

# Transdisciplinary Education for Disaster Risk Reduction (TeDrr)

*Summary of the Workshop held at United Nations University,  
Institute for the Advanced Study of Sustainability on 31 October, 2014*

United Nations University Institute for the Advanced Study of Sustainability

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## PREFACE

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Global disaster risk reduction has progressed through the active support of international organizations and committed governments. During the past two decades, the focus has shifted from response to a proactive preventive approach, and the focus on hazard mitigation has been replaced by the more appropriate risk assessment approach. However, with the increasing concentration of population and assets in urban and vulnerable areas coupled with globalizing processes that have made world populations interdependent, the losses from natural disasters are increasing. In addition, climate change is modifying the magnitude and frequency of weather-related extremes making current safety measures and standards obsolete.

The moves from monodisciplinary approaches to multidisciplinary and then to interdisciplinary practices have enabled collective engagement in disaster management. However, to address mounting challenges there is an urgent need for more efficient transdisciplinary approaches that bring all stakeholders together, including academia, local governments, NGOs and communities, to enable rapid transfer of knowledge, experiences and quick feedback.

Based on past experiences, University Network for Climate and Ecosystems Change Adaptation Research (UNCECAR), a network of leading universities in the Asia Pacific region, proposes the promotion of project-based Transdisciplinary Education for Disaster Risk Reduction (TeDrr) programmes by a broad coalition of universities, local governments, and NGOs as a commitment to the post-2015 framework for disaster risk reduction. This education will be rooted in sustainability science that will also support the post-2015 Sustainable Development Goals.

TeDrr workshop will be a forum for researchers, practitioners and various stakeholders to present their experiences and inform practical mechanisms and new approaches, and initiate programmes and further collaboration in implementing transdisciplinary education programmes for DRR. The present workshop lays the foundation for establishing a framework and network for the promotion of transdisciplinary education.

*Srikantha Herath*  
*Academic Director, Postgraduate Programmes and*  
*Senior Academic Programme Officer*  
*The United Nations University*



## ABSTRACT

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On October 31 2014, representatives from various universities and research organizations from Japan and Asia, as well as government organizations, gathered at UNU Headquarters in Tokyo to discuss new approach to education for disaster management. As an exploratory conference, the one day event entitled *Transdisciplinary Education for Disaster Risk Reduction* was jointly organized by the UNU Institute for the Advanced Study of Sustainability (UNU-IAS) and the University Network for Climate and Ecosystems Change Adaptation Research (UNCECAR). The event was successful in building a consensus on framework for future transdisciplinary educational programs and laid down further steps towards establishing TeDrr pilot projects as building blocks for such programmes among the university network members.

The first part of the conference consisted of presentations that aim to provide participants with insights on the various experiences of leading academics, experts and practitioners in disaster risk reduction. The second portion of the conference was a panel discussion offering a space for in-depth discussions including both international and local perspectives for initiating potential models of Te-DRR and for forging partnerships among various stakeholders.

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The United Nations University*





## OVERVIEW

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The TeDrr conference was opened by the Director of UNU-IAS, Dr. Kazuhiko Takemoto and followed by an introduction of UNCECAR and an overview of the sessions by Dr. Srikantha Herath, Academic Director of UNU-IAS. It was followed by presentations in the morning and a panel discussion in the afternoon moderated by the former rector of UNU, Prof. Hans van Ginkel and Prof. Monte Cassim from Ritsumeikan Trust.

### 1.1 OPENING REMARKS

*Dr. Kazuhiko Takemoto*  
*Director, UNU-IAS*

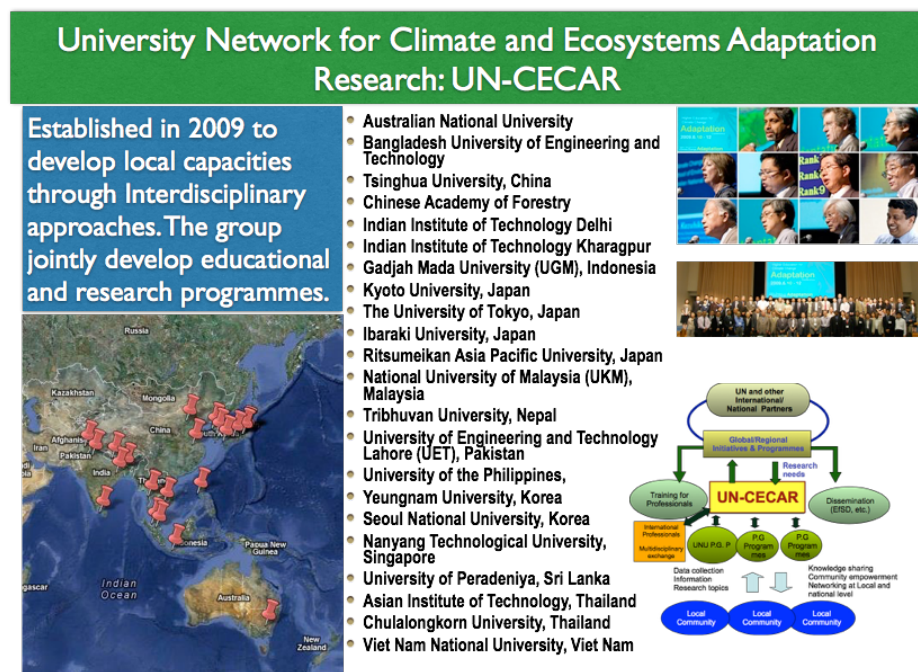
Dr. Kazuhiko Takemoto's opening remarks explained the importance of the conference theme, emphasizing the need to prepare for post-2015 framework for disaster risk reduction and its role towards achieving the goals of sustainable development. He mentioned about the lack of local capacity as a major difficulty in addressing disaster risks and posed the question about the kind of education and capacity required to achieve the post 2015 SDG goals. The involvement of all stakeholders such as the academia, business, communities, and other stakeholders was considered necessary to address the emerging risks. Moreover, transdisciplinary education and training was highlighted as very important in implementing measures for disaster risk reduction in an effective and efficient manner.

