



Guiding Principles



Mode of Delivery



Environment Disaster Linkages



Higher Education in Sustainable Development



Hydro-meteorological disasters



CCA-DRR Synergy



University Network



Inventory of Resources



Curriculum Contents

Higher Education in Disaster Risk Reduction

Issues, Challenges and Ways

Participating Universities and Organizations

Kabul University, Afghanistan
BRAC University, Bangladesh
Royal University of Phnom Penh, Cambodia
Beijing Normal University, China
Jadavpur university, India
Tata Institute of Social Sciences, India
University of Madras, India
Institute of Technology Bandung, Indonesia
Kyoto University, Japan
Tokyo Polytechnic University, Japan
University of Tokyo, Japan
Universiti Kebangsaan Malaysia, Malaysia
Tribhuvan University, Nepal
University of Peshawar, Pakistan
University of Philippines Los Baños, Philippines
Nanyang Technological University, Singapore
Inje University, South Korea
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, Vietnam
Hue College of Economics, Vietnam

Observers and /or Advisors

ADRRN, Myanmar Engineering Society
Church World Services
GTZ Pakistan, SEEDS, United Nations University

(Updated list as of March 2011)

Inventory of Universities



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AUEDM: www.auedm.net

About AUEDM



The Asian University Network of Environment and Disaster 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

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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.



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Context



Context

When disaster education is mentioned, the usual focus is more on the school or family or community education. Very little focus is given so far on the higher education. However, higher education (in college and university) is the key to develop professionals in the subject. Higher education in disaster is still lacking in most of the countries and regions. In this context, the lessons of environment or the field of sustainable development can provide useful tips. Higher education is not only the curriculum, but the approach or mode of delivery is equally important. To develop an appropriate higher education a system of educational governance is important (COE 2005). Given the role of education has for the overall societal and economic development, there is a necessity to ensure the responsiveness of higher education to the changing needs and expectations of society. In this respect, it is important to ensure participation of external actors in the governance of higher education and to allow the flexibility to accommodate the continuous change of the needs and requirements over time. COE (2005) made several recommendations for higher education, which can be considered as the base of the disaster education in colleges and universities. These include: serving the need and expectation of the society, having appropriate academic freedom, process of setting up long terms goals and developing appropriate strategies for achieving them, providing reasonable scope of innovation and flexibility in research, promotion of good educational governance through regional and international networks, and ensuring quality control of teachers and students.

For development to be sustainable, mitigation of the destructive effects of natural disasters remains a challenge. Proper application of scientific and technical knowledge on disasters offers an opportunity to reduce the vulnerabilities and risks of various social groups. Disaster education is now recognized as an essential element in formulating the appropriate disaster risk reduction strategies for any country. Over the last few decades, there has been remarkable

progress in developing the theoretical basis for disaster management. The advancement in science and technology allows better understanding and presentation of risk and vulnerability issues; application of remote sensing techniques and GIS has significantly contributed in this regard. Social scientists have been successful in exploring the various social dimensions associated with disaster risks and vulnerabilities.

Higher education in disaster risk reduction (DRR) is a multi-disciplinary issue. It encompasses all faculties of knowledge ranging from science, social science, humanities and so on. It has not been long that some formal academic degrees have been offered in the field of disaster risk reduction from a few academic institutions worldwide. Since long before offering academic degrees, many institutions around the world have been conducting disaster related research and offering training programs of varying duration. The objective of these research and training and degree programs are mainly to foster local or regional need.

It is important to facilitate disaster risk reduction (DRR) education at tertiary level through development of a regionally suitable and sufficiently flexible curriculum structure. Before embarking on developing a curriculum structure for DRR education, particularly at the post graduate level, it is important to differentiate DRR education from DRR training. This is because, prior to the evolution of mainstream DRR education, DRR training either in the form of response and recovery or preparedness had a fairly wide spread across agencies concerned with it. DRR education is not only about the creation of well versed professionals in DRR but is also a vehicle for knowledge accumulation and importantly knowledge creation. While there are academic programs that deal with disasters from the perspective of discipline that hosts them i.e. geology, engineering, geography to name a few, there is yet to visibly emerge DRR as a discipline on its own, which takes comprehensive account of all components.



Higher Education in Sustainable Development

Higher Education in Sustainable Development

CRE (1994) has developed the university charter for sustainable development in 1994. The charter points out that education at all levels, especially university education for the training of decision-makers and teachers, should be oriented towards sustainable development and foster environmentally aware attitudes, skills and behavior patterns, as well as a sense of ethical responsibility. Education must become environmental education in the fullest sense of the term. To conduct appropriate education in sustainable development, the charter urges the universities to take appropriate actions as: institutional commitment to the principles and practices of environmental protection, promoting environmental ethics among teachers, students, education of university employees, programs in environmental education, inter-disciplinarily, dissemination of knowledge, networking, partnerships, and technology transfer. The point most applicable to higher education [HE] was the need for the reorientation of existing education to take sustainable development principles into account (Brunton 2006). In addressing this point, McKeown (2002), makes the argument that countries should be careful not to confuse reorientation and increasing the amount of education. Despite numerous bodies arguing that economic, social and environmental issues need to be equally weighted it is often the environmental angle that comes to the fore. 'Greening the university' or 'greening the curriculum' have become commonly used phrases that tend to refer to the integration of environmental perspectives into university operations and teaching (Alabaster and Blair 1996). Brunton (2006) from his study concludes that the ingredients for effectively incorporating ESD into teaching and learning practices include:

- **Full integration of ESD into the curriculum (i.e. not a one-off or final-year option module, with continuity (i.e. not a three-year project that ends in a report)**

- **Student-centered activities and assessments that reward critical thinking and reflective learning, e.g. use of problem-based learning, projects, case studies, portfolios, field studies**

- **Trans-disciplinary teaching, with modules that are taught by staff from a range of disciplines and encourage contact between students from different subject areas**

- **Teaching that emphasizes that ESD is an ongoing process, i.e. part of a lifelong learning journey where answers are not hard and fast.**

