

2010–2021 Ten-Year Report

IRDR ICOE -TAIPEI



**International
Science Council**
The global voice for science



Preface

This report is written primarily to provide documentation to summarize the outcomes of the IRDR ICoE-Taipei (International Centre of Excellence Taipei) in its first 10 years of service. This document is intended to serve not only as an archive for Academia Sinica in Taipei but also as a gate for people outside of Taiwan to better understand what ICoE-Taipei is, as well as its roles in promoting Disaster Risk Reduction (DRR) across the world, especially in Southeast Asia. As the Center's current Executive Director, I feel it is a necessity to compile such a documentary, considering the IRDR program under ISC (International Science Council) is uncertain for its future in the next 10 years.

In this report, we will show that 15 international training workshops, which we call Advanced Institute (AI), have been organized and held in 2011-2021. The 15 AIs covered different fields in DRR have become a signature event for the ICoE-Taipei in the DRR community and people around the countries in Southeast Asia. As a member of ISC's IRDR programs, we are very proud of that. Indeed, the AI is the most important activity for ICoE-Taipei and a complete summary of these 15 Ais is given in this report. Other critical activities are also summarized, including the "Seed Grant Program," "Online Master Forum Series", and so on. I hope that the report also can attract people, especially young students and scientists, who are interested in participating in DRR-related training workshops (and other activities) and will consider those organized by the ICoE-Taipei to be a good one to attend, learn, and enjoy the wonderful, unique experiences.

I would like to first thank Ying-Hsuan Lin, who made a compilation for most of this report during her service time as a science officer at ICoE-Taipei. She deserves the highest credit for this report. Chichi Peng really is the one who made the final touch during the publishing process. Si-Yu Yu, who has been serving as a science officer for two different time periods, was a long-time member with enormous contributions to the Center. Jeffery Chia-Hsing Lee has been a science officer for a few years and deserves credit for his dedication. Former vice president (of Academia Sinica), Chao-Han Liu served as the first Executive Director of the Center from 2010 to 2015. Shih-Chun Candice Lung served the term of Executive Director from 2015 to 2017. Special thanks to Yue-Gau Chen for his overall support as the Secretary General of the Center for Sustainability Science, the host for ICoE-Taipei at Academia Sinica. I would like to take this opportunity to thank so many international colleagues and friends who have been helping the Center through the years, particularly the IRDR family, including the IPO, Science Committee, and SAB members of the ICoE-Taipei, for your endless comments, suggestions, and encouragements.

Jian-Cheng Lee

Executive Director of IRDR ICoE-Taipei
September 2022



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VISION, MISSION, AND TASKS

VISION

The long-term goal of ICoE-Taipei is to reduce disaster losses through integrated research and international cooperation from both natural and social sciences perspectives

MISSION

The Center intends to serve as an international platform for conducting disaster risk reduction research and organizing training courses for capacity building, adopting an integrated multi-disciplinary approach from the perspectives of natural and social sciences.

TASKS

- Exchange of scholars between research institutes
- Sharing of ideas and information
- Collaborative research
- Education and training
- Establishment of a partnership network for disaster reduction research





1. Introduction

The International Center of Excellence in Taipei (ICoE-Taipei) completed its first 10 years by the end of 2021 since its launch in November 2010. Academia Sinica in Taiwan, the International Science Council (ISC) (then International Council for Science, ICSU), and Integrated Research on Disaster Risk (IRDR) (an interdisciplinary program under THE ISC) signed a joint agreement wherein all the three parties agreed to support and cooperate to improve the interconnection network of regional disaster prevention and mitigation, particularly to promote capacity-building activities.

During the first 10 years of ICoE Taipei, a mature operation model has been gradually developed for implementation. ICoE Taipei has been making efforts to 1) promote multiple international-exchange activities, 2) implement multiple international training courses, and 3) fund multiple regional cross-country research teams. The origin, structure, and operation strategy of the ICoE Taipei are described in the following sections.

i. Background

Different types of disasters have continuously occurred in many regions around the world in the past few decades. Losses associated with environmental hazards and the social impacts of natural hazards continue to increase globally. This is primarily due to the presence of a greater vulnerability in those disaster-prone areas. Despite increasing knowledge and understanding of natural hazards, various types of disasters, either sudden or slow, still affect people's lives. Moreover, human social and economic development has further contributed to increased vulnerability, thereby impeding humans' ability to cope with disasters and their effects.

Therefore, disaster risk management and mitigation probably require regional strategies to deal with or fulfill local needs. Geographical characteristics and human cultural and economic activities demonstrate significant differences across continents. Regional integration operation centers play an important role in cross-border cooperation on such matters. We, the IRDR ICoE-Taipei, aim to perform this responsibility in the Asia-Pacific region.



Recognizing the much-needed related science, back in 2010, the International Council for Science (ICSU), the International Social Science Council (**ISSC**)¹, and the United Nations Office for Disaster Risk Reduction (UNDRR), formerly the United Nations International Strategy for Disaster Reduction (UNISDR), created the IRDR to address the challenges posed by natural and human-induced environmental hazards. Later on, the importance of science and technology was also acknowledged in the Sendai Framework for Disaster Risk Reduction (SFDRR), which was adopted at the Third UN World Conference on Disaster Risk Reduction held in Sendai, Japan, in March 2015. The Sendai Framework highlighted the urgent need to take actions to enhance the scientific and technical work on Disaster Risk Reduction (DRR). It is mobilized by the existing networks and scientific research institutions at all levels and in all regions—with the support of the UNDRR and the Technical Advisory Group.

To facilitate DRR, the ICoE-Taipei, the very first ICoE under IRDR, was launched at Academia Sinica in November 2010. ICoE Taipei, together with its ICoE community, is collaborative in nature to implement global research and outreach to the IRDR Science Plan and IRDR Strategic Plan (2013-2017). In particular, ICoEs make regional based programs possible by participating and investing in area focused or localized events.

As the IRDR approaches the end of its ten years of activity, the IRDR ICoE-Taipei now has an opportunity to reflect on its status, progress, and future goals for a potential new scope of collaboration and leadership in the wider science community, and beyond.

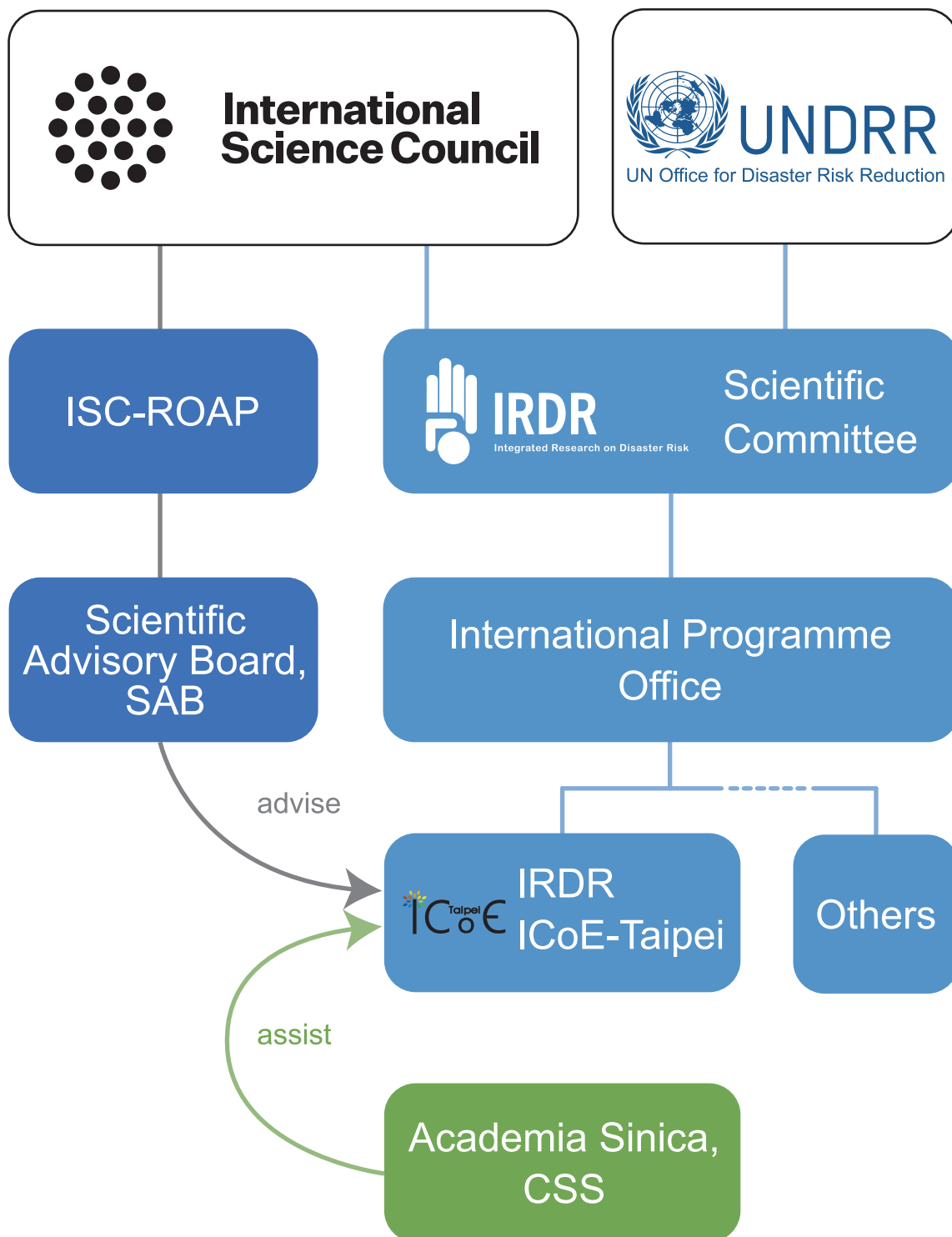
¹ In July 2018, the International Science Council (ISC) was formed by merging the International Council for Science (ICSU) and the International Social Science Council (ISSC), with a vision of science as a global public good and the mission to be a strong and respected voice of science. Unless for any specific purpose, the abbreviation of ISC will be used in the rest of the report.



ii. The Structure of the ICoE-Taipei

In terms of authority, Academia Sinica and ISC supervise the administrative operations of the ICoE Taipei, while the scientific advisory board (SAB) provides consultation and guidance on development strategies.

Figure 1 – Organisation structure chart of the IRDR ICoE-Taipei

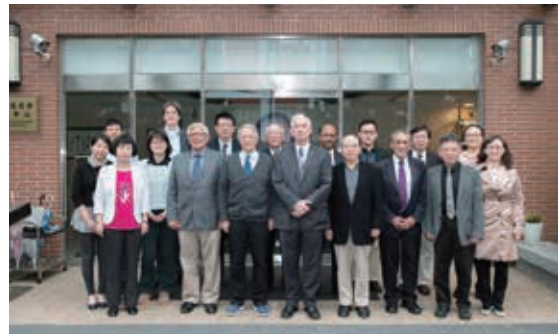


A. Scientific Advisory Board

The ICoE-Taipei has set up an international scientific advisory board composed of seven to nine members. At least one member of the board must be a serving member of the IRDR Scientific Committee. Board members serve for three years and can be renewed once. A complete list of board members since 2010 is provided in Appendix A.

The IRDR ICoE-Taipei SAB meeting is held once a year to review the annual report and discuss strategic directions and plans. The SAB members are all from international academic institutions or universities, or highly reputed organizations that have rich experiences in international collaboration with DRR. For the annual SAB meeting, the IRDR ICoE-Taipei also invites representatives of the ISC and IRDR IPOs as guests to share their opinions.

Figure 2 – The IRDR ICoE-Taipei’s annual SAB meetings.



B. Executive Office

The executive office has one concurrent executive director and one science officer. Two full-time assistants were added in 2020. Additional administrative support—including financial aid and manpower—comes from the Center for Sustainability Science of Academia Sinica.

