



4.3. Education and Training

Priority emphasis must be given to education as an essential part of disaster reduction strategies. Education is a crucial means within local communities around the world to communicate, to motivate, and to engage, as much as it is to teach. Awareness about risks and dangers needs to start in early education before abilities to address them can become part of growing civic and professional responsibilities as people mature. The various dimensions of disaster risk within a community can be addressed and continuously reinforced, passed between generations, through formal educational programmes and professional training.

People's understanding and the exercise of their professional skills are essential components of any risk reduction strategy. An investment in human resources and increasing individual capabilities across generations are likely to have more lasting value than any specific investments made in technical measures to reduce risks.

This section will examine the following aspects of risk reduction education:

- *basic role of education and training;*
- *primary and secondary schooling;*
- *disaster and risk management training centres;*
- *academic and educational programmes;*
- *professional trades and skills training; and*
- *capacity-building.*

Basic role of education and training

Past experience has revealed the enormously positive effects of education for disaster risk reduction. Children who know how to react during an earthquake, community leaders who have learned how to warn their neighbours in a timely manner, and societies familiar with preparing themselves for natural hazards all demonstrate how education can make an important difference in protecting people at the time of a crisis.

Education for dealing with risk and disaster preparedness represents a long-term goal. Cultural norms and values as well as related risk perceptions must shift, a process which cannot happen overnight. Education requires a constant and consistent approach, beginning at an early age and continuing through generations.

Over the last two decades, interest in risk management has emerged from the earlier study of specific hazards, the responsibilities of civil defence authorities and the largely structural nature of physical protection. Education and

training about disaster and risk management could no longer be considered as an area of specialist scientific study. During this period, the institutional emphasis related to education and training has changed dramatically.

New hazards and the more complex conditions of risk require that increased attention must now be given to a wider public involvement in learning about risk reduction. Institutional facilities and the professional relationships required for educating future generations equally are becoming more diverse.

Academic research has become much more focused on the transfer of knowledge and experience. This necessitates a much closer association between specialists and populations at risk. This has prompted more participatory research in which women and other highly vulnerable populations are involved, leading to the production of community-generated vulnerability and capacity assessments. As growing attention is given to environmental concerns in basic and early education, new opportunities emerge to introduce subject matter about risk and preventive behaviour into classrooms.

More attention has been devoted to the social and economic conditions of vulnerability. As a result, conventional thinking about disaster management has become much more closely linked to basic developmental issues. By looking beyond the physical attributes of hazards alone, a greater emphasis has been placed on matters associated with risk factors and preparedness strategies.

On a professional level, the very concept of a disaster manager, fostered in the 1980s and early 1990s, no longer sufficiently conveys the expanded roles and responsibilities involved in contemporary strategies of disaster risk reduction.

Where disaster management training programmes have been established already, the frames of reference and the intended audiences are expanding. More attention is being given to integrating disaster risk reduction into national development planning processes and in creating more resilient local communities.

A need remains to accommodate the combined influences of environmental and land management issues, climatic uncertainty, changing demographics and the pressing demands for sustainable livelihoods.

These concepts are now being conveyed increasingly through both educational efforts which concentrate on improving knowledge and understanding, and through a variety of training programmes which seek to improve skills and abilities.

It is clear that disaster risks can only be managed on a multidisciplinary basis that narrows the gaps between researchers and practitioners, teachers and students. While there is a much greater need for wider dissemination of professional and technical knowledge, there is at least as much need for study and understanding about the underlying social and economic dimensions of risk too.

Professional training will play a growing role as public and political authorities recognize that effective risk management strategies require many different skills. Such an investment in the development of human resources can only be sustained to the extent that the value of risk management becomes institutionalized, and likewise is reflected throughout a growing range of educational curricula for students of all ages.

A glance at the US National Oceanic and Atmospheric (NOAA) education web site gives some idea of the many types of educational resources and additional web sites that are available to teach about these issues and natural hazards.

<<http://www.education.noaa.gov/>>

Primary and secondary schooling

To inform and insure the future of all communities, education for disaster reduction needs to begin with youth. Disaster reduction education at the primary and secondary levels fosters awareness and better understanding about the immediate environment in which they and their families live and work. Children are widely known to be influential and effective communicators, and more often than not lessons learnt at school are later transmitted to the home. There are many documented occasions when the safety of a family, or the insistent prodding of a child to protect an important element or feature of the household, have been traced back to a “safety lesson” learned at school.

Numerous opportunities exist whereby educational programmes can be used to introduce hazards, surrounding conditions of vulnerability and community risks. While the sophistication and complexity of educational material for children certainly increases with age and the level of their schooling, teachers can use their imagination to integrate disaster reduction into even the most elementary curricula.

“One of the most significant trends affecting disaster preparedness and response is the transformation that has occurred in disaster management... Once focused equally on war readiness and planning for disasters and viewed as the exclusive purview of individuals with military backgrounds, ‘civil defence’ has evolved into the profession of emergency management – a profession that requires diverse skills, ranging from the ability to develop formal disaster plans, to skills in community outreach and organisational development, the ability to mobilize political constituencies, and knowledge of new and emerging technologies. The professionalization of the field has been accompanied by the development of new organisations, specialty fields and credentialing processes, as well as the growth of college and university curricula focusing on principles of emergency management. With this ongoing evolution in disaster management, disaster research must continue to document how and why disasters occur as well as their immediate and long-term impacts.”

Source: K. Tierney, 2001.



Living with Risk: A global review of disaster reduction initiatives

As much as wise public health behaviour, fire safety, and civic responsibility are routinely taught in schools, knowledge about local weather conditions, nearby geological risks, or careful use of natural resources are equally pertinent to developing a culture of prevention through educational programmes. School subjects in science, geography, environment, reading, health, social studies, communications, and even art all provide openings in which hazard and risk awareness can be cultivated.