In an interesting article, Fortuin and Bush (2010) mentioned that to understand the complex issues environment and sustainable development, the scientists need "boundary crossing skills" next to domain specific knowledge and communicative and social skills. Citing the example of the European Workshop (EUW) as an interdisciplinary course, the paper suggests to incorporate course structure [stage based with specific phases focusing on specific inter-disciplinary topics], course components [including matrix approach with course reporting and fieldwork], communication among students, and role of teachers as essentials to facilitate the "boundary crossing skills" among the students. Two components of the EUW, the matrix approach and the field work, particularly contributed to enhancing students' awareness of disciplinary and cultural boundaries. They also contributed to the students' appreciation of using different disciplinary and cultural perspectives in solving problems. The students developed a positive attitude or habits to crossing boundaries, a precondition for being able to cross them. By working on a real project in an intercultural setting, the students can be confronted with shortcomings of scientific research and the often politicized nature of environmental management. Learning to cope with these issues by questioning the reliability of information and



Higher Education in Sustainable Development

realizing that decisions are often made in a particular context, exposed the students to the central challenges of crossing boundaries between theory and practice, disciplines and cultures. This realization will be transferred into research and professional skills as they advance with their academic and professional careers and will be further exposed to the complexity of environmental and societal problems. Realizing that one should cross boundaries to solve problems could be one of the most important elements in their education (Fortuin and Bush, 2010).

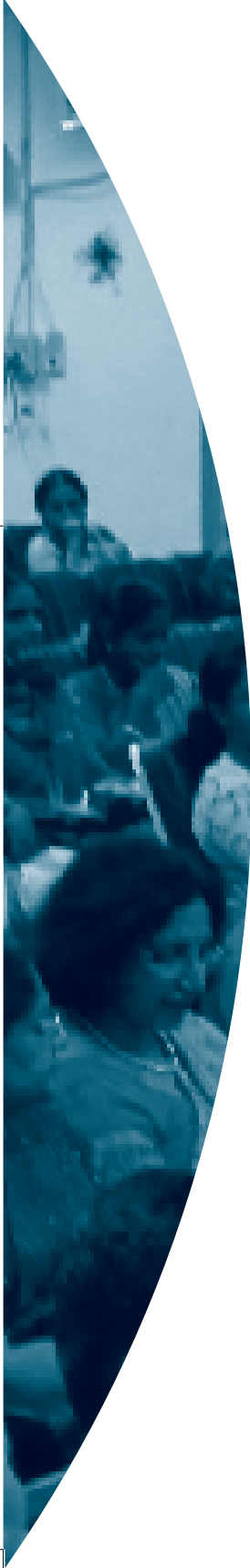
There exist several other models of deep learning (Warburton 2003), sustainability trans-disciplinary education model (STEM) (Clarke and Button 2011), competency enhancement for interdisciplinary issues (Parker 2010) in higher education. Deep learning is a key strategy by which the students extract meaning and understanding from course materials and experiences (Warburton 2003). Because of the range and interconnectedness of environmental, social and economic issues, and the importance of interdisciplinary thinking and holistic insight, deep learning is particularly relevant in the context of education for sustainability. However, deep learning can be inhibited if the existing interests or backgrounds of students have a strong disciplinary focus. The STEM integrates the sciences, arts and aesthetics, and the university with the greater New Britain community, and beyond (Clarke and Button 2011). Academic areas included geography, environmental science, communication, art history, aesthetics, and teacher education. The trans-disciplinary methodology was integrated in a learner-centered design. As a result of the mutual learning implicit in the STEM, all participants expanded each other's understandings of sustainability. Students were learning from instructors, instructors were learning from students, students were learning from students, instructors were learning from instructors, and all were learning and sharing knowledge with the greater community. As a result, all participants gained a deeper and broader understanding about human-environment relationships and how humans impact natural resources. Competencies are at the heart of the new forms of inter-agency and inter-professional working that is increasingly recognized as essential to deliver care

and sustainability in a joined-up world (Parker 2010). The literature review demonstrates developments towards action competencies in inter-disciplinary for sustainability but with an over-reliance on students guiding their own practice and reflection. Findings highlight potential elements of a more widely informed knowledge literacy, including philosophical, sociological and cultural aspects, that is needed to support the development of these competencies.

In a review of the progress of higher education in sustainable development, Ryan et al. (2010) have pointed out that the Asia-Pacific region offers many creative initiatives and shows considerable progress in ESD and in understanding the learning dimensions of sustainability. At the same time, it mirrors global trends that further work is needed to promote systemic change in educational arenas, particularly in terms of strategic integration within higher education institutions. Nomura and Abe (2010) pointed out that encouraging leadership development for sustainability amongst university executive staff members is critical to continuing and strengthening efforts in this area in Japanese higher education. In contrast, the example from India shows that several principles of sustainable development are embedded in the country's education policy (Chhokar 2010). It is perhaps the only country where the highest court has mandated environmental education at all levels of formal education, which includes a compulsory undergraduate course. However, the challenges of implementing this requirement effectively are hampered by lack of inter-disciplinary competence among staff and students, and traditional methods of assessment in higher education. In case of China, teaching about sustainable development has been integrated into technical fields, especially at universities in major cities, and research has been undertaken to develop economically effective and environmentally friendly innovations (Niu et al. 2010). However, resources and capacities are still very limited, given the ambitions associated with sustainable development in China. Different examples demonstrate the need to harness national policy, to develop local and regional initiatives and to work effectively towards more profound change in higher education curricula and through collaboration with external communities and stakeholders (Ryan et al., 2010).



Emerging Issues

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Disaster Risk Reduction (DRR), being an inter-disciplinary subject has its links to other sectors, like environment, development, human security. The link between environment and disaster is prominent in the area where natural and social issues merge, and this is specifically prominent in the rural areas where most of the communities depend on agriculture and natural resources for their livelihood. These issues are linked with the overall concept of human security (Shaw 2006). Climate change impacts are often regarded as the missing link between environment and disaster. However, the relationship is not clearly reflected in the national policies and international and local actions. Following section shows some of the key issues to be reflected in higher education in DRR.