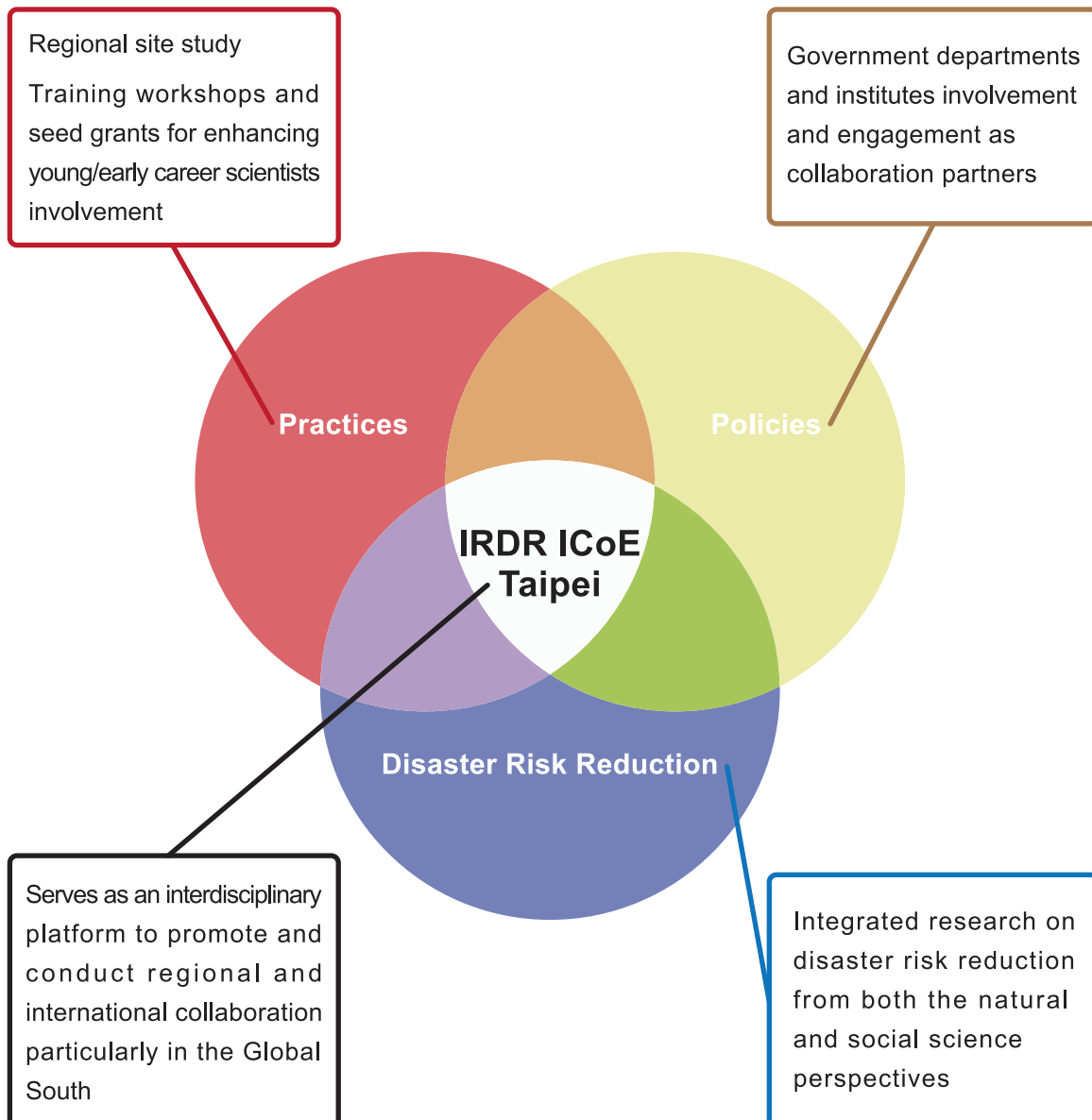


iii. Mission and Tasks

The ICoE-Taipei makes efforts to perform several tasks, including 1) participating in international DRR-related seminars; 2) organizing DRR-themed training activities, and 3) providing financial support for related regional research projects. Also, the IRDR ICoE-Taipei is to serve as an international platform to promote DRR through an integrated multidisciplinary approach for both natural and social sciences.

The ICoE-Taipei seeks to connect the main different components in DRR, including young and senior scholars, decision-makers, and stakeholders, and to build effective networks for integrating scientific knowledge, policies, and practices (see Figure 2). In setting its mission and priorities, the ICoE-Taipei implements the SFDRR and the IRDR objectives and contributes to promoting and supporting projects and organizing capacity-building activities relevant to DRR, in parallel with the implementation of the SFDRR.

Figure 3 – IRDR ICoE-Taipei functions as an interdisciplinary platform.



iv. Models of Operation

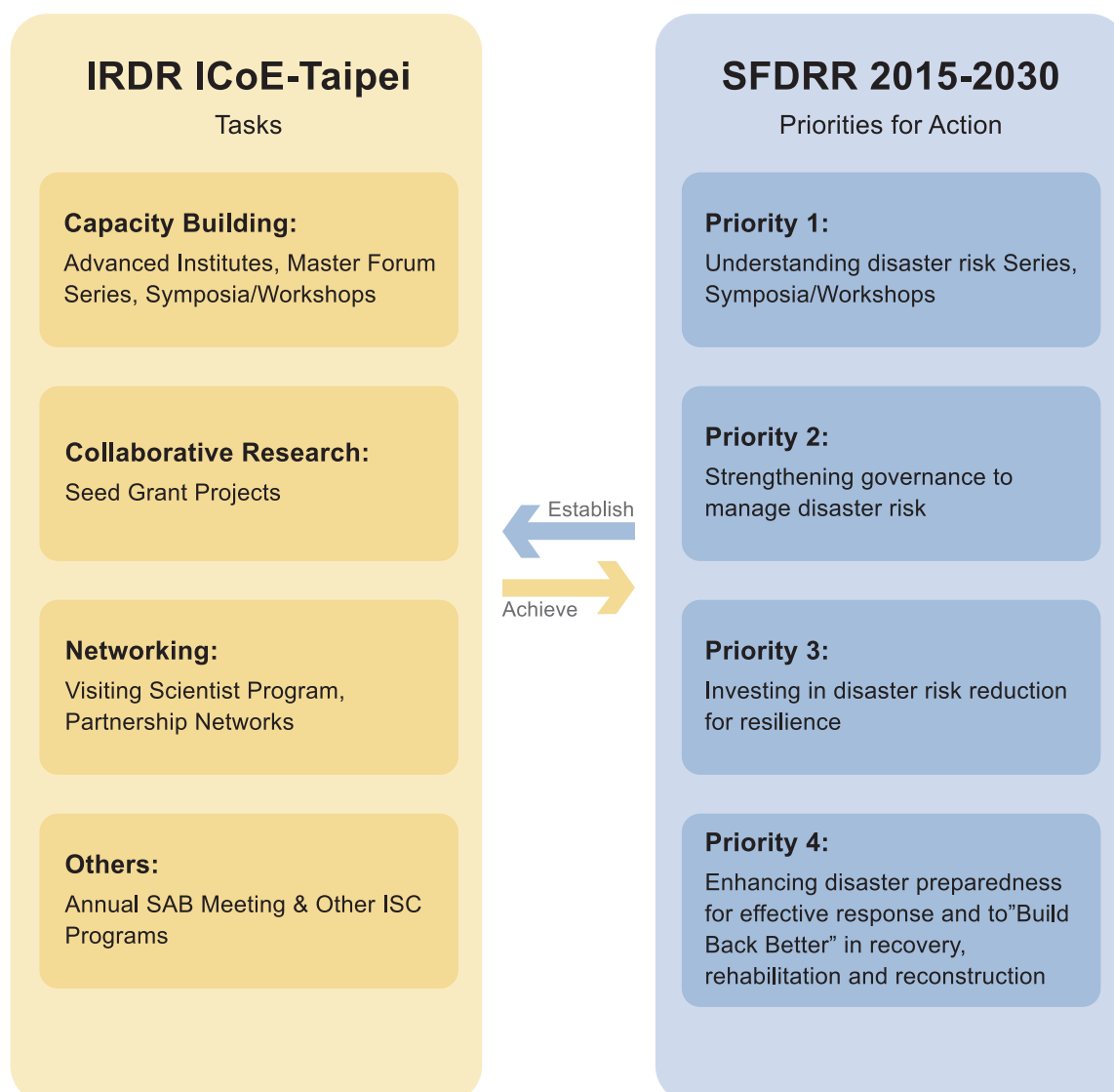
As a regional-level initiative, the IRDR ICoE-Taipei has been serving as an international platform for DRR for building capacity and facilitating collaborative research.

The IRDR ICoE-Taipei aims to build capacity in Southeast Asia and the Asia-Pacific region by a) organizing regional training courses; b) facilitating collaborative research among scientists; and c) creating a network to connect scientists, engineers, government officers, practitioners, and other key stakeholders.

These tasks also align with the action priorities of the SFDRR, which means that the IRDR ICoE-Taipei is committed to keeping up with the global agenda (Figure 1).

We use training courses to achieve the task of capacity building in disaster reduction-related knowledge and to improve the expertise of the personnel involved. We refer to these training courses as "Advanced Institutes" (AIs). Besides hosting/conducting AIs for capacity building, ICoE-Taipei also sponsors collaborative research on IRDR with international and domestic research institutes.

Figure 4 – Comparison of the IRDR ICoE-Taipei's tasks and the SFDRR's priorities for action.





2. International Capacity-Building Program

i. Background: Als in 2010–2021

The ICoE-Taipei targets countries in Southeast Asia and the Asia-Pacific region for capacity-building Als. We especially welcome and encourage young and early-career scientists from diverse disciplines and national backgrounds to join our organizing events. By offering travel subsidies to cover flight and accommodation expenses, we have supported more than 300 young and early-career scientists and researchers from over 20 nations to attend the Als since 2010.

Since 2013, the ICoE-Taipei initiated a regional DRR theme project and has provided seed grants to more than 20 of the AI participants. From 2012 to 2021, we have held 15 Als, in other words, 1 to 2 AI training courses each year on average.

So far, our 15 Als have created and discussed five DRR-related topics: a) air pollution and heat climate, b) earthquake, c) landslide/flood, d) volcanic eruption and e) hazard risk management.

A. Als on Air-pollution and Climate-related hazards

- I. Advanced Institute on Disaster Risk Reduction with Systems Approach for Slow-Onset Climate Disasters: Sensors, and Big Data, AI-SOCD on Air Pollution (July 2017)
- II. Advanced Institute on Disaster Risk Reduction with Systems Approach for Slow-Onset Climate Disasters: Heat Stress Sensors, Early Warning, and Information Technology, AI-SOCD-heat stress (June 2018)
- III. 2019 Advanced Institute on Health Impacts and Air Sensing in Asian Pollution, AI-Hi-ASAP 2019 (September 2019)
- IV. 2020 Advanced Institute on Health Impacts and Air Sensing in Asian Pollution, AI-Hi-ASAP 2020 (October 2020)
- V. 2021 Advanced Institute on Health Impacts and Air Sensing in Asian Pollution, AI-Hi-ASAP 2021 (October 2021)

B. Als on Earthquake hazards

- VI. Advanced Institute on Earthquake Hazard and Risk Assessment in East Asia, AI-EHRA (October 2018)
- VII. Advanced Institute on Earthquake Early Warning in East Asia, AI-EEW (March 2019)

C. Als on Landslide and Flood

- VIII. Advanced Institute on Landslide Risk Reduction Training School – Landslide hazards: From Site Specific to Regional Assessment, AI-LRRTS (August 2018)
- IX. Advanced Institute – Training Course on Landslide Investigations and Hazards Mitigation, AI-LIHM, Hanoi, Vietnam (July 2019)

D. AI on Volcanic Eruption

- X. Advanced Institute on Asian Consortium of Volcanology – 4th Field Camp of Asian Consortium of Volcanology, AI-ACV (October 2019)

E. Als on Hazard Management

- XI. Advanced Institute on Data for Coastal Cities at Risk, AI-DATA (October 2012)
- XII. Advanced Institute on Forensic Investigations of Disasters, AI-FORIN (March 2012)
- XIII. Advanced Institute on Disaster Risk Reduction and Loss Mitigation, AI-DRR & LM (April 2015)
- XIV. Advanced Institute on Knowledge-based Actions for Disaster Risk Reduction, AI-KBA (April 2017)
- XV. Advanced Institute on Knowledge-based Actions for Disaster Risk Reduction, AI-KBA (December 2021)

ii. Als on climate- (air pollution and heat) related hazards

With the goal of sustainable development and building research capacity in areas related to climate change and environmental change, the ICoE-Taipei training courses address issues such as coastal cities' climate risks, environmental data synthesis, microclimate, and air quality. The following sections outline the issues of air pollution and heat stress.

Air-Pollution. We held the five-day 2017 AI-SOCD (Advanced Institute on Disaster Risk Reduction with Systems Approach for Slow-Onset Climate Disasters) at Academia Sinica, Taipei from 10 to 14 July 2017 in partnership with the ICSU ROAP (Regional Office for Asia & the Pacific). Among more than 120 applicants, 22 participants came from 11 Southeast Asian countries.

The main objective of the workshop was to provide the participants with the best practices and enhance their systematical understanding, skills, and practical knowledge of slow-onset climate disasters. The lectures were designed to focus on air pollution, sensors, and big data. The organizers invited 13 internationally renowned scholars, eight of whom stayed for the entire five days to interact with the participants. The 2017 AI-SOCD sessions included lectures on systems approaches, air pollution, IoT, and big data, as well as break-out sessions, hands-on practices, and field visits. For the field visits, the participants had the opportunity to use low-cost portable/wearable air sensors and conducted on-site tests at a temple and a night market in Taipei City, which were two potential hotspots of air pollution.

Figure 5 – Group photo of AI-SOCD in July 2017.



Heat stress. Heat stress has been highlighted as an important issue due to climate change in the SFDRR report. Both heat stress and the increasing air pollutants are detrimental to human health. From June 4 to 8, 2018 we held an intensive training workshop, Advanced Institute for Systems Approach to Disaster Risk Reduction (AI-SOCD), at Academia Sinica in Taipei. The focus was on heat stress sensors, early warning, and information technology. The ICoE-Taipei co-organized the workshop with

the ISC ROAP and the Central Weather Bureau of Taiwan.

Figure 6 – Group photo of AI-SOCD heat stress in June 2018.



As the most pressing environmental health crisis in the world, air pollution causes a significant number of deaths in Asia and the Pacific regions. This hampers the region's ability to grow sustainably. Air pollutants, especially aerosols, contribute to the greatest uncertainty in climate change projections. Aerosols affect cloud formation, atmospheric radiation, and thus, regional climate. Moreover, the health impact of air pollution is one of the most important challenges facing the above-mentioned regions. Reducing air pollution has the co-benefits of decelerating climate change and protecting public health.