Support for educational programmes to feature disaster risk reduction issues and to motivate the participation of youth in the subject through schooling also can be advanced through international initiatives. In this respect, UNESCO is planning to conduct an international programme on education for disaster reduction during 2004 to correspond with the global preparations for the World Conference on Disaster Reduction to be held in Kobe-Hyogo, Japan in January 2005. It will also contribute to the UN International Decade of Sustainable Education scheduled to run from 2005 to 2015.

As universally regarded institutions of cultural value in all societies, schools also provide a powerful example for the community. In times of

crisis, many times schools serve as a place of refuge; as much as they also serve at less critical times as a community place for elders to gather and discuss important matters for the future of the community. Because of these features, school facilities can themselves serve as examples of safe construction, good and protected location, or as a place to bring different parts of the community together for shared contributions in maintaining a safer public environment.

Institutionally too, educational bodies have an important role to play in stimulating and maintaining practices that serve the public interest. Teachers are often admired community leaders, whose opinions and dedication are respected in matters of public interest that extend beyond the classroom. For this reason, the extent to which teachers embrace, and communicate, the importance of a safe school building, protection from physical harm, and an informed and actively involved group of citizens of all ages can become a strong influence in creating a disaster-resilient community.

The examples that follow give some indication of the variety of activities in disaster risk management education and training.

Box 4.11

American Red Cross *Masters of Disaster Curriculum for Disaster Safety*

The American Red Cross, with generous support from the Allstate Foundation, has developed a curriculum that not only teaches students about disaster safety, but helps teachers meet their required objectives as well! Teachers have a lot to cover to meet the learning objectives prescribed by their school system, and that is why we have developed the *Masters of Disaster* curriculum—to help teachers integrate important disaster safety instruction into their regular core subjects such as language, arts, math, science, and social studies.

This is not additional material for teachers to work into an already packed school day. Rather, the *Masters of Disaster* curriculum, which is aligned with the National Education Standards, supplements the lessons teachers are already teaching. At the same time it provides students with information to help them prepare for disasters and stay safe during and after a disaster in their home, school, or community.

The *Masters of Disaster Curriculum Kit* contains ready-to-go lesson plans, activities, and demonstrations on disaster-related topics that teachers can incorporate within core subject areas. A teacher can show students how to plot latitude and longitude on a map by using the curriculum's lesson on how to track a hurricane. They can augment instruction on the water cycle with activities in the lessons on floods. A teacher working with students on word recognition and decoding can choose to use the vocabulary section of the curriculum.

While strengthening students' core academic skills in science, math, social studies, and language arts (including reading, word comprehension, and spelling), the *Masters of Disaster* curriculum educates them about hazards that cause injury, death, and damage in the United States. The materials are designed for flexibility, so that teaching teams can integrate hazard-related lessons into the core academic subjects. The curriculum focuses on: general disaster preparedness, hurricanes, floods, tornadoes, lightning; and earthquakes.

Source: <<http://www.redcross.org/disaster/masters/intro.html>>.

Box 4.12

Education through practice

Established in 1997, Association Prévention 2000 aims at raising awareness and promoting education on natural hazards, particularly – but not exclusively – among schoolchildren in France and Nicaragua. Many of its activities revolve around disaster mitigation and exploring innovative uses of the Internet and information technology to promote the understanding and techniques of disaster reduction. Its main instrument is an Internet site with considerable documentation on natural disasters, considered by many as one of the pre-eminent sources of French-language information on natural disasters.

Association Prévention 2000 is a key player in the education group of the French Association for Natural Disasters Reduction (AFPCN), as well as being a member of the jury for scholars organized every year by the French ministry of the environment. It also motivates young people aged between 10-15 years to inquire from their elders about previous natural disasters in their communities, and then to produce local hazard maps. Many French cities such as Orleans and Tours have become official partners of this initiative. Adolescents aged 16-17 who are interested in pursuing hazard reduction projects can be assigned a scientific partner nominated by AFPCN to oversee their projects.

An Ambassador Network was launched in 2001 to bring together all French schools with educational activities related to disaster risks. The French ministry of education has recognized this pilot project as a valuable instrument in the field of environmental action. Now comprising more than a dozen schools, it produces a newsletter 'Mitig'info' destined for disaster risk professionals in French-speaking regions of the world.

<<http://www.prevention2000.org>>

Disaster and risk management training centres

There are a number of highly regarded disaster management training institutions that have evolved from an earlier emphasis on operational activities. Previous attention devoted to contingency planning and community preparedness has been reoriented towards motivating local participation and multidisciplinary outlooks that can create disaster-resistant communities.

Centres have been organizing a variety of training programmes for the past 15-20 years. Today, graduates from these programmes often constitute the core of disaster professionals in many developing countries, particularly in Africa and Asia.

Often through their efforts, earlier training has provided impetus to the creation of national training programmes or centres within individual disaster-prone developing countries. Current trends in national training reflect efforts to impart instruction for further extension of risk reduction practices through community-level practices, often through the use of locally developed training materials. These initiatives also foster the growth of smaller informal training sessions adapted to local situations and needs, often drawing on local case examples.

Another variation on this type of training for disaster risk management which also reflects admirable examples of capacity-building is represented by the efforts in Cambodia and Viet Nam. In both of these countries exposed to frequent natural hazards, sustained efforts have been committed to institutionalizing training capabilities within the ongoing programme activities of their National Red Cross and Red Crescent Societies.

Structured programmes are conducted at both national and local community levels of activity to increase subject knowledge as well as the necessary communication and motivational skills of trainers. All necessary training materials are in place, and have either been developed or translated into local languages. Past experiences and various examples of community activities to identify risks, prepare for forthcoming seasons of heightened exposure to likely hazards, and lessons learned have all provided insights for the development of locally relevant case examples.