### 1.2 OVERVIEW AND UNCECAR EXPERIENCE

*Prof. Srikantha Herath*  
*Academic Programme Director/ Senior Academic Programme Officer, UNU-IAS*

Dr. Srikantha Herath introduced the rationale behind the aims of the sessions, and the experiences of UNCECAR in implementing teaching and training courses as well as research projects under its framework. He focused on the question on how research knowledge can be translated to practice efficiently to address the challenges that are brought about by rapid rate of global change. Climate change, that bring about increasing disaster risks is one of the challenges that needs to be addressed urgently, through appropriate adaptation strategies. With sustainability as a long term objective, adaptation strategies must be primarily local as it depends on local bio-physical and social characteristics. Given the complexity and future uncertainty of these complex problems, adaptation practices should be continuously monitored and updated to satisfy the needs of different constituents and stakeholders. In order to satisfy these diverse needs there had been a move from multidisciplinary perspectives towards interdisciplinary solutions that brings experts from different disciplines to work towards mutually acceptable solutions.

UNCECAR is a consortium of Universities in the Asia Pacific region committed to the development of education and research programmes in the postgraduate sector to enhance resilience against global change based on sustainability science. The network has developed postgraduate educational programs on climate change, renewable energy, leadership and fisheries, that are now being offered across the region in a blended on-line and classroom teaching mode, hosted at partner institutions. UNCECAR has promoted inter-disciplinary education through capacity building training programmes that address climate change and disaster risk reduction. The current challenge of implementing these solutions in an effective manner requires a transdisciplinary approach, that involve all concerned stakeholders. From the UNCECAR experience, such programmes can be implemented through field research pilot projects that can be upscaled to large scale projects. The sessions in the conference are expected to bring in perspectives on how we can develop a framework to address this unique need by combining education, research and training programs coordinated and implemented by universities.



## 2.1 UNIVERSITY PARTNERSHIP IN INTERNATIONAL DEVELOPMENT

*Prof. Toshio Koike*  
*Professor, The University of Tokyo*

Prof. Toshio Koike explained the need to develop ability of systems to manage human-induced issues and reduce risks by transferring and sharing scientific knowledge. To solve these problems we need to engage interdisciplinary and transdisciplinary approaches. In his presentation, he emphasized three components in realizing interdisciplinary and transdisciplinary approaches as;

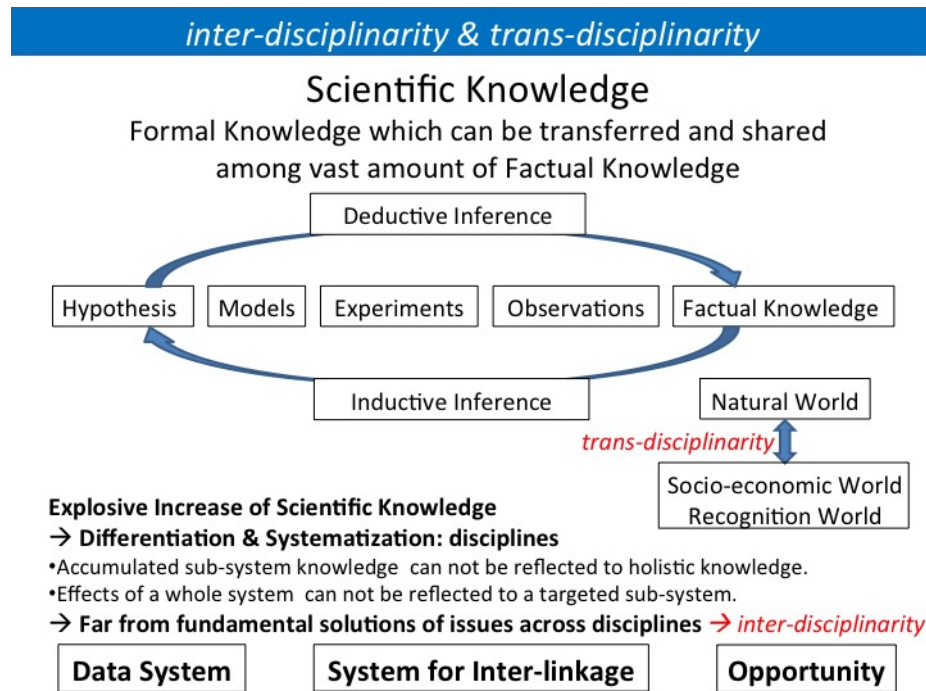
1. data system
2. system for inter-linkage and
3. opportunity