The ICoE-Taipei has been engaged in capacity-building training courses in the Asia-Pacific region on air pollution investigation and public health assessment for several years. The Health Impacts and Air Sensing in Asian Pollution (Hi-ASAP) program, for example, has been endorsed as a Future Earth Asia activity. The main goal of the Hi-ASAP is to provide scientific evidence to support effective policy actions and reduce air pollution levels, particularly PM_{2.5}. Research groups from 13 different areas of the Asia-Pacific region expressed their interest in the Hi-ASAP. The first work timeline phase of the Hi-ASAP is from 2019 to 2023, with a total of five steps: preparation (2019), launch (2020), intensive monitoring (2021), data analysis (2022), and publication (2023). Although the original plan for 2020 was disrupted by COVID-19, the IRDR ICoE-Taipei still organized two virtual training workshops during the year.

Figure 7 – Hands-on practices of air quality and human physiology measurement under different circumstances. AI on Hi-ASAP 2019



Figure 8 – Group photo of AI on Hi-ASAP, September 2019.

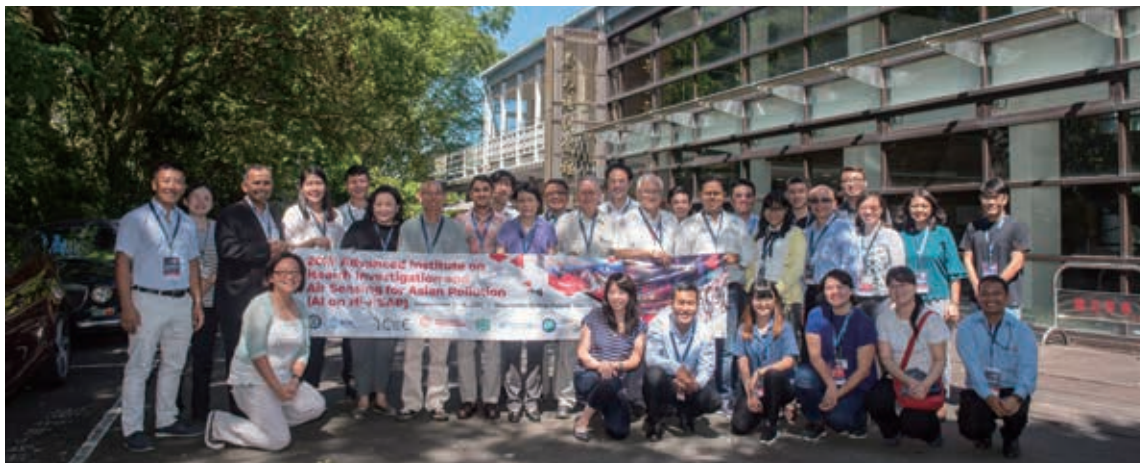


Figure 9 – The virtual training workshop on Hi-ASAP 2020.

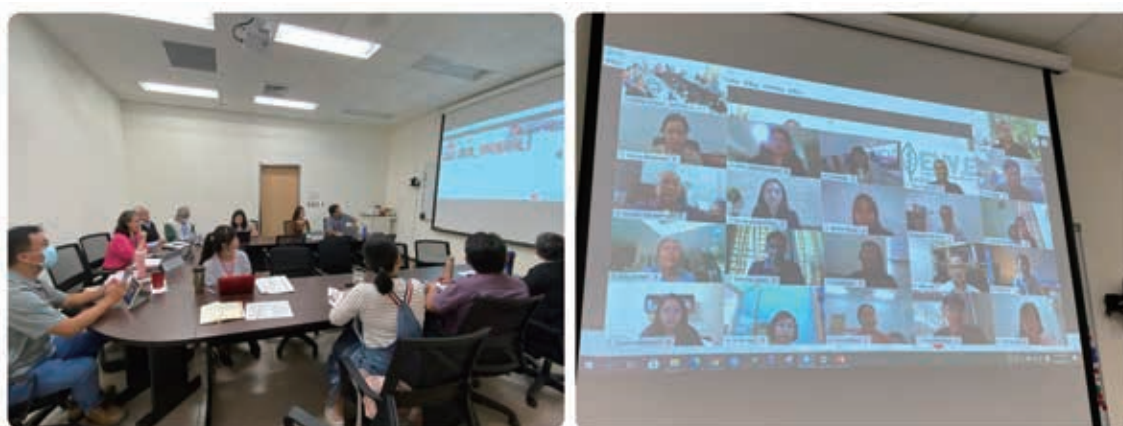


Figure 10 – The virtual AI on Hi-ASAP 2021.



iii. Als on earthquake hazards

East Asia is located in the western Pacific, where large and moderate earthquakes occur frequently. Many large cities in East Asia (e.g. Tokyo, Taipei, Manila, and Jakarta) are located either on or near active seismic zones and are exposed to high-to-severe seismic hazards and risks.

2018 AI-EHRAEA. The Advanced Institute on Earthquake Hazard and Risk Assessment in East Asia was conducted at Academia Sinica, Taipei, Taiwan over five days from 1 to 5 October 2018. This training course focused on all aspects of earthquake hazards and risk assessment, including seismic hazard and risk modeling, active fault source model, geodetic deformation model, ground motion prediction and scenarios, as well as hazard and risk products.

Figure 11 – Snapshots of lecture and group discussions at the AI-EHRA, October 2018.



2019 AI-EEWSEA. The Advanced Institute on the Earthquake Early Warning System in East Asia (AI-EEWSEA) was held at Academia Sinica, Taipei, Taiwan for four days from 25 to 28 March 2019. The purpose of this activity was to share the experiences of operating the P-alert system. We invited 17 participants and lecturers from more than 10 nations to join the training camp. Nine senior lecturers from Taiwan taught early seismic warning theories, techniques, and practices in this advanced course. The early warning operating experiences of different countries were shared and discussed.

The IRDR ICoE-Taipei strived to include several policymakers and stakeholders in the training events. A total of 26 participants were selected based on their locations, affiliations, and professional backgrounds. They were from 10 different countries around the world, namely Greece, India, Indonesia, Myanmar, New Zealand, Singapore, Solomon Islands, South Korea, Taiwan, and Vietnam, mostly but not restricted to South and East Asia and the Pacific.

Figure 12 – Group and lecture photos from the AI-EEW, March 2019.



iv. Als on landslide and flood hazards

2018 AI-LRRTS. Landslides are one of the common natural hazards around the world, seriously affecting human life and the economy. It is crucial to have a basic understanding of slope stability analysis and key mechanical parameters. Southeast Asian countries have long suffered from landslides due to their location in one of the most tectonically active regions and the influence of strong monsoons.

To advance the understanding, practical analysis, laboratory testing, monitoring, modeling, and hazard evaluation of landslides, the Advanced Institute on Landslide Risk Reduction Training School-Landslide Hazards: From Site Specific to Regional Assessment (AI-LRRTS) was held at the National Central University, Chungli, Taiwan from 27 August to 1 September 2018. During the training course, the participants not only took the lectures from experienced experts but also shared their experiences in their home countries.

Figure 13 – Field trip photos from the AI-LRRTS, August 2018.





2019 AI-LIHM. The Advanced Institute on Landslide Investigations and Hazards Mitigation (AI-LIHM) was held in Vietnam for six days from 20 July to 25 July 2019. This training course comprised a series of comprehensive lectures, practices, and field trips that intended to provide fundamental knowledge of landslides. The courses focused on disaster monitoring,

forecasting, and warning of landslide-related hazards and emphasized hands-on practice and field trips. A total of 13 lecturers from Taiwan, Vietnam, and Japan were involved in the courses. 27 academic and practical personnel from the government, academe, and graduate institutes were selected to participate in this training camp.

Figure 14 – Fieldtrip for landslide observation and discussion in Halong Bay.



Figure 15 – Lecture and hands-on practice of the 2019 AI in Hanoi, Vietnam.



V. AI on Volcanic eruption hazards

2019 AI-ACV. The East Asian subregion is located in the Pacific Ring of Fire, while Southeast Asia is located in the vast Sumatran subduction zone. Both are vulnerable to volcano-related disasters. In 2016, Japan's Mount Aso erupted, and Indonesia had volcanic eruptions of Mount Sinabon and Mount Agung in 2017. Mount Mayon in the Philippines also erupted in January 2018. Considering these recent events, it is possible that other fires in the Asia-Pacific region could also erupt in the future and cause severe damage to people living in these areas.

The Advanced Institute on Asian Consortium of Volcanology (AI-ACV) was held in Taipei from 28 October to 2 November 2019, on phreatic eruption and its hazard management. More than 40 young scientists from Japan, Singapore, the Philippines, France, Spain, New Zealand, the United States, England, Indonesia, China, South Korea, and Taiwan participated in the training camp. Participants consist mainly of volcanologists in the Asia-Pacific. This AI focused on the interpretation of volcanic observation data in many aspects, including geophysics, geochemistry, geology, and petrology. Both lecturers and early career scientists shared data related to active volcanoes. Group exercises and field trips were conducted to facilitate discussions and hands-on experiences.

Figure 16 – Photos of group discussions and field trips from the AI-ACV in 2019.



vi. Als on hazard risk management

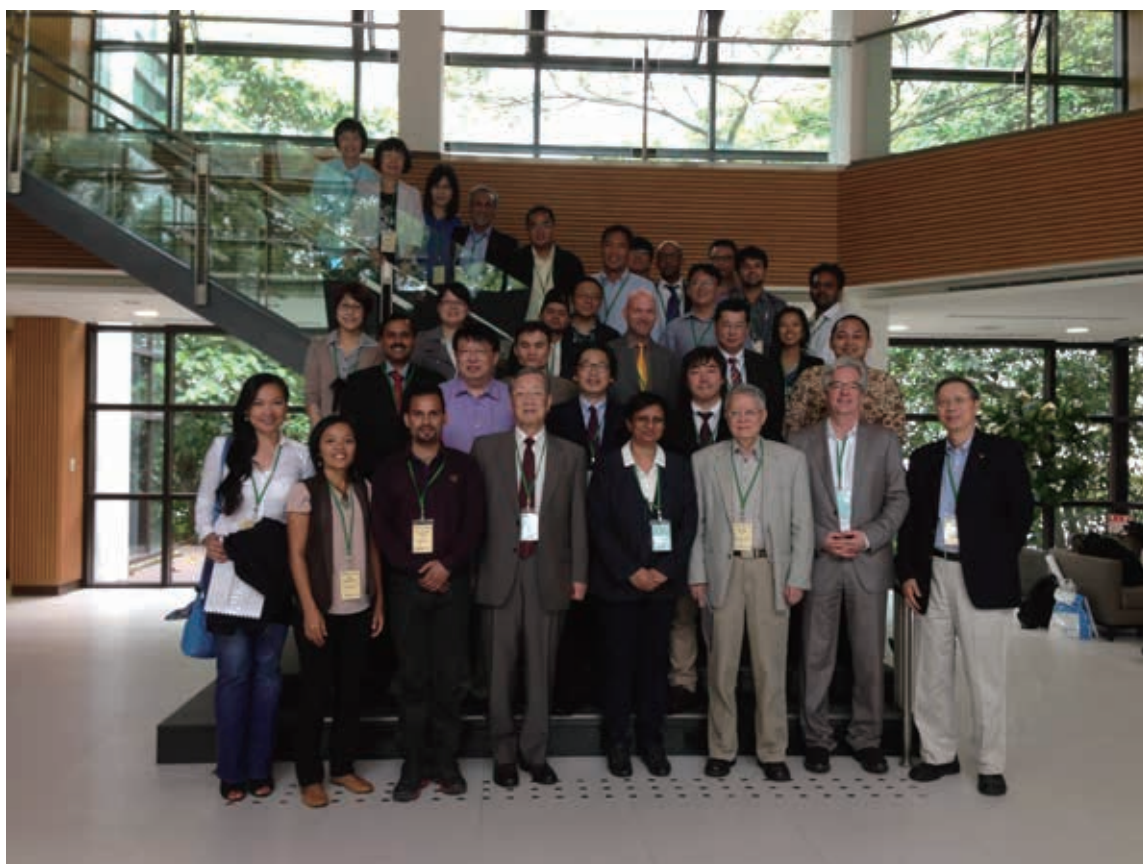
2015 AI-DRRLM. The Advanced Institute on Disaster Risk Reduction and Loss Mitigation (AI-DRRLM) was held at Academia Sinica, Taipei, Taiwan from 19 to 25 April 2015. The six-day intensive training event was conducted by the IRDR ICoE-Taipei in partnership with START (www.start.org) and the ICSU. A total of 90 international applicants applied to participate in AI-DRRLM, of which 18 young researchers and practitioners from 10 countries in Southeast Asia were selected to attend. The lecture sessions were led by eminent academic scholars and practitioners in disaster risk reduction and management. The AI also offered hands-on interactive exercises, trainee panels, and field site visits. Furthermore,

all participants were encouraged to conceptualize individual or collaborative projects, which were presented in a plenary session at the end of the AI and were submitted for competitive funding to support follow-up research activities in 2016 (i.e. one-year ‘Seed grant project’).

Figure 17 – Group photo from the AI-FORIN, March 2012.



Figure 18 – Group photo from the AI-DRRLM in 2015.



