



Research

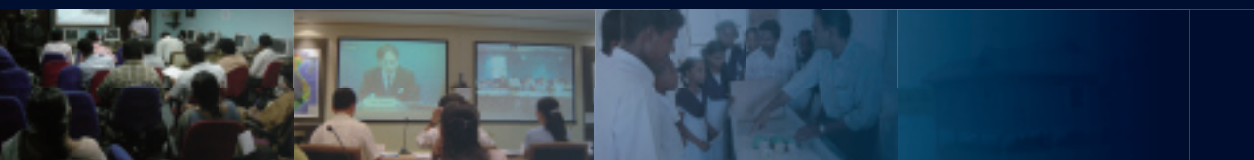


# Education Research Interface of Climate Change Adaptation and Disaster Risk Reduction

auedm.net

Education

Practice



ASIAN UNIVERSITY NETWORK OF  
ENVIRONMENT AND DISASTER MANAGEMENT (**AUEDM**)



[www.auedm.net](http://www.auedm.net)

# About AUEDM



The Asian University Network of Environment and Disaster Risk Management (AUEDM) is a unique initiative of prominent Asian universities coming together to share knowledge resources related to environment and disaster risk management amongst themselves and with the larger group of stakeholders working on these issues beyond conventional national and thematic boundaries.

AUEDM partners work in close collaboration to jointly conduct research, share findings and find ways forward in a part of the world that is increasingly at threat due to rising disaster events and climate change impacts. AUEDM also works closely with governments, corporate citizens, international agencies and civil society organizations to establish collaborations that eventually lead to reduction of risk for the most vulnerable communities.

## Who can be members of AUEDM:

The universities of Asia who are conducting education and research in the field of disaster and environmental management can apply for the membership. There is no fee for the membership; it is a voluntary network aiming at the cutting-edge field based research and higher education in the related field.

For further details, visit:

[www.auedm.net](http://www.auedm.net)

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## Acknowledgements

This publication was made possible with the help and cooperation of the AUEDM members, advisors and observers, which is highly acknowledged. AUEDM acknowledges the funding support from Mitsui Foundation for its operation for past 2 years. Publication support is acknowledged from the Kyoto University ARS GCOE Program (Sustainability / Survivability Science for a Resilient Society Adaptable to Extreme Weather Conditions). Photo credit goes to the Kyoto University Graduate School of Global Environmental Studies International Environment and Disaster Management Laboratory. This publication is Kyoto University's contribution to the Nairobi Work Program of UNFCCC.



**Global COE Program**

Sustainability / Survivability Science for a Resilient Society Adaptable to Extreme Weather Conditions

Design and Layout Takayuki Moriyama

Supported By: Mitsui Foundation 2008-2011



## WHY NETWORK OF ASIAN UNIVERSITIES?

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## NEEDS

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## OBJECTIVES OF THE NETWORK

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## CHARACTERISTIC FEATURES

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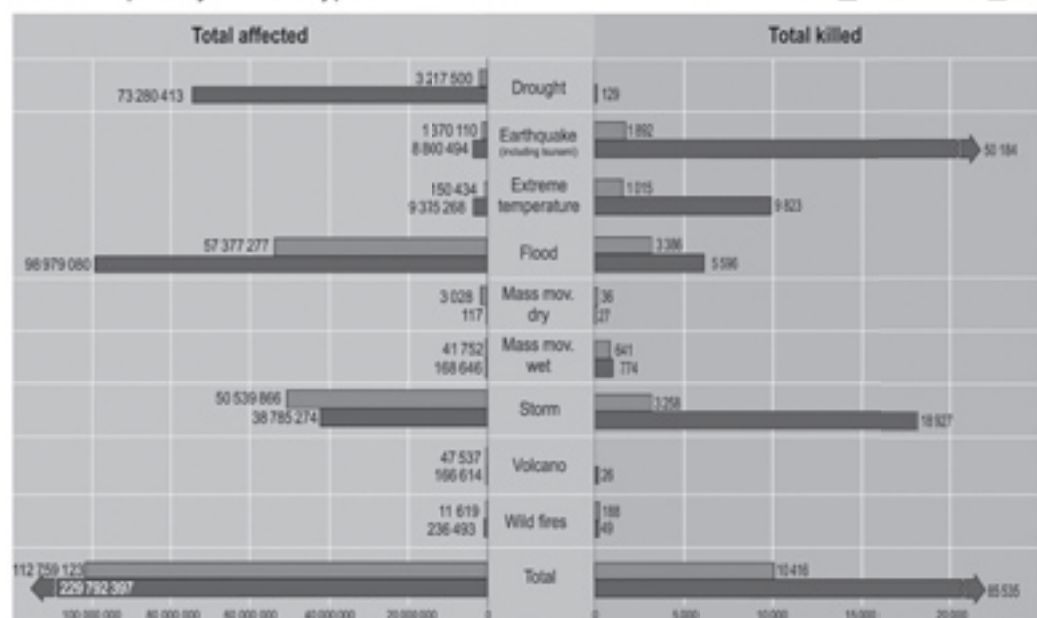
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# 1

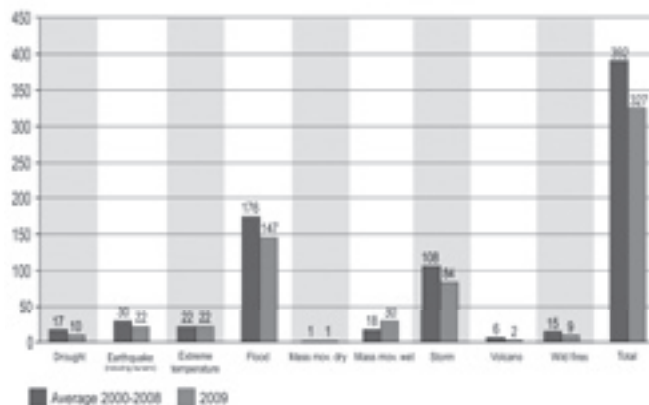
## BACKGROUND

*The Asia Pacific region is hit by more disasters than any other region. In terms of number of victims, its position is even higher, by huge margins. This has led to a trend of post disaster response mechanisms in most countries. University knowledge capabilities, and community wisdom are seldom put to use.*

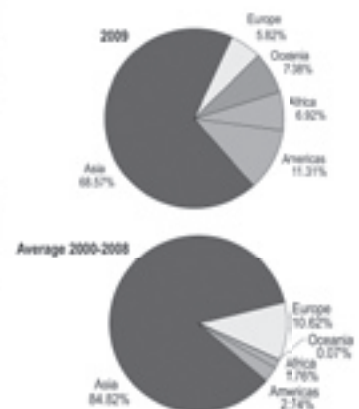
Human impact by disaster types



Natural disaster occurrence by disaster type



Percentage of people killed by natural disasters by region



Source of data: EM-DAT: The OFDA/ CRED International Disaster Database



## Asia's Disasters

Asia and the Pacific form the world's most disaster prone region. Due to its long history of frequent disasters, and highly vulnerable and poor communities, disaster management in the region has had a response orientation rather than a preparedness and mitigation one. As a result, traditional disaster management systems have been centered on relief and its management. This is also why many countries in the region have long established National Disaster Management Organizations or equivalent agencies that are based on civil defense backgrounds and on response orientation. The approach of responding to disasters and risk has been thus based on resource and logistic based understanding, and there is very little in terms knowledge based planning and action, in spite of a very rich wealth of university based technical expertise and civil society based local knowledge.

Disaster impacts are increasing across Asia, and disasters are becoming increasingly complex, which includes so many different dimensions. Japan is one of the leading countries in DRR, but in the 1995 Kobe Earthquake (The Great Hanshin Awaji Earthquake) more than 6400 people were killed. The most damages in this earthquake were the non-engineered constructions. There exists engineering knowledge but there is still a need for social processes to transfer that knowledge into practices. This shows the importance of multidisciplinary research. The 2004 Indian Ocean Tsunami had a lead-time of more than two and half hours, but the early warning information could not reach the people and communities in most affected countries. Therefore, there is a need for educational knowledge, research and practice in DRR. Similar experiences are seen in 2008 Nargis Cyclone and other disasters in the region. The above mentioned examples show that there is a need not only of educational products in DRR but also needed are improved processes implementation. The synergy between research, education and implementation is also very important.

## Environment Disaster Linkages

The link between development, environment and disasters is a very deeply entrenched one. Unplanned, ad-hoc and poor development is directly responsible for a significant part of the vulnerabilities observed in the region. Large scale industrial developments unmindful of related risks and pollution considerations, the rise of high density settlements with inadequate infrastructure, unengineered buildings, all have contributed to high levels of risk. The intermediary in this process is often the environment, as can be seen clearly in the case of climate change that has been established to have arisen out of anthropological causes.

While there is very popular recent focus on carbon footprints, the concept of ecological footprints has existed for a long time in the academic domain. The fact that the environment has a limited carrying capacity beyond which it cannot support consumption and emission levels has been a well known fact for very long, and has been articulated in scientific terms for many decades. Yet ecological footprints have gone on increasing exponentially with increasing consumption patterns that have accompanied development and economic growth.

# Hydro Meteorological Disasters

The most significant increasing trend that threatens vulnerable populations in the mountain regions, river basins, arid swathes and coastal stretches of Asia is one of increasing hydro-meteorological disasters. In terms of climate change induced catastrophic events, these threaten us with shocks such as cyclones, cloudbursts, flash floods and urban floods. On the other hand, in terms of prolonged stresses, they threaten us with drought and water stresses.