Both of these programmes have demonstrated the beneficial values of a methodical and sustained approach to institutional training conducted throughout the country landscapes by a recognized and highly regarded national institution. The esteem represented by the national societies provides legitimacy and professional credibility to the subject. The voluntary and community-based nature of Red Cross and Red Crescent work invites a high degree of dedicated public involvement.



These elements in themselves contribute to an ongoing national effort in public awareness in local communities, reinforced to a common standard of information and expectation by excellent practical disaster preparedness manuals. It is a justifiable mark of pride in both of these programmes that while earlier training was prompted and conducted by international agencies or external NGOs, the core training capabilities are now undertaken fully by nationals of the respective countries.

Box 4.13

Training centres

With broad regional or global relevance:

- Asian Disaster Preparedness Center in Bangkok, Thailand
- Asian Disaster Reduction Center in Kobe, Japan
- Disaster Management Center at the University of Wisconsin in Madison, United States
- Emergency Management Australia Institute in Mount Macedon, Australia
- International Institute for Disaster Risk Management in Manila, Philippines

More specific subregional or national focus:

Asia

- Bangladesh Disaster Preparedness Center in Dhaka, Bangladesh
- Centre on Integrated Rural Development for Asia and the Pacific in Dhaka, Bangladesh
- International Centre of Integrated Mountain Development in Kathmandu, Nepal
- National Centre for Disaster Management at the Indian Institute of Public Administration in New Delhi, India
- National Institute of Rural Development in Hyderabad, India
- Uttaranchal Disaster Mitigation and Management Centre in Dehra Doon, India

Africa

- Africa University in Mutare, Zimbabwe
- African Centre for Disaster Studies at Potchefstroom University in South Africa
- Disaster Management Institute of Southern Africa in Gauteng, South Africa
- Disaster Management and Mitigation Unit of the National College for Management and Development Studies in Kabwe, Zambia
- Disaster Mitigation for Sustainable Livelihoods at the University of Cape Town, South Africa

Box 4.14

Red Cross and Red Crescent education for preparedness and disaster risk management

The International Federation of Red Cross and Red Crescent Societies is devoting energy to disaster education in many countries. Activities include:

- educating geography and social studies teachers in the Caribbean so they can include disaster education in their classrooms;
- working with tertiary institutions in Pacific island states to incorporate disaster management topics in their curricula;
- developing games and drama exercises as a means of imparting disaster preparedness information to children in the Pacific; and
- using television cartoons to convey messages to adults and children in Central Asian countries.

Academic and educational programmes

Natural hazards have generally been studied in the physical sciences or expressed in terms of physical forces considered by technical disciplines such as engineering. Historically, there has been less academic interest in studying the social and economic effects hazards have on societies.

Noteworthy exceptions in the United States included the early exploration of sociological aspects of disasters in the mid 1960s at the Ohio State University Disaster Research Center. Such thinking, coupled with the social and physical dimensions of geography, later led to the creation of the Natural Hazards Research and Applications Information Center at the University of Colorado in 1974.

Parallel developments occurred in Europe during the 1970s as a variety of technical specialists contributed ideas that led to the creation of the Centre for the Research and Epidemiology of Disasters (CREED) in the School of Public Health at the Catholic University of Louvain in Brussels in 1972.

In 1978, the ideas of a multidisciplinary group of researchers called the London Technical Group led to the creation of the International Disaster Institute, a specialist research centre, in London.

Academic programmes related to hazard studies and emergency management have expanded widely over the past ten years but only in some parts of the world. The University of Colorado's Natural Hazards Center lists more than 60 centres that study hazards and disasters. In addition, an equal number of academic institutions are listed that offer either graduate or undergraduate programmes in emergency management, mostly in the United States.
<<http://www.colorado.edu/hazards>>

The US Federal Emergency Management Agency promotes the professionalization of emergency and disaster risk management through skills training programmes, support for the development of professional certification and degree programmes in higher education. These activities include the development of college-level courses introducing key concepts and theories across the curricula of colleges and universities. Instructor's guides for all these college courses are available online.
<<http://training.fema.gov/EMIWeb/edu>>

ADRC in Kobe, Japan, identifies more than 70 training institutes and other programmes available around the world. It cites education programmes for technical specialists and programmes run by national and professional organizations including academic institutions that offer short-term professional courses in various aspects of disaster management. <<http://www.adrc.or.jp>>

University of Portsmouth, United Kingdom

One academic programme that reflects the development of contemporary programmes in disaster risk management is the Bachelor of Science degree in Disaster Risk Management, offered since 2002 by the School of Environmental Design and Management at the University of Portsmouth in the United Kingdom. The course focuses on disaster preparedness and mitigation, economics and financial planning and other means that can reduce vulnerability within the wider context of disaster risk awareness, appraisal, reduction and management. Intended to be multidisciplinary in orientation, the programme addresses four broad themes: disaster studies, natural hazards, international development and risk management. Related units of instruction

contribute skills in areas including data analysis, GIS technology, economics, and research management so that tools and techniques can be applied for effective disaster risk management practices. <<http://www.port.ac.uk/edam>>

University of East Anglia, United Kingdom

Individual courses were offered by the Overseas Development Group at the University of East Anglia in the United Kingdom during 2003. This reflects the emerging interests in relating disaster risk reduction to matters of climate change, sustainable development and environmental management issues.
<<http://www.odg.uea.ac.uk>>

The course Integrated Approaches to Climate Change Management is conducted in conjunction with the Tyndall Centre for Climate Change, also located at the University of East Anglia. It provides a comprehensive introduction to the concepts, techniques and tools available for integrated assessment of the challenges presented by global climate change and its management in the short, medium and long term. The overall objective of the course is to provide participants with the background knowledge, skills, and concepts needed for their work in specifying and implementing integrated climate change management systems across a wide variety of national and regional settings. The course is designed in the context of the objectives of the UN Framework Convention on Climate Change. <http://www.odg.uea.ac.uk/pages/course_integrated.html>

