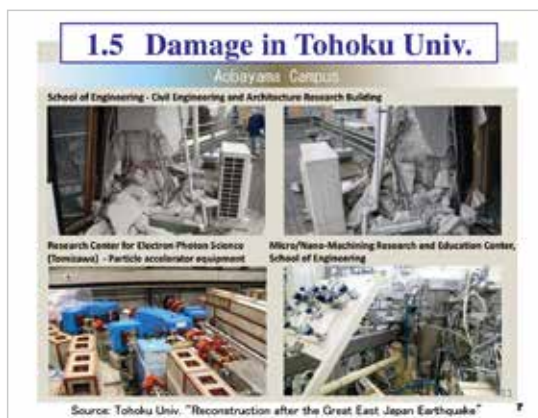
To revise and improve our former disaster management plan and introduce business continuity element, we have researched our risk of damages by natural disaster. The precondition of our university is that, all our buildings have already been strengthened against earthquakes, the land level of our campus is quite higher than the water level of Hirose River which flows near-by and therefore our risk of floods is not high. However, we have cliffs and steep slopes around two of our campuses and we have to prepare for landslide.
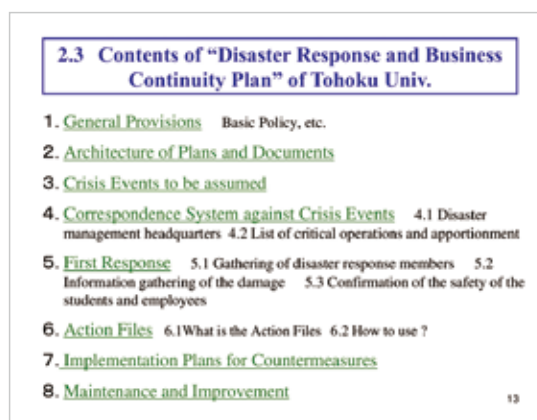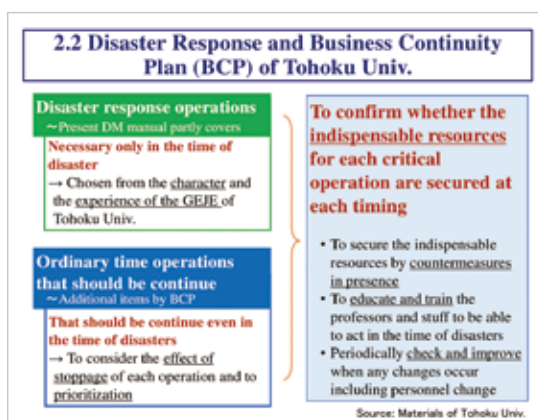
We drafted our disaster management and business continuity plan (DMBCP) by utilizing the record of responses and revival actions from the damages of the GEJE. Our university's headquarters executed exercises once a year based on the DMBCP three times since 2015, and revised the plan for overcoming problems we discovered every year. For example, the meeting room for the main member of disaster management headquarters with the emergency power supply provided was not wide enough for information exchange, for example, reports of most serious incidents among the members were not in speedy nor smooth. We have to continue exercises to improve the DMBCP in the future.

Lastly I would like to discuss the importance of safety confirmation of all students and stuffs. Our university has placed it as most important matter after a disaster, based on the experience of the GEJE. However, if a university thinks that safety of each student and staff is self-responsibility issue, safety confirmation doesn't seem so serious procedure in a time of disaster. It might be upon the policy of each university.

Case Study 2:
DREAM for Campus Safety

Bingwei Tian
Associate Professor, Institute for Disaster Management and Reconstruction, Sichuan University

DREAM, coined by Bingwei Tian, is an acronym for "Disaster Reduction Ecological Artistic Map", which is presently an innovative map in the field of disaster prevention and reduction. It is a new thematic map that integrates traditional map and knowledge of disaster reduction, which also relates to ecology and historical culture. DREAM involves four layers, which are basic layer, disaster reduction layer, natural & ecology layer and human & history layer. The basic layer shows geographical information, with data based on remote sensing images that obtained from satellite, unmanned aerial vehicle etc. The disaster reduction layer provides information of local disaster risk and resources for disaster response or reduction like shelter, escape route et al. by utilizing GIS and remote sensing technology. The natural & ecology layer and human & history layer exhibit local ecological civilization and historical and humanistic environment, using positioning technology. DREAM integrates the boring knowledge of disaster prevention and mitigation into the map with the concept of combing precision science and local art. In normal time, DREAM can be used as a map of education popularization, disseminating knowledge of disaster prevention and reduction, ecological environment and human art. When disaster comes, DREAM can be used as a visual escape emergency plan to help people evacuate orderly.

The first DREAM was created for campus Jiangan, Sichuan University, under the collaboration of students, artists and community. DREAM plots the locations of the campus's human & history, natural & ecology, and especially disaster risk reduction information. DREAM has provided a new way for students to join in service learning. To produce the map, students were grouped for different subject fields. They collected information and discussed each other. Moreover, since there were also social community to participate in DREAM producing, students had opportunity to communicate with them. Compare to traditional teaching methods, service learning can practice student's activities and their ability to learn knowledge, especially strengthen their team consciousness. Accordingly, DREAM has the characteristics of comprehensive, local, scientific, artistic, practical and participatory, which make it be an advanced and innovative product in present disaster reduction and security maps over the world.

As a service learning method, DREAM is also prospective in application in other universities. The concept of DREAM is expected to be applied in all other places in the world, such as community, tourist spots, natural reserves and so on.

