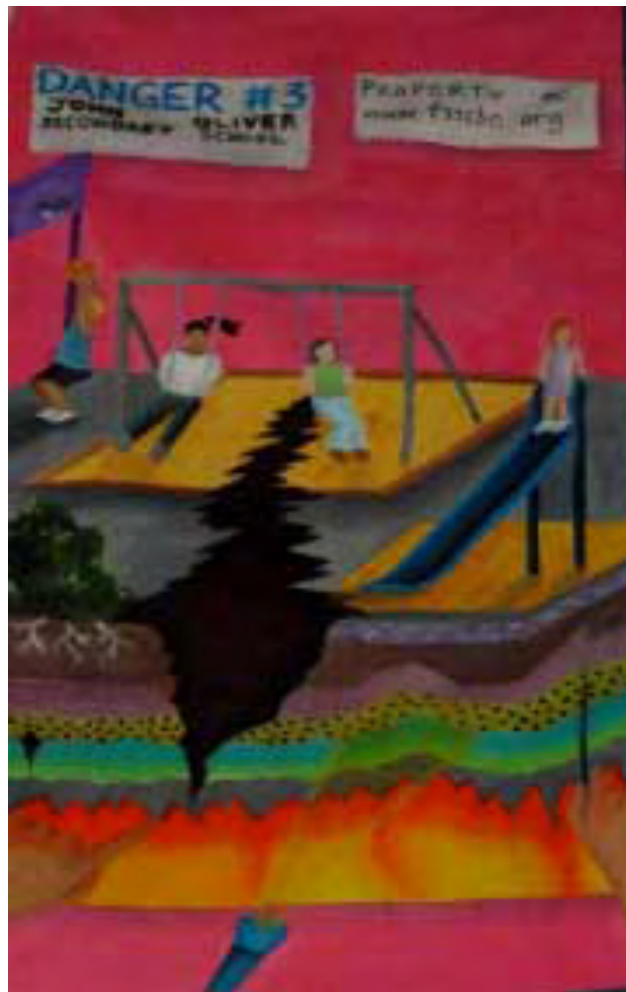# Disaster Prevention for Schools
Guidance for Education Sector Decision-Makers

Consultation version, November 2008

Student disaster reduction awareness campaign banner
Courtesy of Families for School Seismic Safety, Vancouver, B.C.

International Strategy for Disaster Reduction
Thematic Platform for Knowledge and Education

2008

Acknowledgements

Dedication

To the tens of thousands of children who have lost their lives in preventable disasters in schools in our century, and to Jackie Kirk, Nicole Dial, Shirley Case and Mohammad Aimal, who lost their lives in pursuit of education for all children, in whose memory we redouble our efforts to prevent these avoidable tragedies.

Table of Contents

PART A: INTRODUCTION

A.1. DISASTER IMPACTS ON SCHOOLS

Natural hazards are not occasional phenomena with unfortunate consequences. Floods, wind and ice storms, earthquakes, drought, volcanic eruption, and tsunami lead to about 400 national disasters, an average of 74,000 deaths and more than 230 million people affected every single year (CRED, 2008). Local disasters and pandemics more than double these numbers. Three-quarters of the world's population were affected by these phenomena at least once between 1980 and 2000. *Each time a disaster occurs, masses of children are excluded from school, many never to return.* Floods alone affect upwards of 500 million people per year. Worldwide, 450 cities each with a population over 1 million face recurring earthquakes. Cyclones, typhoons and hurricanes are amongst the deadliest and costliest of disasters. Droughts and desertification now affect 250 million people and threaten 1.2 billion in 110 countries (UNESCO, 2007). *These disasters can all be mitigated with knowledge and planning, physical and environmental protection measures, and response preparedness.*

School destroyed in Bam earthquake, memorial wall.
Courtesy of I.I.E.E.S, Tehran

Disasters have PHYSICAL impacts:
The ultimate exclusion occurs when students and staff are killed in unsafe schools, built in harms way, or not built to withstand expected and recurring natural hazards. Non-structural hazards like falling objects, bursting pipes, and blocked fire exits can also cause death and serious injury.