Their impact on urban settlements is also increasing, though not as visible and noticed as the case of catastrophic events. Unmanageable migration, often in waves or migration storms that are related to distress migration are burdening the already bursting Asian cities to a point of breakdown. Urban droughts are an intimidating phenomenon that looms in the face of many Asian cities already reeling under severe and prolonged water stresses. What climate change threatens to do to the water towers, the mighty glaciers and water reservoirs in the mountain regions, only compounds the seriousness of these threats.



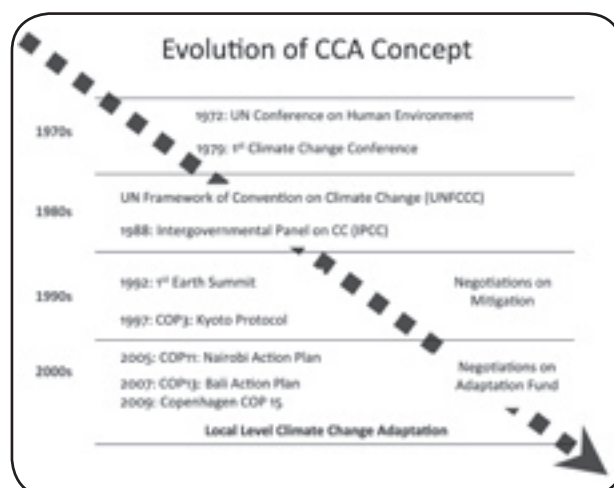
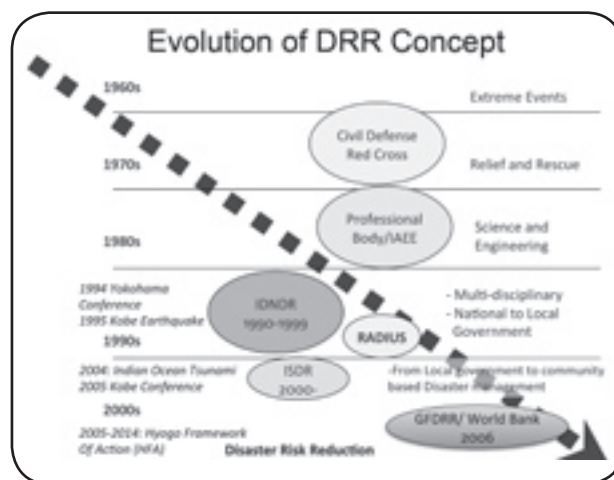
## CCA-DRR synergy

Climate Change Adaptation (CCA) and Disaster Risk Reduction (DRR), though broadly understood to be linked in some ways, have not yet been taken as a holistically linked complementary set of actions that require collaborative and coordinated action by all concerned stakeholders.

The significance of CCA-DRR synergy cannot be felt more by vulnerable communities who do not feel the impact of climate change or natural disaster sectorally, but it hits them as a combined whole with devastating effects. It needs to be appreciated that a piece-meal, sectorally split approach to this complex set of problems will not bear fruit.

Recent work by some of the AUEDM university partners has thrown light on the intricate linkages between cross sectoral development activities, their impact on the environment, subsequent detrimental impacts of a deteriorating environment on human life, and the integrated approach needed to address this combined threat of climate change and disasters.

Such an understanding can be very meaningfully deployed at various levels – from governance to voluntary action to education, and can go a long way in developing community based and environment based resilience to climate change as well as disasters.



source: Shaw R. 2008

# 2

## CONTEXT OF ACADEMIC RESEARCH AND FIELD PRACTICE

*A closer look at the trend of the disasters across the region suggests that economic losses are mounting, and the deeper impacts on vulnerable communities are being observed in spite of increased preparedness efforts. The focus needs to also be on softer impacts of disasters such as crop failure, water stresses, distress migration and resultant urban poverty and vulnerability.*

*An enhanced understanding of community based vulnerability and risk that has evolved over the past two decades throws light on the critical links related to disaster impacts. Instead of viewing disasters as time specific events leading to loss of lives and property, they are now seen increasingly as disruptions in livelihoods that perpetuate poverty and vulnerability unless specific efforts are made to break the cycle. This has led to far greater importance being attached to issues of access to resources, fulfillment of basic needs, creation of assets, addressing discrimination, and of course reducing shocks and stresses.*

*Such a holistic understanding is highly applicable to the emerging threats of climate change related disasters, importantly including the long term and day to day stresses that poor and vulnerable communities have to endure. Such understanding has emerged only due to concerted academic and research efforts by leading institutions. Most of this research has been the result of work by academicians in close partnership with civil society actors and vulnerable communities themselves. Concepts and tools such as Town watching, Participatory Rapid Appraisal (PRA, also in variant forms as Participatory Learning and Appraisal or PLA, Action Oriented Learning or AOL) and Community Action Planning have emerged through such efforts.*

*Hence, an informal and formal network to share the educational product, experiences and actual implementation can strengthen this synergy. In the education sector, the field-based campus is very important. Therefore, there is a need to go beyond the traditional educational institutions to work with local NGOs, local government, and international organizations.*

## HFA and Education

Strengthening networks and promoting dialogue and cooperation among disaster experts, technical and scientific specialists, planners and other stakeholders is recognized as the key to addressing the immensely large scaled issues that are faced today. Including disaster risk reduction and environmental subject matters in formal, non-formal, and informal education and training activities has been found to be the only way for ensuring reduction of future risks, particularly in the Asian context, with most countries being in a transitional economic state.

While there are a number of disaster management training programs on going in different areas, there is dearth of formal DRR education. The status of CCA education is far worse, as much of the academia is still working to find ways forward with the understanding of the subject itself. The universities can play a huge role in establishing and then mainstreaming DRR and CCA through education.

Taking the Hyogo Framework for Action (HFA) approach may be of great value not only in streamlining the efforts in an agreed and established structure, but also for ensuring a convergence and compatibility with other local, national, regional and global efforts around DRR for mutual benefit. Working along the five priorities of action of the HFA can serve this purpose. In essence it would mean working for making DRR and CCA education a local and national priority, focusing on research and education for appreciation of risks and early warnings, innovating and spreading the education, focusing on underlying risk factors, and finally on preparedness.



# AUEDM arises from Imperatives

AUEDM has been conceived and pursued by its member organizations based on this common understanding and motivation. It has come about from felt needs that appear to be crucial for the survival of millions of poor and vulnerable men, women and children living on the margins of society in Asia. AUEDM come together for reasons of educational, research and networking imperatives.

**Educational imperative:** To discuss the status and scope of environment and/or disaster management curriculum in the higher studies in each university. Each country has its own perspective. Some countries have full two years DRR master program. Some universities have some modules of DRR in the postgraduate programs. Therefore, the attempt is not to standardize the program, but to learn and understand the process in DRR. The challenge is how effective the process can be customized into each context.

**Research imperative:** To discuss the possibility of climate change adaptation as the key entry point of collaborative research. Each country has a high prevalence of impacts of climate change being borne by the most vulnerable communities. Impacts are most visible on coastal, mountain, urban poor and migrant communities. Since adaptation is a relatively new subject, heavy investments need to be made in research on effective local adaptation as a means for coping with imminent climate change impacts and linked disasters.

**Network imperative:** To discuss the establishment of the Asian Universities network. While there are integral commonalities in the vulnerability context and the nature of impacts, the local setting and contextual nuances are highly varied across Asian countries. Networking is the only way to share knowledge and experiences, and to draw lessons based on principles derived from practices. The network is thus expected to go a long way in the development of a regional knowledge base, making it accessible for practitioners, and using it to influence the policy environment.



# 3

## INVENTORY OF ACADEMIC INSTITUTIONS IN ASIA

*AUEDM has brought together a wide range of academic and research actors from the area of environment and disaster management from across Asia. Each of the members is working on ways to address their respective nations' disaster management and climate change adaptation needs. While some are already running disaster management courses successfully, others are in the process of developing or planning such courses. Interestingly, many university actors are stepping out of their conventional roles and are engaging with governments for advocacy work, with civil society organizations for voluntary work, and directly with communities for field work as well as for cross learning.*

*This section looks at the risk profiles, disaster management context, climate change adaptation approach and identified research and academic gaps as identified at national level. It also includes a brief description of the academic programs being conducted or planned by the university partners in each country.*



# Bangladesh

## ► BRAC University



There are strong indications of change in the climatic variables and increase in the mean sea level in Bangladesh. The changes will have strong connections with the frequency of floods, cyclones and drought at local level. Developing directions for CCA, in particular, would be challenging for Bangladesh as many unplanned or poorly planned development activities make communities vulnerable.

Bangladesh has a Ministry dedicated in part to Disaster Management and a Standing Order on Disaster (SOD). The Climate Change Cell (CCC), the Comprehensive Disaster Management Program (CDMP) and the Disaster Management Bureau (DMB) of the Government are developing climate change knowledge networks aiming to collect, analyze and disseminate climate change related data and information. Based on the directives in the National Adaptation Plan of Action (NAPA) of the country, the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) prioritizes six thematic sectors to develop capacity of individuals, communities and institutions to cope with CCA. It emphasizes on sustainable development, poverty reduction and increased well being of the vulnerable groups.

There are, however, many gaps that need to be addressed:

- Quantifiable indicators to measure the impacts and achievements are needed
- Gaps remain in appreciating and addressing gender, the disabled, urban population, insurance, safety net programs specifically in CCA approach
- Communities need to be guided through indigenous knowledge integrating scientific explanations of the erratic weather patterns for better resilience.
- Emphasis is needed in research on energy efficiency and bio-fuel developments, waste management, handling microclimatic

conditions in micro-regions through adaptations like plantations, strengthening of settlements and infrastructure, water use etc.