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, non-engineered 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.

Human Security

The relationship between human security and the environment is most pronounced in areas of human dependence on access to natural resources. Environmental resources are critical part of the livelihoods of many people. When these resources are threatened because of environmental changes, people's human security is also threatened, and people move from the rural areas to the marginal lands, which leads to a decline in the household income. This relationship is captured in the promotion of sustainable development. Two other fields – environmental security and sustainable development – emerged and grew roughly during the same period as human security and human development. Disaster risk reduction has a direct connotation to human security. Many of the natural disasters like flood and drought are directly related to the environmental degradation and climate change. Disaster events affect the poor the most by affecting their lives, properties, and livelihoods. Therefore, by creating disaster-resilient communities, it is possible to enhance human security. Although some countries have taken pro-community measures to enhance environmental sustainability, thereby reducing the impacts of disasters, there is still a long way to go in the direction of synergy of community-based natural resource management and disaster risk management.



AUEDM

Background,
History, Activities

AUEDM

Background, History, Activities

The Asian University Network of Environment and Disaster Management (AUEDM) is a unique initiative of prominent Asian universities that come 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, in addition to conventional national and thematic boundaries. AUEDM members work in close collaboration to conduct education and research, share findings and find ways forward in a region that is increasingly at threat due to climate change impacts. AUEDM also works closely with governments, international agencies and corporate and civil society organizations to establish collaborations that eventually lead to resilient communities. AUEDM reflects each member's commitment to implementation-oriented education and research in the field of environment and disaster risk reduction. The objectives of AUEDM are:

- 1. To share and work together (bilaterally or multilaterally) in promoting environment and disaster risk reduction in higher education (focusing on, but not restricted to, post-graduate education)**
- 2. To collaborate on field-based and policy oriented research focusing on different aspects of disaster risk reduction and environmental management**
- 3. To broaden the scope of education and learning in the environment and disaster risk reduction field through collaboration with diverse stakeholders including NGOs and local governments**
- 4. To document, develop and disseminate knowledge products in the field of environment and disaster risk reduction**
- 5. To provide a forum for consultation, information sharing and cooperation among universities on matters and themes of common interest**

6. To enhance recognition of the vital role of universities in implementation-oriented education and research in environment and disaster risk reduction

One of the specific features of the AUEDM is close cooperation with the civil society organizations. Non-government organizations (NGOs) have direct field access, and experiences in grass-root project implementation. However, these experiences are not properly reflected in the educational curriculum. Thus, the network aims at bridging academic research, education and field practice. Some of the highlights of the university-NGO cooperation are:

- 1. Quality of knowledge and information: All participating universities in the targeted countries are esteemed organizations in the field of disaster risk management. Therefore, it brings high quality knowledge and information.**
- 2. Extensive network: The four universities have largest networks in the tsunami affected areas, and thus ensure that the knowledge product will have largest circulation in future.**
- 3. Ensuring sustainability: Through development of the certificate courses and customized courses, young professional development will be ensured, which is linked to the sustainability of the disaster preparedness activities in the targeted countries and communities.**

AUEDM Started from an Imperative

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 risk reduction 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.

AUEDM collaborates with different other networks

The Asian Disaster Reduction & Response Network (ADRRN) is a network consists of 34 national NGOs from 16 countries across the Asia-Pacific region. With a strong footprint in the region, the network members are constantly engaged with local communities strengthening their ability to combat disasters, providing humanitarian aid like food, water, shelter and health care, protecting critical facilities like schools and hospitals, creating awareness, advocating for policy changes and improving the capacity of community based organizations.

For over 20 years, CITYNET (The Regional Network of Local Authorities for the Management of Human Settlements) has committed itself to helping local governments improve the sustainability of human