2017 AI-KBA. Knowledge-based action has long been valued for the cross-cutting connections it fosters among the key playmakers of DRR, such as scientists, policymakers, emergency responders, and practitioners.

However, in practice, effective DRR knowledge-based actions might also require unconventional thinking and strategic practices. To disseminate successful experiences throughout the Asia-Pacific region, the Advanced Institute on Knowledge-Based Actions for Disaster Risk Reduction (AI-KBA) was held from 17 to 21 April 2017 at Academia Sinica, Taipei, Taiwan.

A total of 16 participants from eight Southeast Asian countries, including Malaysia, India, the Philippines, Pakistan, Singapore, Thailand, Myanmar and Bangladesh, joined the training courses. This workshop was organized based on the collaborative flagship project between the ICoE-Taipei and the National Science and Technology Center for Disaster Reduction (NCDR) in Taiwan, providing young to mid-career practitioners, researchers and policy makers in the region with the best practices, enhanced understanding, skills and practical knowledge to apply systems approaches in DRR knowledge-based actions.

Visiting Emergency Operation Centre in New Taipei City (photo credit: Dr Mohamad Syazli Fathi, Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia)



Group discussion (Photo credit: Dr Mohamad Syazli Fathi, Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia)



Visiting EMS and Fire dispatch Centre in New Taipei City (Photo credit: Dr Mohamad Syazli Fathi, Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia)



Figure 19 – Group photo from the AI-KBA, April 2017.



This event was also reported in Taiwan's media and News agency as follows:

國際減災專家參訪新北 提升亞太災害防救能量

發稿時間：2017/04/20 15:30:00



4月20日印度、馬來西亞、菲律賓、巴基斯坦、新加坡、泰國、巴拿馬及孟加拉等8國防災學者及政府單位代表參訪新北市政府消防局

國際減災專家參訪新北 提升亞太災害防救能量

(中央社訊息服務20170420 15:30:25)中央研究院永續科技中心為提升亞太地區防災能量，舉辦國際減災進階訓練(AI-KBA)課程，並規劃於106年4月20日下午2時安排國際減災專家團隊參訪新北市災害應變中心、消防局119指揮中心及特搜大隊，針對防災科技成果及消防局防救災經驗進行交流。

國際減災專家參訪新北 交流救災經驗

中央社 2017.04.20 09:00

(中央社記者林長福新北20日電)來自8個國家、16位國際減災專家，今天參訪新北市消防局及災害中心，瞭解災害發生時新北市的防災體系及運作機制，並分享各國災害防救經驗及研究成果。

中央研究院永續科技中心為提升亞太地區防災能量，舉辦國際減災進階訓練(AI-KBA)課程，下午2時安排國際減災專家團隊參訪新北市災害應變中心、消防局119指揮中心及特搜大隊，針對防災科技成果及消防局防救災經驗進行交流。

1999年九二一地震後，防災科技研究對防災、減災工作的重要性顯著提升，引發外界關注政府各類防災政策，國家災害防救科技中心(NCDR)透過科學方法與科技研發，提升災害防救的實際作業效能。

中央研究院永續科技中心、國際災害應變整合研究中心(IRDR ICoE-Taipei)、國際科學理事會亞太地區事務處(ICSU ROAP)及國家災害防救科技中心，17日至21日聯合舉辦「國際減災進階訓練」(AI-KBA)課程，邀請國際專家來台交流。

與會專家學者來自印度、馬來西亞、菲律賓、巴基斯坦、新加坡、泰國、巴拿馬及孟加拉等8國，16位各國防災學者及政府單位代表共襄盛舉，本次活動除分享台灣災害防救科技研究成果外，並致力提升亞太地區災害防救整體能力。

新北消防局指出，下午參訪行程由災害應變中心開設及運作機制介紹；消防局防災救災指揮部中心新製電腦輔助巡邏機制介紹，將獲消防局副局長陳榮平主持。

新北消防局表示，希望透過此次國際防災訓練與交流，汲取世界各國防災知識及經驗，持續與各國防災團體接軌，拓展新北市防救災的國際觀。

消防局長黃清海指出，期許未來持續努力與相關單位，實踐防災、救災作為，共同為民衆的安全把關，創造更安全的城市，讓新北市成為「安全」、「安心」、「安穩」三安城市。

2021 AI-KBA. As a sequel to AI-KBA in 2017, the 2021 training workshop is intended to present a systematic approach, which is named The Online Synthesis Systems (OSS) for Sustainability and Resilience, for disaster risk reduction knowledge-based actions. The OSS is a web-based knowledge integration system in which Facilitators are designed to use the knowledge on-site to solve stakeholders' problems as a means of strengthening resilience and promoting sustainable development. The four-day workshop was held in a hybrid form, with speakers mainly from Japan teaching via online video device, and 25 trainees from Vietnam, Nepal, Sri Lanka, Indonesia, India, etc., and ICoE staff attending online or in-person at Academia Sinica.



vii. Summary of the AIs and feedback

During its first 10 years from 2011 to 2021, to effectively build the capacity for cross-border and cross-disciplinary research, the IRDR ICoE-Taipei selected key playmakers of DRR, with emphasis on young and early-career scientists in Southeast Asia and the Asia-Pacific regions, for AI training courses and experience sharing. By December 2021, the ICoE-Taipei collectively organized 15 AIs, providing training workshops to over 300 young/early-career scientists from over 20 countries and supporting the trainees' further development by offering competitive seed grants.

Figure 20 shows the distribution of AI participants by nationality and the number of AI participants annually. As seen from this graph, the number of AI trainees has been continuously increasing from the decade 2011-to 2021. However, greatly impacted by the Covid-19 pandemic, the number of AI participants shrunk in 2020-2021.

Figure 20 – Distribution of trainees in the AIs from 2015 to 2021.

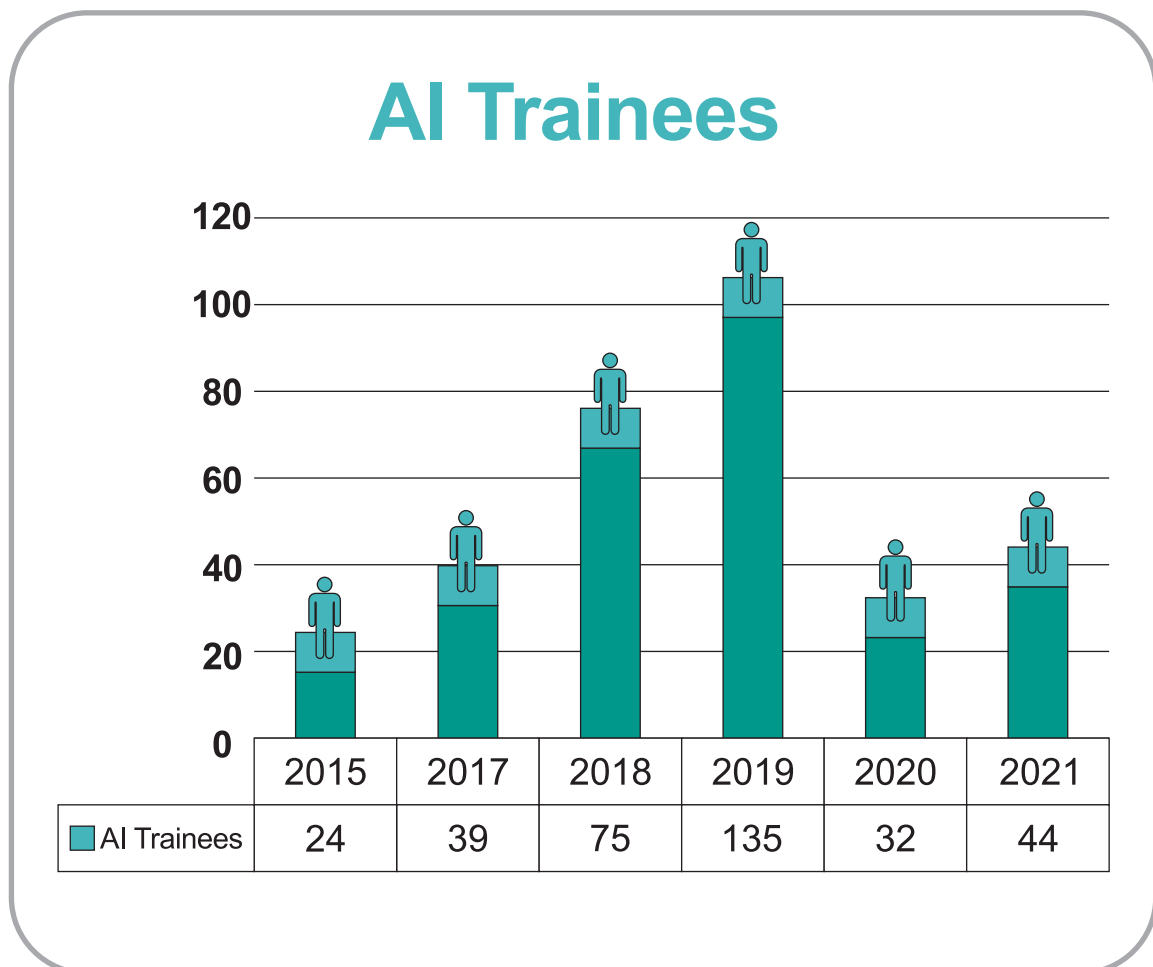


Figure 21 – The distribution of trainees by country.

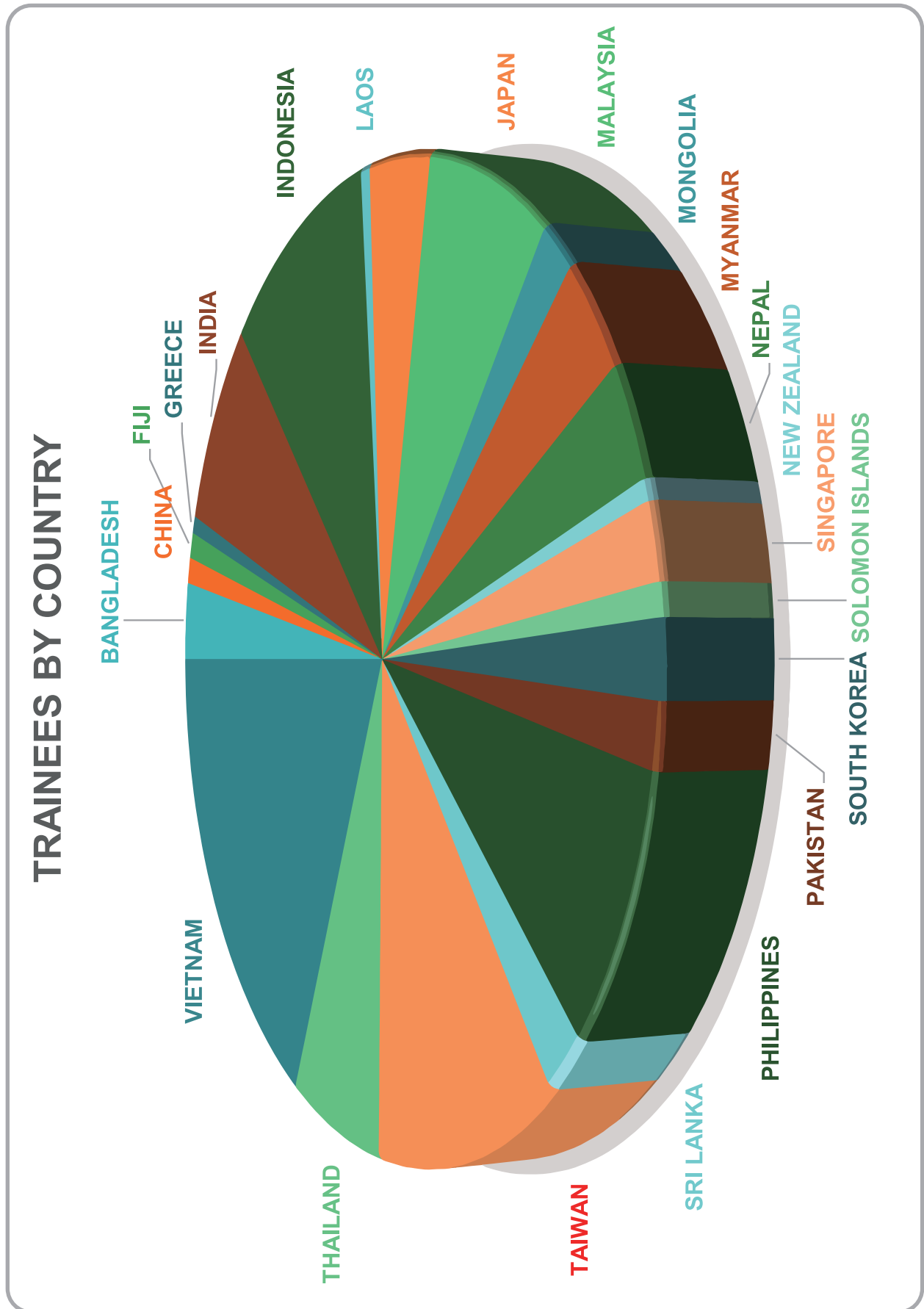




Figure 22 – List of dates and themes of our 15 AIs in 2012-2021

1	March 2012	Advanced Institute on Forensic Investigations of Disasters, AI-FORIN
2	October 2012	Advanced Institute on Data for Coastal Cities at Risk, AI-DATA
3	April 2015	Advanced Institute on Disaster Risk Reduction and Loss Mitigation, AI- DRR & LM
4	April 2017	Advanced Institute on Knowledge-based Actions for Disaster Risk Reduction, AI-KBA
5	July 2017	Advanced Institute on Disaster Risk Reduction with Systems Approach for Slow-Onset Climate Disasters: Sensors, and Big Data, AI-SOCD on Air Pollution
6	June 2018	Advanced Institute on Disaster Risk Reduction with Systems Approach for Slow-Onset Climate Disasters: Heat Stress Sensors, Early Warning, and Information Technology, AI-SOCD-heat stress
7	August 2018	Advanced Institute on Landslide Risk Reduction Training School – Landslide hazards: From Site Specific to Regional Assessment, AI-LRRTS
8	October 2018	Advanced Institute on Earthquake Hazard and Risk Assessment in East Asia, AI-EHRA
9	March 2019	Advanced Institute on Earthquake Early Warning in East Asia, AI-EEW
10	July 2019	Advanced Institute – Training Course on Landslide Investigations and Hazards Mitigation, AI-LIHM, Hanoi, Vietnam
11	September 2019	Advanced Institute on Health Impacts and Air Sensing in Asian Pollution, AI-Hi-ASAP 2019
12	October 2019	Advanced Institute on Asian Consortium of Volcanology – 4th Field Camp of Asian Consortium of Volcanology, AI-ACV
13	October 2020	Advanced Institute on Health Impacts and Air Sensing in Asian Pollution, AI-Hi-ASAP 2020
14	October 2021	Advanced Institute on Health Impacts and Air Sensing in Asian Pollution, AI-Hi-ASAP 2021
15	December 2021	Advanced Institute on Knowledge-based Actions for Disaster Risk Reduction, AI-KBA