The scope and content of the course *Indicators for Sustainable Development* correspond to the current global interest in indicators of all kinds. Sustainable indicators are now used in almost all regions to determine the essential viability of development programmes and to determine future objectives. This course explores the current use of indicators and teaches a practical, participatory and holistic approach to their development. Key areas covered include the current use of various indicators in a wide range of global contexts, their use and applications, and the critique of good and poor practices. The course reviews alternative methods for developing indicators of all kinds and teaches systemic sustainability analysis. This



Box 4.15

Disaster risk reduction education in Latin America and the Caribbean

- The University of Antioquia in Colombia is home to the WHO/PAHO Collaborating Centre for Education in Public Health. The faculty of social sciences offers a masters degree in contemporary social sciences and risk management.
- The Center of Studies on Disasters and Risk at the University of the Andes in Bogota, Colombia offers a postgraduate programme in risk assessment and disaster prevention.
- The University del Valle in Bogotá, Colombia offers a postgraduate programme in integrated risk management.
- The Institute of Technology in Ejido, Venezuela offers a technical degree in emergency management and disaster response.
- The Central University of Venezuela Faculty of Medicine has included subjects on emergency and disaster preparedness in the undergraduate curriculum for many years.
- The Cuyo National University in Mendoza, Argentina offers a postgraduate degree in prevention, planning and integrated management of risk-prone areas.
- In Chile, the first postgraduate course on journalism and disaster management has been initiated.
- The National University of Costa Rica offers a masters degree in natural disaster mitigation for Central America, (established through the cooperation of the Swedish Agency for Research Cooperation with Developing Countries in association with other Central American state universities).
- The University of Costa Rica offers a series of courses related to hazards.
- The National Autonomous University of Nicaragua is designing a masters degree in prevention and mitigation of natural disasters.
- The Del Valle University in Guatemala is designing a masters degree related to disaster emergency preparedness and response.
- The University of West Indies' Jamaica and Trinidad and Tobago campuses offer disaster management courses as part of bachelor degree programmes. At the Mona and Cave Hill campus, masters degree programmes on the environment include disaster management components.

holistic approach to the development of sustainable indicators can be applied to participants' own country or professional contexts.

<http://www.odg.uea.ac.uk/pages/course_indicators.html>

The course Disasters and Development: Hazard, Risk and Vulnerability Assessment introduces and evaluates the claim that in many cases poverty and disasters are interdependent. Unsustainable development practices contribute to many kinds of disasters. These disasters in turn increase poverty leading to increased vulnerability through the adoption of unsustainable survival and coping strategies. Proactive risk management is considered as a counter-measure including disaster preparedness and mitigation planning activities. The course is designed for development professionals, emergency planners, government policy and decision makers, civil defence officers and aid workers interested in becoming more attentive to risk issues. Topics include methods to identify hazards and risks, assessing risk exposure and the incorporation of risk considerations into policy decisions to reduce potential risk impacts and prevent disasters.

http://www.odg.uea.ac.uk/pages/course_disaster.html>

Case: Switzerland

There are several academic programmes in Switzerland that are representative of courses of technical study available to pursue training in various dimensions of disaster risk management. One such course is composed of postgraduate studies in the analysis and management of geological risks organized by the Faculty of Sciences of the University of Geneva in association with the Swiss Federal Institute of Technology in Lausanne.

This training is intended primarily for geologists, geographers, geo-technicians, civil engineers and land-use planners. It has the objectives of developing their expertise in the field of natural risk mitigation by integrating it in the planning of sustainable development. The programme offers a multidisciplinary approach to develop solutions for a society confronted with natural risks. It engages specialists who can advise public interests and the private sector to take preventive measures which can reduce the impact of natural disasters. The programme involves consideration of multiple risk assessments related to earthquakes, floods, volcanic eruptions and landslides; the practice of natural disaster mitigation measures; and the overall strategy of mitigation management.

<<http://www.unige.ch/hazards/ceerg>>

Box 4.16

Disaster risk reduction education in Asia and Pacific Regions

Asia

- Indira Gandhi National Open University in New Delhi, India offers a certificate on disaster management at undergraduate level, and a post-graduate diploma in disaster management. <<http://www.bangaloreeducation.com/courses/cdm.htm>>
- The Centre for Environmental Planning and Technology in Ahmedabad, India offers a course in urban disaster management in the School of Planning. <<http://members.tripod.com/~rsharma>>
- The Centre for Environmental Science and Engineering (CESE) at the Indian Institute of Technology (IIT) in Mumbai, India offers post-graduate programmes and activities pertinent to natural hazards and disaster risk reduction. The centre offers advanced degrees in technology involving course work followed by research and also offers interdisciplinary doctoral programmes. These programmes are designed to address the needs and challenges of major industrial interests, governmental sectors, international and UN agencies including the World Bank, UNDP and UNEP. <<http://www.iitb.ac.in/centre~cese>>
- The Centre of Studies in Resources Engineering (CSRE) is another centre at IIT, Mumbai. Since its inception in 1976, it has been involved in developing remote sensing technologies and their applications for natural resources management and environmental monitoring practices. The centre has also done pioneering work in the area of low-cost GIS applications. <<http://www.csre.iitb.ac.in/>>
- Moratuwa University in Sri Lanka includes concepts of disaster management in courses conducted by the departments of town and country planning, architecture, and building economics. <<http://www.mrt.ac.lk/academic.shtml>>
- Ruhuna University in Sri Lanka offers a general and special undergraduate degree programme in natural hazard management within the Department of Geography. <http://www.ruh.ac.lk/Uni/Hss/geography/ge_courses.html>
- The Bandung Institute of Technology in Bandung, Indonesia offers several courses which relate to architecture and environment, and urban planning issues. <<http://archnet.org/courses/>>
- The Coastal Resources Institute at Prince of Songkhla University in Thailand is an institute with a commitment to establishing coastal management that leads towards sustainability. Interdisciplinary methods and tools are applied to consultancy, research and development in media-based activity areas. <<http://www.psu.ac.th/corin/>>