With regards to data systems, he explained that we need large volumes of data to address complex environmental problems but there are difficulties in access, quality, reliability, and technicalities that lie exclusive in the domains of a specific discipline. The increase in diversity and increase in volumes of these observation data are challenges that need to be addressed. To solve this, data integration and analysis systems are needed to enable the transfer and creating the type of knowledge that would help reduce disaster risk, solve environment problems and generate socio-economic benefits. Next, he cited two examples of inter-linkage systems, where integration of various sources of data and collaboration between various sectors, were important in providing necessary information.

First is the water-climate-agriculture project in Cambodia, where collaboration with Japan Aerospace Exploration Agency (JAXA) was useful to provide data they needed where rice production groups provided information from economic modeling to come up with data for simulation system that integrated predictions from climate models for integrated water resource management and climate change adaptation strategies.

The second one is the integration of river-sewage-public health in collaboration with Hue city in Vietnam where they first issues were identified through stakeholder meetings for co-designing the research programme and then working with economic modeling group and combining flood prediction model with economic model to simulate impact of construction of levee for disaster prevention benefiting economy and the society.

Finally, he talked about the opportunity to promote science and technology's efforts as a key in making the products useful to the society.



## 2.2 TRANSDISCIPLINARY EDUCATION PROGRAMS: EXPERIENCES FROM LANDSLIDE MITIGATION

*Prof. Hiroshi Fukuoka*  
*Professor, Niigata University*

Prof. Fukuoka introduced three examples of transdisciplinary programmes on landslide mitigation and emphasized three elements that are necessary in these programmes for a transdisciplinary approach. This involves;

1. community-based participatory learning
2. active involvement of various stakeholders
3. raising awareness and readiness to reduce vulnerability and susceptibility and lastly is
4. enhancing resilience through a holistic mechanism that involves all levels of education.

The first example provided was Kyoto's University Inter-Graduate School Program for Sustainable Development and Survival Societies (GSS) which started in 2011. This graduate programme aims at meeting the new challenge of producing hyper doctors who are capable of integrating scientific approach and practical applications on top of the traditional academic doctorate. Through collaboration and joint research, students are trained to be super doctors.

The second one is the collaboration between JICA and the civil defence of the Honduras national government which employed participatory learning in their workshop in a remote village in Honduras, where participants were asked to draw their experiences. The inputs from this workshop were combined with expert interpretation of topography and involved discussion between experts and sharing of information.

The last example was about the International Consortium (ICL) established in 2002 with support from about 75 countries. Among the various activities, the most outstanding achievement was with University of Gadjadara in Indonesia where students are engaged in community service activities as compulsory component of the curriculum ranging from various fields such as science, engineering, psychology, law, etc. Students were dispatched to the 2009 Padang Earthquake hit area and worked with the community in creating hazard maps, census building, measurement and development of early warning systems.

### 2.3 JAXA'S ACTIVITIES FOR DISASTER RISK REDUCTION

*Mr. Kenichi Toda*

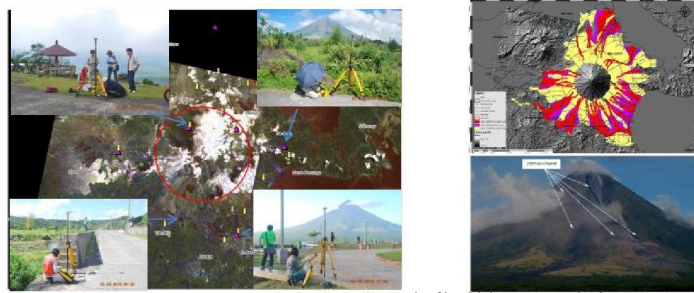
*Head, Disaster Management Support System Office Japan Aerospace Exploration Agency (JAXA)*

In his presentation, Mr. Toda introduced the Japan Aerospace Exploration Agency (JAXA)'s space-based activities for disaster risk reduction in Japan and Asia-Pacific region. He first explained the usefulness of space technology as a powerful tool for Disaster Risk Reduction (DRR). Based on earth observation satellite images, information can be provided to related agencies during the response, recovery and preparation/mitigation stage. JAXA has been conducting DRR projects using earth observation satellites in cooperation with Japanese government and in agreement with local governments. JAXA provides disaster observation data, emergency observation data, different extraction information, satellite geographical information including training and know-how on image analysis while disaster prevention agencies provide utilization results report, advice and recommendation and request for utilization and future systems.