AUEDM

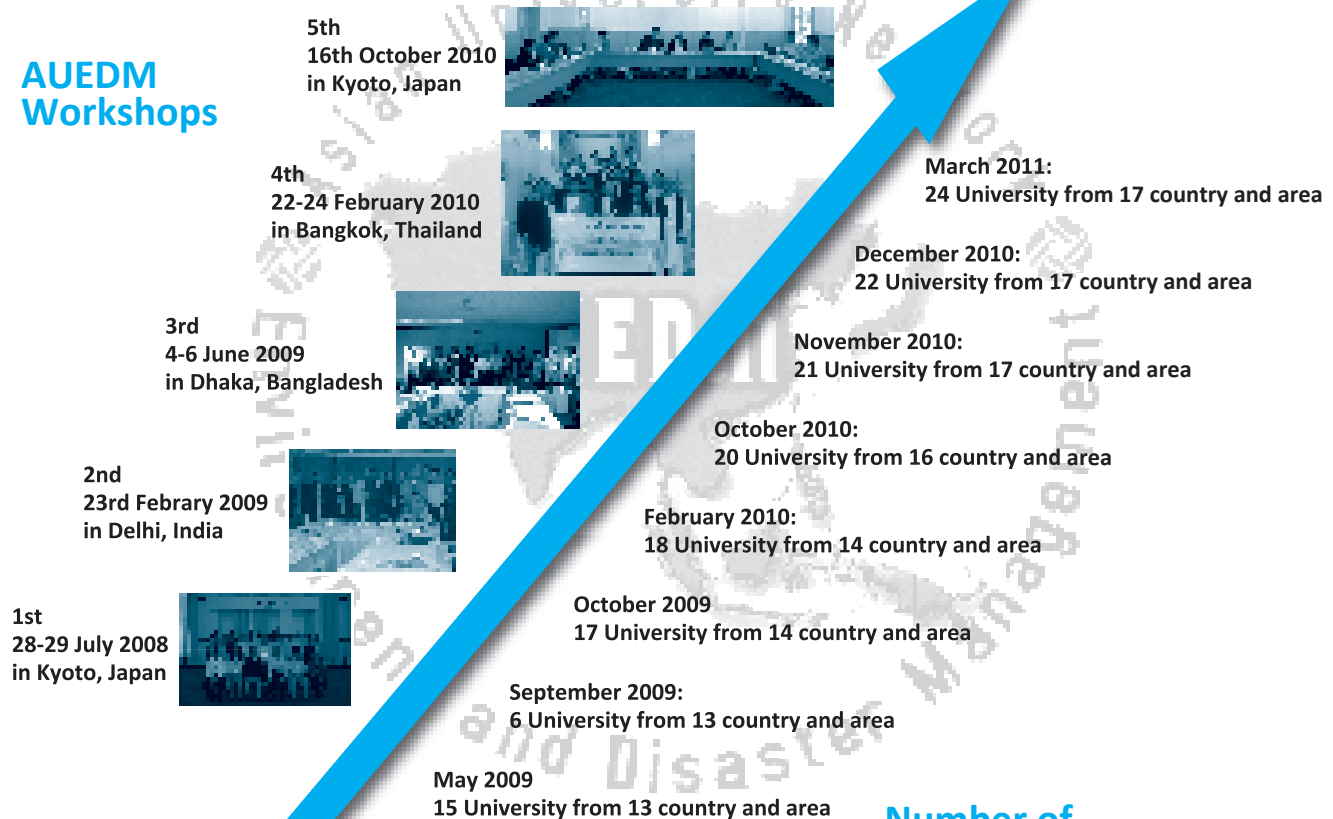
Background, History, Activities

settlements. Starting with 26 members in 1987, CITYNET has grown to become an international organization of more than 100 members in more than 20 countries, most of which are cities and local governments in the Asia-Pacific region.

United Nations University has started an innovative networking among universities called UNCECAR. The University Network for Climate and Ecosystems Change Adaptation Research (UNCECAR 2009) was established in 2009 by leading universities in the Asia Pacific region to strengthen the higher education sector to respond effectively to climate and ecosystems change. Research and education are the main focus of UN-CECAR. The network will bring together all-available resources and expertise across disciplinary lines to work collaboratively to enhance understanding on how climate change is affecting roughly two-thirds of the world's population who live in Asia Pacific region, and advance adaptation research for the design of appropriate policy and development strategies.

History and Evolution of AUEDM

AUEDM Workshops



Number of Member Universities



Guiding Principles of Higher Education

As explained in the earlier section, disaster risk reduction (DRR) is an inter-disciplinary subject, and needs to be practical and field oriented with a balanced approach of theory and practice. In reality, DRR higher education is practiced in different departments in the universities, starting from engineering, science, architecture, agriculture, economics, social science and humanities. A comprehensive DRR course is desirable but possible not a practical solution in many countries, depending on the market mechanism of required professionals. DRR higher education can learn significantly from the process and approaches of sustainable development. Following parts are some suggested future directions of higher education in DRR.

Inclusive Curriculum

Disaster type, nature, intensity, density, frequency, perception, damages, response, relief, recovery, prevention, mitigation, and preparedness vary not only in terms of location but also relate to the socio economic conditions, technical capabilities, political priorities, development agenda of particular societies. While each has its own priority a curriculum structure needs to address issues at a general level that are inclusive of all for a well rounded foundation to proceed to specific issues. This requires a faculty network with technical support of the Universities concerned in order to design a universally acceptable curriculum on disaster risk reduction and climate change adaptation. This should consider the potential time investment of both students and teachers and optimize the opportunity for quality student faculty interaction in support of learning and sharing information on approaches and innovation in the field of disaster risk reduction.

Theoretical Focus

The curriculum will focus on imparting education primarily in the field of disaster risk reduction with climate change adaptation, disaster risk reduction/prevention/mitigation as important components. The theoretical focus will be on the basic concepts and theories of disaster risk reduction climate change adaptation, global warming and scientific understanding of the various types of disasters.

Field Orientation

The curricula will not only focus on theoretical knowledge but the faculty and students would undertake research on disaster related issues. Exposure of students to real life situations to assess vulnerabilities, mitigation and preparedness measures will help them bridge the theories with the practice. Scientific approaches could be adopted to conduct research work on Disaster risk reduction more

at the field level to make it valid, applicable, and authentic. New techniques could be identified and adopted in this regard particularly for risk, vulnerability, and capacity assessment. Tools from the relevant field could be merged in the field of disaster risk reduction for the conduction of various studies and researches.

Multidisciplinary

Disaster preparedness and Management are multidisciplinary in nature. Various subjects like Geography, Environmental Sciences, Geology, Economics, Sociology, Social work, Psychology, Medical Sciences, Civil engineering, City and Regional Planning, Architecture, Urban and Regional Planning, Agriculture, Forestry, Animal/ Plant Sciences and Management Sciences contribute to the field of disaster management. Keeping in view the disaster risk reduction cycle it has special area of interest and research. The curriculum of disaster risk reduction will focus on all subjects. This multidisciplinary approach will provide a vast field of research and coordination on one hand and also increase the need of understanding of the subject as a whole on the other. The important point is to streamline these multidisciplinary course contents and researches to an integrated and coherent subject of disaster management.

Skill Enhancement

The curricula will focus on producing trained man power. The training should be based on experiences learned from the previous case studies according to market demand. The trained manpower produced from the university would be engaged in the Government / Non-Government / private sector institutions dealing with disaster preparedness and management and thus play an important role in minimizing the losses caused by the disaster through better preparation and management.

Model Contents of Curriculum

The curriculum is context specific, country specific, and university specific. AUEDM does not prescribe a standard curriculum, each partner university need to develop its own curriculum. However, following are some basic examples of curriculum contents, which need to be customized based on the local context. It needs to be kept in mind that the contents described here are for multi-disciplinary courses, which can be provided to the students with different background.