BRAC University offers Certificate, Diploma and Master Degree courses in Disaster Management. The courses are multi-disciplinary, and students from a broad range of disciplines apply for them. Professional and practical experience is also taken into consideration. The programs satisfy the need for training staff members of national and international NGOs, and government departments relating to disaster management. Besides these specific courses, the Bachelor of Architecture Program also offers content on Building for Disasters, and covers building design principles to withstand disasters and to assist post disaster rebuilding.

*BRAC University*  
<http://www.bracuniversity.net/>



# Cambodia

## ► Royal University of Phnom Penh



According to the declaration on a disaster situation in 2002 by Prime Minister Hun Sen, Cambodia experienced severe flooding in 2000, which cost US\$ 150 million in terms of loss of infrastructure and property, and killed 347 people, 70 percent of whom were children. The following year floods occurred in some parts of the country while at the same time other parts were affected by drought. These climate related disasters resulted in US\$ 36 million worth of damages and 61 people lost their lives. Climate related disasters struck again in 2002, and while there was no reported loss of life, the country experienced a rice shortage, for 63% of agricultural land were either flooded or drought struck. Undoubtedly, Cambodia is prone to climate variability, especially the provinces closed to the coastline and those situated along the Mekong and Prassac rivers.

In relation to climate related epidemiology, the main health problems in Cambodia are malaria, diarrhoea, and a few other listed diseases. With tropical climatic conditions, Cambodia is very favourable for disease transmitting vectors and a significant number of infectious diseases such as malaria are commonly found in the country. It is reported that more than 10 percent of all inpatients were infected with malaria. Cambodia can be divided into three main malaria regions. The first region is the north eastern and north western provinces and the rubber plantations, which cover about 4.5 percent of the total population. The second region is the central part, which is considered as quite sensitive region to malaria (medium sensitive). The third region is the remaining parts of the country, which is considered as less or not sensitive region. In 2006, there were recorded 122 deaths per 4 hospitals.

With regard to institutional arrangement for combating climatic related disasters, Cambodia Climate Change Office (CCCO) was established in 2003 to work with all relevant government agencies, NGOs and other related stakeholders. CCCO is the implementation body, compiling GHG

information, mitigation efforts inventory, and information on climate change adaptation activities. Cambodia ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1995 and it entered into force in 1996. The country began its first climate change related project in 1999: Cambodia's Climate Change Enabling Activity Project (CCEAP). This project was implemented by the Cambodian Ministry of Environment (MoE) with support from the United Nations Development Program (UNDP) and the Global Environment Facility (GEF). The objective of this three-year project was to prepare the Initial National Communication of Cambodia to the UNFCCC. This was seen as the first step taken by the Government in implementing the UNFCCC in Cambodia.

At national level, the National Adaptation Programme of Action to Climate Change (NAPA) has produced an important document to mitigate/adapt to climate change impacts, especially in relation to irrigation schemes and flood prevention dikes in the agriculture and water resource sector, and health risk prevention activities, both long and short term, in the health sector. The budget estimation for mitigation/adaption is about US \$149 billion.

The Royal University of Phnom Penh, especially the Department of Environmental Science (DES), has played an important role in the area of climate change and DRR in Cambodia. It plays three roles namely teaching, conducting research, and national consultation. DES provides a wide array of courses from engineering to environmental management including policy studies. A number of DES lecturers have conducted research on climate change topics (climate change vulnerability assessment, mitigation and adaption). Furthermore, the results of the studies are shared among relevant stakeholders, especially policy makers and practitioners.

*Royal University of Phnom Penh*  
<http://www.rupp.edu.kh/index.php>

# China

## ► Beijing Normal University



China suffers most natural disasters in the world. Annually, disasters of various types, with high frequency and wide distribution, affect 300 million people, destroy more than 3 million buildings, and cause direct economic losses of about 200 billion RMB. Floods in the Yangtze River Basin in 1998, extreme cold weather and sleet in Southern China in 2008, and the Wenchuan Earthquake on May 12, 2008 all caused huge casualties and economic losses. Under the ongoing global climate changes, the risks of extreme weather phenomena in China are increasing. Natural disaster events may grow due to imbalanced distribution of precipitation, unusual temperature changes, etc. Along with the global climate changes and rapid economic development, China is facing the increasing pressure on resources, environment and ecology. How to cope with natural disasters and adapt to climate changes has become more severe and complicated in China's future.

The Chinese national platform of DRR, National Committee of Disaster Reduction, was set up in 2005 including government agencies, technical agencies and civil society organizations. China attaches great importance to legislation regarding DRR and has enacted 30 relevant laws and regulations, including Emergency Response Law of the People's Republic of China, Flood Control Law of the People's Republic of China, Meteorology Law of the People's Republic of China, Regulations on the Prevention and Control of Geological Disasters, etc.

China's National Climate Change Program was launched in 2007 and a white paper on China's Policies and Actions on Climate Change was released in 2008. China has been adhering to the following principals on CCA issues: addressing climate change under sustainable development, bearing shared and distinctive responsibility, focusing on both mitigation and adaptation, integrating policies of CCA and relevant

issues, emphasizing scientific advances and innovations, and calling for passive participation and wide cooperation.

Since climate change may increase uncertainty of disaster risks, research focuses should be paid on fields relating CCA and DRR, such as meteorological disasters, sea level rise, glacier shrinkage, etc. Given situation in China, following research areas are proposed:

- Climate change influences on tropical cyclones, Floods, and the subsequent risks. Relationships between meteorological disasters and climate change are critical themes.
- Climate change, droughts and food security. Whether or how climate change affects drought risk regarding food security needs to be addressed.
- Sea level rise and storm surge in coastal areas. The coastal areas are the most developed in China. Sea level rise and increasing risk of storm surge are able to threaten economical development of China.

*Beijing Normal University*  
<http://www.bnu.edu.cn/>

# India

- ▶ Tata Institute of Social Sciences
- ▶ University of Madras



India has varied geo-climatic zones and is experiencing the increasing impact of different types of disasters and climate change on all fronts and in many forms. More than 7500 km length coastline of India is facing the threat of sea level changes, especially the chronic disasters like loss of biodiversity, intense erosion of coastline, coastal flooding, incursion of saline water in to coastal aquifers, etc.

In India not all possible consequences of climate change are yet fully understood, but the three main 'categories' of impacts are those on agriculture, sea level rise leading to submergence of coastal areas, as well as increased frequency of extreme events. ADB report 1995 stated that if there is one meter rise in sea level will leads to displacement of 7 million coastal population. Though there is a major technology gaps especially in implementing energy conservation measures, India is taking considerable actions in terms of policies, programs and research initiatives.

There is a strong need for implementing CCR-DRR within the framework of developmental policies. In this connection, the following are main research foci in the coming years:

- Improvements in agricultural practices
- Alternate construction practices to meet the energy crisis and to face climate hazards
- Demarcating vulnerability set back lines to restrict / regulate coastal developmental activities
- Networking of federal and local government agencies to work out modalities for CCA – DRR, and
- Scientific database to support people centered management plan by involving all the stakeholders in decision-making

University of Madras conducts a core

course on Natural Hazards and Disaster Risk Management as part of the M.Sc. in Applied Geology. Additionally, an elective course on Natural Hazards and Disaster Risk Management is also being offered to the postgraduate students in other Schools / Departments such as School of Social Sciences, Life Sciences, etc. Both the Centre for Ocean and Coastal Studies and Centre for Environmental Studies are also offering the DRM course for M.Sc. in Ocean Science and Technology and M.Sc. in Environmental Sciences.

At the Tata Institute of Social Sciences, a Master's program in Disaster Management is offered by the Jamsetji Tata Centre for Disaster Management (JTCDM) Spread over four semesters, it has foundation and core courses with various concentrations. There is also a significant element of field work, which is in real life situations, giving very good exposure.

*Tata Institute of Social Sciences*  
<http://www.tiss.edu/>

*University of Madras*  
<http://www.unom.ac.in/>



# Indonesia

## ► Institute of Technology Bandung



Indonesia, with its 17,000 islands and 226.1 million population, is a country prone to, besides geological hazards, climate change threats such as sea level rise, threatening lowlands and small islands where 42 millions people live (including 9 millions living in the metropolitan area of Jakarta), with inundation and storm surges. Floods and landslides are common occurrences in various parts of the country.

EMDAT data (1975-2006) shows that floods are the most prevalent (31%) and destructive disaster type (more than 4.6 million people affected), earthquakes (25%) are the most deadly (10,391 people killed), and wild fires are the most costly (US\$ 9.3 billion).

Climate change will increase hydro-meteorological disasters, while the sea level rise will swallow more than 2000 islands by 2030 (WV Disaster Monitor). Crop yields are forecasted to drop (by 50 % for maize and 4 % for rice)

Indonesia has enacted Law No. 24 Year 2007 on Disaster Management. There are also a number of ancillary regulations that relate to the subject. There are currently very limited law and policy documents on CCA in Indonesia. As a start, the Law No 17 Year 2007 on National Long Term Development Plan 2005-2025 highlights the issue and the National Action Plan for Climate Change, and the National Development Planning: Indonesia Responses to Climate Change document and the Presidential Regulation on the establishment of the National Council for Climate Change take the matter forward.

The following research areas have been identified and proposed:

- Review and analysis of various policy documents on CCA and DRR
- Review of good practices in the consultative process and public consultation

- Research on the improvement of the process of localizing national policies on DRR and CCA
- Development of a common framework for DRR and CCA at national and local level.

Institute of Technology Bandung (ITB) has been a long-term partner in disaster risk reduction activities. The university is planning to start a new master program under the applied Geology and Geotechnology, which will be an interdisciplinary course. The university also does cutting-edge research in the field of innovative research in the field of CCA and DRR, especially with local stakeholders.