viii. Other notable co-organized/co-sponsored capacity-building activities

A. 2014 WSS Seminar on Sustainable Urbanisation

The 2014 World Social Science (WSS) seminar, co-sponsored and organized by the International Social Science Council, the National Taipei University, and the ICoE-Taipei, was held from 2 to 8 November 2014, at Academia Sinica, Taipei, Taiwan. A total of 18 early-career social scientists from 14 countries participated in this seminar, which was composed of an interactive workshop approach and roundtable discussions on various aspects of sustainable urbanization. Dr. Rudiger Klein, then Executive Director of IRDR, presented a talk on ‘Managing disaster risk to strengthen resilient municipalities—approaches under the global IRDR program.

Figure 23 – Group photo from the 2014 WSS seminar on sustainable urbanization.



B. PIAD 2015 Workshop

The 2015 International Workshop on Psychological Intervention After Disasters (PIAD) was organized by the International Union of Psychological Science and supported by the ICoE-Taipei, the ICSU-ROAP, the Chinese Psychological Society, the United Nations University, and the Center for Applied Developmental Science. This workshop is aimed at researchers, educators, and practitioners

in the Asia-Pacific region. Their academic background is mainly in psychology and they have an interest and experience in working with disasters. The PIAD workshops were held regularly in China, Taipei, Kuala Lumpur, and Yokohama from 2014 to 2017. The fourth PIAD workshop was held in November 2015 in Taipei, Taiwan.

Figure 24 – Group photo from the 4th PIAD Workshop in 2015.

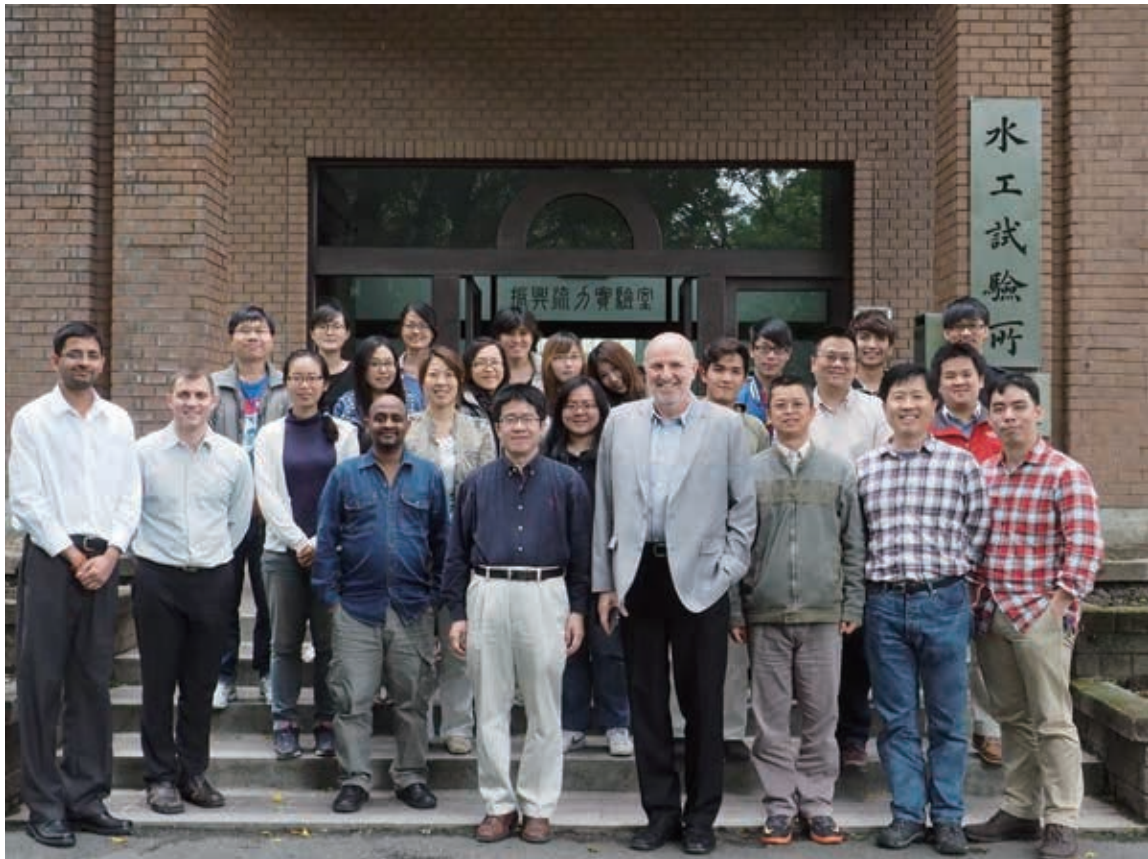


C. 2015 Training Workshop on System Approach to Disaster Management

A training workshop focused on a systems approach to disaster management was held in Taipei, Taiwan, from 20 to 22 April 2015. This workshop was co-organized by the IRDR ICoE-Taipei, the National Taiwan University (NTU), and the National Science and Technology Center for Disaster Reduction (NCDR) of Taiwan. There were 20 Taiwanese participants in the workshop. The main instructor was Dr. Sloboden P. Simonovic of the University of Western Ontario, Canada, who was a visiting scientist of the IRDR ICoE-Taipei in April 2014. The main activities

of this workshop included a) sharing research experiences in a systems approach to disaster management; b) discussing modeling of climate change's impacts on the management of water resources and natural disasters; c) introducing quantitative resilience as a new way of modeling risks of climate-related natural disasters; d) developing decision support tools for the implementation of a systems approach to disaster management, and e) providing training on the development and use of systems tools for disaster management.

Figure 25 – Group photo from the training workshop.



D. 2016 Future Earth Asian Perspective Symposium on Air Pollution Transdisciplinary Collaboration

This symposium was held in February 2016 at Academia Sinica, Taipei, Taiwan. There were 29 speakers from 12 Asian countries, and 106 participants attending the symposium. The meeting topics included a) research challenges for air pollution in Asia; b) research opportunities of air pollution from co-benefit perspectives; and c) regional perspectives on air pollution transdisciplinary collaboration.

Figure 26 – Group photo from the Future Earth Perspective Symposium in 2016.



E. 2016 International Training Workshop on Natural Disaster Reduction, Natural Disaster Risk Modelling, and Applications

The IRDR ICoE-Taipei co-organized the International Training Workshop on Natural Disaster Reduction, Natural Disaster Risk Modelling, and Applications with the National Science and Technology Center for Disaster Reduction (NCDR) of Taiwan. The workshop was held from 26 to 30 September 2016, in

Taipei, Taiwan. It focused on natural disaster risk modeling and provided a platform for participants to share geological, hydrological, and climate disaster evaluation models and related experiences.

Figure 27 – Photo from the International Training Workshop on Natural Disaster Reduction, Natural Disaster Risk Modelling, and Applications in 2016.



E. 2016 Training Workshop on Monitoring and Forecasting Severe Weather with Remote Sensing Technology

This training workshop, which focused on Monitoring and Forecasting Severe Weather with Remote Sensing Technology, was held at Academia Sinica, Taipei, Taiwan from 28 November to December 2016. The ICoE Taipei co-organized the event with the NCDR of Taiwan and the Research Center for Environmental Changes (RCEC) of Academia Sinica. The participants included experts from Taiwan (Pao K. Wang, Gin-Rong Liu, and Chian-Yi Liu), Czechoslovakia (Martin Setvak), the United States (Dan Lindsey), and Hungary (Mária Putsay). A total of 25 participants came from Taiwan, Thailand, Indonesia, the Philippines, and Vietnam. The topics in this workshop included a) fundamental theory of severe weather; b) implementation of remote sensing technology (RST); c) collection, analysis, and interpretation of weather information and data; and d) vulnerability and risk assessment and pre-warning application using RST.

Figure 28 – The cover of the 2016 workshop booklet of Workshop on Monitoring and Forecasting Severe Weather with Remote Sensing Technology.



Some words from our AI participants and organizers:



Irfan Ahmad Rana, currently an assistant professor in the Department of Urban and Regional Planning, School of Civil and Environmental Engineering, National University of Sciences and Technology (AI-KBA 2017 participant. Photo credit: Irfan Ahmad Rana)

Si-yu Yu, former ICoE Taipei staff; Currently a PhD student at the Department of Architecture, National Chengkung University



“I recall fond memories of the workshop. I was a Ph.D. student back then and was working along the lines of DRR research. The workshop helped me forge contacts and networks with DRR experts in the Asia-Pacific regions. The lectures, visits, and discussions helped me refine my Ph.D. and potential future research directions. I will never forget the hospitality and sponsorship by the Institute. Without them, it would never have been possible for me to visit the vibrant, modern, and lovely Taipei.”



3. Seed Grant Program

To encourage junior researchers and strengthen regional collaboration, since 2013, the IRDR ICoE-Taipei has been providing seed grants to our AI participants. In practice, the ICoE-Taipei discussed its seed grant plan in its annual Scientific Advisory Board (SAB) meeting.

This competitive research grant program aims to help young researchers to take the first step in conducting transdisciplinary, cross-country DRR projects within the Asian and Pacific regions. The selection criterion was whether a research project is built upon a team of cross-border and interdisciplinary partners. The IRDR ICoE-Taipei usually announces its call for seed grant proposals on a yearly basis and grants each awarded project USD 15,000 after a detailed review process conducted by our seed grant committee formed by ICoE-Taipei, ISC-ROAP, and experts in relevant fields. As of October 2021, the Center has funded 28 AI follow-up seed grant projects from eight different training courses (i.e., AIs) (Table 1).

Not only during the grant period but also after the research project is completed, we hope that our seed grant awardees can further develop or promote their research results. We have specific incentives for that. For example, the leading Principal Investigators of AI-SOCD-Air projects that were awarded in 2017 organized a special session for the 2019 annual meeting of Asia Oceania Geosciences Society (AOGS 2019), which is one of the largest scientific conferences in Earth Sciences in Asia. The ICoE Taipei provided some financial support to them for the session. We will continue to track the past seed projects and provide support to promote future cooperation and development.

The five codes for tracking the projects

1	Submitted projects review
2	Awarded project approval and funding transfer
3	Mid-year report submitted
4	Draft report review
5	Final report approval and funding transfer

Table 1. Overview of the AI follow-up Seed Grant projects until December 2021.