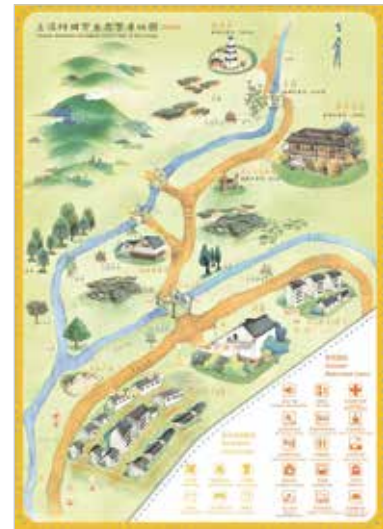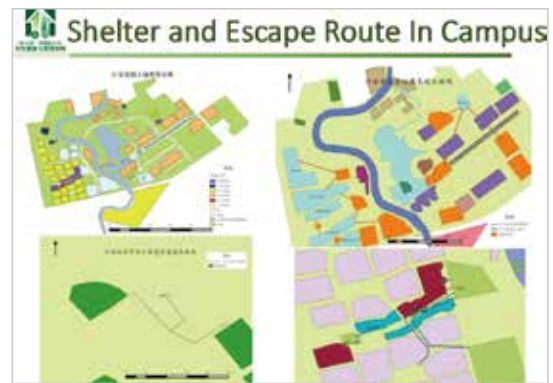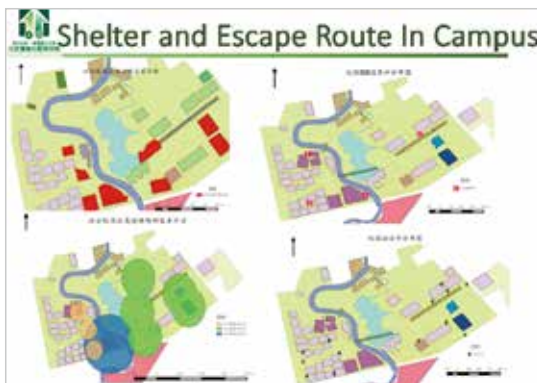Fig.1. DREAM of JiangAn Campus, Sichuan University, China

Fig.2. DREAM of Tuxi Community, Sichuan, China

Case Study 3:
NUS Crisis & Emergency Management Framework

Mohammad Fazulee Bin Abdul Rahman

Senior Manager, Office of Safety Health & Environment,
National University of Singapore

The Office of Safety, Health and Environment (OSHE) is the corporate office in charge of occupational safety & health matters, environmental compliance and emergency management in NUS. OSHE supports the NUS mission by ensuring university activities, in particular high risk activities such as construction, laboratory and workshop-based activities, university and student events are conducted safely so as to prevent harm, injury or ill health from befalling to the people undertaking such activities.

The Emergency Management (EM) Division was established in July 2005 to manage major crisis incidents and equip staff and students with the knowledge and skills to manage crises and emergencies in their own respective areas. The scope of EM has grown to include all areas of Emergency Preparedness & Management, Life Safety for University (Student Events & Activities), Fire Safety and Business Continuity. EM also plays an essential role in coordinating with the NUS Counselling and Psychological Services for mental health support to students/ next-of-kin and staff during emergencies. We shared how efforts in ensuring Emergency & Crisis Preparedness for the university is paramount in ensuring effective Incident Management, Crisis Management and Business Continuity during any incident and capturing lessons learnt post incident for continual improvement (See Annex 1).

The NUS Crisis and Emergency Management (CEM) framework and policy were developed and had successfully guided NUS in managing incidents since it's launched in 2005. This policy describes the broad framework for the dealing with crises and emergencies in the National University of Singapore (NUS) in coordination with national emergency services. It is designed to assist the university in coping with the anticipated needs generated by a crisis so as to deliver a quick and effective response to the situation, to protect and save lives, minimize damage to property and the reputation of the University. It covers all staff and students in NUS (including those working or studying full-time, part-time, on attachment, internship or exchange programs). Crisis communication and management training are conducted to train each faculty Incident commander and as well as staff supporting in emergency and crisis management. We shared key points of our CEM framework and highlighted the importance and lessons learnt from these points (See Annex 2).

OSHE provides a range of services to meet the needs of our stakeholders. These include policy formulation, program development, advisory services, training, safety promotion, safety audits and inspections and incident management. One of the most valuable services offered by EM is still the role of advisor during emergencies. An example of how EM manages injuries, death and threat of violence cases in the university was shared (See Annex 3). NUS faculties and units can depend on the NUS EM team for guidance and support throughout the entire incident.