*Institute of Technology Bandung*  
<http://www.itb.ac.id/en/>

# Japan

## ► Kyoto University



Japan is prone to a wide range of hazards including earthquakes, typhoons, floods, and water scarcity, besides the climate change threats of catastrophic events, rainfall variability and sea level rise. Under the Basic Act on Disaster Control Measures, the Central Disaster Management Council was formed, its brief being to ensure the comprehensiveness of disaster risk management and to discuss matters of importance with regard to disaster management. The Council was designated as one of four Councils on key policy fields of the Cabinet Office. The National Disaster Management System of Japan engages with multi stakeholder groups that include bank, media, civil society and infrastructure representatives besides the ministries and government agencies. Other than this, the Central Disaster Management Council, that reports to and gives opinion to the Prime Minister or Minister of State for Disaster Management, has heads of designated public corporations, President of Japanese Red Cross Society, President of Japan Broadcasting Corporation, Nippon Telegraph and Telephone Corporation, and subject experts as its members. This very structure ensures multi stakeholder representation and cooperation at the highest level.

At Kyoto University, Disaster Management subject is taught under the Master and Doctorate programs in Environmental Management courses in the Graduate School of Global Environmental Studies. Master program is for 2 years, and Doctorate program is 3 year course and has two themes: doctorate in environmental management (with compulsory internship of 9 months: mainly targeting to develop practitioners), and doctorate in environmental studies (with only research, mainly targeting to develop researchers). Master course is targeted to develop young professionals, and therefore has a very strong field oriented program, with internship course for 3 -5 months, with 10 credits.

The establishment strategy of the environment and disaster management course includes the following:

- Need for multi and cross-disciplinary education and research in the field of environment and disaster management
- Need for field oriented action learning program, which has a balanced mixture of theory and practice
- Need for synergy of environment and disaster risk reduction
- Strong focus on Asian countries, working closely with multi stakeholders, like local governments, NGOs, universities and UN and other international agencies.

Disaster related courses are also taught in other different disciplines, including Engineering, Architecture, Agriculture and Science, including climate science and modeling of climate change. Besides, there is a separate institution called Disaster Prevention Research Institute (DPRI).

*Kyoto University*

[http://www.ges.kyoto-u.ac.jp/cyp/html\\_lang=en](http://www.ges.kyoto-u.ac.jp/cyp/html_lang=en)

<http://www.iedm.ges.kyoto-u.ac.jp>  
[http://www.dpri.kyoto-u.ac.jp/web\\_e/index\\_topics.html](http://www.dpri.kyoto-u.ac.jp/web_e/index_topics.html)

# Malaysia

## ► Universiti Kebangsaan Malaysia

(National University of Malaysia)



Natural hazards most common to Malaysia include flood, landslides, haze (local and trans-boundary) and forest fire. Records show that flood events are the major disaster occurring in the country, affecting the greatest number of people over the last 100 years. There is an increasing trend of total people killed and monetary loss within the past decade. Based on localized climate projection, a substantial increase in monthly rainfall over the North East Coastal region and decrease in monthly rainfall in West Coast of Peninsular Malaysia may be expected by 2050.

Malaysia is concerned about occurrences of natural and technological disasters that adversely affect its people. In 1997 the National Security Council issued a directive on "Policy and Mechanism on National Disaster and Relief Management". A National Steering Committee on Climate Change (NSCCC) was established for guiding national responses on climate change. With growing concerns on the impacts of climate change, a Cabinet Committee on Climate Change was formed in early 2008 and a National Policy on Climate Change was formulated. The Policy calls for mainstreaming of measures to address climate change challenges for sustainable development; integration of balanced adaptation and mitigation responses into national policies, plans and programs to strengthen the resilience of development; and strengthening of institutional and implementation capacity through coherent coordination of policy responses.

Main concerns and issues identified are:

- If CCA measures are to be efficient and effective they must build on and expand existing DRR efforts, whilst sustainability of DRR approaches will be affected without consideration of the impact of climate change.

- Measures more typically associated with CCA will support DRR through reducing long-term vulnerability and influencing development potential.

- To support the collaboration mechanism, assessment and mapping of past disasters and climate change projection should be undertaken in an integrated and localized manner.

- Analysis will encompass identifying past and current vulnerabilities and assessing success of current adaptation to climate risks, with a view to enhance capacity and resilience.

Southeast Asia Disaster Prevention Research Institute (SEADPRI-UKM) in University Kebangsaan Malaysia offers Master-by research and Doctoral-by research courses in Hazard/Disaster Studies, Meteorological Hazards, Geological Hazards and Technological Hazards. The institute conducts multi-disciplinary research on hazard management and policy aspects, and serves as center of reference for the region on scientific and governance issues on hazards.

*National University of Malaysia*  
<http://www.ukm.my/portal/>



# Nepal

## ► Tribhuvan University



More than 75 percent of the population in Nepal is still dependent on agriculture and agriculture is still the major contributor to the GDP of Nepal. Therefore, Nepal will be adversely affected by Climate Change. In addition to that Nepal is prone to many hydro-meteorological disasters, which claim more than 400 lives in average each year. Adverse effect of climate change has been observed in prolonged drought pattern, shift in monsoon and low productivity of regional and seasonal crops. Nepal has Disaster Relief Act from 1980.

Although DRR is a cross cutting issue and needs to be incorporated in all development spending, the focal point for DRR in Nepal is only a small unit within the MoHA. Ministry of Environment is the focal point for CCA as climate has been compartmentalized as an environmental issue. Broadening the scope of DRR and CCA and understanding their inter-linkages is essential for future development intervention.

The direct and indirect impact of climate change in agriculture and livelihood of rural and urban communities is one of the research areas. The inter-linkage of lowered agriculture production and increased vulnerability of people to communicable diseases like cholera and diarrhoea is another area for research. The loss of agriculture production has resulted in migration of working population to the urban areas and creating pressure in urban centers. The urban centers are facing myriads of problems including food shortage, shortage of drinking waters, increased pollution level and deterioration in overall living condition. The inter-linkage of Climate Change, vulnerability of people and urban disasters is another area, which needs to be further explored and understood. The Institute of Engineering at Tribhuvan University Currently offers Masters in Sustainable Water Sanitation, Health and Development, Masters in Urban

Planning and Masters in Water Resources Engineering, which incorporate different aspects of disaster management courses. The courses offer modules such as Post Disaster Water and Sanitation Management, Global Environment Change, Public Health and Risk Assessment, Environmental Engineering, Community Development, Water Induced Disasters. Along with these modular courses, the institute encourages students to carry out research on Disaster management, Community based disaster management, Climate change and Environmental management. A Masters in Disaster Management and Development Studies is proposed to start from 2010. The University also offers course content related to disasters and environment under its engineering and architecture degree courses.

*Tribhuvan University*  
<http://www.tribhuvan-university.edu.np/>

# Pakistan

## ► University of Peshawar



A number of factors are responsible for the vulnerabilities of Pakistani society to hazards. These include a fragile natural environment, lack of awareness and education, environmental degradation resulting from poorly managed urban and industrial development processes, deforestation, climate change and variability, poor construction practices, poor livestock and agricultural management, weak early warning systems and poverty.

Keeping in view the losses of the earthquake 2005, the National Disaster Management Ordinance (NDMO) 2006 has passed by the government of Pakistan, the implementation of which would be ensured by the National Disaster Management Commission. The government of Pakistan through (NDMO) established National Disaster Management Authority at Federal level. The National Disaster Management Authority (NDMA) is the only focal point for coordinating and facilitating the implementation of strategies and programs on disaster risk reduction, response and recovery.

Future research projects need to study some critical aspects as highlighted below:

- Climate Change a Reality or Natural Phenomena
- Manmade and Extreme Natural Events
- Causes and Factors of Climate Change in Pakistan
- Impacts of Climate Change in Pakistan
- Climate Change Adaptation in Pakistan
- Climate Change and Disaster risk Reduction in Pakistan
- Climate Change and Hyogo Framework for Action in Pakistan
- Climate Change and National Development

The Centre for Disaster Preparedness and Management (CDPM), University of Peshawar, offers a post-graduate one-year diploma in the Disaster Preparedness and Management. CDPM also intends to initiate a wide range of training and learning programs for teachers, students, managers, practitioners, and administrators to improve their knowledge and skill in disaster management. It also conducts weekly seminars for students, teachers and professional on disaster management issues.

*University of Peshawar*  
<http://www.upesh.edu.pk/>

# Philippines

## ► University of the Philippines Los Baños



The Philippines is considered one of the most disaster-prone countries in the world. Its exposure to natural hazards is largely due to its geographical location. Situated within the Circum-Pacific belt of fires and along typhoon path, the Philippines becomes exposed to natural perils like earthquakes, volcanic eruptions, typhoons and their resultant effects like tsunami, landslides, floods and flashfloods. The country experiences an average of twenty (20) typhoons annually, around half of which are destructive. In terms of climate-related hazards, the ENSO phenomena and the associated flood, drought, forest fire, severe storms and heavy precipitations-causing landslides and flash floods, have become more frequent and severe during the last 20 to 30 years.

A Presidential Decree formally established the National Disaster Coordinating Council (NDCC), Regional Disaster Coordinating Councils (RDCC), and Local Disaster Coordinating Councils (LDCCs). The Philippines' First National Communication on Climate Change was submitted in December 1999. More recently, in recognition for the need to legislate enabling laws and policies on climate change, the Senate Committee on Climate Change and Oversight Committee on Climate Change Adaptation were created. One of the current initiatives of both Committees is the proposed Climate Change Act that aims to mainstream climate change into government policy formulations, creating for this purpose the Climate Change Commission, and create framework program and national and local action plans for climate change.