JAXA also participates in Sentinel Asia, a voluntary initiative as a collaboration between space agencies and disaster management agencies, applying remote sensing and Web-GIS technologies to assist disaster management in the Asia-Pacific region. Sentinel Asia aims to improve safety in society by ICT and space technology, improve speed and accuracy of disaster preparedness and early warning and minimize the number of victims and social/economic losses. It consists of 95 JPT members including 80 agencies from 25 countries and 15 international organizations and ADRC members. It serves as a platform to discuss about cross-cutting issues and is the world's biggest integrated community working on information sharing and human networking through capacity building and outreach. For the last year, Sentinel Asia has observed about 200 disasters in the region. This project-based activity toward the practical use of space technology is a success story towards disaster mitigation and capacity building. JAXA also conducts capacity building activities in Asia such as the GSMap or the Global Satellite Mapping of Precipitation that forecast flood and contribute to early warning in poorly-gauged river basins. In collaboration with the Asian Development Bank, a river basin management project with remote sensing technology in Bangladesh, Vietnam and the Philippines is also undergoing. Finally, Mr. Toda shared the Advanced Land Observing Satellite-2 (ALOS-2), which was launched successfully and planned to start data distribution in November as JAXA continues to make emergency observation to contribute to DRR all over the world.

## Activities of Sentinel Asia Success Story & Capacity Building

- **Project-based activity toward the practical use of space technology called as “Success Story”**



Study of landslide warning and volcano monitoring for Mt. Mayon

- **Capacity Building and Human Network**



The 9th Sentinel Asia System Operation Training by JAXA, hosted by BPPT in October 2012



The 8th Sentinel Asia System Operation Training by JAXA, hosted by AIT in February 2012

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### 2.4 INCORPORATING SCIENCE AND TECHNOLOGY FOR DISASTER REDUC- TION, - THE JAPANESE EXPERIENCE -

*Dr. Satoru Nishikawa*  
*Vice President, Japan Water Agency*

In his presentation, Dr. Nishikawa gave a comprehensive background of the history of various disasters experienced by Japan and also explained several philosophies in the past that are up to now existing in modern Japan. He explained that the 1959 Ise-wan typhoon and the 1995 Hanshin earthquake were the two turning points in recent Japan towards developing a comprehensive disaster reduction policy. The Ise-wan Typhoon led to the creation of the Disaster Countermeasures Basic Act 1961 that established the Central Disaster Management Council. This is a good example of a consolidated national effort where all relevant ministers, the semi-public sectors and some private sectors were given responsibilities. He noted that after 1995 Kobe earthquake, there was a paradigm shift that followed. From a government centered disaster reduction approach, the multi-stakeholder approach to disaster risk reduction was advocated. He summarized the Japanese experience with three elements;

1. constant improvement for DRR
2. constant enlargement of participation and
3. constant expansion of scope of DRR

Finally, he emphasized the necessity of investing in science and technology for disaster reduction and presented some expectations for the post-2015 framework for DRR. Science and technology is required and embedded in each of the gears relating to the elements of the machinery for a safer world and numerous efforts that are necessary to save *lives* and *livelihoods*. He ended his presentation with a message towards creating a win-win strategy



towards risk reduction, putting added value in safety and resilience and understand the science and technology behind these scenes.

### How can we motivate individuals to take preventive action ?

- Disasters are not somebody else's affair.
- Do's and Don'ts preaching style educational materials do not attract adult's attention.

The tragic footages are not isolated events, it may be right behind you !

(the award winning poster of the 2005 competition)



## 2.5 THE ROLE OF UNIVERSITIES IN ADVANCING DISASTER RISK REDUCTION

*Prof. Yuichi Ono*

*Assistant Director and Professor, International Research Institute of Disaster Science, Tohoku University*

Prof. Yuichi Ono Assistant Director and Professor, International Research Institute of Disaster Science, Tohoku University

Prof. Ono explained that there are three large disaster institutes in Japan; University of Tokyo, Kyoto University and Tohoku University. The International Research Institute of Disaster Science in Tohoku University as established in 2012 as a response one year after the tsunami with an approach that is totally multidisciplinary. It covers 37 areas of research under 7 divisions and more than about 100 full-time researchers, making it one of the largest and most comprehensive institutes in the world. It also engages with private sector, working with companies and partnering with international organizations such as UNU, UNDP, ESCAP, ISDR, and World Bank. It works towards removing barriers that separate the academe from the communities and thus, provides services that directly benefit the communities. He then gave several examples of how the institute has contributed to the International DRR policy making.

The first one is Prof. Koshimura's work on the use of science for policy making in disaster recovery in the case of Sendai. A simulation was provided to show how multiple protection measures can be established to minimize losses towards making tsunami-resistant city.

The second example focuses on the weak area of disaster-related statistics. A joint international workshop has led to the adoption of the ESCAP Resolution

on 23 May 2014 where 62 countries agreed on developing range of disaster-related statistics.

The third example is assisting the Technical and Scientific Advice and Inputs to the Third World Conference on Disaster Risk Reduction in Sendai next year. One of the products is the HFA IRIDeS Review Report, which documented the experiences of Tohoku and recommendations to be shared with ISDR and other organizations.