In the ever changing world, OSHE's EM portfolio and responsibilities will continue to grow to meet any new areas and challenges faced by our stakeholders' in the area of emergency preparedness. EM will continue to review our procedures and plans to ensure NUS is well prepared for future incidents.
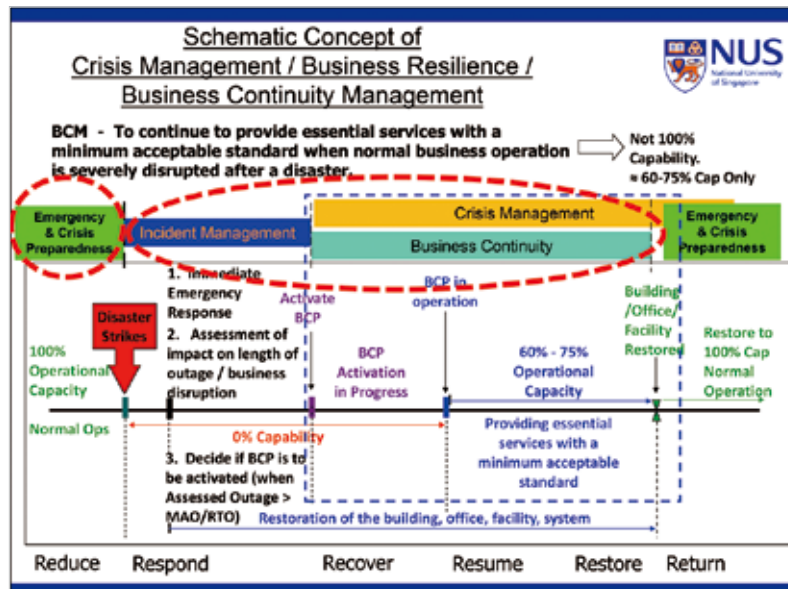
Annex 1
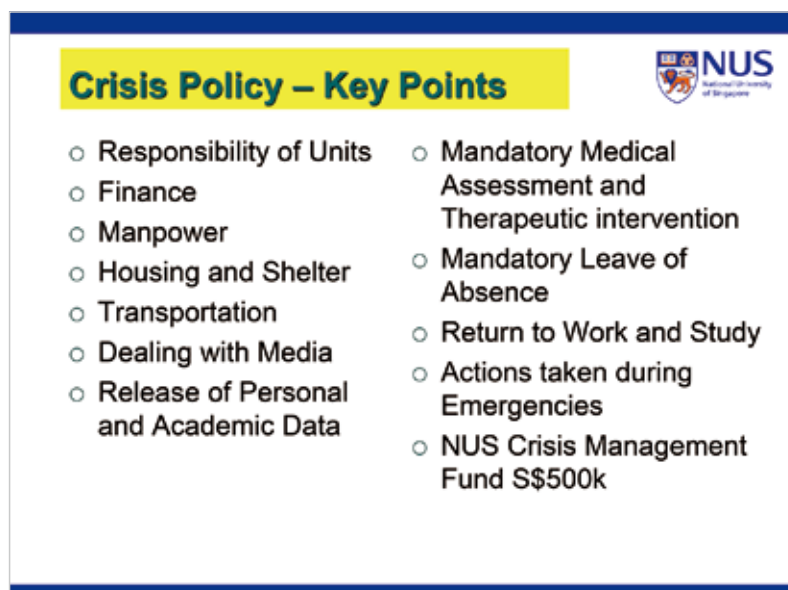
Annex 2

Managing Injuries, Death & Threat of Violence NUS

Situation/Scenario	Mitigation/Response
1. Student & Staff mental issues & outbreaks	1. Work with & guide faculty in immediate stabilization & managing the incident
2. Threatening of violence (self harm/harm to others), suicide attempt, stalking	2. Work with authorities (local & foreign) in notification of next-of-kin and managing the case
3. Missing students	3. Updating University Senior Management & coordinating appropriate response
4. Completed suicide	4. Internal & external communication
5. Injuries & deaths in student activities	5. Crisis mental health support

Annex 3

Case Study 4:
Campus Safety and Emergency Command Platform System in Tsinghua

Hui Zhang

Professor, Institute of Public Safety Research,
Tsinghua University

Campus safety is critical in the University. Tsinghua University is looking into development of campus safety database and information platform. Systematically review of campus risk is performed and the key issues are identified. Monitoring and warning system is designed based on new technologies, such as face/license plate recognition system, smart phone and big data. The campus safety is also connected to the neighborhood and to the city. The campus safety protection system is established. As test, the system is used for tracking the vehicle and road damage in the campus. The system can also be used for better management of student activities. Further work will be focused on better management of campus life and effective response of any disasters.
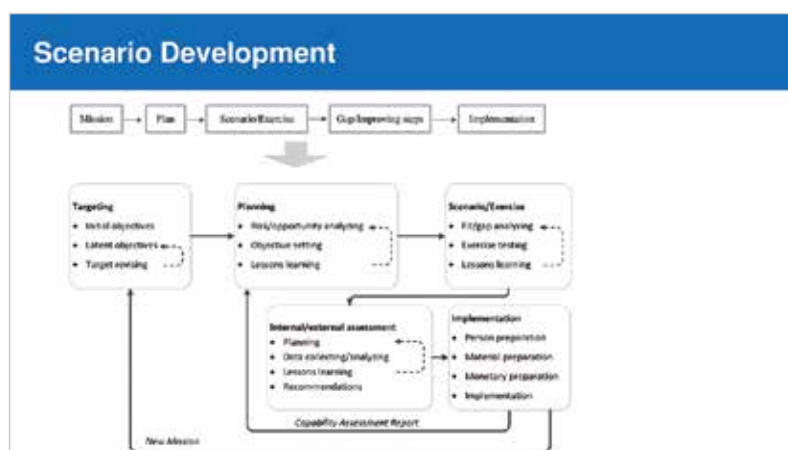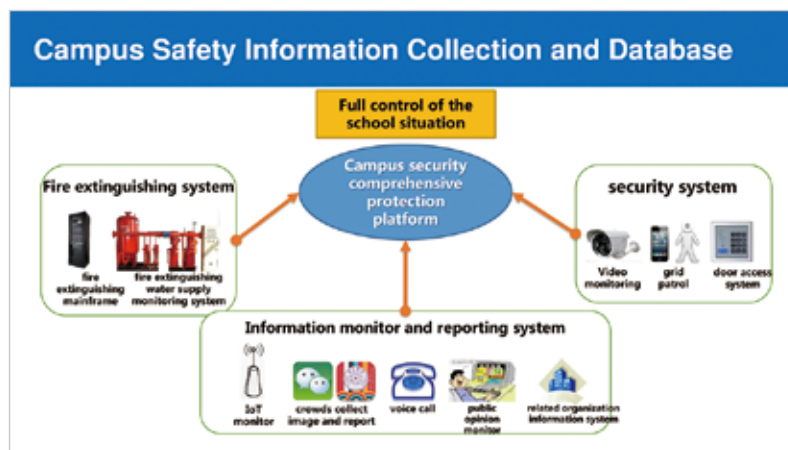
Daily Supervision and Early Warning
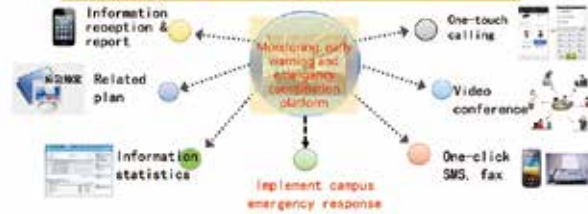
Emergency Management

Case Study 5:
Experience of Disaster Management with Business Continuity Plan in Taiwan

Chia-Ying Lin

Assistant Research Fellow,
National Science and Technology Center for Disaster Reduction

The challenges business owners faced are complicated in Taiwan since Taiwan is located in a high natural disaster risk area. To reduce disaster risk, the whole disaster risk reduction (DRR) life cycle should be considered. Regarding DRR life cycle, disaster resilience is identified as an essential ability. Business Continuity Plan (BCP) suggests a procedure to enhance resilience. With business continuity, disaster impacts could be mitigated, the operation disruption time could be shortened, and the recovery time could be accelerated.