Pacific

- The Centre for Hazard and Risk Management – Risk Frontiers, (formerly, the Natural Hazards Research Centre) at Macquarie University in Sydney, Australia has a mission to create strategic risk management and training solutions for insurance companies and their clients by means of leading research into natural perils and their consequences. <<http://www.es.mq.edu.au/NHRC/>>
- The Centre for Disaster Studies at James Cook University in Queensland, Australia is a multidisciplinary research unit presently housed in the School of Tropical Environment Studies and Geography. The centre addresses both public interests and professional needs in the fields of emergency management and meteorology for the benefit of city councils and other researchers. <<http://www.jcu.edu.au/>>
- The Earthquake Hazard Centre at Victoria University in Wellington, New Zealand is a non-profit organization located in the School of Architecture, supported by the Commonwealth Science Council. It acts as an information network and dissemination centre for earthquake-resistant construction in developing countries. It shares basic earthquake engineering knowledge that is readily available in some countries with professionals working in construction-related fields in developing countries. <<http://www.ehc.arch.vuw.ac.nz/>>

Another approach for disseminating educational opportunity is being pursued by the Natural Hazards Competence Centre (CENAT) at the Swiss Federal Institute for Snow and Avalanche Research in Davos, Switzerland. It was created in 1995 as a focal point for international and national institutions working in the field of natural hazards and to foster interdisciplinary research on the causes of natural hazards and their effects. It also coordinates the work of specialists by forming specialized teams for teaching and research purposes. The centre is made up of university institutes which are themselves part of the Swiss Federal Institutes of Technology. A virtual campus

project has been conceived to offer an electronic learning course in coping with natural hazards based on the combined curricula of the seven CENAT partner university institutes. <<http://www.cenat.ch/cenat.html>>

Other regional variations of these approaches also exist, although comprehensive listings of formal programmes are not so readily available. However, selected examples demonstrate the type and range of postgraduate programmes in disaster risk management that are currently available in Latin America and the Caribbean, Asia, and Pacific regions.



Professional trades and skills training

In Asia, the past 30 years have seen a remarkable growth in the number of professionals trained in different science and engineering branches related to geological, hydrometeorological and climate hazards. There are now many more people with the skills to assess and interpret the physical phenomena of natural hazards, even in smaller developing Asian nations.

However, the teaching of science and engineering only infrequently proceeds into matters of hazard and risk assessment. When the subject is addressed, the courses tend to teach mostly structural mitigation and feature largely physical means of controlling the effects of natural hazards, such as the utility and construction of check dams, flood embankments or retaining walls.

While modern science widely acknowledges that societies are increasingly complex, there is little corresponding attention paid in formal educational programmes to the social, economic or political factors associated with risk management. Accordingly, there is still a lack of social scientists, community-based leaders or broadly informed public administrators practicing in the field of risk reduction.

Asian Urban Disaster Mitigation Programme

One exception is the Asian Urban Disaster Mitigation Programme (AUDMP), implemented under the auspices of ADPC in eight Asian countries. This programme's approach to education includes the development of generic curricula on urban disaster mitigation, which can be adapted and institutionalized at national and local levels through other partnered training institutes.

An array of training programmes, methods and tools have been produced over the past eight years including courses on floods, earthquakes and technological hazards. Other courses have emphasized community-based approaches to disaster reduction and most recently, risk communications. Courses for safer construction techniques for masons have also been developed. In Asian countries, it is more likely to find specialized institutions related to disaster management created by state authorities <<http://www.adpc.net/audmp>>.

Education about sustainable development

An online discussion prior to the 2002 World Summit on Sustainable Development considered how best to promote education and capacity-building for the management of risk reduction. It considered means to incorporate disaster risk reduction in sustainable development practices.

The discussion also reflected a common understanding that education is linked to safety in many immediate and long-term ways. It noted that education must involve public awareness of hazards, advocacy for creating a culture of prevention, development of school curricula and professional training.

However, it was also observed that the issue is not simply one of recommending more education. There is equally a need to address the ways in which these various forms of education and training can link and complement one another.

START – IIASA Fellowships

Another example of building professional capacities in the field of applied environmental change and disaster risks is represented by an innovative public-private partnership. The System for Analysis, Research and Training (START), based in Washington DC, is working in partnership with the International Institute for Applied Systems Analysis (IIASA) in Laxenburg, Austria with the financial support of the David and Lucille Packard Foundation.

Together they provide an opportunity for applicants to participate in the Advanced Institute on Vulnerability to Global Environmental Change. The programme has three components comprising a three-week seminar conducted at IIASA, one-year research grants for successful Institute Fellows, and a workshop that culminates in the presentation of the Fellows' research.

This programme invites the participation of young scientists and professionals under the age of 40 years from developing countries,

although subject to available funding, exceptional applicants from industrialized countries may be considered. The Advanced Institute is multidisciplinary and applicants with backgrounds in social science, natural science, engineering, management and public policy are encouraged to participate. <<http://www.start.org>>

Local collaboration in construction practices

A disproportionate exposure to risk is concentrated in developing countries where a dramatic potential for loss can be attributed to unsafe buildings. Most of these buildings are constructed informally. The involvement of certified technicians or the application of formal engineering practices in these constructions is limited, often due to economic realities.

The problem of safer construction becomes one of conveying sound, risk reduction building practices to the building owner. One mechanism that has been used is by working closely with local artisans, carpenters, masons and other skilled tradesmen who provide most technical expertise in construction.