Model Contents of Curriculum

INTRODUCTION

1. Disaster Management: An Overview

HAZARDS AND DISASTERS

2. Earthquake Risk Management: Problems and Prospects
3. Tsunami Risk Reduction
4. Flood Risk Management
5. Cyclone Risk Management and Mitigation
6. Drought Risk Management
7. Post Tsunami Hazards along the Indian Coast

RISK AND VULNERABILITY

8. Building Codes and Land Use Planning: Challenges of Development
9. Social Vulnerability
10. Macroeconomic Management and Sustainable Development
11. Environmental Vulnerability and Disaster Risk Reduction
12. Climate Change Risk Reduction: Decision Making in Uncertainty
13. Financial Management of Disaster-related Economic Loss

DISASTER REDUCTION TECHNOLOGY

14. Implementation Technology for Disaster Reduction
15. Disaster Management for Infrastructures
16. Geo-spatial Information and its Usage
17. Using Multimedia Technology for Disaster Risk Management
18. Transferable Indigenous Knowledge in Disaster reduction

EDUCATION AND COMMUNITY

19. Disaster Risk Reduction Education
20. Essentials of School Disaster Education
21. Community Capacity and Disaster Resilience
22. Community Based Disaster Recovery
23. Community Based Disaster Management and Social Capital
24. Designing Resilience for Communities at Risk

CROSS CUTTING ISSUES

25. Disaster, Environment and Development Linkages
26. Understanding the Impacts of Disaster on Poverty and Deprivation
27. Climate Change Adaptation and Human Health
28. Human Exposure, Health Hazards and Environmental
29. Impacts of Hydro-meteorological Disaster on Agriculture
30. Forest Management and Disaster Risk Reduction
31. Rural Livelihood and Disaster Risk Reduction
32. Essentials of Urban Disaster Risk Reduction
33. Institutional Capacity in Disaster Management
34. Corporate Sectors and Disaster Risk Reduction
35. Pre-disaster Recovery Planning

REGIONAL EXPERIENCES

36. Asian Experiences of disaster risk reduction
37. African experiences of disaster risk reduction
38. American experiences of disaster risk reduction
39. Small islands and experiences of disaster risk reduction

Following part is another example of multi-disciplinary courses to be provided to the students with wider background. This is to be noted that the previous and following contents are intended for the inter-disciplinary master courses.

1. Geohazards - physical and geodynamic characteristics of earthquakes, landslides, meteorites, sub marine earthquakes, tsunamis, soil erosion etc.

2. Hydrometeorological hazards - tropical cyclones, monsoonal floods, flash floods, rain storm, snow fall, avalanches, landslides, tornados, wind storm, lightning, me-teorites, droughts & wildfires. Cause of natural hazards and disasters.

3. Global climate change - global warming & global environmental change – impact on natural resources, environment, deforestation, environmental damages due to disaster, watershed management.

4. Coastal hazards - impact of natural hazards on development prospects – threat of sea level changes on the global coast, chronic disasters such as coastal erosion / accretion – coastal pollution.

5. Technological / Industrial hazards - Accidents in factories and nuclear power stations. Protection against contamination of the environment from radioactive fall-out and leaking of toxic chemicals. Industrial pollution, effluent contamination and acid rain.

6. Public health and biological hazards - Outbreak of Dengue and Malaria epidemics, bird flu, swine flu, contagious diseases e.g. AIDS. Protection and awareness. Ground water contamination; Water-borne diseases affecting bowels/kidney. Human disasters due to air accidents and bomb explosions etc.

7. Social and economic vulnerabilities as root cause of disaster risk reduction - gender, food security and poverty. Psychological impacts of disaster, social aftershocks, vulnerable groups like women, children, disable and aged.

8. Environmental Vulnerabilities and illustrate the environment-human interactions.

9. Technology Tools in Disaster Management - Hazard-prone areas identification – application of remote sensing and GIS tools – hazard mapping – risk modeling, risk zonation and damage assessments (i.e monetary assessment models in a post disaster scenario or pre disaster projection methods) – vulnerability variables and their methods of importance..

10. Hazards and Disasters in Asia - Preparations and analysis of list of disaster and hazard data base (existing) in Asian countries.

11. Disaster Mitigation and Recovery - Inter-relationship between mitigation and re-recovery - process for developing hazards mitigation plan, implementation of comprehensive mitigation strategies. Urban/ Rural planning and urban infrastructure planning.

12. Early Warning Systems. This chapter will provide basics of early warning system for both hydro-meteorological and geological hazards. Specific focus will be given on the risk communication to enhance the early warning to action.

13. Disaster Risk Reduction - Risk reduction concept – pre and post disaster comparison and analysis – community based disaster risk reduction - understanding the disaster cycle.

14. Disaster Recovery Planning – disaster emergency preparedness and on recovery and reconstruction.

15. Community Based Disaster Management - Stakeholders' participation and preparation of comprehensive management plans –community-based disaster risk management – participatory risk assessment.

16. Coastal Areas Management - Coastal regulations, coastal management in tsunami reconstruction, relocation issues - national and international scenarios.

17. Disaster Planning and Management - Responsibilities of government/private sector in emergency management and disaster recovery

18. Economics of Disaster Management – Economic evaluation of disaster risk reduction, cost benefit analysis of risk reduction activities.



Mode of Delivery





Mode of Delivery

Lectures and Coursework

Lectures are probably the traditional teaching method in many circumstances and for many students; especially for communicating conceptual knowledge, and where there is a significant knowledge gap between lecturer and audience. In disaster risk reduction the lectures are effective because they exploit the spontaneous human aptitude and communications. Experienced teachers should be invited for delivering lectures to the students of disaster management. Teachers from universities, disaster or environment ministries, fire station, life-line related companies, the city government, the volunteer organization and so on should be involved. In some cases there may be students who have experience in DRR in which case the lectures can be supported by interactive session for cross learning.