He also presented some collective capabilities of university partnerships, including a Multi-Hazards Program of the Association of Pacific Rim Universities (APRU) with around 45 universities in 15 countries.

## 2.6 COMMUNITY-BASED DISASTER RISK REDUCTION AND THE ROLE OF UNIVERSITY NETWORKS

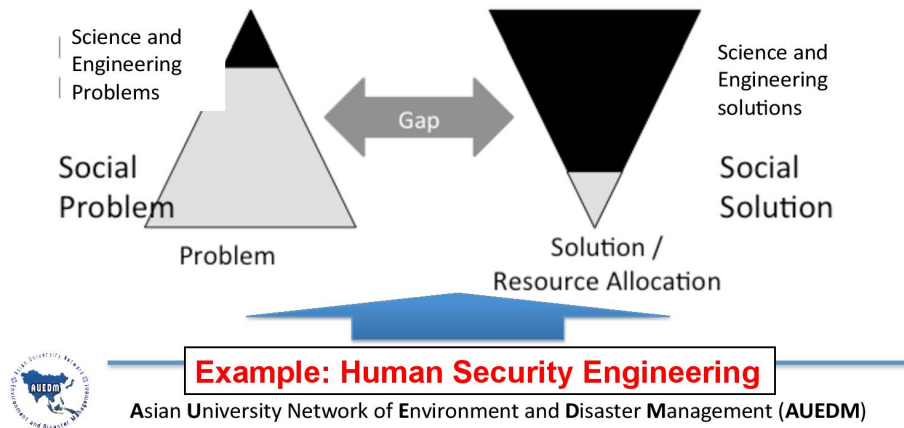
*Prof. Rajib Shaw*  
*Professor, Kyoto University*

Prof. Shaw presented the works of the Asian University Network of Environment and Disaster Management (AUEDM) and the UNUISDR Science Technology and Academic Group for Asia in DRR programs in the academe. AUEDM is a network of universities from 17 countries, following the Indian Ocean Tsunami in 2004. It started from drawing recovery lessons in Sri Lanka, Indonesia and India and documented how working with local governments and communities can be integrated in educational programs in universities. When students go out of the universities and work with universities, they come up with ideas and practical lessons. The network aims to develop the essentials of DRR in higher education and research. Some of the guiding principles of the network are inclusive curriculum with a theoretical focus, field oriented, multi disciplinary that enhances the skills and pay attention to market/demand oriented specifics of graduates from DRR programmes. Based on GET matrix: Governance, Education and Technology - for mainstreaming DRR education, he focused the discussion on the three groups of technology; Implementation Oriented Technology, Process Technology and Transferable Indigenous Knowledge. An analysis of the DRR curriculum shows the need for more focus on process technology in addressing the gap between the social problem and the social solution or resource allocation. He also presented a methodology developed to address the climate disaster risk index (CDRI) to understand the resilience of a city. A CDRI tool composed of 5x5 matrix, 25 parameters integrating 125 variables was employed in different cities such as Chennai, Delhi, Makati, Bandung and Dhaka. He ended his presentation by introducing several publications of the network that are available to the public, noting that while almost 25 years of work was carried out in DRR area, further work is necessary towards making DRR as a more established discipline.



## Approaches

- Breaking traditional disciplinary boundaries
- Customizing social and engineering solutions



### 2.7 EXPERIENCES OF KNOWLEDGE INTEGRATION AND STAKEHOLDER COLLABORATION IN SUSTAINABILITY SCIENCE: CHALLENGES AND OPPORTUNITIES FOR TRANSDISCIPLINARY EDUCATION FOR DISASTER RISK REDUCTION

*Prof. Masaru Yarime*

*Project Associate Professor, The University of Tokyo and Honorary Reader, University College London*

Prof. Yarime's presentation emphasized the need to promote innovation based on a solid understanding of the structure of problems involving in complex interconnections of various factors including science, technology, economy, and politics from inter- and transdisciplinary perspectives. As the existing models of university-industry-government collaboration tend to focus on narrowly-defined technical issues, a new approach to promoting collaboration with a variety of relevant stakeholders will be effective for integrating relevant knowledge and implementing social experimentation. He also shared some emerging practices of leading universities across the globe illustrating the important aspects of stakeholder collaboration, which include the creation of future visions based on science, setting of concrete targets, active participation and engagement of various stakeholders, development of new technologies and systems through social experimentation, effective feedback to decision makers, incorporation into institutional design, and legitimation of innovation in society.

Based on the experiences of academic development, institutionalization, and stakeholder collaboration in sustainability science, he laid down several questions that explore the challenges and opportunities for transdisciplinary education such as how to integrated different approaches as a coherent academic field. He ended the presentation with several challenges in the institutionalization of transdisciplinary approach in university policies and assessment that will not hinder the engagement of researchers with actors from outside the academe. To shift priorities, several measures should be

structured as part of university policies such as incentives and evaluation criteria that encourage collaboration and building it as a part of the assessment and promotion system in universities. University appraisal and performance based research funding systems could serve as policy instruments that will drive research outputs that are useful not only to the economy, but also to society and the environment.