Disasters have EDUCATIONAL impacts:
Damaged schools disrupt hard won educational rights. When instruction time is lost, quality of education drops. When there are no plans for alternative locations and students are denied continuous schooling, many will never be able to catch up and will drop out permanently. When educational records are missing, students may fail to matriculate and go on to further education.

Disasters have ECONOMIC impacts:
Schools damaged beyond repair or unsafe require a level of reinvestment many times higher than the initial small incremental cost of building safely. Loss of income, housing, and delays in matriculation make it challenging for families to support children continuing their education.

Disasters have PSYCHOSOCIAL impacts
Lack of resiliency development and prior empowerment leaves school communities ill-prepared to deliver psychological first aid and to recover rapidly. Students lose a sense of continuity and their hopes and plans for the future are destroyed.

CHILDREN'S RIGHTS	**The UN Convention on the Rights of the Child** (1990): This recognizes that every child has both the inherent right to life (Article 6) and the right to education (Article 28). Known, expected and recurring hydro-meteorological and geophysical hazards threaten both of these rights. Today as the global commitment to the Millennium Development Goals is avidly pursued, including achievement of universal primary "Education for All" by 2015, deliberate proactive steps are needed to ensuring that every school is a safe school, and that children's education includes the knowledge they need to keep themselves and future generations safe.

The promise of education will only be fulfilled if every new school built is a safe school

"HFA PRIORITY #3"	**The UN International Strategy for Disaster Reduction:** **The Hyogo Framework for Action** (2005)Priority 3 of the HFA is to: "Use knowledge, innovation and education to build a culture of safety and resilience at all levels." Disasters can be substantially reduced if people are well informed and motivated towards a culture of disaster prevention and resilience, which in turn requires the collection, compilation and dissemination of relevant knowledge and information on hazards, vulnerabilities and capacities. Key activities are: (i) Information management and exchange (ii) Education and training (iii) Research (iv) Public awareness http://www.unisdr.org/eng/hfa/hfa.htm

The World Education Forum's Dakar Framework for Action: Education for All (EFA) (UNESCO, 2000) acknowledged that natural hazards pose significant challenges to countries in meeting their EFA goals, and would require international level support. Worldwide 875 million school children live in high seismic risk zones, with 32 million of these children newly enrolled in primary education (Wisner et. al. 2004). As this threat has continued to grow, neither national nor international commitments have kept pace with the huge numbers of children affected.

A partial list of the physical impacts of disasters on schools, school-children, and teachers provides compelling evidence that cannot be ignored. School buildings destroyed must be rebuilt at much greater

cost than the 4-8% average incremental cost of disaster-resistant construction. Some of these events will continue to strike during the school day, when vulnerable school buildings will collapse and may cost tens of thousands of children their lives if no action is taken.
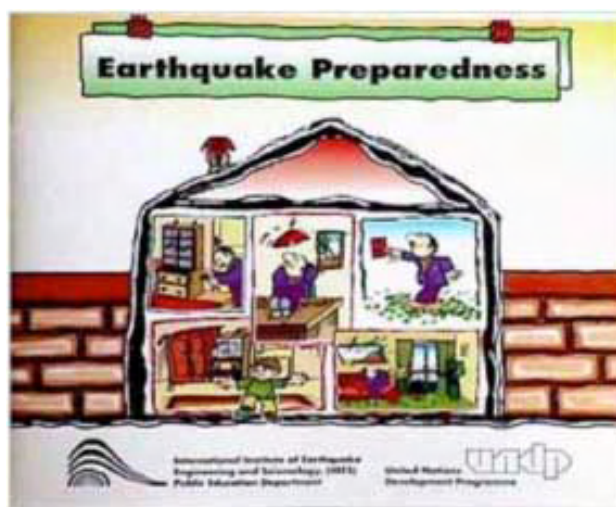
Courtesy of UNDP