Fieldwork

Fieldwork is the means of gaining first-hand knowledge of an environment. This experience plays a fundamental role in the teaching of disaster risk reduction. This activity makes the lesson more interesting to students and through it students acquire certain skills, which are rarely learnt in the classroom. Some of these skills, which they can use in everyday life, include the skill of observation, of experimentation and investigation, problem solving, cooperation, communication and decision-making. In disaster risk reduction the students need to carry out data collection and calculations in order to achieve results and they are also encouraged to use different research tools. Tools like questionnaire, interview schedule, FGD (focus group discussion) etc. are common research tools. For students, whether they are in Master's level or in PhD, field work is to be compulsory. The prime focus of the AUEDM is to present an opportunity for graduates from a variety of disciplines to expand their viewpoint through a combined program of taught and research components. The field work/

research will create deeper insight of the issues associated with risk and vulnerability assessment, preparedness, response, recovery, reconstruction and rehabilitation, development and the enhancement of community capacity in a broad range of disaster scenarios.

Internship

Long-term (from 3 to 5 months, depending on the nature of the course) internship program of the students can be considered as a compulsory subject in the DRR education in the university. The internship needs to be long-term, and through this education process, the students need to go out of the university boundaries. The internship places can be research institutions, government departments (national and local), non-government organizations (NGOs), international organizations and bilateral donors and private sectors. Specific monitoring mechanism needs to be placed to ensure the quality of internship. The internship program provides practical, real world knowledge to the students. It also helps them in future job prospects.

Market Demand/Socialization

To some extent, a disaster is predictable, but there are varying degrees of uncertainty as to how and when it will occur. The incidence of a disaster creates varying degrees of anarchy combined with a variance between resources and needs. Therefore, in order to reinstate an affected society back to its pre-event position, it requires extraordinary efforts. While, in the past, responses were slow, today we can rely on the provision of timely relief, but the precision of what we provide to meet the needs of the affected community leaves much to be desired. There is a need of expert people in the field for disaster management. This need can be socialized through advocacy events and effective communication with the relevant institutions, departments and