#	Project	Progress				
		1	2	3	4	5
2013 World Social Science (WSS) Seminar follow-up seed grant						
WSS-01	Integrating Knowledge in Disaster-Risk Reduction	Completed				
WSS-02	Multi-Scale Policy Implementation for Natural Hazard Risk Reduction	Completed				
WSS-03	Communication Influences on Decision-Making in Disaster Recovery & Reconstruction	Completed				
WSS-04	Building More Resilient Megacities in the Developing World	Completed				
2015 AI-DRR&LM follow-up seed grant		1	2	3	4	5
DRR&LM-01	Strengthening community Resilience: The case of Coastal and Island Communities in the Philippines	Completed				
DRR&LM-02	Web-Based Decision Support System for Hazard Mitigation, Coastal Planning under Storm Surge in Ho Chi Minh & Chennai Cities	Completed				
DRR&LM-03	Socio-Ecological Resilience as a Sustainable Development Strategy under the context of Emerging Disaster Risks for Rural Settlements in Different Geo-Climatic Zones of India	Completed				
DRR&LM-04	Strengthening Community Resilience on the Coastal and Isolated Islands of Indonesia: A case study in the Mentawai Islands – West Sumatera	Completed				

2017 AI-KBA follow-up Seed Grant		1	2	3	4	5
AI-KBA-01	Evidenced-Based analysis of Flood Risk Management and Social Vulnerability – A System Approach in Sakon Nakhon Province, Thailand	Completed				
AI-KBA-02	Earthquake Resilient Communities in ASEAN Region: A Transdisciplinary Approach	Completed				
AI-KBA-05	Developing Indicators for Resilience of Micro Small Medium-sized Enterprises (MSMEs) in Asia				Drop	
AI-KBA-06	Developing Humanitarian Aid Distribution Process Information System Framework for ASEAN Countries	Completed				
2017 AI-SOCD-air follow-up Seed Grant		1	2	3	4	5
AI- SOCD-03	Building urban resilience: A systems approach to analyze social and personal health risks of jeepney commuters and drivers to PM2.5 in Metro Manila, Philippines	Completed				
AI- SOCD-04	Interface between science-based data and policy action to improve the existing Mandalay City Waste Management: Ambient Air Monitoring, Air Impact Assessment, Personal PM2.5 Exposure, Health Risk Assessment, Awareness and Mitigation Measures	Completed				
AI- SOCD-05	The influence of biomass burning on a high concentration of PM2.5 in selected areas in Southeast Asia	Completed				
AI- SOCD-07	Urban transportation-related air quality and their impact on human health	Completed				
2018 AI-SOCD-heat follow-up Seed Grant		1	2	3	4	5
AI-SOCD-Heat	Examining the Heat Stress Impact on the South Asian Vulnerable Urban Population – A System Thinking Approach (SPIN)	Delayed				
AI-SOCD-Heat	Health and Environmental Vulnerability of Smallholder Rice Farmers to Extreme Climate: A Comparison Study on Agroecology	Delayed				
2018 AI-LRRTS follow-up Seed Grant		1	2	3	4	5
AI-LRRTS-01	Integration of Geoscience Methods to Investigate Slope Stability: Case Study Over Doi Tuong Area, Hoa Binh Province, Vietnam.	On hold				
AI-LRRTS-02	Community-Based Landslide Hazard, Vulnerability Assessment and Risk Reduction Plan – A study on Selected Communities from India, Sri Lanka, and Malaysia	On hold				
AI-LRRTS-05	Impact of climate change, land use land cover, and socio-economic dynamics on landslides in South and East Asia	On hold				
AI-LRRTS-06	Building Resilience against Landslide Disaster Risk in Nepal: A Disaggregated Examine from Site-Specific to Region	Completed				
2018 AI-EHRA follow-up Seed Grant		1	2	3	4	5
TC-EHRA-01	Contemporary Earthquake Potential Analysis along the Central and Nepal Himalayas	On hold				
TC-EHRA-03	Develop Seismic Vulnerability Map on Bandung area, West Java Indonesia.	On hold				
2019 AI on Hi-ASAP follow-up Seed Grant		1	2	3	4	5
AI-Hi-ASAP-01	Health Impact of PM2.5 Exposure to the Street Vendors in the Highly Polluted Mega City (Dhaka, Bangladesh) – A Pilot Study					
AI-Hi-ASAP-03	Assessment of the emissions of street cooking activities in Bangkok and subsequent effects on ambient PM2.5 and human health					
AI-Hi-ASAP-04	Characterization of Urban Community Exposure to Particulates Air Pollution and Their Health Response in Klang Valley Region, Malaysia					
AI-Hi-ASAP-07	Fine particulate matter (PM2.5) and risks of cardiorespiratory diseases: a panel study in Ho Chi Minh City using low-cost sensors					
2020 AI on Hi-ASAP follow-up Seed Grant		1	2	3	4	5
AI-Hi-ASAP2020-03	A solution-oriented pilot study using low-cost sensors on exposure to PM2.5 and health indicators in factories, markets, and residences in Yangon					
AI-Hi-ASAP2020-04	Associations of indoor PM2.5 concentrations and heart rate variability in selected households in Metro Manila, Philippines					
AI-Hi-ASAP2020-05	Exposure of School Children to Particulate Matter in High Traffic and Industrial Areas, Malaysia					



4. Online Master Forum Series

In response to the difficulties and challenges posed by COVID-19, the ICoE-Taipei launched a series of new activities in 2020, notably the Online Master Forum. By so doing, we expanded the spectrum of disasters to include one that was rarely explored before—epidemics and pandemics.

Several distinguished scholars were invited subsequently to provide their valuable insights into societal responses and transformations in 2020-2021. **Professor. Gordon McBean**, a well-known climate scientist and the former president of the ISC, first addressed how the global community can seize opportunities to accelerate social transformation with ‘Rebuilding from COVID-19 to Achieve Global Agenda 2030’. **Professor. Chien-Jen Chen**, an internationally reputed epidemiologist and the former vice-president of Taiwan delivered a lecture in our second Master Forum Series event on ‘COVID-19 Containment and Economic Revitalization: Taiwan Model for Mitigation of Pandemic Disaster’ and shared how Taiwan managed to contain the spread of COVID-19 and reduce its economic impact. In October 2021, we invited **Professor. Gabriele Bammer**, a Senior professor at Australian National University and an expert of social and environmental science, to introduce the thinking framework and related expertise for interdisciplinary research to the audience of the Forum.

i. Online Master Forum I: Professor. Gordon McBean

The first Master Forum event was held on 29 September 2020.

The talk was titled ‘Rebuilding from COVID-19 to Achieve Global Agenda 2030.’ In the talk, McBean showcased how our planet Earth has been gravely impacted by the COVID-19 pandemic, and how governments from around the world have tackled the crisis differently. He demonstrated that there is an opportunity out there to build on global scientific expertise across the span of Global Agenda 2030, which includes the Climate Agreement, Sendai Framework, Sustainable Development, and related issues.

For example, McBean pointed out that the science within the Integrated Research on Disaster Risk program assists in the characterization of hazards, vulnerability, and risk in an integrated manner, leading to effective decision-making in complex and dynamic risk contexts, including society’s response, to develop government-led knowledge-based actions for reducing risk and curbing losses across the full agenda. A total of 125 people registered for the live streaming event, and the video on YouTube had 213 views as of October 2021.

Figure 29 – Master Forum was given by Dr. Gordon McBean on the Agenda 2030 on 29 September 2020.



ii. Master Talk: Professor. Chien-Jen Chen

The second Master Forum talk, which is titled 'COVID-19 Containment and Economic Revitalization: Taiwan Model for Mitigation of Pandemic Disaster,' was delivered in December 2020 by Dr. Chien-Jen Chen, an epidemiologist and the former Vice-President of Taiwan. Chen shared his observations and expertise on Taiwan's success regarding epidemic prevention policies when the COVID-19 crisis first broke out in 2020. According to Chen, the success was learned from the country's previous experience dealing with severe acute respiratory syndrome (SARS) in 2002. In explaining the so-called

"Taiwan model," which came to be known as one of the success stories of COVID-19, Chen said, "Taipei took early steps to control the spread of the virus, including closing its borders with China (particularly with Wuhan, the center of the pandemic), and later announcing the closure of its borders with the world. Taiwan also harnessed the power of digital technology to effectively track contact tracing and implement mass quarantines." More than 300 people attended the live talk, and the YouTube video reached 228 views as of October 2021.

Figure 30 – Master Talk by Chien-Jen Chen on Taiwan's successful experience with the pandemic.



iii. Master Forum II: Professor. Gabriele Bammer

In her talk, which is titled ‘What expertise do you need to tackle complex interdisciplinary problems?’, Prof Gabriele Bammer described the key aspects of expertise required to tackle complex societal and environmental problems. These aspects include harnessing and managing diversity, synthesizing disciplinary and stakeholder knowledge, applying systems thinking, understanding and managing multiple unknowns, and appreciating the complexities of how change occurs. Bammer has been developing the new discipline of integration and implementation sciences (see i2s.anu.edu.au). She is a professor in the Research School of Population Health at the Australian National University (ANU). Her publications include *Disciplining Interdisciplinarity: Integration and Implementation Sciences for Researching Complex Real-World Problems* (author, 2013), *Research Integration Using Dialogue Methods* (co-author, 2009), *Change! Combining Analytic Approaches with Street Wisdom* (editor, 2015)

and *Uncertainty and Risk: Multidisciplinary Perspectives* (co-editor, 2008). A total of 276 people registered for this live streaming talk, and the YouTube video reached 565 views as of October 2021.

Figure 31 – Master Forum with Prof Gabriele Bammer on the disciplining interdisciplinarity approach.



5. Special Sessions at International Conferences

i. Special Session in AOGS 2019

The IRDR ICoE-Taipei and Future Earth Taipei co-organized a session entitled ‘Regional Collaborative Research on Air Pollution Sensing and Health in Asia’ at the Annual Conference of the Asia Oceania Geosciences Society (AOGS) held in July and August 2019 in Singapore. We presented collaborative research between atmospheric chemistry and

human health and six case studies, including four IRDR ICoE-Taipei’s seed grant projects, in the session. The idea of interdisciplinary research attracted a lot of interest from Asian countries. We also assisted the Belmont Forum and Belmont Forum Program Office, MOST (Taiwan) in their booth during the exhibition.

Figure 32 – Speakers in our special session of the AOGS 2019.



ii. Special Session in SRI 2021

The ICoE-Taipei organized a special session at the Sustainability Research & Innovation Congress 2021 (SRI2021) which is titled ‘A Dialogue Forum: To Distill from Experiences of Stakeholders, Scalable Strategies for Disaster Risk Reduction and Societal Resilience Building’. This session aimed to bring together experienced stakeholders to share their knowledge and wisdom through open discussions. We encouraged the exchange and dissemination of effective strategies and best practices. Antonia Loyzaga (President and Trustee, National Resilience Council and Manila Observatory), Hans Sy (Chairman, SM Prime), Prof Gabriele Bammer (Australian National University), Markus Reichstein (Director, Max-Planck-Institute for Biogeochemistry), Stephen Dovers (Emeritus Professor, Australian National University),

Jian-Cheng Lee (Executive Director, IRDR ICoE-Taipei), Yue-Gau Chen (Distinguished Research Fellow, Research Center for Environmental Changes, Academia Sinica), Prof Hassan Virji (Hiroshima University and many others), Wei-Sen Li (Secretary-General, National Science and Technology Center for Disaster Reduction), Emeritus Prof John Handmer (Senior Scientific Adviser, International Institute for Applied Systems Analysis (International Institute for Applied Systems Analysis, IIASA) and Yamazaki-Honda (Deputy Director-General, National Research Institute for Earth Science and Disaster Resilience (NIED) participated in this session and engaged in an open-ended dialogue on complex problems.

Figure 33 – The dialogue session in SRI 2020 (virtual conference).



6. Collaborative Research

Given the disaster risk situation in the Asia-Pacific region, the IRDR ICoE-Taipei has devoted a significant portion of its resources to training and supporting IRDR in the region. One of the tasks is to establish an exchange scholar program and encourage more foreign scientists to visit Taiwan. The visiting program is open to the world.

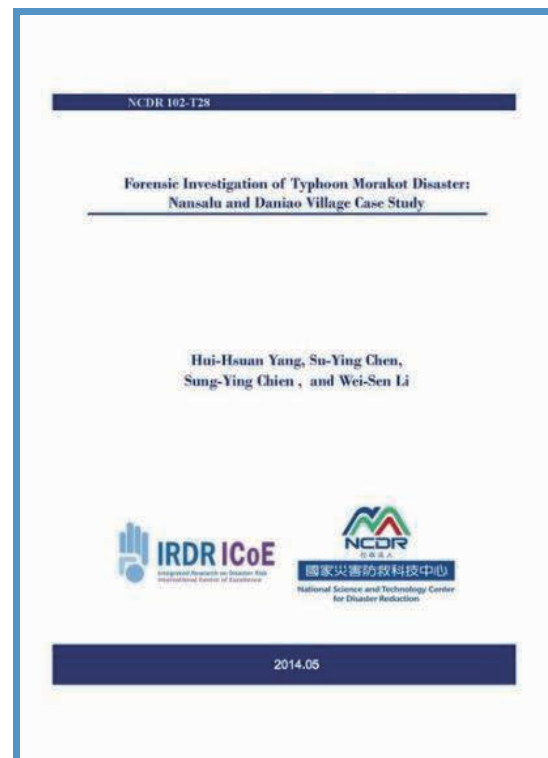
i. Flagship Project

The ICoE's Flagship Project in 2014–2015 was initiated in response to the third objective of the 10th IRDR Science Committee (SC) Meeting in Sanya, China, which aimed at reducing disaster risk and curbing losses through knowledge-based actions. The ICoE-Taipei and the National Science and Technology Center for Disaster Reduction (NCDR) in Taiwan together proposed and developed this project. Natural sciences, social sciences, and engineering were all incorporated into this methodology.

This project was carried out by the IRDR ICoE-Taipei and the NCDR in collaboration with several major municipalities in Taiwan to enhance digital emergency preparedness through multilateral information sharing. Based on the results of this project, a FORIN report titled 'Forensic Investigation of Typhoon Morakot Disaster: Nansalu and Daniao Village Case Study' was published in May 2014. This study applied the FORIN methodology to investigate the root causes of the Typhoon Morakot disaster.

Based on this collaborative flagship project, Tony C. Liu (IRDR-ICoE, Academia Sinica, Taiwan) and Wei-Sen Li (NCDR) published a case study titled 'Improved Evacuation Procedures Save Lives in Taiwan from Severe Flood and Debris Flow' online on the UNISDR/Prevention Web STAG page in March 2015.