A PARTIAL LIST OF RECENT IMPACTS OF DISASTERS ON SCHOOLS *(deaths in schools shown in bold)*		
2008	Myanmar	2,250 schools completely collapsed in Cyclone Nargis. Another 750 were severely damaged.
2008	**NW China**	**An estimated 10,000+ children died in their schools.** An estimated 7,000 classrooms were destroyed.
2007	Bangladesh	Cyclone destroyed 496 school buildings and damaged 2,110 more
2006	Philippines	Super Typhoon Durian caused $20m USD damage to schools including 90-100% of school buildings in three cities and 50-60% of school buildings in two other cities.
2006	Leyte Island, Philippines	**245 children and their teachers died** in a mudslide that buried the village elementary school after 5 days of rain had ceased.
2006	**Uganda**	**13 children died in a school dormitory fire where children were using candles for lighting.**
2005	**Northern Pakistan, Kashmir**	**17,000 students died at school, and 50,000 were seriously injured, many disabled. 10,000 school buildings destroyed. 300,000 children affected. In some districts 80% of schools were destroyed.**
2005	Gulf States, USA	56 schools were destroyed and 1,162 were damaged. 700 schools were closed and 372,000 children displaced. 73,000 college students displaced. $2.8billion was spent to educate displaced students for a year.
2004	Indian Ocean	A tsunami destroyed 750 schools in Indonesia and damaged 2,135 more. 150,000 students without schools. 51 schools were destroyed in Sri Lanka, 44 in Maldives, and 30 in Thailand.
2000	Cambodia	Severe floods directly affected between 500,000 and 1m.students in 1,000 – 2,000 schools in 8 provinces.
2004	Bangladesh	1,259 school buildings were lost to floods and 24,236 were damaged.
2004	**Tamil Nadu, India**	**93 children died in a fire due to explosion of a cooking gas cylinder**
2003	Bam, Iran	67 of 131 schools collapsed, the remaining were heavily damaged. (10,000 school children and 1,200 teachers died and more than 32,000 students were adversely affected.)
2003	**Bingol, Turkey**	**84 children and teachers die in collapsed school building in a moderate earthquake.** 4 schools collapsed. 90% of schools were impacted and education disrupted.
2003	Xinjiang, China	900 classrooms in dozens of schools collapsed in earthquake 27 minutes before thousands of children returned to their classrooms. **Middle school collapsed killing at least 20 students.**
2003	Dominican Republic	18,000 students lost their classrooms.
2003	Boumerdes, Algeria	103 schools destroyed, 753 severely damaged. Cost of rehabilitation $79 million.
2002	AbGarm	16,500 students education disrupted when 8 schools collapsed and 137 were damaged.
2002	**Molise, Italy**	**26 children and 1 teacher died in a school earthquake collapse.**