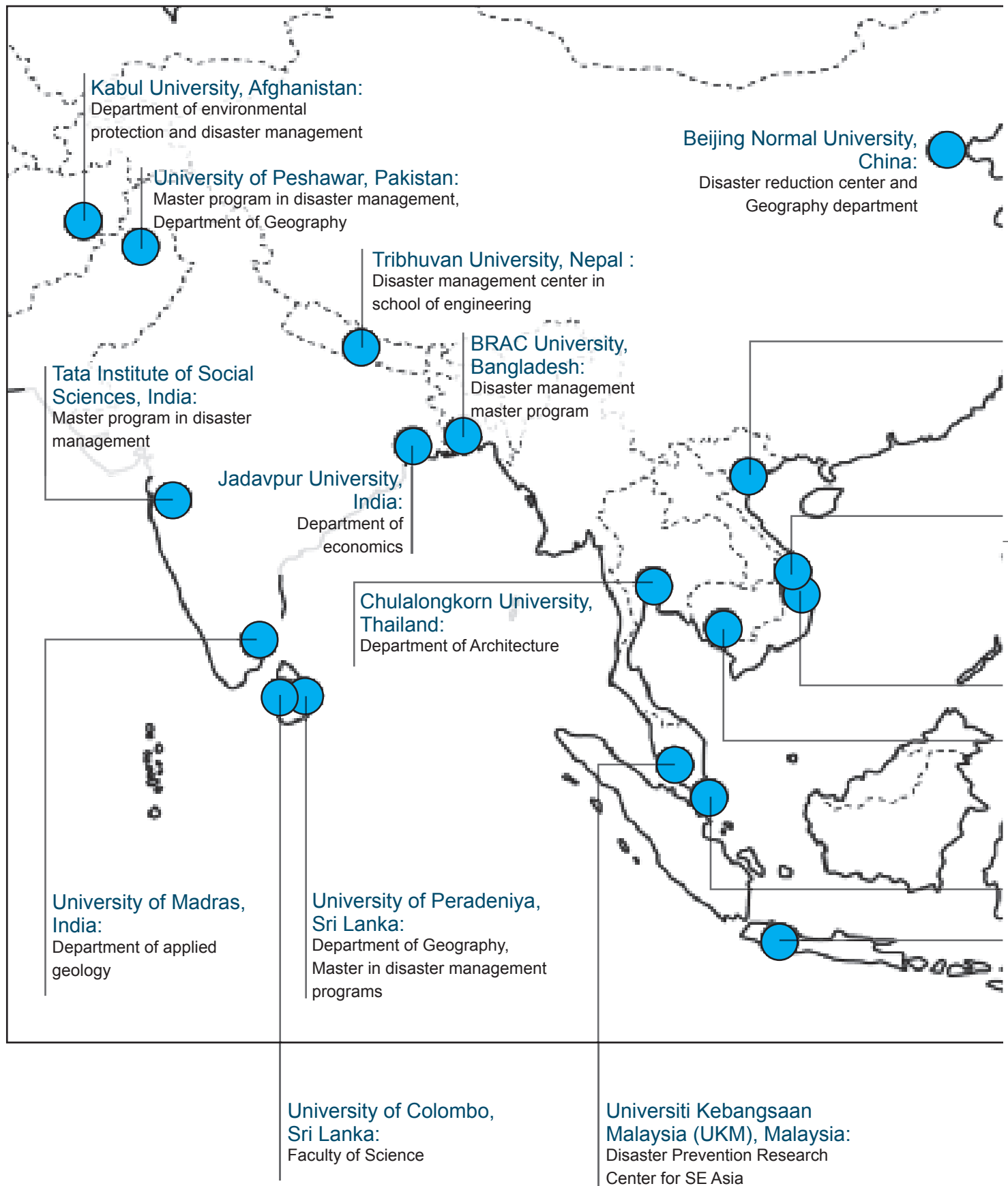
Mode of Delivery

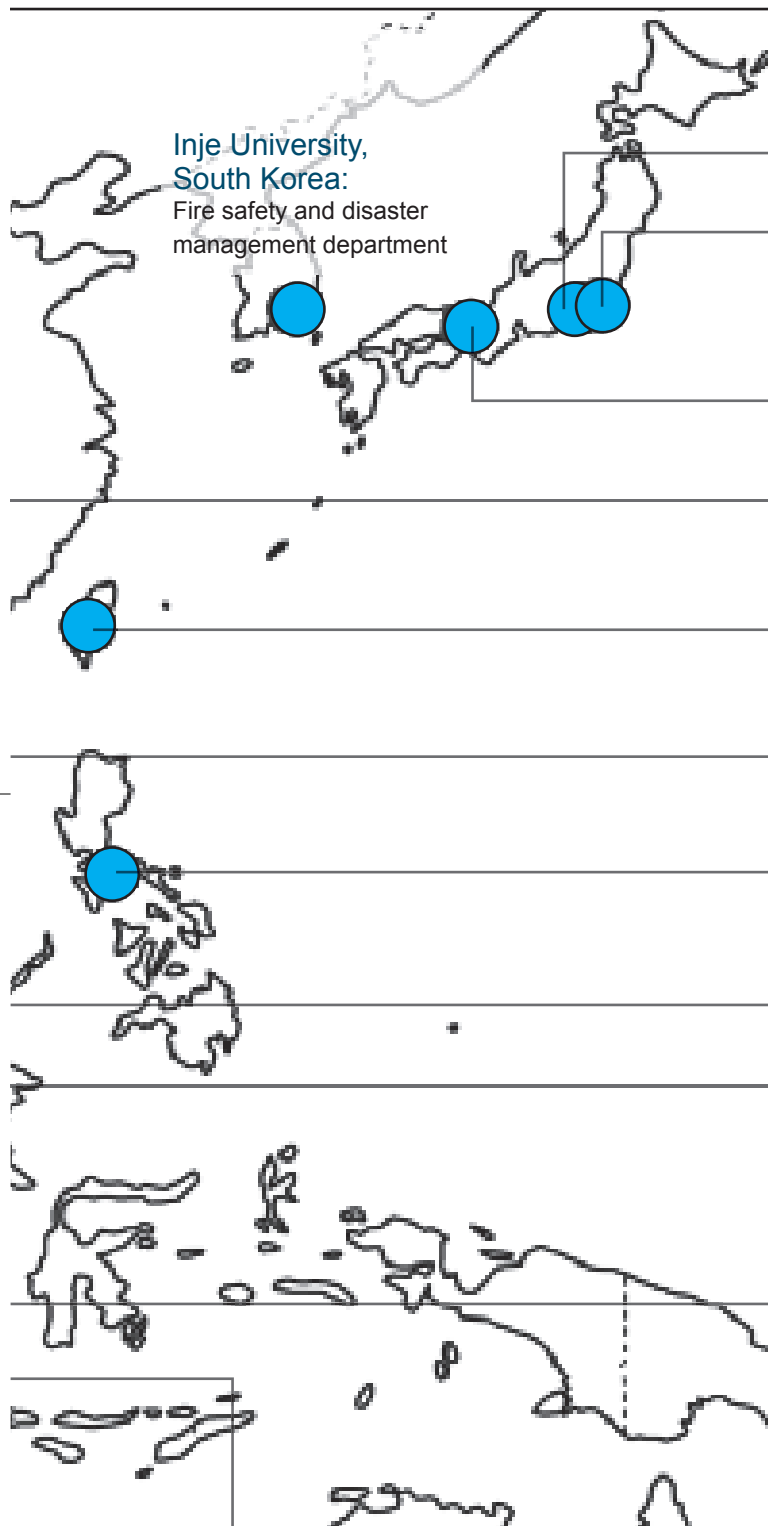
organizations. Disaster risk reduction should be mainstreamed with all the developmental activities. There should be a separate section in each department and ministry for disaster management. These qualified graduates should be placed in departments and organization like Authorities at various levels, emergency response and coordination bodies, early warning, flood control and disaster monitoring bodies, universities and research institutes, non-government organizations, community based organizations, and international development organizations, local and municipal administrations, with Civil Defense, media or hospital management, training institutions, consulting companies or private business. These graduates have high capacities to adjust to the steadily rising complexity of an interlinked and globalizing world because of the interdisciplinary character of the education.

Research Linkages

Academic institutions/Universities and Aid agencies have significant contributions towards sustainable DM. Schools, college and university programs play a key role in establishing successful partnerships with operational organizations because of the technical content of these areas and the expectation of outreach among these departments. Universities have provided research opportunities and contextual knowledge that are of potentially great value for operational agencies. Increasingly university settings may serve operational agency staffs that are prepared to reflect, write and publish on the insights they have gained from their experiences. Academics, for their part, already derive considerable advantage when operational agencies facilitate their access to the field. In both applied and social sciences, essential field data may be difficult or impossible (or dangerous) to gather without an affiliation that is accepted and locally trusted. It is important both for that organization employees and university faculty members to have the opportunities to spend time in each other's programs.

Inventry of Universities





Inje University, South Korea:
Fire safety and disaster management department

Tokyo Polytechnic University, Japan:
Civil engineering department, wind engineering

University of Tokyo, Japan:
Civil engineering, urban safety center

Kyoto University, Japan:
Graduate school of global environmental studies and Disaster Prevention Research Institute

Hanoi Architectural University (HAU), Vietnam:
Disaster risk reduction in urban planning and architecture

National Yunlin University of Science and Technology, Taiwan:
Research center on water and soil related disaster management

Hue College of Economics, Vietnam:
Disaster studies in economic faculty

University of Philippines Los Baños, Philippines:
School of Forestry and Agriculture

Danang University of Technology, Vietnam:
Graduate school of environmental studies