There is significant overlap between the theory and practice of disaster risk reduction and climate change adaptation. An initial important approach to address these gaps is conducting research on the following issues:

- Policy and institutional analysis to develop mechanisms for integrating climate change adaptation and disaster risk reduction.
- Case studies of best-bet practice where adaptation and DRR have been integrated successfully at the local level
- Development of methodologies and tools for integrating CCA and DRR

The university does not offer stand alone degree in disaster management. However, it offers one course (subject) on climate change entitled "Tropical Forests and Climate Change" as part of the graduate degree program in Forestry. Some other aspects of climate change are incorporated in other existing subjects/course in forestry.

*University of Philippines Los Baños*  
<http://www.uplb.edu.ph/>



# Sri Lanka

- ▶ University of Colombo
- ▶ University of Peradeniya



Over the past few decades various types of disasters have struck in Sri Lanka. The likelihood of recurrence of natural disasters like floods, cyclones, landslides, droughts, and recently tsunami are bound to increase in the future. In addition to the uncertainties and extreme events of weather, it is evident that natural hazards will aggravate due to population increase, rural-urban migration and scarcity of safe lands. Following the tsunami and influenced by the launching of the Hyogo Framework for Action 2005-2015 at the World Conference on Disaster Reduction in January 2005 in Kobe, Japan, the government took action to introduce a legal framework that would provide for initiating well thought of actions to be prepared for most types of disastrous events expected.

A list of plans, policies and legislations which were addressed the Disaster risk reduction and climate change adaptation are identified as; Biodiversity Conservation Action Plan (1999), Soil Conservation Act (1996), National Environmental Act, Caring For Environment (CFE) 2003-2007, Path to Sustainable Development Clean Air 2000, Action plan in 2002, Coast Conservation Act, Coastal 2000 and so on. It is also necessary to re-evaluate the existing methodologies and introduce new concepts applicable to various sectors such as water resources, industrial, energy, agriculture to cope up the additional pressure that would arise due to the issue of climate change.

Some of the critical issues and gaps are:

- A central database which integrated information from different sectors, such as fisheries, agriculture and infrastructure and etc. is needed
- Within the research community there is a lack of space for discussion on issues relating to climate change in Sri Lanka.

- To address local problems related to climate change, analysis of research findings and suggestions has to be considered locally through established CDM/Climate Change Centers, and should be funded by the Central Government.

University of Peradeniya offers a Bachelors Degree in Disaster Management, and also offers disaster and environment related content in other courses such as Master of Science degree courses in Bio diversity, ecotourism and environment management, in Environmental science, in GIS and remote sensing, in Water resources management, and in Environment management. The Medical Faculty offers various short training programs (2-10 days) related to disaster management for health practitioners. Optional courses like Climate change and human response, Landscape ecology and Environmental management are also offered at the Department of Geography for MA/ M.Phil degree program.

University of Colombo offers a Diploma in Disaster Management in Department of Physics. The university has started innovative research on CCA and DRR.

*University of Colombo*  
<http://www.cmb.ac.lk/>

*University of Peradeniya*  
<http://www.pdn.ac.lk/>

# Taiwan

## ► National Yunlin University of Science & Technology



The common disasters that relate to the climate of Taiwan are typhoons, floods, debris flows (landslides) and droughts. The precipitation in the wet and dry seasons is extremely different. The rivers in Taiwan are short in length and steep. The use of surface water resources in Taiwan is inefficient. The key branches of the economy are agriculture and fishery, which consume a great quantity of water. The concerns that must be considered are 1) the strength and frequency of extreme events will increase, 2) the difficulties of predicting disasters will increase, and 3) the difficulties of preparing for disaster consequences will increase.

According to the adaptation strategies in National Communications, the specific needs for research are around completing impact assessments of sea-level rise, strengthening flood and drought prevention and rescue, drafting response measures to agriculture and livestock production affected by disastrous weather, analyzing the impacts of climate change on fisheries, monitoring the density and growth of disease vectors in all regions, and increasing biological diversity at the ecosystem level (UNFCCC National Communication of the Republic of China (Taiwan), 2002).

National Yunlin University of Science & Technology offers a two year Masters Degree course that addresses these needs. The requirement for graduate students to earn the Masters Degree of Science from the graduate school of Disaster Prevention and Environmental Engineering is to take courses totaling 30 credits, including a 2 credit seminar, and a 6 credit thesis. Most courses are designed for using the students' research and studies. There are many possibilities for students to get practice opportunities from the government and private sector, such as the Research Center for Soil & water Resources and Natural Disaster Prevention that provides practice opportunities for the students.

There are also other courses that offer content related to disaster management:

- (1) Special topics of disaster prevention course content include typhoon disaster management, flood disaster management, debris disaster management.
- (2) Soil & Water Conservation course content includes an introduction of geologic characteristics and hydrological types that exist on the island as well as what kinds of soil and water disasters that exist on the island and how to deal with them. These classes also require field surveys.
- (3) Analysis of Hydrology course content includes rainfall types analysis, runoff analysis, frequency analysis of rainfall and flood as well as how to apply the technique of hydrologic analysis to flood control. Field survey is also required in these classes.

*National Yunlin University of  
Science and Technology*  
<http://www.csx.yuntech.edu.tw/index.htm>

# Thailand

## ► Chulalongkorn University



Future projections on climate change can be summarized as more hot days, longer summers, higher rain intensity, more water which can be translated to more droughts and floods. In addition, sea level rise also has been projected. The prospect of severe drought and flood risk has been raised.

There is no specific law in relation to DRR in Thailand. There are several existing laws that DRR is a part of, in the form of preventive and control measures such as hazardous material act, land transportation act, air transportation act, urban planning act, irrigation act, building control act, etc. There are two government departments that handle major task is DRR: Department of Disaster Prevention and Mitigation, Ministry of Interior, and National Disaster Warning Center, Ministry of Information and Communication. There are several other government departments that handle partial responsibilities related to DRR.

The government established the Climate Change Coordinating Unit under the supervision of the Office of Natural Resources and Environmental Policy and Planning, Ministry of Natural Resources and Environment, and drafted a regulation. Although some policies, laws already exist, but there are very diverse perspectives and focuses between the policies, laws, and government agencies. The lack of unified policy or law such as disaster management act or national policy and coordination among government agencies compound by their different views make their efforts in DRR and CCA ineffective. Lack of public education, access to information, effective communication methods both in normal and emergency situation, capacity building (disaster preparedness) and coordinate and effective government action have placed citizen in a very vulnerable situation.

From the analysis above major research areas required on the CCA-DRR can be:

- Public education and outreach, information flow,
- Institutional arrangements (conflict and coordination, research and education, linking science and policy and policy making),
- Resilience and adaptation: communities and indigenous knowledge and practices,
- Environmental equity and justice.

There is no disaster management course at present at Chulalongkorn University. The closest field in relation to disaster management is Environmental Management (Hazardous Waste Management), which is offered as M.Sc. and Ph.D. Degree Program. Disaster related courses are also taught in Civil Engineering (earthquake resistant structural design: special short course), and Environmental Engineering (industrial and hazardous waste management).

*Chulalongkorn University*  
<http://chula.ac.th/chula/en/index.html>

# Vietnam

- ▶ Danang University of Technology
- ▶ Hanoi University of Architecture
- ▶ Hue College of Economics, Hue University



Vietnam spans a wide range of latitudes and therefore experiences a range of climates, exposing it to variability related risks under climate change. The long coastline of Vietnam is also vulnerable to Pacific tropical cyclones between June and November, which contribute significantly to wet season rainfall totals. The location and topography of Viet Nam make it one of the most disaster-prone countries in the world, suffering from typhoons, tropical storms, floods, drought, seawater intrusions, landslides and forest fires. Of these, the most damaging and frequent are typhoons, tropical storms and floods.

Vietnam has developed and promulgated relevant legal documents for natural disaster prevention, response and mitigation, such as Law on Dyke, Water Resources Law, Law on Forest Protection and Development, Law on Environment Protection and so on. Key documents of relevance to both disaster management and climate change include the National Target Program to Respond to Climate Change and the Ministry of Agriculture and Rural Development (MARD) Action Plan Framework for Adaptation to Climate Change.

Both in the area of climate change adaptation and disaster risk management, groups have been formed to better coordinate related activities within government agencies and between government and international community. There is also a Steering Committee for the National Target Program to Respond to Climate Change. Other existing institutional coordination mechanisms include the Natural Disaster Mitigation Partnership (NDMP).

As the main gap is to make synergy of climate change adaptation and disaster risk reduction, some of the specific needs for

research are listed below:

- Vulnerability and adaptation assessment
- Initiatives, activities on climate change adaptation and disaster risk management
- Coordination's amongst government's agencies as well as between government with communities of international donors and NGOs
- Adaptive capacity, policy and decision making
- Finance allocation

In case of Danang University of Technology (DUT), new master program of environmental management has been started, which includes the disaster reduction teaching and research components.

Disaster Management subject is currently not taught in Hanoi Architectural University (HAU). Depending on student and his supervisor interest, the subject can be a part of the final project leading to master thesis in architecture and urban planning programs. Faculty of Urban and Regional Planning propose to start a new program related to higher education in disaster related subjects.

Hue College of Economics has been involved in the research related to the CCA and DRR, however there is not regular program on DRR or CCA. Very recently, the college plans to start environmental economics and disaster risk reduction courses in the undergraduate programs.