2001	Cariaco, Venezuela	2 schools collapsed in an earthquake. **46 students died.**
2001	**El Salvador**	85 schools were damaged beyond repair. Replacement and repair cost $114m. **22 preschoolers and their teacher were killed in an aftershock a month later.**
2001	Arequipa, Peru	98 school buildings seriously damaged by earthquake
2001	Taiwan	A three-story school collapsed in the middle of the night.
2001	**Bhuj, India**	**971 students and 31 teachers were killed by this earthquake, though most children were outside for Republic Day celebrations.** 1,884 schools collapsed, destroying 5,950 classrooms including 78% of public secondary schools. 11,761 school buildings suffered major damaged with 36,584 classrooms unusable.
1999	Pereira, Colombia	74% of schools in 2 cities were damaged (22 in one city alone were destroyed). Children were outside for lunch.
1999	Chi Chi, Taiwan	51 schools collapsed and 786 were damaged. Cost of school reconstruction and repair was $1.3 billion
1999	Kocaeli, Turkey	43 schools were damaged beyond repair and hundreds more damaged. School was suspended for hundreds of thousands of children for 4 months.
1998	Bangladesh	Flooding destroyed 1,718 school buildings and 12,000 were damaged.
1998	Eastern Nepal	1,200 schools destroyed or heavily damaged.
1997	Ardakul, Iran	**Primary school collapse killed 110 students (earthquake).**
1997	Cariaco, Venezuela	**2 schools collapsed in earthquake, killing 46 students.**
1993	Maharashtra, India	48% of the 8,311 killed were under the age of 14. Many schools were destroyed by earthquake.
1992	Erzincan, Turkey	**A 6 story medical school collapsed in moderate earthquake, burying 62 students**
1989	El Asnam, Algeria	70-85 schools collapsed or severely damaged in earthquake.
1988	Udayapur, Nepal	6,000 schools destroyed in earthquake.
1988	Yunan, China	1,300 schools destroyed in earthquake
1988	**Spitak, Armenia**	**2/3 of the 25,000 earthquake deaths were school children killed in their schools. 400 children died in 1 school alone. 32,000 children were evacuated**
1985	Mexico City, Mexico	Several schools collapsed in the early morning before school started.
1964	Anchorage, Alaska	Half of the city's schools were severely damaged by an earthquake during school hours, however the school was unoccupied due to the Good Friday holiday.
1963	Skopje, Macedonia	44 schools (57% of urban stock) were damaged by earthquake, affecting 50,000 children.
1958	Chicago, USA	**92 students and 3 adults died in a fire** at Our Lady of the Angels School
1952	Sapporo, Japan	400 schools collapsed in the earthquake.

WARNING!

AWARENESS & CONCERN DO NOT EQUAL KNOWLEDGE AND UNDERSTANDING

Unfortunately there is no direct link between awareness of risk and knowing what can be done about it. A survey in Utah, USA found that "In contrast to the relatively high level of awareness and concern [70% perceived the importance of earthquake education], is the apparent low level of actual understanding, even at a very simple level, of what living in a seismically active area means and what would be most effective actions to take" (Ross, Ed. 1989 p.79). More recent research conducted by the All India Disaster Management Institute found that even in Chennai and Ahmedabad where the devastating effects of a tsunami and an earthquake were felt in the recent past, teachers had virtually no awareness of the natural hazard risks faced by their schools nor awareness of how to mitigate these. Content rich, systematic and sustained education is needed in the specific measures and skills for risk reduction and preparedness. (AIDMI, 2006)

A.2. DISASTER PREVENTION FOR SCHOOLS

"Disaster Reduction Begins at School" was not just the catchy slogan for the UN International Strategy for Disaster Reduction's 2006-8global campaign. It is instead an abiding truth, a fervent hope and a call to action. Known and expected hydro-meteorological and geological hazards do not have to result in disasters. Disaster risk reduction scientists and advocates are convinced that *the practical and technical knowledge already exists to prevent most of the losses of life, limb, livelihood, community, and cultural heritage that increasingly attend these natural hazard events.*

Basic education and disaster prevention go hand in hand. The methods for recognizing and assessing the future impact of hazards, vulnerabilities and risks and identifying strengths and capacities happen to contain the fundamentals of scientific thinking as well as the basics of good citizenship and participatory governance. The values, attitudes and technologies needed for physical protection; informed planning, environmental stewardship disaster-resilient design and construction, are the same as those fundamental to sustainable development and livelihood security. The skills and provisions for disaster response are empowering and confer safety in everyday life. Disaster resiliency is built upon a foundation of analytical and problem-solving skills and draws from the development of personal and inter-personal intelligences.

Fortunately disaster risk reduction is not just "one more thing" to be squeezed into an already full curriculum. It may well be the glue that ensures the survival of our children and future generations. Progress on millennium goals notwithstanding, unsafe schools have and will continue to betray the trust and hope that placed in them, unless educational authorities and communities are conscious and pro-active. Children and teachers will continue to be killed and injured in huge numbers, *while* at work in their school classrooms, unless responsibility is jointly taken now to make them safe. Children will continue to be excluded from school because plans have not been made for fully expected and recurring hazards, unless school communities take responsibility now for contingency planning. All of these are within our grasp – and all convey the poignant truth that humankind sustains itself through the power of education.