#### Functions of Universities-Stakeholder Collaboration for Sustainability through Transdisciplinarity

- Creation of future visions based on science
- Setting of concrete and practical goals and targets
- Joint scenario making with stakeholders
- Promotion of active participation and engagement of various stakeholders
- Data collection and analysis on societal needs
- Development of new technologies and systems through social experimentation with university as a platform, living laboratory
- Impact Assessment, with transparency, objectivity, practicality
- Legitimation of innovation in society
- Effective feedback to decision makers in the private & public sectors
- Incorporation into institutional design
- Agenda-setting at regional, national, and global levels

## OPERATIONALIZING TRANSDISCIPLINARY EDUCATION FOR DISASTER RISK REDUCTION

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### 3.1 SUMMARY OF PRESENTATIONS AND DISCUSSIONS

#### 3.1.1 *Presentations*

The speakers in the morning brought in important perspectives from their respective experiences in incorporating a transdisciplinary approach in their activities related to DRR. The speakers shared their experiences in their respective projects and highlighted several lessons and experiences in designing transdisciplinary programs based on field projects that help efficient integration of research, education and training for disaster reduction measures that are sustainable. As the postgraduate sector acts as an engine in customizing useful global knowledge, especially considering sustainability issues, the discussion also focused on the roles of university partnership in promoting sustainable development through efficient management of disaster and environmental risks. New approaches of looking at the problem through interdisciplinary and transdisciplinary approaches would provide opportunities that serve as key for creation of data system, promotion of science and technology efforts and in the end, conveying the products to the society to address their needs and local issues.

#### 3.1.2 *Discussion on International Perspective*

Moderated by Prof. Hans van Ginkel, the discussion in the afternoon clarified some important perspectives in developing a framework for transdisciplinary projects, considering the varied and rich international experiences gained by the successful development of the Regional Centres of Expertise on Education for Sustainable Development (RCEs). The RCE-program was proposed by the Ubuntu Alliance during the World Conference on Sustainable Development (Johannesburg, 2002) and led by UNU-IAS through the RCE Global Service Centre. It may be clear that disasters, disaster risks and risk reduction have been important topics in education for sustainable development from the beginning. In the DESD no less than 129 officially acknowledged RCEs were developed, worldwide. All based on local funding. The discussion highlighted several questions that were taken forward to the following panel discussion that was dedicated to explore commitments, action plans, inputs and a transdisciplinary framework for education projects.

Based on the lessons from RCEs, it was suggested that UNCECAR could play an important role in further developing knowledge and learning on DRR as a crucial theme under the sustainable development agenda. Thinking of UNCECAR, clusters of institutions can make up a network dedicated on a local project involving willing and interested stakeholders to work together with universities on a particular aspect of disaster that is unique in their area.

In Sendai, what they would like to see is what can be done so that further progress can be made in the DRR initiatives. These targets should be realistic and build up on existing capacities or resources. What UNCECAR can do is to undertake the role of mobilizing the existing institutions that are willing to collaborate and participate in the project. As for benefit-based participation, if the projects will be recognized for its expertise, all the other stakeholders who are partners can also benefit from the reputation set by recognition of the network's work in the region. But the form of benefit that would usually work is through financial incentives. In this manner, it was highlighted to seek the support of funding institutions to launch a call for a prize award on best project, wherein UNCECAR can act as the secretariat to facilitate the mechanics of the award. Through entrepreneurial grants or micro-finance privilege, communities will be interested to be continuously involved as a partner and this will help in making the project sustainable in the long term.

Prof. Hans suggested several ways in which UNCECAR can play a key role in pioneering transdisciplinary education programmes, bringing together knowledge and expertise from relevant disciplines and different partners in society. First is to engage local actors such as schools and communities and instead of creating new disciplines or institutions adopt a transdisciplinary approach in making education projects beneficial and understandable to the society. Next is creating an incentive based participation that would also help address the funding requirement to make a project sustainable. It is crucial to think continuously of ways to create 'win-wins' for all involved, so that it will be possible to start with the people and budgets which are already there. What UNCECAR should do is to bring together the expertise of its university members and come up with a methodology that can be used to evaluate what is a good project, and facilitate an incentive prize in the form of an award that comes with a financial stimulus, that would support the best project awardees.

Finally, once these good practices have been compiled, identify the gaps in knowledge and understanding, as well as the resources needed to address these and offer this as an opportunity to the respective stakeholders who would like to partake in the recognition of creating models that could work. Some of the questions that should be addressed include looking at how the member universities can contribute by comparing their activities and identifying which aspects need more attention. In filling up the gap, it is best to identify a strategy that would identify partners or stakeholders other than the university which may contribute further and include them in this network of experts. Prof. Hans concluded the discussion by emphasizing that disaster risk reduction is a potential area for UNCECAR, if the universities are given the freedom to shape it and develop it as their own network of networks. Highlighting this process is important. As is the case with the RCEs, universities should act as the core centres of expertise that would develop their projects with the support from all relevant stakeholders in the communities.