As they are local residents themselves, they can work as motivators for both current and future

Box 4.17
Practical training in Nepal

The Kathmandu Valley Earthquake Risk Management Project was implemented by the National Society for Earthquake Technology (NSET) in Nepal. Engineering students participated in a building inventory and vulnerability analysis programme during their summer vacation.

More than 100 students were involved in the programme and learned different aspects of safer construction in earthquake-prone areas, which had not otherwise figured in their engineering curriculum.

Even such an informal exposure to risk issues and student recognition of the relevance to their studies demonstrates a potential for future courses for the younger generation. <<http://www.nset.org.np>>

Box 4.18
Regionally-based training capabilities

LÍDERES is a vulnerability reduction course taught in Spanish and targeting the Latin American disaster management community. It is organized by PAHO/WHO and taught almost exclusively by specialists with an international reputation. It aims to strengthen the managerial skills required by disaster risk reduction practitioners. The content of the LÍDERES course is constantly evolving and is revised in response to the needs of its audience. <<http://www.idg.es/lideres>>

UNICEF, LA RED and the Latin American Social Science Faculty (FLASCO) collaborated on a project in 1998 to introduce reforms in the local curricula of risk and disaster education, subsequently published in Educación y Desastres. <<http://www.desenredando.org>>

improvements. To accomplish this type of risk reduction training, it is necessary to recognize the role of these artisans more fully and to engage them in better understanding about the issues involved.

These and similar programmes often have their roots in earlier training programmes for local leaders and artisans first developed during the mid-1990s. These include such activities as those promoted by the Core Shelter Construction Programme in the Philippines, as well as parallel approaches adopted in Nepal through the National Society for Earthquake Technology. In both instances, these practical approaches to local acceptance and furthering artisan training have been successful with considerable interest shown by the participants. They have also led to a replication of the principles in neighbouring communities.

In Latin America and the Caribbean, there has been a growth in educating and employing professionals with skills necessary for risk reduction from within the region. This is in contrast to an earlier reliance on external technical advice and abilities. This practice of developing local capabilities has been encouraged by international agencies.



Capacity-building

Capacity-building can be achieved through means such as training and education, public information, the transfer, provision or access to technology or other forms of technical assistance intended to improve institutional efficiency.

In disaster risk reduction, the concept also relates to the training of disaster managers, the transfer of technical expertise, the dissemination of traditional knowledge, strengthening infrastructure and enhancing organizational abilities.

UN University Centre on Human Security and the Environment

An important and innovative approach to addressing these issues is demonstrated by the decision taken in 2002 to create a United Nations University (UNU) Research and Training Centre on Human Security and the Environment in Bonn, Germany. This new institution is being organized through the joint commitments of the German ministry of education and research, the North Rhine Westphalia state ministry of education, the City of Bonn, and the United Nations University system to foster interdisciplinary research, training and capacity-building.

By creating a new global centre of expertise that brings together the multiple interests in human security and environmental issues in 2004, it is anticipated that it will become a focal point for international networking. With inter-sectoral initiatives it will be able to develop innovative and integrated approaches to further the wider dissemination of the subject.

It is envisaged that specific emphasis will be given to the following types of activities:

- support research and training with a primary orientation towards applications;
- develop methodologies related to integrated risk assessment and management, with particular regard given to traditional and local knowledge;
- encourage policy dialogue among researchers, politicians, policy makers, and other stakeholders for context-specific issues;
- foster regional cooperation and partnership

within and between industrialized and developing countries, bridging technological and knowledge divides between North and South outlooks and abilities;

- facilitate cooperation and coordination of the many efforts of pertinent institutions of excellence worldwide; and
- pursue unbound research of a complex nature that embodies social systems, environmental concerns, and political constructs that combine in ways that are decisive for human security.

In a broader context, most UN programmes are geared to support capacity-building. In 2001, UNDP strengthened disaster reduction capacities in over 60 countries. Programmes included building local capacities for disaster reduction in Central America and Jamaica, developing a new national risk and disaster management system in Haiti, and strengthening national disaster offices in the Caribbean.

UNDP also developed regional strategies for disaster management in Southern Africa Development Community (SADC) countries and among other countries in South-Eastern Europe. It addressed flood risk reduction in the Tisza river basin for Hungary, Romania and Ukraine, and drought risks in Iran, Tajikistan and Uzbekistan. UNDP also supported capacity-building programmes in Albania, East Timor, Romania, Madagascar and Malawi, among many others.

UN Disaster Management Training Programme

The UN Disaster Management Training Programme (DMTP), currently administrated by UNDP, supports capacity-building efforts in the UN system, international organizations and individual disaster-prone countries. Workshops have promoted the establishment of national or regional centres and strengthened their capacities to study technological and environmental hazards, seismic protection, crisis prevention and preparedness.

DMTP has conducted more than 70 workshops involving 6,000 participants in Africa, Latin America and the Caribbean, Asia and the Pacific, the Middle East and the Commonwealth of Independent States.

Its training materials include 22 modules, 27 country case studies, simulation exercises, trainers' guidelines, and videos. They encompass a wide range of topics including learning about disasters, techniques for risk assessment and perspectives about the links between crisis and development.

The training modules have been produced in English, French and Spanish, with selected modules also translated into Arabic, Bahasa Indonesian, Chinese, Portuguese, Russian, and Vietnamese. <<http://www.undmtp.org>>

Latin America and the Caribbean

The Organization of American States (OAS), PAHO and other organizations including LA RED have sought to build capacity through expanded education opportunities in Latin America and the Caribbean over many years.



Pan American Health Organization (PAHO)

PAHO's Catalogue of Disaster Publications and Information Resources contains a detailed description of all PAHO disaster training materials such as books, CD-ROMs, slides and videos.