*Hanoi Architectural University*  
[http://www.hau.edu.vn/index\\_eng2.htm](http://www.hau.edu.vn/index_eng2.htm)

*Danang University of Technology*  
<http://www.ud.edu.vn/>

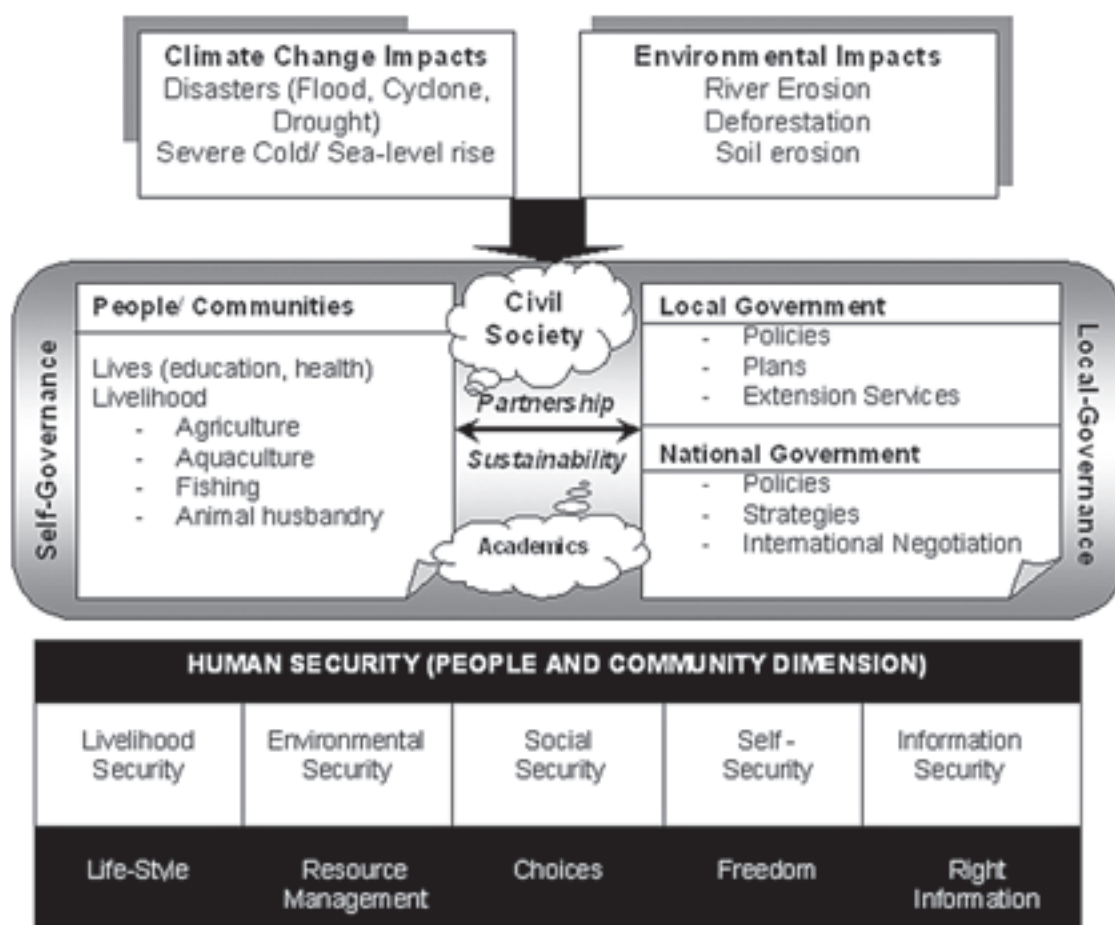
*Hue College of Economics*  
<http://hce.edu.vn/english/index.htm>



# 4

## INTERFACE OF CCA DRR AND THEMATIC FOCUS

*Disaster Risk Reduction (DRR) as a theme has driven the research and education agenda, particularly since it got an impetus through the HFA in 2005. Recent concerns on climate change gave a push to the mitigation and adaptation streams, of which adaptation is an issue closer to the concerns of vulnerable communities in Asia who have little contribution to emissions and therefore a minimal role to play in climate change mitigation, but whose future is jeopardized by imminent climate change impacts and is thus dependent on appropriate Climate Change Adaptation (CCA) interventions. CCA and DRR are also closely interlinked, and have a number of other related thematic areas of concern that need to be focused upon.*



source: Shaw R. 2006



## Coastal Zone Management



Coastal zones are among the hotspots of impending disasters, threatened by cyclones, storm surges, sea erosion, flooding, sea level rise and tsunamis. Many of these events are expected to become increasingly severe due to climate change and related sea level rise, changing ecosystem and increasing severity and variability of catastrophic cyclones. To exacerbate the situation further, almost all coastlines in Asia are seeing a surge in population concentration as urban centres, ports, transportation corridors and special economic zones mushroom along them. In addition, many of the issues related to pollution, poor development and resource management filter down to the coastal areas, causing devastating impacts on coastal livelihoods. Since most communities living in coastal zones are directly or indirectly dependent on fishing, drop in fish yield is an economic risk associated with coastal zone mismanagement. Coastal ecosystems are also negatively impacted by pollution, development in sea ports and climate change, destroying coral reefs and mangroves which offer additional protection from impending hazards. Further, due to close proximity to the source of tsunamis, earthquakes, and the sudden changing nature of storms, early warning becomes a key issue for coastal communities. Integrated coastal zone management has emerged as a way forward, but much research and support efforts are required to refine its components and to propagate it for effective impact.

## Mountain Ecosystem



Mountain ecosystems have unique characteristics: the varied environment at different altitudes, the high number of natural hazards faced (earthquakes, forest fires, flash floods, landslides and avalanches), poor accessibility and infrastructure, scarce livelihood opportunities and a fragile eco-system. Further, modern developments have produced factors such as out-migration, children leaving villages to get better education, and the detrimental environmental impacts of ad-hoc development projects, all of which contribute to increasing vulnerability in mountain areas. Climate change threatens to make matters much worse, with depletion of glaciers, incidences of cloudbursts and flash floods, widespread water stresses, and Glacial Lake Outburst Floods (GLOFs) are threatening mountain communities more than ever before. More and more communities are at risk not only due to the increasing hazards, but also because mushrooming settlements of high density and high risk constructions, mostly in mountain cities.

Local inhabitants, however, are able to successfully interpret their landscape, translating the signals provided by large rocks or the flow of the river into knowledge about where and how to settle. Specific local practices also exist in mountainous areas, such as slope farming to reduce erosion, glacier grafting to control water predictability, and vertical transhumance to diversify crops and livestock. These practices, developed over a history of habitation and experience relating to the local environment, provide valuable knowledge that allows mountain communities to pursue livelihoods in the face of risky environments. Mountain ecosystem management emerges as a complex developmental system that needs to be supported by research and disseminated through education.



## Forest Management

Forests have a crucial role in maintaining the balance of nature. They are natural sinks for carbon emissions, and are providers of live sustaining oxygen, besides being preservation grounds for biodiversity that is crucial for the sustenance of life in the eco-system as we know it. Forests maintain an eco-balance, but their rapid depletion is disturbing this balance very fast. While their degradation or loss impacts the entire humanity, the hardest hit in the immediate term are the forest dependent communities. Their life and livelihoods have always been symbiotic with nature, but is threatened with the depletion of forests, climate change impacts an resultant disaster risks. Reduction of emissions from deforestation and forest degradation (REDD) has been recognized by the international climate change management community in the Copenhagen Accord of 2009 also, but without giving specifics of how developmental stresses can be prevented from making this an impossible task. Research and education inputs are required not only for identifying the critical issues and targets, but also the processes required to achieve these.



## Urban Risk Reduction

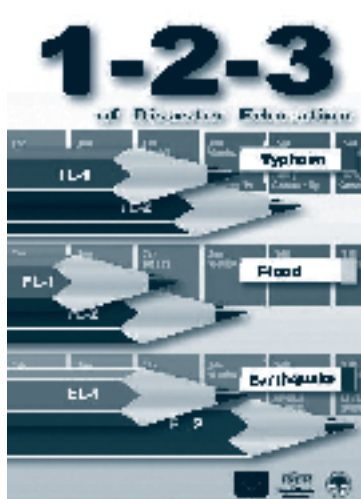
As cities across the region have urbanized rapidly in the past few decades, most cities have confronted environmental problems such as poor air and water quality, high levels of traffic congestion and ambient noise, poor-quality built environment, derelict land, greenhouse gas emissions, urban sprawl, generation of waste and waste-water. In particular, cities in the rapidly developing nations face problems related to the living conditions in which the urban population lives. Needless to say that Asia has the largest population, as well as urban population at risk. This problem is rapidly increasing in proportions due to developmental migration compounded with the threat of climate change related migration. Climate change impacts in mountain regions are triggering a downward migration, while those in coastal regions are triggering an upward migration. Projected migration storms threaten to swamp Asian cities with hundreds of millions of distress migrants in the coming decades if no immediate steps are taken and projections come true. There is a need to look at the urban risk with two specific tools: community based initiatives, and integration of disaster and environmental issues. Therefore, “eco-community” is regarded as one of the major implementing mechanism in solving environment and disaster issues in the urban area. These again are new concepts that still need to be adequately validated through thorough research and subsequently need to be mainstreamed into developmental education.







## Education and Learning Approaches



Environment and disaster education is aimed at proactive action, which links knowledge and practice. AUEDM's emphasis in education and learning field is to develop innovative approaches, test those approaches in the field, and come out with specific educational policy and framework. Community participation is considered as the cross-cutting research pillar for this purpose. With the broader boundary of community participation, research needs to be conducted under the following topics: Social Capital, Sustainable Livelihood, Sustainable Community Based Disaster Risk Reduction, Community Based Forest Management, Climate Change Adaptation, and Corporate Community Interface (beyond the traditional Corporate Social Responsibility). All these issues are very much based on the common concept of community based interventions and their sustainability.