Figure 34 – The Flagship project in 2014–2015 yielded the FORIN report.

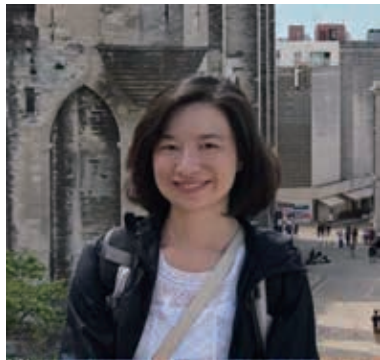


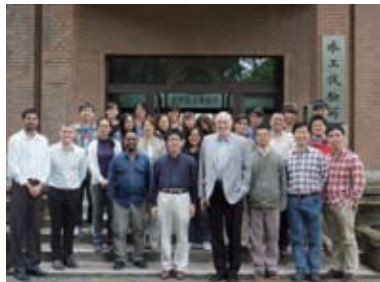


ii. Visiting Scientist Program

To promote integrated research and practices on DRR, exchange ideas and information among scientists from different disciplines, and lay a foundation for partnership networking, advanced DRR training, and collaborative research by exchanging scholars between research institutes, the ICoE-Taipei provides financial support for visiting scientists and fellowship programs.

A review committee consisting of three members—the ex officio and a couple of SAB members—is selected to review the submitted documents. The criteria, expected outcome, and expected contribution of the visiting scientist program to DRR research are decided by the review committee in advance.

Table 2 - Visiting scientist programs supported by the Center

<p>2013-2014 :</p> <p>Dr Elaine KH Lin visited Academia Sinica from April 2013 to March 2014. During the period, she worked with Director Shaw-Chen Liu in the Research Center for Environmental Changes, Academia Sinica, and conducted a research project entitled ‘Livelihood Vulnerability to Typhoon Associated Hazards in the Southeast Asia: A Comparative Study in Taiwan and the Philippines’.</p> <p>Photo taken in the 2013 field trip visiting local people six months after the strike of typhoon Pablo (2012)</p>	 
<p>2014-2015 :</p> <p>Professor Slobodan P. Simonovic (Professor and Research Chair, Department of Civil and Env. Engineering, Institute for Catastrophic Loss Reduction, The University of Western Ontario) visited the ICoE Taipei office in April 2014 and 2015. During his visit in 2015, we arranged several training courses and workshops such as ‘System Approach to Management Disasters’, ‘Decision Support Tools for Water and Environment Systems, and ‘Flood Control and Flood Risk Reduction Capability, Flood Management Practices and Emergency Response Process’ at National Taiwan University, National Chiao-Tung University, and NCDR.</p>	 

2015 :

Professor Shen-En Chen of the University of North Carolina, Charlotte visited Academia Sinica in November-December 2015 and worked with Director P.K. Wang in the Research Center for Environmental Changes, Academia Sinica. Prof Chen conducted the project entitled 'Taiwan Carbon Capture and Storage Potential Assessment Including Classical and Innovative CCS Techniques'.



2016 :

Dr. Michelle Yung-Feng Huang (University of Washington) visited Academia Sinica from January to December 2016, working with Director P.K. Wang in the Research Center for Environmental Changes, Academia Sinica. Dr. Huang conducted the project entitled 'Hillslope Erosion Tendency in the Storm Event Series'.

2019 :

On 13-18 May 2019, ICoE Taipei invited three internationally renowned marine climatologists to participate in seminars and discussions in Taiwan. Professor Brian Hoskins of the United Kingdom, Professor Peter Bellwood of Australia, and Professor Gretta Pecl of Australia discussed marine and atmospheric environments from an international sustainable development perspective. They highlighted how the institutional functions were related to these issues.



iii. Other Notable Scientific Collaborative Activities

To follow and keep up with the worldwide DRR scientific trend, as well as establish and improve future collaboration, the ICoE-Taipei is dedicated to endorsing or participating in many important international DRR activities.

A. 1st & 2nd Workshop to Strengthen Scientific Advisory Capacities for Disaster Risk Reduction in 2016 and 2017

The year 2015 marked a milestone in the history of disaster reduction, as it saw the adoption of a global framework for action, the Sendai Framework for Disaster Risk Reduction 2015-2030. The framework calls for stronger mobilization and application of science in policymaking and practice, as well as enhanced international scientific cooperation. Addressing the Sendai Framework, the 1st workshop was held on 25-26 August 2016 in Bangkok, Thailand. It aimed to strengthen each country's scientific advisory capacities for disaster risk management, share experiences across cultures, and support the interface between the IRDR and DRR policy platforms. This workshop was co-organized by the IRDR's International Programme Office (IPO), the National Research Council of Thailand (NRCT), and the ICSU Regional Office for Asia and the Pacific (ROAP). As representatives of the IRDR ICoE-Taipei, Prof Shih-Chun Candice Lung and Dr. Chia-Hsing Jeffery Lee attended this workshop with over 40 experts and government officers from 16 countries. In the workshop, most participants agreed that communication between science and policy is essential to strengthening the science-policy interface. And each country should find or designate a key person who is willing and able to improve the science-policy interface. In addition, a long-term framework for the science-policy interface should be also established.

B. The 2nd Workshop to Strengthen Scientific Advisory Capacities for Disaster Risk was held in Taipei, Taiwan, in January 2017.

Figure 35 – Group photo from the 1st DRR scientific advisory capacities workshop.



Figure 36 – The 2nd DRR scientific advisory capacities workshop.





7. Participation in IRDR activities

Domestically, the ICoE-Taipei has been working closely with governmental agencies of Taiwan involved in disaster management, such as the National Science and Technology Center for Disaster Reduction (NCDR), the Central Weather Bureau (CWB), and the National Center for Research on Earthquake Engineering (NCREE), on training activity content design. Internationally, we also have maintained close partnerships with the ISC ROAP, START, Future Earth Risk KAN,

and other international organizations as the action network and have been promoting and sharing the experiences of the training activities (See Appendix B). Moreover, we have actively and regularly participated in the IRDR SC meetings (usually twice a year) and related events. In the SC meetings, we shared our work and progress and received feedback on their future work. Hereafter we showcase a few examples of the conferences organized by IRDR in which we participated in the regular SC meetings in the last 10 years.

i. 2016 Pan-Asia Risk Reduction (PARR)

The Pan-Asia Risk Reduction (PARR) Fellowships are led by START and offer unique research, training, and educational opportunities to Asian scientists, practitioners, and policymakers to enhance their capabilities of advancing and utilizing the knowledge of critical issues of disaster-related vulnerability and risks in the Asia-Pacific region.

The PARR's core partners include START, the Oscar M. Lopez Center (Manila), Kyoto University, ICoE Taipei, Manila Observatory (Philippines), Asia-Pacific Network for Global Change Research (APN), and Thammasat University (Thailand).

Figure 37 – Group photo from the PARR Fellowship Program Inception Meeting, in Manila, Philippines. (September 2016)



ii. 2016 UNISDR Science and Technology Conference on the Implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030, Geneva, Switzerland

Dr. Shu-Li Cheng participated in this conference as a representative of the IRDR ICoE-Taipei in January 2016.

iii. The 23rd Pacific Science Congress in 2016 – ‘Science, Technology, and Innovation: Building a Sustainable Future in Asia and the Pacific’

The Congress was organized by Academia Sinica. The ICSU President, Prof Gordon McBean, was invited to give a plenary speech on ‘Integrated Research for Reducing Disaster Impacts for a Sustainable Future Earth. More than 500 participants attended the event. The IRDR ICoE-Taipei co-organized two disaster-related sessions with the NCDR.

Figure 38 – Photos from the 23rd Pacific Science Congress – ‘Science, Technology, and Innovation: Building a Sustainable Future in Asia and the Pacific, in Taipei, Taiwan (June 2016).



iv. 2016 CWB-APCC Workshop on Climate Service for Health

The IRDR ICoE-Taipei co-sponsored the CWB-APCC Workshop on Climate Service for Health workshop with the CWB in October 2016 in Taipei, Taiwan. In this workshop, Prof Indira Nath (All India Institute of Medical Sciences, National Academy of Sciences, India) was invited to present a seminar on 'Climate Service for Health.'

Figure 39 – Group photo from the CWB-APCC Workshop on Climate Service for Health in Taipei, Taiwan. (October 2016)



v. The Global Forum on Science and Technology for Disaster Resilience, Tokyo, Japan in 2017

In November 2017, the ICoE-Taipei participated in the GFSTDR and presented a lecture titled 'Build Back Better.'

Figure 40 – Group photo from the Global Forum on Science and Technology for Disaster Resilience, in Tokyo, Japan. (November 2017)



vi. 2nd Asia Science and Technology Conference for Disaster Risk Reduction, Beijing, China in 2018

The ICoE-Taipei joined the ASTCDRR held in Beijing in April 2018. In the meeting, ICoE-Taipei presented an oral communication to illustrate its missions. We also discussed disaster prevention and adaptation plans and shared Taiwan's experience with the audience.

Figure 41 – Photo from the 2nd Asia Science and Technology Conference for Disaster Risk Reduction, in Beijing, China. (April 2018)



vii. 2018 Research Summit on Health-Related Emergency and Disaster Risk Management (H-EDRM)

In July 2018, the ICoE-Taipei participated in the Research Summit on Health-Related Emergency and Disaster Risk Management (H-EDRM) in Hong Kong. We shared our experiences on health policy implementation in disaster risk management.

Figure 42 – Group photo from the Research Summit on Health-Related Emergency and Disaster Risk Management (H-EDRM) in Hong Kong. (July 2018)





8. Perspectives

Reflecting on the first ten years of ICoE-Taipei, we feel that the ICoE-Taipei has been gradually establishing an international hub in East Asia for ‘everything’ about disaster risk reduction (DRR). Especially, we consider ourselves to be a powerhouse for organizing the programs on capacity building on DRR in Southeast Asia and the Pacific. We also feel that the ICoE-Taipei, amongst 17 ICoEs of the IRDR family, has made a case that the ICoE can make significant contributions to the DRR programs on the regional scale. On the other hand, we also have become aware of great challenges to achieving the ultimate goals of IRDR in a lot of ways. Taking capacity building as an example, we are still at the stage of lack of not only understanding of the scientific nature of disasters themselves, but also appropriate approaches on how to transfer the science to the public and policymakers. And how to integrate multiple disciplinary sciences into a more

complete comprehensive scientific view for dealing with DRR associated human impact remains still a grand challenge. In brief, we certainly still have a big gap to fill.

In the upcoming years, the ICoE-Taipei would continue to do what has been its strength: serving as a regional hub in Southeast Asia and the Pacific for capacity building on DRR. We also seek to improve and strengthen our tasks. A few additional approaches are considered to be included, for instance, 1) closer connections and cooperation with other ICoEs in the Asia-Pacific region, and 2) more follow-up programs for the Seed Grant previous awardees.

As Academia Sinica commits to strongly supporting the ICoE-Taipei, we expect to play a role and make contributions to DRR prevention, preparedness, and resilience on the world map, for the next ten years and beyond.

Appendix A. Scientific Advisory Board Member list by terms

	First term 2012-2014	Second term 2015-2017	Third term 2018-2020	Fourth term 2021-2023
International Member	Gordon McBean Hassan Virji Kuniyoshi Takeuchi Mohd. Nordin Hasan	Gordon McBean Hassan Virji Kuniyoshi Takeuchi Mohd. Nordin Hasan Haruo Hayashi	Mohd. Nordin Hasan Haruo Hayashi Anond Snidvongs Antonia Yulo Loyazaga James Terry Tony C Liu	Haruo Hayashi Anond Snidvongs Antonia Yulo Loyazaga James Terry Tony C Liu
Domestic Member	Wen-Hwa Chen Wei-Ling Chiang Ching-Yen Tsay Ching-Hua Lo Liang-Chun Chen	Ching-Yen Tsay Ching-Hua Lo Liang-Chun Chen Hongey Chen Chao-Han Liu Shyh-Jiann Hwang	Ching-Hua Lo Liang-Chun Chen Hongey Chen Chao-Han Liu Shyh-Jiann Hwang	Shyh-Jiann Hwang Kuo-Fong Ma Wei-Sen Li





Appendix B: Implementing partners in the AI activities or other notable activities

Program	ISC members	Intl. Sci. Entities	Other Sci. Entities	Govt.	Another sector
<i>AIs on Air-pollution</i>					
Advanced Institute on Disaster Risk Reduction with Systems Approach for Slow-Onset Climate Disasters: Sensors, and Big Data, AI-SOCD on Air Pollution (July 2017)	ICSU ROAP, IRDR, Regional Center for Future Earth in Asia	International Global Atmospheric Chemistry Project, Monsoon Asia, and Oceania Networking Group (IGAC-MANGO)	Academia Sinica, Institute for Environment and Development (LESTARI UKM)		
Advanced Institute on Disaster Risk Reduction with Systems Approach for Slow-Onset Climate Disasters: Heat Stress Sensors, Early Warning, and Information Technology, AI-SOCD -heat stress (June 2018)	ICSU ROAP, IRDR		Academia Sinica		
2019 Advanced Institute on Health Impacts and Air Sensing in Asian Pollution, AI-Hi-ASAP 2019 (September 2019)	ISC ROAP, IRDR, Regional Center for Future Earth in Asia, Future Earth Taipei	International Global Atmospheric Chemistry Project, Monsoon Asia, and Oceania Networking Group (IGAC-MANGO)	Academia Sinica		
2020 Advanced Institute on Health Impacts and Air Sensing in Asian Pollution, AI-Hi-ASAP 2020 (October 2020)	ISC ROAP, IRDR, Regional Center for Future Earth in Asia, Future Earth Taipei	International Global Atmospheric Chemistry Project, Monsoon Asia, and Oceania Networking Group (IGAC MANGO)	Academia Sinica		