The damage due to 2016 Southern Taiwan earthquake indicated the challenges of business continuity. Business owners should consider not only their own factory but the disruption of public services. According to these requirements, NCDR developed several platforms for information sharing and earthquake scenario simulation. Platforms for information sharing were developed for public and specific users. It allows users access natural disaster information, such as climate, earthquake, and so on. For specific users, they could get more particular information including regional disruption information, disaster-prone area, etc. Another platform named Taiwan Earthquake impact Research and Information Application platform (TERIA) was developed to provide assistance in preparedness phase. Earthquake impacts to facilities of public services could be simulated by TERIA, therefore, the vulnerability could be located. Currently these platforms are used by many organizations to assess disaster risk and knowledge sharing.

For campus safety, buildings and people were identified as key factors. In Taiwan, Earthquake Early Warning System (EEWS) for campus was constructed for risk communication to alert students and staffs. Also, seismic upgrading project was extensively executed to upgrade the seismic capacity of public school buildings. We tried to enhance campus safety against earthquake by both physical and technology ways.

Platforms for Information Sharing

Science Parks

Scenario Simulation for Earthquake

Taiwan Earthquake impact Research and Information Application platform (TERIA)

Risk of roads and bridges near Hsinchu Science Park

- High Risk (Bridge):
  - 國道：3座
  - 鐵道：4座
  - 市區道路：2座
- Risk (Road)：
  - Most of roads are at low or very low risk
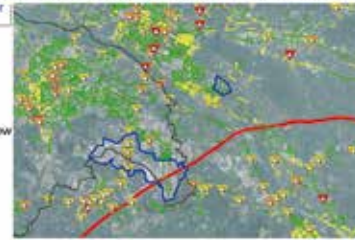
Risk (road)
— Very low
— Low
— Medium

Risk (Bridge)
▼ Low
▼ Medium
▼ High

Damages to public services in 2016 Southern Taiwan earthquake

Item	Num. of service suspension	Num. of Restoration	Under repair	unrepairable
Tap water (household)	400,300	395,300	5,000	0
Electricity (household)	173,084	172,664	0	420
Natural gas (household)	1,241	1,034	0	207
Land-line phone (household)	1,248	1248	0	0
Cell-site for mobile phone (site)	131	131	0	0

Expected or non-expected damages to production lines after 2016 quake

Fallen pipelines   Assembly line

Risk Communication: Earthquake Early Warning System (EEWS) for Campus

- Risk communication allows people at risk to understand and adopt protective behaviors
- Earthquake Early Warning System (EEWS) for campus
  - Developed by Central Weather Bureau, National Center for Research on Earthquake Engineering and National Taiwan University

Regional EEWS   On-site EEWS

Building news tickers

Host for receiving and exhibiting warnings

Broadcasting
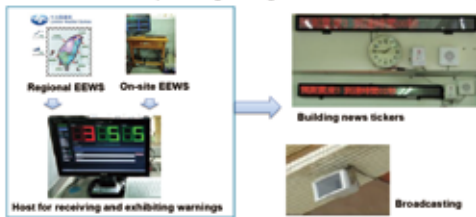
Seismic Retrofit of School Buildings

- In order to upgrade the seismic capacity of public school buildings and ensure the safety of students and teachers before the next severe earthquake, the seismic upgrading project was extensively executed.

Strategies for School Upgrading in Taiwan
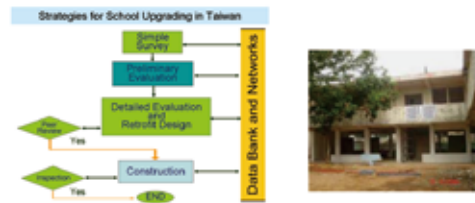
Case Study 6:
Initiatives in Disaster Risk Reduction and Climate Change Adaptation

Jessica K. Cariño

Professor, Vice Chancellor for Administration,
University of the Philippines Baguio

The University of the Philippines Baguio is a constituent unit of the University of the Philippines System, the country's National University. It is situated in the Cordillera highlands of Northern Luzon, an upland ecosystem which is home to indigenous peoples collectively referred to as Igorots and characterized by growing vulnerability and problems in resource management. In partnership with the United Nations World Food Program, UP Baguio established the Knowledge and Training Resource Center for Climate Change and Disaster Risk Reduction (KTRC) under its research/extension arm, the Cordillera Studies Center (CSC). The goal of the CSC-KTRC is to contribute to greater resilience of communities vis-à-vis climate change and disasters, by (a) providing readily accessible scientific studies and IEC materials on climate change to vulnerable local communities; (b) serving as a repository of learning materials on CCA and DRRM; and (c) serving as a University-based training center that provides a package of CCA and DRRM-related capacity building programs.

Among the outputs of the CSC-KTRC are the implementation of various training workshops on CCA and DRRM and the development of training modules available for use by various institutions, local government units and communities in the Cordillera; the strengthening and the codifying of the Emergency Response Protocols of UP Baguio; and the conduct of action or applied researches where research findings are immediately fed into policy of and implementation by public and private sector programs and projects.