It lists other sources of information, including the Virtual Health Library for Disasters and principal web sites that contain PAHO publications and multimedia content. The catalogue is available on the Internet and print copies are available on request. <http://www.paho.org/english/dd/ped/Publication_eng.htm>

There has been much progress in risk management in the public health services of the region. All ministries of health in Latin America and the Caribbean now employ at least one official who is in charge of disasters. In many countries there is an entire department or agency devoted to the subject.

In Argentina, Bolivia and Chile, new water and sewage concessions require participating private sector companies to meet disaster reduction criteria in the construction, operation and maintenance of water and sanitation systems.

Vulnerability studies have been carried out in Brazil, Chile, Costa Rica, Ecuador, Peru and Venezuela to examine water supply and sewage systems. This has led to an increased availability of current technical information and a growing demand for training in disaster reduction in this field.

EDUPLANhemisférico

Another comprehensive inter-American strategy demonstrates joint efforts to reduce the education sector's vulnerability to natural hazards. Launched by the Unit for Sustainable Development and Environment of the Organization of American States (USDE/OAS), working with PAHO in 1993, EDUPLANhemisférico employs various means to protect schools.

While its multiple approaches are more fully presented in terms of protecting vital infrastructure (see chapter 5.3.), the programme also features a commitment to improve the curriculum related to reducing risks. It encourages the addition of more elements pertaining to understanding vulnerability and risk reduction in primary, secondary and higher education throughout the Americas so that individuals and various professional interests are prepared to work together for disaster reduction.

LA RED

LA RED too, has developed methodologies for training local authorities in risk management which include individual training modules and information materials. They are being applied in many countries in the region and also have been adapted to local conditions.

Africa

Risk reduction efforts in South Africa require a considerable amount of inter-sectoral collaboration. As such, a training and capacity-building working group has been established so that one body can monitor disaster management training and research throughout the country.





The working group has compiled a comprehensive framework for all types of formal and non-formal disaster management training and other capacity-building programmes. It is also in the process of establishing a body to set standards for disaster management training consistent with the accreditation requirements of the National Qualifications Framework and the South African Qualifications Authority.

Schools can play a vital role in expanding community outreach for hazards awareness and risk reduction, although it is often a challenge to insert the subject into other course curricula. Past experience demonstrates that a limited perception of local hazards and disaster reduction is frequently attributed to a lack of training, awareness, education, and self-reliance within the body of communities.

An effective educational programme conducted through the schools not only teaches children their basic subjects, but also reaches deep into the community through them, their parents and teachers. In the case of Africa, much work can be done in the future to include hazard and risk awareness into basic school programmes through standard environment, geography and science subjects.

Although the African continent does not yet have the breadth of institutions devoted to capacity-building specifically related to disaster risk reduction found elsewhere, there are some important examples that demonstrate a growing interest in the area.

University of Capetown, South Africa

The Disaster Mitigation for Sustainable Livelihoods Programme (DiMP) is located in the Department of Environmental and Geographical Science at the University of Cape Town in South Africa. Initiated in 1996, the programme follows the university's mission statement that stresses teaching should be linked to the new challenges in society, educating for life.

The specific purpose of the DiMP programme is to educate people in the field of disaster management in order to counter the increasing losses stemming from natural disasters in South Africa. In this regard, DiMP is very relevant to the country's contemporary disaster management legislation which calls for more attention to be given to disaster prevention and mitigation.

DiMP focuses on research activities as well as teaching programmes of all kinds. The programme offers undergraduate and graduate degree studies as well as professional short-term training courses throughout the year. The programme encourages interdisciplinary competencies, synthesizing the physical and social dimensions of disaster issues. In May 2003, the university's Department of Environmental and Geographical Science outlined a Masters Degree in Disaster Risk Science which will commence in the 2004 academic year. While its full realization will depend on necessary financial commitments, it will represent the first graduate degree of its kind in Africa. <<http://www.uct.ac.za/>>
<http://undmtp.org/inventory/pages/sa_inventory/sa_uni_cape.html>

Potchefstroom University, South Africa

Similar interest in cross-sectoral capacity-building is demonstrated by the activities of the African Centre for Disaster Studies (ACDS) established within the School for Social and Government Studies of Potchefstroom University in South Africa, in January 2002. It aims to address the need for world-class training, education and research in disaster-related activities within South Africa and the wider African context. ACDS seeks to achieve social development and sustainable livelihoods within the context of excellence in disaster training, education and research.

ACDS offers short courses in all aspects of disaster studies with a particular focus on disaster risk reduction in order to minimize risk and vulnerability to hazards in communities most at risk. Longer academic programmes include a one-year certificate course in disaster studies, and from 2004 an undergraduate degree course in disaster management will be offered.

In addition, the ACDS develops capabilities through disaster research and consulting activities in the field of disaster management by making use of local and international expert knowledge. It strives to increase community involvement and local development of capacities through risk and vulnerability reduction activities.
<<http://acds.co.za/>>

Asia and the Pacific

Sharing experiences and collateral learning through organized training programmes enable disaster managers to learn from each other's experience throughout the country. In India, the National Centre of Disaster Management in Delhi, the Assam Administrative Staff College and other administrative staff training institutes elsewhere in the country conduct disaster management and preparedness training.



The Disaster Mitigation Institute, India

Other institutions invest in building national capabilities by emphasizing local experiences that can be linked more widely to national expertise. The Disaster Mitigation Institute (DMI), based in Ahmedabad, Gujarat is such an example. Its mission is to reduce the impact of disasters on communities by raising awareness, helping to establish and strengthen sustainable institutional mechanisms, enhancing knowledge and skills, and facilitating the exchange of information and experiences obtained through local learning.

DMI is one of an emerging type of institute which seeks to provide a particular focus for disaster managers and to encourage wider participation at the grassroots, national and international levels of activity. Courses reflect both national and local orientations by adapting, testing and then applying existing and emerging frameworks for community-based disaster risk management.