Royal University of Phnom Penh, Cambodia:
Department of environmental management

Nanyang University of Technology, Singapore:
Civil Engineering department

Institute of Technology Bandung, Indonesia:
Civil and geotechnical engineering

Inventory of Resources

1. Krishnamurthy, Bruce C. Glavovic, Andreas Kannen, David R. Green, et al.(2008): Integrated coastal zone management, RPS Publisher, Singapore.
2. Shaw R. and Krishnamurthy R. (2009): Disaster Management: Global challenges and local solutions: University Press and CRC Press, 648 pages.
3. Shaw R., Sharma A. and Takeuchi Y. (2009): Indigenous Knowledge and Disaster Risk Reduction: From Practice to Policy: NOVA Publication, USA, 490 pages.
4. Phong T. and Shaw R. (2009): Integrated river basin management for effective flood risk reduction, Research Publication, Singapore, 268 pages
5. Shaw R. and Krishnamurthy R. (2010): Communities and Coastal Zone Management: Research Publication, Singapore, February 2010, 354 pages.
6. Abe M., Takeuchi Y. and Shaw R. (2011): Adaptive and sustainable post tsunami human resettlement, RPS, Singapore, 209 pages
7. Surjan A., Takeuchi Y. and Shaw R. (2011): From Disaster and Climate Risk to Urban Resilience: Approaching through Community Based Environmental Improvement, RPS, Singapore, 282 pages



Community, Environment and Disaster Risk Management

1. Shaw R., Srinivas H. and Sharma A. (2009): Urban Risk Reduction: An Asian Perspective, Emerald Publisher, UK, December 2009, 373 pages.
2. Shaw R. and Thaitakoo D. (2010): Water Communities, Emerald Publisher, UK, June, 2010, 274 pages.
3. Iwasaki S. and Shaw R. (2010): Integrated Lagoon Fisheries Management: Resource Dynamics and Adaptation, Emerald Publisher, UK, 218 pages
4. Shaw R., Pulhin J. and Pereira, J. (2010): Climate Change Adaptation and Disaster Risk Reduction: Issues and Challenges, Emerald Publisher, UK, 391 pages
5. Shaw R., Pulhin J. and Pereira, J. (2010): Climate Change Adaptation and Disaster Risk Reduction: Asian Perspective, Emerald Publisher, UK, 478 pages
6. Shaw R. and Sharma A. (in press): Climate and disaster resilience in cities, Emerald Publisher, UK, expected in March 2011
7. Shaw R. and Nguyen H. (in press): Droughts in Asian Monsoon Regions, Emerald Publisher, UK, expected in August 2011
8. Shaw R. and Tran P. (in press): Environment and Disaster Linkages, Emerald Publisher, UK, expected in September 2011
9. Shaw R. (in press): Community Based Disaster Risk Reduction, Emerald Publisher, UK, expected in December 2011
10. Shaw R., Shiwaku K. and Takeuchi Y. (in press): Disaster Education, Emerald Publisher, UK, expected in June 2011

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<http://www.rpsonline.com.sg/journals/101-ajedm/ajedm.html>

Volume 2 number 1:

special volume on Natural Resources, Infrastructure, and Post-Conflict Peace-building: Lessons from the United States and Japan

Volume 2 number 3:

special volume on Japanese Experiences of Disaster Risk Reduction

Volume 2 number 4:

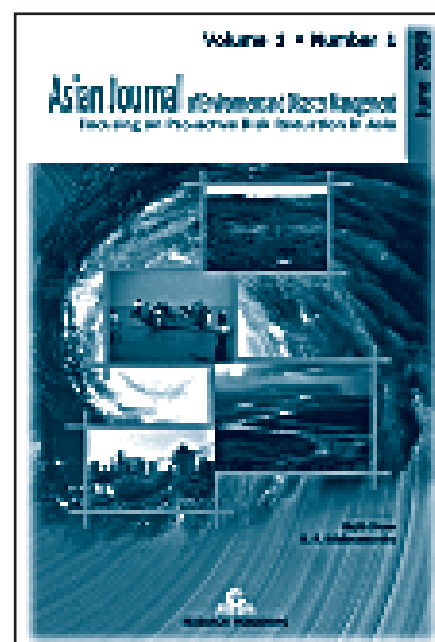
special volume on Climate Change Adaptation: Perspectives in the Asia Pacific

Volume 3 number 1:

special volume on Disaster Reduction Technology Information: DRH Initiative Toward Implementation of Product, Process, and Wisdom

Volume 3 number 2:

special volume on Disaster Education and Risk Communication for Climate Change Adaptation in Japan and Taiwan



Common Online Resources

1. United Nation International Strategy for Disaster Reduction: <http://www.unisdr.org/eng/library/lib-index.htm>. This is the Inter-Agency Library for the ISDR reflects the activities of major stakeholders involved in disaster risk reduction.
2. PreventionWeb: <http://www.preventionweb.net/english/>. PreventionWeb serves the information needs of the disaster risk reduction community, including the development of information exchange tools to facilitate collaboration. Information regarding the design and development of the project together with background documentation can be accessed here along with some services that have been put in place.
3. The International Recovery Platform: <http://www.recoveryplatform.org/resources/>. IRP is an international source of knowledge on good recovery practice.
4. The Asian Disaster Preparedness Center (ADPC): <http://www.adpc.net/v2007/IKM/ONLINE%20DOCUMENTS/Default-DOCUMENTS.asp>. The online information center has a wide range of DRR publications of ADPC projects and studies.
5. ProVention: <http://www.proventionconsortium.org/?pageid=4>. The online resources of ProVention is rich and updated of DRR publications
6. The World Bank: <http://www.worldbank.org/reference/>. There is a section on DRR in the online resource of the WB that include numerous studies and reports on DRR.
7. EM-DAT The international disaster database: <http://www.emdat.be/>. EM-DAT contains worldwide data on the occurrence and impact of natural disasters from 1900 to the present. The database is free and fully searchable through the website, also allowing users to download available data.
8. Disaster Risk Reduction Library: <http://drrlibrary.org/>. This online library contents a good source of DRR publication
9. International Environment and Disaster Management: http://www.iedm.ges.kyoto-u.ac.jp/top_e.htm. IEDM has a long list of downloadable research papers and books on DRR
10. ADRC: <http://www.adrc.asia/publication.php>. ADRC publication archive has a various papers on DRR.