AUEDM's approach is based on the following guiding principles:

- Environment and Disaster education goes beyond the university or formal educational institution
- Environment and Disaster education needs a synergy and balanced mix of traditional knowledge and modern techniques
- Open learning is an important tool for disaster education

## Local Governance System



DRR and CCA essentially boil down to Good Development, which is enshrined in good local governance and appropriate local practices. The emphasis is on local communities being in charge of their resources. Their participation in decision making is the main step required for this. The critical linkages under this are those of access to resources, fulfillment of basic needs, and creation of assets. When resources are restricted and barriers in accessing them are too large, as is projected to be the outcome of climate change, infringement of rights is seen and it becomes difficult to even fulfill basic needs of the vulnerable communities. Only when there is sufficient access to resources to be able to create physical, social, economic, political and environmental asset, can communities be protected from shocks and stresses. The current efforts of the United Nations for localizing the HFA are also in line with the approach of strengthening local governance systems and empowering them with appropriate knowledge, tools and skills for mainstreaming DRR and CCA in their developmental work. The research and education community can play a very useful role in this by bringing together the applied science within and across the various related subjects.



# 5

## IMPLEMENTATION TOOLS

*The CCA and DRR interface and the thematic focus areas need to find a space in the research and teaching agenda of universities to be mainstreamed effectively. Since AUEDM focuses on practicality of academic content, it emphasizes on appropriate tools for translating agreed principles into field practice.*

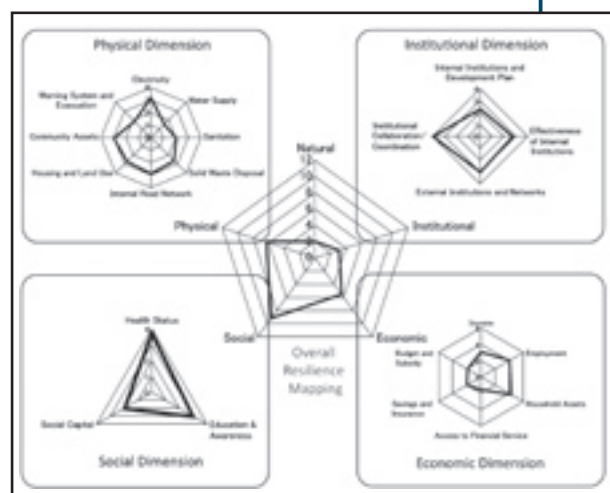
### Climate Disaster Resilience Indexing (CDRI)

Kyoto University, with international partners, has been working on the issue of climate and disaster resilience in Asian cities. The work is based on the implications of climate change on disaster risk, and the fact that community resilience is seen as derived out of climate and disaster resilience. The initiative has so far worked on:

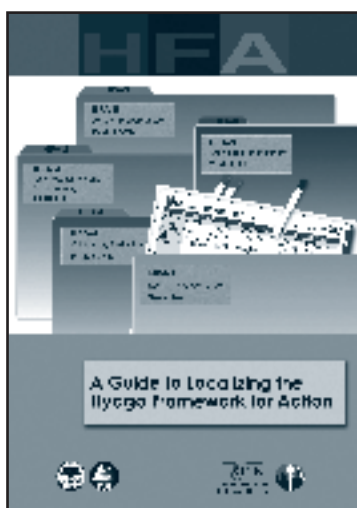
- Developing a methodology for CDRI (Climate and Disaster Resilience Index)
- CDRI application to measure community's climate disaster resilience
- Climate Disaster Resilience Mapping for the identified communities
- Strength and weakness of different sectors of each dimension of CDRI (physical/social/economic/institutional/natural) of a community so that authorities and development organizations can prioritize the sectors for policy implication
- Inputs for policy formulation process of development organizations for urban communities climate action planning and working towards risk reduction.

The initiative has led to the production of a number of city profiles of cities vulnerable to climate related disaster risks.

<http://www.iedm.ges.kyoto-u.ac.jp/report/City%20Profile%20L.pdf>



## Local Words into Action



The Hyogo Framework for Action (HFA) was formulated as a comprehensive, action-oriented response to international concern about the growing impacts of disasters on individuals, communities and national development. The HFA was finally brought to fruition and adopted by 168 Governments at the World Conference on Disaster Reduction, held in Kobe, Hyogo Prefecture, Japan, 18-22 January 2005. The outcome it seeks is “The substantial reduction of disaster losses, in lives and in the social, economic and environmental assets of communities and countries.” This is further elaborated into three Strategic Goals and five Priorities for Action.

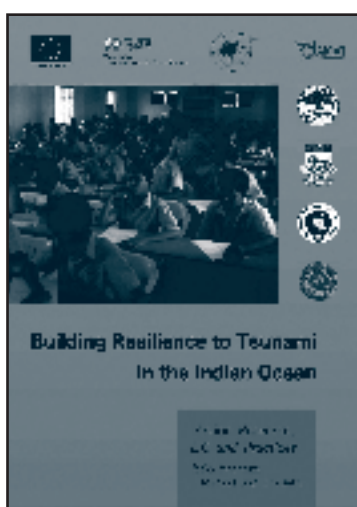
Among other things, the HFA calls on the ISDR to “facilitate consultative processes to develop guidelines and policy tools for each priority area, with relevant national, regional and international expertise.” The document “Words into Action: A Guide for Implementing the Hyogo Framework” was the

first product generated to meet this call. Drawing on wide expertise and experience, the Guide describes 22 tasks that are organized to help address and guide the implementation of the HFA’s five Priorities for Action. Depending on the national situation, the tasks may provide good starting points for organizing action, or useful references against which to check existing policies and procedures. Different users can draw on the parts that are useful to them, adapting the tasks according to their particular needs.

The ISDR, Kyoto University and other organizations are currently working on taking this process a step further, and bringing out a series of documents on Local Words into Action, aiming to enable local authorities and stakeholders take grassroots level action for implementing the HFA.

<http://www.unisdr.org/eng/hfa/hfa.htm>

## Higher Education



Disaster management was not visible as a significant theme in higher education till a decade ago. Rising incidences of disasters, and the focus brought upon the subject through concerted efforts of the United Nations and others through the International Decade for Natural Disaster Reduction (IDNDR), the Hyogo Framework for Action (HFA) and other processes. Higher education programs in the form of Master Degree courses in Disaster Management and related fields, elective courses within degree programs of related subjects like engineering, architecture, social science and others are making their presence increasingly felt. Many of the AUEDM partners are successfully conducting such programs as detailed in an earlier section. Much remains to be done in this direction, with the felt need of many more agencies promoting many more courses to fill the gap of professionals on the ground. There is also a need for informal and cross sectoral movement within the higher education stream, in keeping with the multidisciplinary nature of CCA and DRR.

## Blended Learning

The concept of blended learning entails multiple method learning, through distance learning, video-conferencing, action based learning, contact programs and interactive self evaluation based learning tools. The concept is promoted by the Tokyo Development Learning Centre (TDL) of the World Bank. It is also implemented by affiliate agencies of AUEDM network partners through Global Open Learning Forum for Risk Education (GOLFRE), which is a pedagogy developed by international universities and NGOs who have come together to bridge the gap between knowledge and practice – knowledge as it exists in universities and research centers, and practice as carried out by field workers who are among the most critical frontline practitioners playing major role in reducing disasters. The pedagogy integrates knowledge that exists with frontline workers and academic research for training and development. Its mandate is to tap tacit knowledge, practical wisdom and human capital to create an institutional approach to risk reduction.

The primary aim of the approach is to make disaster and climate related education accessible and affordable, particularly for frontline workers who are often in remote areas and have full time jobs. In order to make the learning process enjoyable and easier, instead of being burdensome, a case teaching methodology is followed. The learning forum's mandate is significant in four main ways:

- It considers risk reduction as a developmental issue, not just mitigation
- It utilizes local knowledge as the core to its educational and training programs
- It integrates the arts into promoting risk reduction in addition to development practitioners
- It offers an online menu of best practice principles and case studies for training and education



## Nairobi Work Program Regional Center Approach

The Nairobi Work Program (NWP) is a 5 year program (2005-2010) implemented by Parties, intergovernmental and non-governmental organizations, the private sector, communities and other stakeholders. Its objective is to assist all Parties, in particular developing countries, including the least developed countries and small island developing States to:

- improve their understanding and assessment of impacts, vulnerability and adaptation to climate change;
- make informed decisions on practical adaptation actions and measures to respond to climate change on a sound scientific, technical and socio-economic basis, taking into account current and future climate change and variability.

The NWP is undertaken under the Subsidiary Body for Scientific and Technological Advice (SBSTA) of the UNFCCC. The NWP disseminates knowledge and information on adaptation including outcomes of program implementation and action by partners as widely as possible through a variety of knowledge resources and publications. The NWP relies on regional centers as a means to deliver information and training, and in doing so, focuses on the following:

- Learning institutions to assist vulnerable communities to identify long-term needs;
- International, regional and national adaptation research and technical support Centres;
- Exchange of experiences on endogenous technologies.



Nairobi work programme on impacts, vulnerability and adaptation to climate change:  
[http://unfccc.int/adaptation/nairobi\\_work\\_programme/items/3633.php](http://unfccc.int/adaptation/nairobi_work_programme/items/3633.php)

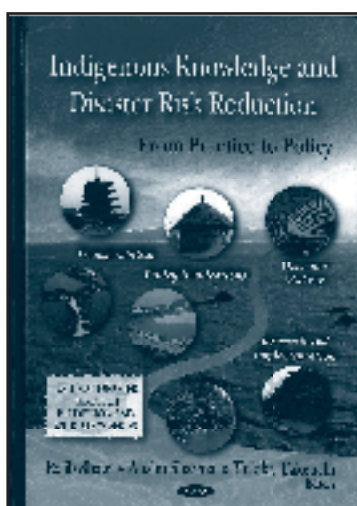
## Community Based Approaches



Community based approaches have evolved and have gained wide acceptance in recent decades. What started as Rapid Rural Appraisal methodologies for accessing local information through group interactions using specific tools for facilitating focused discussions has in more recent times evolved into an array of participatory toolkits. Known with different names such as Participatory Rapid Appraisal (PRA), Participatory Learning and Action (PLA), Action Oriented Learning (AOL) and other such names, the processes involve structured interactions with local community groups to gather information in an open ended manner and rapidly as opposed to the closed set of data gathered through time consuming questionnaire surveys earlier. Community based appraisal is best followed up with community based planning, referred to as Community Action Planning, and community based monitoring and evaluation. The community based approach attaches a very high level of significance to local knowledge and wisdom, and believes in the ability of local populations to solve their own problems. Building from local action based planning, it builds upwards to strategic and policy levels, thus adopting a bottom up approach.