### 3.1.3 *Panel Discussion on Local Partnerships*

Under the moderation of Prof. Cassim, the panel discussion on local partnerships opened up by welcoming participants from three UNCECAR member universities who were connected via videoconference; Universitas Gadjah Mada, Indian Institute of Technology and National University of Malaysia. He introduced the panelists for the afternoon; Prof. Mai Trong Nhuan, Former

President, National University of Vietnam, and Mr. Yuki Imanari, Head, Development and Institutional Affairs, Asia-Pacific Network for Global Change Research (APN).

Before starting the panel discussion, Prof. Cassim summarized the presentations in the morning clarifying the nature of transdisciplinary education and what does it entail for higher education institutions. There are three functions of higher education that a transdisciplinary project can help perform research, teaching and community service. Through research the universities can help design and develop projects that are based on the specific needs of the communities toward disaster risk reduction. Through teaching courses and training students, universities can teach skills in disaster management and train future experts in their respective disaster type. And making these research and skills useful to the benefit of the community, making it easier to understand and translating them to help solve the unique problems of their communities can make the three-fold role of universities completely performed. It is thus important that each of the member university is clear on their understanding of their local needs.

TeDrr projects should be problem oriented in nature, demanding unique local solutions to specific local problems. These issues are usually complex, and require the involvement of multiple stakeholders that are willing to make many small contributions. The TeDrr initiatives should not only concentrate on higher education, rather should utilize it to affect all education from primary to secondary students. Moreover, as HEIs train teachers, it is important that TeDrr projects should also look at they can projects contribute to training teachers in inculcating TeDrr in their teaching.

*Interdisciplinary Approaches of Education, Research for Proactive Response to Climate Extremes and Disasters (PRACED)*

*Prof. Mai Trong Nhuan  
Former President of the Vietnam National University*

Prof. Nhuan, former President of the Vietnam National University, explored the concept of interdisciplinarity, reflecting on the experiences and lessons learned from Vietnam's interdisciplinary approaches in research and education towards proactive response to disaster and climate extremes and disaster (PRACED) program. Recognizing the importance of strengthening social resilience as a priority, the general goal of PRACED is reducing impacts of climate change and disaster risk and vulnerability by increasing effectiveness of climate change and disaster response (mitigation and adaptation and resistance) for sustainable development . It underlines forecasting disasters based on better understanding of the role and dynamic behavior of the natural factors and climate change in both natural and socio-economic systems in order to propose appropriate measures to respond proactively to the change of natural factors, climate extremes and hazards for increasing sustainability in the study area.

Specifically, the objectives of the programme are;

- Increasing climate change accuracy of long and short-term spatial and time prediction of climate change and disasters
- Better field monitoring and early warning technologies and systems

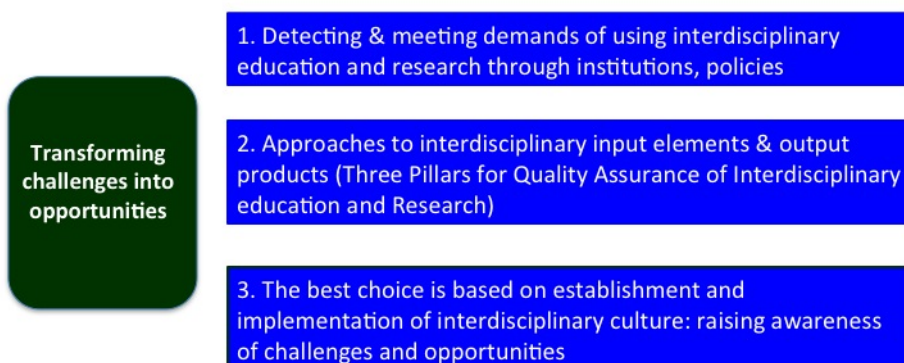
- High accuracy in climate change modeling/ simulating of disaster and climate change
- High accuracy in climate change and disaster risk and vulnerability assessment and forecasting
- Better information sharing, transmitting and transferring technologies and system

He also presented the challenges in implementing interdisciplinary research and suggested that possible solutions should look at how inputs, outputs, resources and quality assurance systems in the university can be improved to encourage interdisciplinary approaches. Encouraging an interdisciplinary culture even in monodisciplinary departments and interdisciplinary programs can lead to students who have high ability in interdisciplinary thinking and innovative approaches. These programs should employ learning by doing approach that provide opportunities for students to work with local stakeholders. These can lead to outputs that are products of interdisciplinary work such as thesis and projects of graduates. The limited availability of teachers, administrators, or staff that have interdisciplinary ability is a problem that can be solved by inviting visiting scholars or staff exchange opportunities and integrate in future recruitment of personnel working in the university. Establishing and developing appropriate criteria and procedures in quality assurance of interdisciplinary programmes is also important that is in line with national and international standards. This can also help in identifying demands and formulating potential outcomes that benefit the participants. He underlined the need to transforming challenges into opportunities to encourage institutionalizing interdisciplinary initiatives that can create policies and strategies for implementation towards strengthening interdisciplinary programs. Generally, it is necessary to raise awareness and development of interdisciplinary approaches among researchers, teachers, officers, learners, stakeholder and all related actors through constant development and implementation of programs that connect all the stakeholders to work together.