GOALS OF SCHOOL DISASTER PREVENTION

The goals of a comprehensive school disaster prevention programme are:
  1. **To save lives and prevent injuries.**
  2. **To prevent interruption of education due to recurring natural hazards.**
  3. **To develop a resilient citizenry able to reduce the social, economic, and cultural impacts of recurring hazards.**

The objectives are to create and maintain safe learning environments, teach and learn disaster prevention, and build a culture of safety around school communities.

The solutions are to:

Create safe learning environments with safe construction and retrofit
- Select safe school sites and design and build every new school a safe school.
- Prioritize replacement and retrofit of unsafe schools.
- Minimize non-structural risks from all sources.

Maintain safe learning environments with school disaster management
- Engage school administrators, staff, students and parents in ongoing school community disaster prevention activities.
- Practice simulation drills for expected and recurring disasters and planning for safe reunification.
- Maintain building structural and non-structural safety measures.

Protect access to education with educational continuity planning
- Develop school and national contingency plans in advance.
- Learn and implement "Minimum Standards for Education in Chronic Emergencies and Disasters".
- Incorporate the needs of children not-yet-in-school, children with disabilities, girls.

Teach and learn disaster prevention and preparedness
- Disaster prevention and preparedness and principles of disaster-resilient construction and environmental protection inside and outside the curriculum.
- Engage teachers and students in adapting, developing and testing strategies and materials for risk reduction education.

Build a culture of access and safety

- Develop and support training programmes for safe school construction and maintenance.
- Incorporate this content into the curricula of pedagogic institutes and post-secondary trade schools.
- Reach out to and involve school communities through non-formal education.
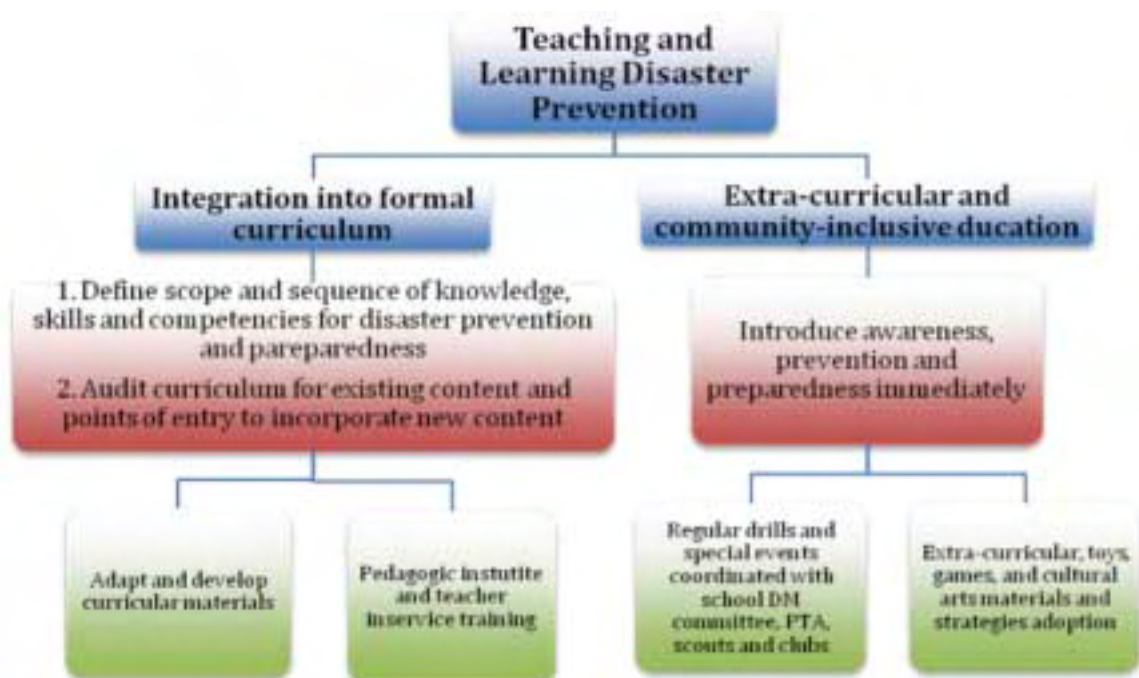
PART B: CREATING SAFE LEARNING ENVIRONMENTS