Its training programmes are motivated by the recognition that without mainstreaming mitigation, attention to urban risks will continue to be oriented around emergency assistance. As a consequence, risk identification, reduction and means to spread risks are unlikely to be on the urban agenda.

The primary aims of DMI's national courses are to build national capacities in disaster reduction by sharing local knowledge and experiences, using interactive and participatory training methods. Course materials are developed in the context of South Asia.

Objectives include:

- examination of different disaster risk management models and approaches;
- analysis of community-based approaches in disaster risk management;
- identification of various risk reduction measures that can be undertaken by a community and the transformation of them into community action plans;
- learning lessons by sharing local experiences; and
- promotion of commonly accepted standards or norms for community involvement in disaster management practices.

Participants are attracted from throughout India as well as from organizations elsewhere. Courses are also conducted in various locations in order to attract local, community-based NGOs as well as individual professionals working in disaster management, government and UN agencies.

The institute also publishes *Afat Nivaran*, a monthly in Gujarati, bringing together the experience and insight of government and NGOs with community workers involved in disaster mitigation and risk management activities. *Vipada Nivaran*, a quarterly published in Hindi, reaches out to decision makers with key ideas and experience from the field. DMI is preparing a code of conduct based on a household livelihood security model for urban settlements that focuses on the main themes of income and productive activities, infrastructure, environment, political-and legal systems, information, legislation and implementation practices.

<<http://www.southasiadisasters.net>>

Local collaboration for training

The School Earthquake Safety Initiative is being implemented by the UN Centre for Regional Development (UNCRD) Hyogo Office in Kobe, Japan, in association with the Earthquake Disaster Mitigation Research Centre in Miki, Japan. It focuses on five cities in four countries in Asia: Bandung and Bengkulu, Indonesia; Chamoli, India; Kathmandu, Nepal; and Tashkent, Uzbekistan.

The objective of the initiative is to develop disaster-resilient communities through self-help, cooperation and education. The initiative aims to promote disaster education among children, parents and teachers.



Living with Risk:
A global review of disaster reduction initiatives

This approach to public education also encourages widespread community involvement in retrofitting school buildings. As a visible and highly valued community asset, a safer school can save the lives of children during disasters and can also be used for relief activities. Schools are important in every aspect of disaster management from promoting a culture of prevention and disaster reduction through ongoing community activities.

In December 2001, the Philippine Institute for Volcanology and Seismology (PHIVOLCS) and UNESCO held a training course in collaboration with the Philippine Commission on Higher Education, UNU and ADRC. The programme was aimed at school commissioners, government education officials, and NGO officials. It concentrated on disaster management and schools, and included a module on best-practice earthquake evacuation. It is expected that disaster preparedness will be reflected in more school curricula across Asia.

Future challenges and priorities

Education and Training

In formal education programmes and professional training activities, the shift from a primary focus on hazards to a broader integration of risk awareness, analysis and management has only just begun.

Major disaster events in recent years have shown the need for greater education in risk management. More sustained focus on informal training and community-based capacity-building is essential.

Priorities of disaster risk education must be integrated in routine education and training programmes. These include:

- proceeding beyond a consideration of emergency response;
- incorporating risk education in national development programmes;
- educating about the social dimensions of risk;
- adopting an institutional basis to transmit experience; and
- sustaining commitment to risk reduction education and training.

Proceeding beyond a consideration of emergency response

There has been a progressive acceptance of the distinction between emergency services required to respond to disaster and the more diverse responsibilities related to risk reduction. Both national and international commitments are necessary to invest in human resource development dedicated to risk reduction, first and foremost to support initiatives in the most disaster-prone countries.

A continued expectation, or reliance of external emergency assistance in response to individual disastrous events will impede any efforts to educate and involve future generations more fully in disaster risk management. The significant imbalance in financial allocations and international emergency assistance during disasters compared to the meagre amounts committed to local capacity-building must be redressed in order to develop effective education and training programmes.

Incorporating risk education in national development programmes

Risk is seldom taught in a systematic way or from a multidisciplinary context. A critical challenge for more effective education and training is the need to broaden the base of association. The subject of disaster risk needs to be integrated in education about national economic growth and development.

Educating about the social dimensions of risk

The socio-economic conditions of vulnerability, matters of social equality related to risk, and local community participation are not yet integrated systematically in education programmes. An emerging trend of advanced academic studies that attract both students and working professionals from a variety of fields including technical, social and administrative disciplines should continue to be encouraged and supported.

A long-term vision is needed to expand educational and training processes in support of creating a broad culture of prevention. This requires commitment to the full and equal access for women and men to professional scientific training and expanding efforts to develop new generations of community educators attentive to local risk issues.

Adopting an institutional basis to transmit experience

Responsibilities in identifying, monitoring and managing risk remain insufficiently represented in educational and professional contexts. While specific aspects of financial risk management are routinely included in economics, financial investment and insurance curricula, parallel approaches to risk management in the technical, environmental or social contexts of a society are much less in evidence.

There is also considerable scope to address risk management in public administration education. This could provide a more sustained basis for making risk management an essential element in government practice. Much more can be accomplished by introducing risk awareness into secondary and even primary education through innovative programmes of teaching science, geography, ecology and civic responsibility.

Future challenges in education revolve around developing individual capabilities and collective institutional capacities. Local communities must be aware of the risks to which they are exposed. They then need to institutionalize the technical and managerial abilities to assess and monitor risk and the political and popular structures to manage risk.

Sustaining commitment to risk reduction education and training

Investment in the development of human resources can be sustained only to the extent that the values of risk management are embedded in education programmes. There is a pressing need for innovative means to convey transformed organizational relationships and to accommodate the mosaic of the many different interests involved in shaping people's understanding about disaster reduction. Accomplishments will depend on the extent that professional abilities are expanded for the future, with an increasing expectation that more substantial private sector involvement will be necessary.