He ended his presentation with some proposals from Vietnam National University for collaboration opportunities such as developing joint interdisciplinary research projects, exchange of interdisciplinary information, data and materials and holding interdisciplinary science conferences and publication. As for education programs, training of interdisciplinary trainers, exchange of interdisciplinary faculty, training programs, and students as well as joint interdisciplinary training courses such as those offered under the framework of UNCECAR can also help strengthen the interdisciplinary culture of universities.

## IV. Solutions for Quality Assurance of Interdisciplinary education & Research

### Establishment of institutions, policies and strategies for interdisciplinary education and research, PRACED



The second panelist, Mr. Imanari firstly introduced his institute, the Asian Pacific Asia-Pacific Network for Global Change Research (APN), and explained their key activities including the projects that they support such as both research and capacity building projects and focuses on addressing high priority issues for member countries. APN activities also focus on three frameworks, i.e. on low carbon initiatives, biodiversity & ecosystem services, and climate adaptation. Under its Climate Adaptation Framework APN supports funding of projects that link climate change adaptation, disaster risk reduction, loss and damage. APN is interested in looking not only at risk reduction but also risk sharing including human mobility and to increase sustainable resilience. He reiterated the points raised by the speakers on linking the bigger initiatives of university networks with those strategies and tools that are available.

Prof. Cassim then opened the discussion to the floor where most of the questions laid out several considerations that were brought about by the perspectives from the morning presentations and discussion on international perspectives. As climate change is an important aspect of DRR, monitoring changes and its impacts should be on top of the priority when designing a project. There is also a need to move from saving lives to saving both lives and livelihood as previous cases of disasters in the past have shown that a disaster can bring another worse disaster following it. Major part of the discussion emphasized the point that DRR only is not enough, it has to also look at the disaster impacts, to prevent multiple failures.

In the discussion the need to train members of the community or stakeholders as experts themselves, instead of merely bringing in scientists or experts from the academia was highlighted. In this way, there will be a sense of ownership that they would uphold, encouraging them to be more proactive in the partnership. Thus existing capacities should be tapped, instead of creating new institutions or networks. Another point emphasized is how would these projects be appealing enough to warrant participation of various stakeholders. First element is engagement. To get the stakeholders engaged, there has to be benefit-based incentives to reward good practices. A part of the discussion focused on how to create this benefit-based incentive mechanism.

The questions pondered on what is the best benefit that each stakeholder may gain from participating in the projects. How to mainstream it, who can create such an award system and how to motivate people to partake in it.

The second point is the process of implementing TeDrr. One way to do this is to create a platform that will serve as a space for all knowledge inputs and put together smaller independent blocks together to create an expert group on a particular kind of disaster that is unique in each area. The moment these expertise are identified, gaps can be filled in by potential partners who can contribute to the goal. It was underlined that keeping the network small so as not to lose identity is important to achieve a bigger impact. This can help create a network of networks, with each university creating its own network of expertise in their local area. Relying on pre-existing networks and resources could be a pattern that would help projects have successful collaborative process. Setting realistic goals and targets and respecting boundaries are of paramount importance as well, respecting how the expertise of each university can match together. Trust in the network is a unique characteristic of UNCECAR given its long term relationship.

Prof. Cassim concluded the panel discussion by emphasizing the role of universities as a key player in clarifying the different activities in DRR and how it would fit in the UNCECAR framework. In Sendai, these projects can be launched and pioneered so that it will provide entry phase. As university members are usually the scientific experts in DRR, making relevant knowledge easy to be understood and applied by the society through the involvement of stakeholders is a goal that they should aspire. As for the incentive scheme, UNU can become a place that can facilitate the creation of a DRR best practice award. This will make way for compilation of good practices from people who apply, and their approach can then be adopted towards a model that could work. This proposal was met by a concluding note from Mr. Imanari from APN assuring its support in the development of activities and depending on the availability of funds, he encouraged looking at this as an opportunity that can gain support from APN.





## CONCLUSIONS

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The conference successfully generated rich discussions in the sessions that identified the challenges that Transdisciplinary education for Disaster risk reduction (TeDrr) should address as well as the methodologies and strategies required. The results of the discussion established a consensus that *TeDrr* should be implemented as project-based pilot research programmes addressing a local complex problem that require the participation of different stakeholders. However the key factors that determine a successful project indeed needs further discussion and research. For example how the project leadership and accountability is implemented, the rewards and motivation, consensus building and conflict resolution all need guide lines for successful implementation of transdisciplinary projects.

The member universities will have this issue discussed and clarified in various upcoming meetings and research initiatives.

TeDrr offers the best platform to have project-based research that can integrate research, education, capacity development and dissemination. The important questions identified are (a) how to move forward in creating the required framework through incentives that will help in producing effective DRR strategies and (b) What are the key elements of a good project, and how to evaluate its achievement and its impacts and (c) How a community dedicated to transdisciplinary approaches can be created and supported.