Thus far, the CSC-KTRC has achieved the following outcomes: increased knowledge on disaster preparedness and response and climate change adaptation in the context of upland/indigenous communities; increased awareness among the educational institutions and local government units on DPR and CCA; improved mechanisms (policies/protocols/guidelines) for DPR in UP Baguio, public elementary and high schools, and local government units.

HOLISTIC AND INTERDISCIPLINARY APPROACH:
E.G. CLIMATE CHANGE AND SUSTAINABILITY SCIENCE
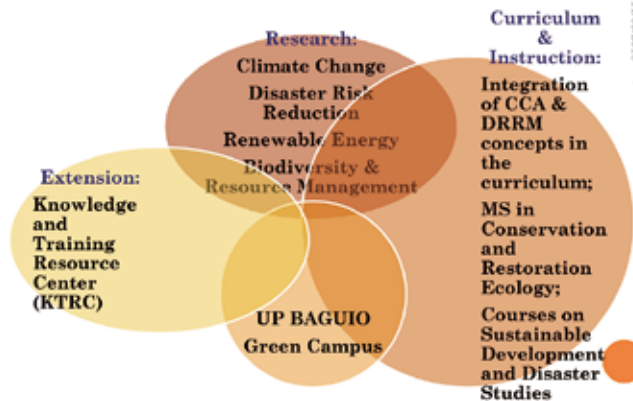
Research:
Climate Change
Disaster Risk Reduction
Renewable Energy
Biodiversity & Resource Management

Curriculum & Instruction:
Integration of CCA & DRRM concepts in the curriculum;
MS in Conservation and Restoration Ecology;
Courses on Sustainable Development and Disaster Studies

Extension:
Knowledge and Training Resource Center (KTRC)

UP BAGUIO Green Campus

KNOWLEDGE AND TRAINING RESOURCE CENTER FOR CLIMATE CHANGE AND DISASTER RISK REDUCTION (KTRC): **OUTPUTS**

Disaster Protocol Development for UP Baguio

KNOWLEDGE AND TRAINING RESOURCE CENTER FOR CLIMATE CHANGE AND DISASTER RISK REDUCTION (KTRC): **OUTPUTS**

o Emergency Response Protocols for UP Baguio

GROUP ACTIVITIES

Group activity 1:

The participants discussed the following two topics in a group work:
1) sharing response experience (what worked and what did not)
2) what are the major issues and challenges in strengthening the preparedness capacity?
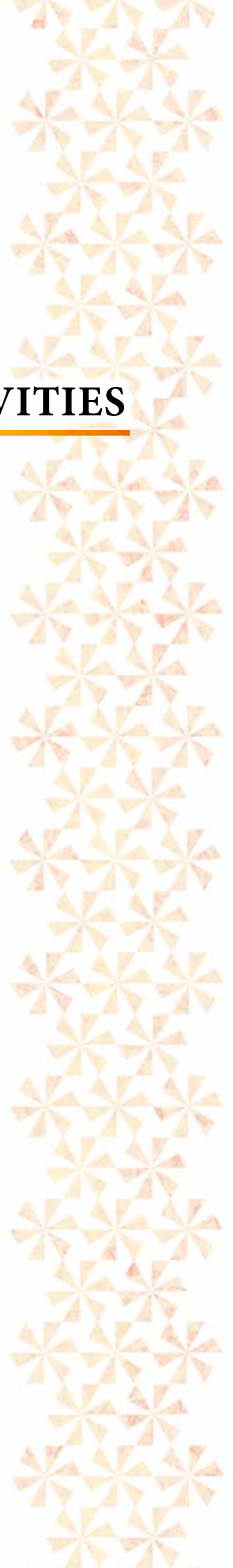
Based on the inputs from all the groups, the participants discussed how to improve the challenges. They agreed that the key issue would be the application of technology and innovation to minimize the risks. At the end of the discussion, the groups came up with the **Key messages for making campus disaster resilient.**

"TECHNOLOGY IS AN ENABLER"

1) **Leadership/Policy/Governance:** Leadership is indispensable during emergencies to make critical decisions and prompt policy responses, often with limited information. Disaster management or emergency plans can assist the decision-making process to identify what needs to be done for immediate response and recovery. In addition, leadership is critical even before emergencies to decide what kind of preparedness and disaster risk reduction measures are taken on campus. It requires human and financial resources. Without strong leadership and governance, it will be difficult to allocate these resources to disaster preparedness and risk reduction. It is highly important for the university executive to have knowledge on the importance of risk management.

2) **Investing in Safety:** Investment both in financial and non-financial purposes for safety is crucial. It is often challenging to secure financial support by universities for the development of systems and disaster preparedness measures as well as human resources support unless a natural disaster is a pressing concern. However, once a disaster happens, without adequate risk reduction measures, the damage and impacts including assets, buildings, and human lives can be enormous. In addition, it will prevent students from continuing their studies and research activities. Creating such an environment is an institutional responsibility and one that requires participation and commitment from multiple parties within the institution. Disaster mitigation is much more economical and effective than disaster response.

3) **Communication strategy and plan:** The strategy is to enhance the capabilities of emergency communications. Emergency communications are crucial for 1) collecting the information on current status and damage caused by emergencies for decision making, 2) sharing decisions made on what to do and not to do, 3) checking the safety of students, staff and faculty, and 4) informing the actions of the next step. The strategy and plan need to be checked and updated regularly, and tested to improve the response capacity to coordinate through exercise and training programs by using available technologies.

4) **Implementation:** One of the priority actions for campus safety is to develop a disaster management plan for the campus mainly to clearly understand how to prepare for and respond to a disaster. Not only that, once it is developed, it has to be tested conducting a simulation exercise based on the plan to see its effectiveness and practicality. "Implementation" and "taking action" is a crucial step for the campus safety.