B.1.   ASSESSING SCHOOL SAFETY

School buildings can and should minimally be designed and constructed to prevent collapse, partial collapse or other failure that would endanger human life when subject to expected wind, water, avalanche, landslide or shaking hazards. If the buildings are to be occupied immediately after a disaster for school, for shelter or emergency operations they can be designed and built to a higher standard than normal construction (OECD, 2004). The necessity for standardized building codes that treat schools as critical

infrastructure, and as high occupancy buildings requiring a higher standard of performance than regular residential buildings is only a starting point. In spite of standardized building codes in most countries, school buildings remain vulnerable. Many countries continue to spend public funds, development banks make loans, and donors sponsor school construction projects where disaster resilience is not a consideration (ADPC, 2008). The incremental cost of building schools safely has been variously found to be 4-12%. The cost of building all schools safely does not compare with the cost of replacing them, after they have injured or killed those they were intended to benefit. (Wisner, 2004).

Public education buildings are often the joint concern of several different government authorities: the national education ministry, a regional or local educational authority, planning or public works departments, municipalities and local communities. Complicated responsibility and accountability can allow school safety to fall through the cracks so an important first step is to clearly identify the bodies and the individuals responsible and accountable for the viability of school infrastructure. The leadership and imperative for school safety usually comes from the highest government education authority. Generally it is a government body that issues a completion certificate attesting that the building has been constructed per specifications and requirements, and is fit for occupancy.

The expertise needed to make safety a reality comes from the earth scientists and climatologists who research the hazards, the local school communities who live with these hazards, the engineers and architects who design the buildings, the public works authorities who set and enforce building standards or authorize construction, the vocational school trainers and contractors who train and supervise the builders, the builders who work with available local materials, the teachers and students for whom the building must be a safe and comfortable place to learn, and the parents who release their children based on their trust in this system. Where NGOs, religious groups or local communities are the designers, builders and/or maintainers, (especially of rural and primary schools) they also assume the responsibility and accountability.

Bringing all of this knowledge together with a single focus, to those who can put it into action is indeed an educational challenge. School safety begins with school site selection, disaster-resilient design and construction from the beginning, or more costly retrofitting for safety afterwards, and continues through building use and maintenance. User communities must be involved from the beginning through the end. Building code compliance depends on builders and consumers alike having a basic understanding of it purpose and principles. Workers and contractors also need comprehension of specific construction detailing and the reasons for it as well. Punitive building code enforcement, after the fact, can only pick up those who are slow to get the message.

Assessing hazards, vulnerabilities and risks

The starting place and cornerstone of school safety is an initial assessment that permits planning to be based upon local physical and social realities.
- Assessment of hazards involves accessing official sources of scientific information and drawing on advice of local scientific experts on different hazards, the types, frequency and typical impacts of geological and hydro-meteorological hazards.
- An assessment of the man-made risks can begin with a school-led, participatory survey of the conditions of the school site and its surrounding neighborhood. An investigation of present realities considers the effects of local land uses (eg. including factors that might increase avalanches, landslides, storm runoff, river or coastal flooding), surrounding buildings, sources of industrial waste, hazardous materials storage sewage or pollution, railroad tracks, roads, electrical facilities and overhead wires, wind-blown debris. It is important that this process draws upon local knowledge, looking to elders for inputs from past experience as well as thinking ahead to the effects of climate change projections for the coming decade or so. This assessment considers how specific hazards or risks change with the season, day of week, or time of day.
- Vulnerability assessment considers both people and built environment (eg. the presence of very vulnerable young or disabled children in the student population, whether girls and boys are exposed differently to risks, the need for open space and evacuation routes, whether the local community relies upon the school as a safe haven or community shelter).