<http://www.hyogo.uncrd.or.jp/publication/pdf/Guide/CBDMUsersGuide.pdf>

## Transferable practice tools



Transferable practice tools are those tools that have been applied and found to be effective in one context, and are believed to be applicable in other contexts due to commonality in principles even though the practice itself may be adapted to some extent. Transferrable Indigenous Knowledge (TIK) is a very significant area of work related to disaster risk reduction and climate change adaptation, in which local practices developed by communities over a long period of time have proven to be effective and can be disseminated to other similar communities for their benefit. The Disaster Reduction Hyperbase (DRH) initiative has promoted this concept. Transferability of practice tools is applicable for non indigenous knowledge too. It relies on the need for cross linkages and cross learning among practicing bodies. AUEDM works within its own network for transfer of practice tools across partners, and also engages with external stakeholders such as the Asian Disaster Reduction and Response Network (ADRRN) for wider transferability and networking.

ADRRN <http://www.adrrn.net/>



# 6

## EDUCATION RESEARCH AND ACTION AGENDA

*Education, research and action have been feeding the DRR sector for long, but mostly in isolation. While education on DRR should reach all stakeholders – communities, fieldworkers, politicians /policy makers / disaster managers, academics including students and researchers, and should be easily accessible, cost-effective and should reflect good practices, it is mostly confined to very select institutions in terms of reflection as well as outreach.*

*If cognizance is given to learning that emerges from practices, shifting the emphasis from mitigation to asset building is today recognized as an effective means of reducing risk and of managing the shocks and stresses of everyday life. Risk reduction in this sense is a developmental initiative. Assets mean both tangible assets such as belongings, shelter and intangible assets such as networking, social and political mobilization. Access to knowledge and reaching the widest range of people with appropriate tools and educational opportunities and raising awareness through education and research are a vital part of reducing risk and policy development.*

*It is therefore a significant aim of the network to link and benefit from knowledge that flows across education, research and action streams, and to ensure a cross learning that eventually feeds into the larger good of the communities at risk. Towards these ends, AUDEM recognizes that:*

- *Education for creating a safety culture is important*
- *Young professionals are important stakeholders of this process*
- *Mutual learning among people and institutions is crucial*

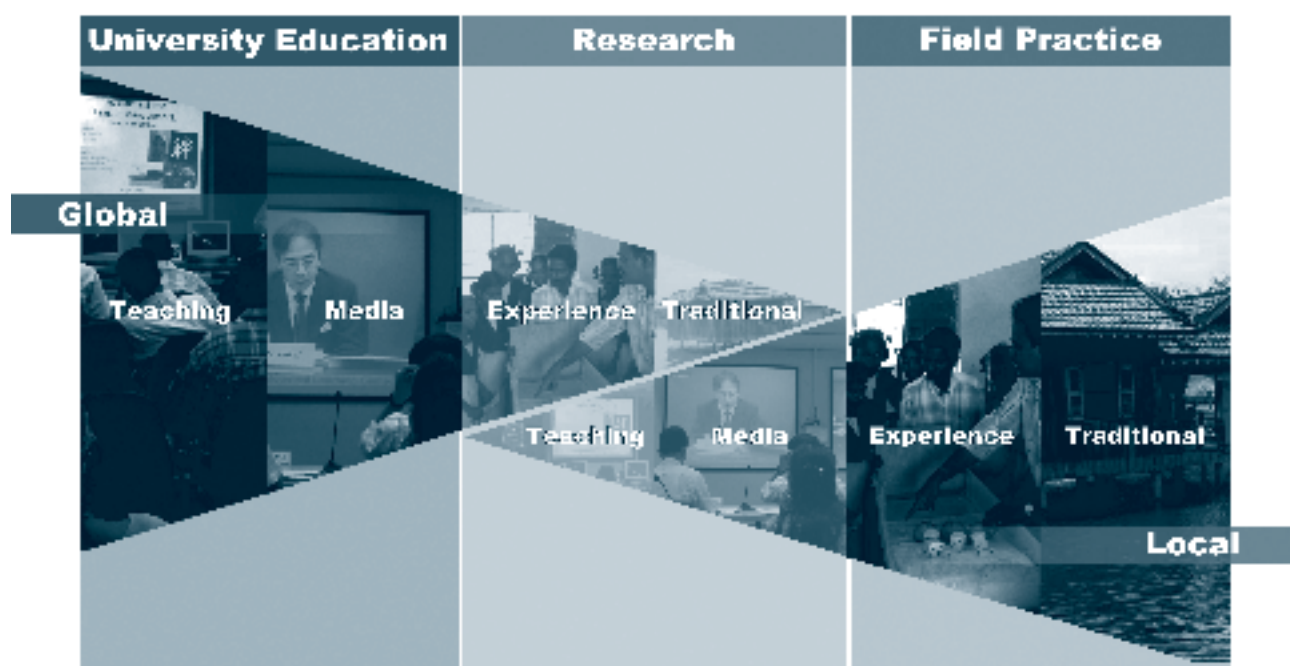


# Linking of Academic Research and Field Practices

University based research and education is focused more on top end knowledge and theoretical content, with little ground based learning. On the other hand, field practice related learning remains primarily ground based, with little use of knowledge on technical advancements. The most ironic fact is that universities and field practice continue in very close physical vicinity of each other, without interacting with each other and benefiting from the useful exchange of knowledge that can take place.

On the university education front, the most common channel of learning through delivery of lessons, backed with reference work done using textbooks, journals and internet reading. In the new age media environment, television, newspapers, magazines and such channels also support university education to a sizeable degree. The inputs based on self-experiences and traditional wisdom is very limited, since the university environment normally does not offer these. The self-experience based learning that does take place is the one that happens mostly before university, or in personal life outside the university, or in job based experiences after the university. In contrast, the learning that takes place within the field practice domain, unaided from external academic sources, is learning that is based on the environment and draws from what happens around the practitioners within their communities, and limited knowledge gained from known experiences outside. As such, the bulk of this knowledge comes from indigenous local sources such as local community elders and experienced persons. The second largest chunk of knowledge comes from self-experiences through the work, and from the media. Only limited knowledge comes from teaching.

AUEDM attempts to capitalize on both these streams by tapping into linkages within each, and also promoting interactions across them.





## AUEDM-ADRRN Linkage : A Knowledge – Action Partnership

AUEDM aims to position itself as a bridge between knowledge and practice, and as such has a natural partnership with the civil society organizations and their networks working on risk reduction in the Asian region. One of the most significant players in this area is the Asian Disaster Reduction and Response Network (ADRRN), a coalition of NGOs from Asian countries working on community based developmental, risk reduction and disaster response themes.

A common thread in the roadmaps of the two networks is the priority given to learning and action processes, largely based on the five priorities of the Hyogo Framework for Action (HFA). Thus the work of AUEDM goes far beyond mere research and education, and that of ADRRN significantly exceeds the boundaries of local action, and both converge at the agenda of:

- making risk reduction a national and local priority,
- improving assessment and early warning capacities,
- promoting education and innovations on the subject,
- identifying and reducing underlying risk factors, and
- promoting preparedness for inevitable impacts of disasters.



## The Road Ahead

AUEDM strives to make significant progress in its nascent efforts in the coming years. It seeks to expand its membership to include many more leading universities in the region, and trigger the process of initiation of many more formal educational programs that will feed the disaster management and climate change adaptation community with skilled person power. It aims to have a stronger and more vibrant system of linkages, which will allow for more collaborative research, complementary educational programs, and synergized activities.

In addition, it seeks to strengthen its links with the practice community, namely the NGOs and NGO networks of the region who are natural consumers of the research and academic products and services of the university community. It looks forward to a two way learning process through its partnership with the practitioners, and through this to see its work being applied to the benefit of vulnerable communities, and at the same time to see the tacit knowledge from communities being tapped effectively to advance research that is based on ground truths.

With the research, education and practice domains covered, AUEDM is confident of emerging as a useful player for influencing the policy environment towards a healthier and community oriented environment and disaster governance regime across the region.

## Participating Universities and Organizations

BRAC University, Bangladesh  
Royal University of Phnom Penh, Cambodia  
Beijing Normal University, China  
Tata Institute of Social Sciences, India  
University of Madras, India  
Institute of Technology Bandung, Indonesia  
Kyoto University, Japan  
National University of Malaysia (UKM), Malaysia  
Tribhuvan University, Nepal  
University of Peshawar, Pakistan  
University of Philippines Los Baños, Philippines  
University of Colombo, Sri Lanka  
University of Peradeniya, Sri Lanka  
National Yunlin University of Science and Technology, Taiwan  
Chulalongkorn University, Thailand  
Danang University of Technology, Vietnam  
Hanoi Architectural University (HAU), Vietnam  
Hue College of Economics, Vietnam

## Observers and/or Advisors

ADRRN  
Myanmar Engineering Society  
GTZ Pakistan  
SEEDS  
United Nations University

### AUEDM Secretariat

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