5) **Developing strong partnerships** (governments, academia, industry, community): The priority for universities is to protect the lives of students, staff and faculty on campus as well as the assets. However, universities are also recognised as a part of the community. Therefore, the preparedness-capacity of universities has a huge impact on the safety of communities. As a society, we need to collaborate and work together to develop a disaster preparedness and response plan at least by sharing plans and having an opportunity to discuss them. Universities will be able to assist communities by sharing information and providing spaces as evacuation centres in the response stage.

GROUP A

Sharing Responses Experience

What worked

- A lot of Information / Data (Sharing)
- Different Point of view
  Diversity of views
- Consistent Methodology
  · Prevention
  · Reduction
  · Recovery
- Applied to local situations / Problems
- Early Warning Systems
- Quick dissemination of Info on Social Media
- University demonstrating Leadership in Disaster Resilience + Prevention for the community

Interdisciplinary Approach
- Possible experts network
- Sharing lessons learnt
- Students club collaboration

Did not

- Format of Information
- Coordination between groups
- Very Few Technology
- Lack of Clarity on Roles + Responsibility Miss-communication of Info on Social Media
- Discussing how to Involve students energy in Disaster's Awareness
- Difficulties at Different Levels Stakeholders & Leaders
- We were too Polite avoiding any Criticism

Major Issues & Challenges in Strengthening the Preparedness Capacity

- Culture · · · · · Leadership
- Strengthen Format of Information for Sharing – National + Globally "Consistency"
- **BUDGET! / RESOURCES**
- Displaced People – How to deal with it
- Improve Technologies + Data Management in Relation to Disaster Management · · · "Global Experiences" "Mobile Technology"
- Big City   vs   Rural Impacts
  ↑Preparedness   Preparedness↓
- Organizational Resilience – single PT of Failure
- One person driving the agenda → not ingrained the culture
- Sustainability!! **"Continued Focus"**
- Building Indicators (KPI's) to know what is working
- Imbalances Between Recover × Repair / Preventing
- Students main actors for future resilience

GROUP B

Sharing Responses Experience

What worked

- Fire Hazard
- Response Quick
- Plenty of Fire Extinguishers
- Should have planners to Communicate Hazard to Everyone
- Has Emergency Management Plan
- Whole Organization Helps –"Culture"
- Involve Students
- Improvements of All Buildings –Even those not affected by Hazard
- Good Coordination / Organization during Emergency Drill / Response

Did not

- Communication Slow / Long
- After Checking, Some are Expired
- Lacking Emergency Crisis Core Group
- Plan is not read and updated
- Lack of Periodic Drills
- Communication Plan Shared Externally
- Small Participation Rate
- Leadership so everyone is expected to follow drills
- Safety Confirmation
- Too Focused on Grand Building Design, Less on Building Safety

Issues & Challenges in Strengthening Capacity

- Online System, Safety Confirmation
- More Data / Information on Buildings / Students
- Have a "Culture" of Awareness
- University DRRM has to be Institutionalized
- Resources to be in Charge of Centralized Institution → Have to be Ready Anytime

Challenges

- Response Information to Students & Parents
- Need of Emergency Supply

GROUP C

Responses Experience

What worked

①Leadership / Resources
②Multi-hazard Approach / Risk Register
③Training / Exercise / Plan
④Guidance & Checklist
⑤Protecting Asset / BCP / Redundancy

Did not

①Plan is not Test / not Known
②Weakness Coordination
③Warning without Action Plan
④Weak Ownership

Issues & Challenges

①Obtaining Sponsorship of the Leadership
②All Community Approach (Ownership) – Including Students & Parents
③Reaching All Members & Stakeholder
④Maintaining Up-To-Date Plan
⑤People's Centered EWS
⑥Building Resilient Culture
⑦Language & Local Practices
⑧Having the Right Information
⑨Knowing the Vulnerability
⑩Allowed Resources / Risk Tolerance

Group activity 2:

Developing a minimum checklist for campus safety:
The participants were requested in a group to develop a checklist to see the level of disaster preparedness on campus. These are considered as the minimum conditions that universities should install.

Minimum checklist

☑ **Checklist 1: Policy/governance**

- The university has a disaster emergency plan. (communication, electricity backup)
- Staff and faculty are familiar with the plan and understand how to act in case of emergencies.
- The plan is reviewed and updated each year.
- The university sets up a disaster counter measure office once a disaster restrikes.
- The university has an emergency structure.
- The university has a communication plan.
- A disaster emergency drill is conducted at least once a year.
- A safety confirmation plan of students, staff, and faculty is put in place.
- The university has developed an evacuation plan to accommodate students and staff.
- The university has a backup generator on site in case of power outages.

☑ **Checklist 2: Risk management**

- A risk assessment is conducted and regularly updated.
- The university develops a mitigation/risk reduction/preparedness plan.
- Based on the plan, mitigation measures are put in place.
- Emergency supplies (food, water, blanket, etc.) are always available.
- All the measures are regularly checked for effectiveness.

☑ **Checklist 3: Physical/digital infrastructure**

- Buildings have earthquake resistance structure.
- Buildings are facilitated by drainage, electricity, fire alarm systems, sprinklers, fire extinguishers, etc.
- Maintenance work is periodically conducted in buildings.
- Building inspections takes place regularly.
- The critical information in case of emergencies such as evacuation routes and emergency assembly points are shared with students, faculty, and staff. Ideally, these facilities have the signage.
- IT recovery plan is developed.
- Technological tools such as satellite/mobile emergency phones, alarms, and drones are put in place.

☑ **Checklist 4: Awareness training/education**

- An orientation is conducted among freshman students on disaster emergency and preparation.
- Special guidance to foreign students is available.
- Safety protocol for the students abroad is shared prior to their departure.
- A disaster emergency drill is conducted.
- Programs are conducted to raise awareness.
- Trainings for students, staff, faculty, and DRR leaders on campus such as on CPR are conducted.
- Information materials on past disasters, emergency plans, etc. are distributed.