2021 Advanced Institute on Health Impacts and Air Sensing in Asian Pollution, AI-Hi-ASAP 2021 (October 2021)	IRDR, Regional Center for Future Earth in Asia, Future Earth Taipei	International Global Atmospheric Chemistry Project, Monsoon Asia, and Oceania Networking Group (IGAC-MANGO)	Academia Sinica		
<i>Als on Earthquake hazards</i>					
Training Course on Earthquake Hazard and Risk Assessment in East Asia, AI-EHRA (October 2018)	ISC ROAP, IRDR	National Research Institute for Earth Science and Disaster Prevention (NIED), Earth Observatory of Singapore (EOS)	Academia Sinica, Taiwan Earthquake Model (TEM), Earthquake-Disaster & Risk Evolution and Management Center (E-DREaM) of National Central University	Taiwan Earthquake Center (TEC), National Center for Research on Earthquake Engineering (NCREE), National Science and Technology Center for	Sinotech Engineering Consultants, Inc.
				Disaster Reduction, Taiwan (NCDR)	
Training Course on Earthquake Early Warning in East Asia, AI-EEW (March 2019)	ISC ROAP, IRDR		Academia Sinica	Central Weather Bureau (CWB), National Center for Research on Earthquake Engineering (NCREE), Taiwan Earthquake Center (TEC), National Science and Technology Center for Disaster Reduction, Taiwan (NCDR)	San Lien Technology Cooperation Company
<i>Als on Landslide and Flood</i>					
Advanced Institute on Landslide Risk Reduction Training School – Landslide hazards: From Site Specific to Regional Assessment, AI-LRRTS (August 2018)	ISC ROAP, IRDR		Institute of Earth Science of Academia Sinica, Earthquake-Disaster & Risk Evolution and Management Center (E-DREaM) of National Central University		
Advanced Institute – Training Course on Landslide Investigations and	ISC ROAP, IRDR		Academia Sinica, Hanoi University of Mining and Geology (HUMG), Landslide		Cloud Digital Technology Co., Ltd.,



Hazards Mitigation, AI-LIHM , Hanoi, Vietnam (July 2019)			research Team of Academia Sinica (LRT-AS), Landslide Research Team of National Central University (LRT-NCU), Earthquake-Disaster & Risk Evolution and Management Center (E-DREaM) of National Central University, National Chiao Tung University, Disaster Prevention Research Institute (DPRi) of Kyoto University		Amazon Web Services, Inc.
<i>AI on Volcanic Eruption and hazards</i>					
Advanced Institute on Asian Consortium of Volcanology – 4th Field Camp of Asian Consortium of Volcanology, AI-ACV (October 2019)	ISC ROAP, IRDR	Earth Observatory of Singapore (EOS), The Volcanological Society of Japan	Institute of Earth Science (IES) of Academia Sinica	Taiwan Volcano Observatory-Tatun (TVO)	
<i>AI on Hazard Management</i>					
Advanced Institute on Forensic Investigations of Disasters, AI-FORIN (March 2012)					
Advanced Institute on Disaster Risk Reduction and Loss Mitigation, AI- DRR & LM (April 2015)					
Advanced Institute on Knowledge-based Actions for Disaster Risk Reduction, AI-KBA (April 2017)	ICSU ROAP, IRDR		Academia Sinica	National Science and Technology Center for Disaster Reduction (NCDR)	





Appendix C: Full list of activities of ICoE-Taipei in 2011-2021

Activities (co-)led or endorsed by IRDR ICoE-Taipei			
Time	Activity	SG	Role
April 2011	Cities at Risk: Building Adaptive Capacities for Managing Climate Change Risks in Asian Coastal Cities (CAR II)		
12-18 March 2012	Advanced Institute on Forensic Investigations of Disasters – Southeast Asia (AI-FORIN)		Organizer
21-27 October 2012	Advanced Institute on Data for Coastal Cities at Risk (AI-DATA)		Organizer
31 October- 2 November 2012	IRDR Working Group - Disaster Loss Data & Impact Assessment (DATA) 1st Expert Meeting		Organizer
8-9 April 2013	Brainstorming Session on “Future Asia”		Organizer
October 2013	Young Scientists' Conference on Integrated Research on Disaster Risk, Future Earth, and Sustainability		
March 2014	Research Seed Grants to WSS Fellows	♠	Sponsor
May 2014	Report: Forensic Investigation of Typhoon Morakot Disaster: Nansalu and Daniao Village Case Study		Co-publish with NCDR
1-30 April 2014	Visiting Scholar: Prof Slobodan P. Simonovic (Canada)		Organizer
October 2014	Future Earth in Asia: Regional Networking		
October 2014	2014 SAB meeting		Organizer
October 2014	Pan-Asia Risk Reduction (PARR) Fellow Program seminar		Core partner/ Co-organizer
2-8 November 2014	World Social Science Fellows Seminar Sustainable Urbanization - Transformations to Sustainability in Urban Contexts (WSS-ISSC Seminar)		Co-organizer
8-11 December 2014	3rd PIAD Workshop in Mianyang, China		Supporter/ Participant
March 2015	Article: Improved Evacuation Procedures Save Lives in Taiwan from Severe Flood and Debris Flow on UNISDR/Prevention Web STAG page		Co-publish with NCDR
18 March 2015	Workshop on Practice on Disaster Reduction in Asia Pacific Regions, Sendai, Japan		Participant
24-26 March 2015	PARR Round 1 Culmination and Synthesis Meeting and Alliance Meeting, Bangkok, Thailand		Core partner/ Participant
19-25 April 2015	Advanced Institute on Disaster Risk Reduction and Loss Mitigation (AI- DRR & LM)	♠	Organizer
20-22 April 2015	Training Workshop on Systems Approach to Management of Disasters		Co-organizer
28-29 April 2015	Planning Meeting for the PIAD Workshop		Organizer
April 2015	News interview: Dr. Tony Liu was interviewed by a TV reporter in Taiwan on April 21, 2015, regarding loss reduction for earthquakes especially on building evaluation and retrofit after the earthquake in Taiwan on April 20, 2015		Interviewee
1-3 June 2015	13th IRDR SC meeting, Qingdao, China		Participant
9-12 November 2015	4th PIAD (Psychological Intervention after Disasters) Workshop		Co-organizer
21 November 2015	2015 SAB meeting		Organizer

November-December 2015	Visiting Scientists Program: Professor Shen-En Chen (University of North Carolina, Charlotte) "Taiwan Carbon Capture and Storage Potential Assessment Including Classical and Innovative CSS Techniques"		Organizer
January-December 2016	Visiting Scientists Program: Professor Yung-Feng Huang (University of Washington) "Hillslope Erosion Tendency in the Storm Event Series"		Organizer
27-29 January 2016	UNISDR Science and Technology Conference on the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030, Geneva, Switzerland		Participant
29 February- 1 March 2016	Future Earth Asian Perspective Symposium on Air Pollution Transdisciplinary Collaboration		Organizer
5-6 May 2016	15th IRDR SC meeting, Paris, France		Participant
13-17 June 2016	The 23rd Pacific Science Congress - "Science, Technology, and Innovation: Building a Sustainable Future on Asia and the Pacific" IRDR ICoE-Taipei co-organized 2 disaster-related sessions with NCDR		Co-organizer
25-26 August 2016	The 1st Workshop to Strengthen Scientific Advisory Capacities for Disaster Risk, Bangkok, Thailand		Collaborator
19 August 2016	IRDR IPO visit, Beijing, China		Visitor
7 September 2016	Pan-Asia Risk Reduction (PARR) Fellowship Program Inception Meeting, Manila, Philippines		Participant
26-30 September 2016	The International Training Workshop on Natural Disaster Reduction - Natural Disaster Risk Modelling and Applications		Co-organizer
3-5 October 2016	Scoping meeting of organizing activities with ICSU ROAP		Organizer
14-17 November 2016	The 5th Workshop on Psychological Intervention after Disaster (PIAD), Manila, Philippines		Supporter
28 November- 1 December 2016	Training Workshop on Monitoring and Forecasting Severe Weather with Remote Sensing Technology		Organizer
28-30 November 2016	16th IRDR SC meeting, Sanya, China		Participant
11 January 2017	2016 SAB meeting		Organizer
16-17 January 2017	The 2nd Workshop to Strengthen Scientific Advisory Capacities for Disaster Risk		Organizer
17-21 April 2017	Advanced Institute on Knowledge-based Actions for Disaster Risk Reduction (AI-KBA)	♠	Organizer
22-23 May 2017	17th IRDR SC meeting, Cancun, Mexico		Participant
10-14 July 2017	Advanced Institute on Disaster Risk Reduction with Systems Approach for Slow-Onset Climate Disasters (AI-SOCD) Air Pollution, Sensors, and Big Data	♠	Organizer
21 October 2017	Joint Meeting between IRDR ICoE-Taipei and ICSU-ROAP Steering Group on Natural Hazard and Disaster Risk (SGNHDR)		Organizer
21-28 October 2017	32nd ICSU meeting		Participant
20-21 November 2017	18th IRDR SC meeting, Tokyo, Japan		Participant
23-25 November 2017	Global Forum on Science and Technology for Disaster Resilience, Tokyo, Japan Presentation: "Build Back Better"		Participant
January 2018	Report to IRDR IPO		
26 January 2018	2017 SAB meeting		Organizer
15-16 April 2018	19th IRDR SC meeting, Beijing, China		Participant
17-18 April 2018	2nd Asia Science and Technology Conference for Disaster Risk reduction, Beijing, China		Participant



4-8 June 2018	Advanced Institute on Disaster Risk Reduction with Systems Approach for Slow-Onset Climate Disasters (AI-SOCD-heat stress) Heat Stress Sensors, Early Warning, and Information Technology	♠	Organizer
June 2018	Workshop on the Application of Micro-sensors and Exposure Modelling in Personal/Population Exposure Assessment and Epidemiology		
9-10 July 2018	Research Summit on Health-Related Emergency and Disaster Risk Management (H-EDRM), HongKong, China		Participant
27 August-1 September 2018	Advanced Institute on Landslide Risk Reduction Training School – Landslide hazards: From Site Specific to Regional Assessment (AI-LRRTS)	♠	Organizer
1-5 October 2018	Training Course on Earthquake Hazard and Risk Assessment in East Asia	♠	Organizer
16-17 October 2018	International Conference on Integrated Science & Technology Contributions for Informed National Policy-Making and Action for the Implementation of the Sendai Framework, Chengdu, China		Participant
23 November 2018	2018 SAB meeting		Organizer
25-28 March 2019	Training Course on Earthquake Early Warning (EEW) in East Asia		Organizer
May 2019	Visiting Scholar Program		Organizer
13 May 2019	21st IRDR SC meeting		Participant
20-25 July 2019	2019 Advanced Institute -- Training Course on Landslide Investigations and Hazards Mitigation, Hanoi, Vietnam		Organizer
28 July- 3 August 2019	Special Session "Reginal Collaborative Research on Air Pollution Sensing and Health in Asia" of 16th Annual meeting of the AOGS		Co-organizer
2-6 September 2019	2019 Advanced Institute on Health Impacts and Air Sensing in Asian Pollution (AI-Hi-ASAP 2019)	♠	Organizer
8-10 October 2019	22nd IRDR SC meeting		Participant
28 October- 2 November 2019	2019 Advanced Institute on Asian Consortium of Volcanology (AI-ACV) – 4th Field Camp of Asian Consortium of Volcanology		Organizer
4-6 December 2019	2019 SAB meeting		Organizer
September 2020	2020 Master Forum Series: Gordon McBean "Rebuilding from COVID-19 to Achieve Global Agenda 2030"		Organizer
October 2020	2020 Advanced Institute on Health Impacts and Air Sensing in Asian Pollution (AI-Hi-ASAP 2020)	♠	Organizer
November 2020	2020 SAB meeting		Organizer
December 2020	2020 Master Forum Series with Ex-VP, Dr. Chen Chien-Jen, on the COVID-19 Containment and Economic Revitalization: Taiwan Model for Mitigation of Pandemic Disaster (virtual and onsite, December 1)		Co-organizer
April 2021	2021 Master Forum Series: Professor Gabriele Bammer on "What expertise do you need to tackle complex interdisciplinary problems?" (virtual and onsite, April 28)		Organizer
June 2021	Special Session "A dialogue forum: To distill from experiences of stakeholders, scalable strategies for disaster risk reduction and societal resilience-building" of SRI2021		Organizer
October 2021	2021 Advanced Institute on Health Investigation and Air Sensing for Asian Pollution (AI on Hi-ASAP 2021)		Organizer
	Master Forum		
December 2021	2021 Advanced Institute on Knowledge-based Actions for Disaster Risk Reduction (AI-KBA-2021)	♠	



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