☑ **Checklist 5: Physical/psychological aid**

- There is a hotline in place for students, staff, and faculty when they need physical or psychosocial support during and after emergencies.
- There is a prior agreement with local government, organizations, and other universities on collaboration on mutual support in case of emergencies including volunteer registration.

GROUP A

Minimum Checklist For Campus Safety

- Context of Nature Disasters / Stakeholders **Who**
- Use of Scientific Information – Inform Communication **Why**
- Identify Probable Risks "Risk Map" spec. Geographic Location / Social Impacts
- Existing + Building Readiness!!
  Infrastructure + Installations –evac. paths / meeting points
- Institutional Governance / <u>Leadership</u> / Crisis Mgt Cee
- "People Readiness" → "Culture" **How**
- Risk Management Office / Central Point for information / Resources
  Awareness / Training / Document / Disaster Logistic Info / Resources
  List of Volunteers & Coordination / Stakeholder / Civil Protection Society (NGOs
  etc.) / Data Preservation **Where**
- Disaster Protocols / Action Plans / Manuals **What**
- Technological Solutions: Mobile / Software / Mpps/ EWMS / Drones / Alarms /
  Signals **How**
- Medical + Health Support **Why**
  Physical facilities + Emergency Line → Panic Button / APP + Physical Button
  Helpline – Emotional Assistance
  Extended Support Programs / Protocols for Students & Staff (Professional /
  Admin/ Academic) & Families – Focus on impacted people ~ different levels
- Sustainable Culture of Prevention **Why**
  Info / Communication / Education

Minimum Checklist For Campus Safety

Why – Mitigation of Risk (Global/Local) & Build Resilience

What – Sustainable Culture of Prevention & Preservation of Resources (Human & Physical, Digital, Financial)

Who – All Stakeholders (Internal & External) / Institutional Leadership

When
- Awareness
- Incident
- Emergency
- Crisis

Where – University – National · Local · Community Context "Different Campuses"

How – 1, Prevention→Policy 2, PROTOCOLS 3, Action / Recovery 4, Lessons learned

GROUP B

Minimum Checklist For Campus Safety

1, Safe Infrastructure
2, Policy
3, Education
4, Emergency

① Infrastructures & Facilities

1 Building Structure
- Build base on latest building code
- Evacuation Route
- Check & Review each building – the latest update building code

2 Maintenance

3 Signage
- Evacuation sign are in place
- Response guidance poster available in public
- Map / Emergency map
- Assembly point *

4 Building Infrastructure Safety
- Water
- Drainage
- Electricity
- Fire Alarm System
- Sprinkler & Fire Extinguisher
- Pipeline

② Policy / Governance

1 Disaster Management

2 Insurance
- building / life / assets
- BCP
- Simulation Exercise base on DM plan

3 Communication Protocol

4 Risk Assessment

5 Safety Confirmation Protocol

6 Policy Review & Updating

7 Resources
- Financial Resources
- Human Resources

Minimum Checklist For Campus Safety

③ Education

1 Training
- For Students
- For Staff
- For Faculty
- For DRR Leader in Campus - CPR

2 Orientation for all New Member
- At least once a year

3 Drill / Simulation Exercise
- Regular Drill, at least one a year
- Evacuation simulation
- Rescue Kit Simulation – How to Use Emergency Equipment

4 Material
- Orientation material Exist
- Training Modules
- Brochure
- Online information in the campus website

④ Emergency

1 First Aid Kit Available in each building

2 Emergency Power Back Up Facility

3 Emergency Communication

4 *Emergency Supply
- Food
- Drinking Water
- Clean Water
- Warm Cloth

5 Periodic Check of Emergency Facility

6 Rescue Kit

GROUP C

Minimum Checklist For Campus Safety

1 Governance Actions

1.1 Disaster Countermeasure Office
1.2 Conduct Exercises Regularly - Maintenance
1.3 Disaster Manual, incl. Handbook for Students, Staff etc.
1.4 Emergency Response Plan
1.5 Communication Plan
1.6 BCP
1.7 Recovery Plan (If Required)
1.8 EWS
1.9 Safety Confirmation
1.10 Emergency Funding

2 Risk Assessment (RA)

2.1 RA Conducted
2.2 RA Up-To- Date
2.3 Business Impact Analysis
2.4 Mitigation Plan
2.5 Plan Publicly Available

3 Disaster Preparedness Mechanism

3.1 Disaster Resistant Infrastructure
3.2 Awareness-Raising Activity (Inc. Drills & Trainings)
3.3 Special Guidance for Foreign Students (Multi Language)
3.4 Safety Protocols for Students Abroad
3.5 Emergency Communication Facilities (Incl. Back Up System)

4 Response Capacity

4.1 Emergency Supplies (Food, Water, etc)
4.2 Agreement for Assistance from Local Gov, Organization, Other Univ.
4.3 Robust Claiming System For Emergency
4.4 Building Inspection after Disaster
4.5 Student Volunteer

Minimum Checklist For Campus Safety

5 Support System

5.1 Financial Support
5.2 Psychological Support
5.3 Legal Support (esp. for Foreign Students)

6 Data Preservation

6.1 Collect the Data about Human Experiences
6.2 Review Data / Evaluate the Response
6.3 Sharing & Preserving Data / Lesson Learnt
6.4 IT Recovery Plan

7 Humanitarian Aid Plan

7.1 Faculty / Dept. Sending Help to Other Community Near University

FIELD TRIP

Field Trip

After two days of sessions, the workshop participants visited Ishinomaki, Onagawa and Arahama on April 5 to observe the recovery efforts since the 2011 Great East Japan Earthquake and Tsunami.

At Okawa Elementary School, about 70 students and 10 teachers lost their lives by the massive tsunami. The reason this tragedy happened is still under investigation but the experience tells us the importance of understanding hazard risks as accurate as possible based on a long history and disaster experience and of having their own tailor-made preparedness/evacuation plan that advices an urgent action to be taken under emergencies.

Onagwa was heavily damaged by the 2011 disaster claiming 827 lives and destroying 70% of the buildings in the town. In March 2015, the reconstructed Onagawa station reopened and in December 2015, a pedestrianized shopping promenade called Seapal Pia was opened. After extensive land scraping, new residential housing is being relocated at higher elevations on nearby hillsides and leftover soil is being used to raise industrial and commercial sections closer to the water an average of 4.5 meters above sea level.

The Arahama Elementary School was flooded by a massive tsunami up to the second floor when the Great East Japan Earthquake and Tsunami struck. 320 people (students, teachers, and local residents) were evacuated in this building. As an Earthquake memorial project, the school building has been open to the public since April 2017. The visitors can see the damaged school building in unchanged form, as well as large photos and documentary films showing how it looked at the time. By accessing to a direct sense of the power and threat of earthquake and tsunami, visitors can raise their awareness of disaster properness.

Annex 1: Program

Tuesday 3 April

9:30- 9:40	Opening (Prof. Fumihiko Imamura (Director, IRIDeS, Tohoku University)
9:40- 9:50	Group photo
9:50-10:05	Self-introduction
10:05-10:25	Summary of the last workshop and agenda of the workshop/APRU Multi-Hazards program (Dr. Takako Izumi, IRIDeS)

PRESENTATIONS ON DISASTER PREPAREDNESS INITIATIVES ON CAMPUS

10:25-10:55	Case study 1: Tohoku University (Prof. Hiroaki Maruya, IRIDeS)
10:55-11:15	Coffee break
11:15-11:45	Case study 2: University of Indonesia (Prof. Fatma Lestari)
11:45-12:15	Case study 3: Tecnológico de Monterrey (Mr. Arturo Perez Rivera)
12:15-13:15	Lunch
13:15-13:45	Case study 4: Sichuan University (Dr. Bingwei Tian)
13:45-14:15	Case study 5: National University of Singapore (Mr. Mohammad Fazulee Bin Abdul Rahman)
14:15-14:45	Case study 6: Tsinghua University (Prof. Hui Zhang)
14:45-15:15	Case study 7: National Science and Technology Center for Disaster Reduction (NCDR)
15:15-15:30	Coffee break
15:30-16:00	Case study 8: University of Philippines Baguio (Prof. Jessica K. Cariño)
16:00-16:30	Case study 9: The University of Sydney (Mr. Kevin Duffy)
16:30-17:30	Group work 1: 1) sharing response experience (what worked and what did not) and 2) what are the major issues and challenges in strengthening the preparedness capacity?
18:00-	Dinner

Wednesday 4 April

9 :30-10:15	Group presentation
10:15-11:15	Plenary discussion: 1) How can we overcome the challenges/what are needed to be done? and 2) Disaster preparedness minimum checklist
11:15-12:45	Group work 2: Developing a minimum checklist for campus safety
12:45-13:45	Lunch
13:45-14:30	Group presentation
14:30-15:30	Plenary discussion on the checklist: Developing the APRU checklist
15:30-15:50	Coffee break
15:50-16:30	What is the next step? How can APRU/the network assist in strengthening the capacity?
16:30-16:45	Closing

Thursday 5 April

9 :30-16:00	Field trip to the affected sites *(Ishinomaki, Onagawa, Arahama)*

Annex

Annex 2: List of participants

	Name	University Location	University	Title
1	Kevin Duffy	Australia	University of Sydney	Deputy Director, Campus Infrastructure & Services
2	Bingwei TIAN	China	Sichuan University	Lecturer
3	Hui Zhang	China	Tsinghua University	Professor
4	Fatma Lestari	Indonesia	University of Indonesia	Head of Occupational Safety, Health & Environmental (OSHE) Unit
5	Devi Partina Wardani	Indonesia	University of Indonesia	Acting Emergency Management Coordinator
6	Nuraini Rahma Hanifa	Indonesia	Institut Teknologi Bandung (ITB)	Researcher and Secretary of Research Center for Disaster Mitigation
7	Maria Elena Meneses	Mexico	Tecnológico de Monterrey	Professor and Researcher, School of Humanities and Education
8	Patricia Torres Sánchez	Mexico	Tecnológico de Monterrey	South Dean, School of Architecture, Art and Design
9	Ana Lucía Hill	Mexico	Tecnológico de Monterrey	Crisis, Disaster & Risk Manager
10	Arturo Perez Rivera	Mexico	Tecnológico de Monterrey	Construction Director for Mexico City Campus
11	Mauricio Rizo	Mexico	Tecnológico de Monterrey	Auditor Director
12	Jessica K. Cariño	Philippines	University of the Philippines Baguio	Vice Chancellor for Administration
13	Francesca V. Llanes	Philippines	University of the Philippines Diliman	Senior Science Research Specialist
14	Lia Anne L. Gonzalo	Philippines	University of the Philippines Diliman	Senior Science Research Specialist
15	Mohammad Fazulee Bin Abdul Rahman	Singapore	National University of Singapore (NUS)	Senior Manager
16	Fernando Juan Ramos Galino	Spain	Universidad Politecnica de Catalunya	UIA past Director UIA Education Commission
17	Huei-Ru Hsieh	Taiwan	National Science and Technology Center for Disaster Reduction	Assistant Research Fellow
18	Chia-Ying Lin	Taiwan	National Science and Technology Center for Disaster Reduction	Assistant Research Fellow
19	Fumihiko Imamura	Japan	IRIDeS, Tohoku University	Director
20	Hiroaki Maruya	Japan	IRIDeS, Tohoku University	Professor
21	Takako Izumi	Japan	IRIDeS, Tohoku University	Asssociate Professor, APRU Multi-Hazards Program Director