- For each hazard, risk or vulnerability identified, counter-measures should be considered, evaluated and selected to formulate a mitigation plan.

When it comes to school safety, there are several questions to be asked:

1.	Is the site itself safe, or can it be made safe?
2.	Are the school buildings themselves safe, or can they be made safe? What is the construction type? Is the building designed to withstand the expected hazards (eg. elevated for flood, away from landslide and avalanche hazard zones, resilient to shaking by earthquake or wind, roof to hold or deflect snow, insulated from cold and heat)? Do the construction materials and the construction quality ensure the integrity of the building? Are temperature, air circulation and noise control accounted for?
3.	How safe are the building's contents and non-structural building elements: Do the doors open outwards for safe evacuation? Does each room have two ways in and out? Is the roof fastened securely to the walls and the walls securely to the foundation of the building? Is large and heavy furniture fastened to the structure to prevent falling or sliding in wind or earthquake? Are utility pipes and wires flexible and secure?

Simple guidelines or templates available to all schools can help each school to begin this process.

<table>
<tr><td rowspan="2" style="writing-mode:vertical">GOOD PRACTICE</td><td><p align="center">LET THE CHILDREN TEACH US!</p>

Philippines, Sta. Paz Sur; In the barangays (villages) of San Francisco municipality, school children learned in 2006 that their high school was located in a landslide risk area. Students debated whether and how to relocate the school. The headmaster opened the decision to a community-wide referendum. The students were in favor of relocation, though parents were concerned about the extra travel time and local businesses worried about loss of lunch trade. Student organizations in the high school developed an education campaign and their proposal won the vote by 101 to 49 (Plan International, 2007). They dug ditches around their temporary school site and put up tents with their parents. Students now bicycle to their new permanent school that incorporates earthquake mitigation measures and preparation for use as an emergency shelter.</td></tr>
</table>

Assessing resources and capacities

Resources and capacities are just as important as weaknesses and vulnerabilities. These should be considered every possible level; national, regional and local and community levels in relationships to the needs and problems anticipated. Key questions are:

Students of Sta. Paz Sur, Philippines, decide to relocate their schools to a safer location, further from home. Now they ride bicycles to school (see also p. 9).*Courtesy of Plan International*

1. What materials and resources are available? Who are the people and what are the experiences, skills and energies that can be brought to bear on addressing school safety?
2. How can we strengthen and build upon these?
3. Who are all of the possible stakeholders, and how can we involve them? Include of course the teachers, staff, parents and students themselves. Non-governmental organizations experienced in the implementation for community-based disaster risk reduction can be invaluable partners in this work. Local community members are also important contributors.

COMMUNITIES ASSESS HAZARDS, VULNERABILITIES, RESOURCES AND CAPACITIES

Nepal, Bhaktapur, Syangja & Chitwan: The Nepali Red Crescent Society has worked in more than 450 communities prone to earthquakes, floods and landslides. School students are involved in hazard mapping and vulnerability and capacity assessments in their communities. Using peer learning sessions, competitions and Junior RC Circles, students have raised funds for awareness and mitigation work.

Peru: Existing risk maps for 115 towns are being used and a pool of trained consultants based in universities throughout the country are now available to advise Regional Education Offices on safe school site selection.

Philippines, Banaba: A regional NGO, the Center for Disaster Preparedness, and local environmental coalition Buklod Tao (People Bonded Together) pioneered in the development of Child Oriented Participatory Risk Assessment and Planning Tools. Children and parents are engaged in participatory hazards, vulnerability and capacity assessment. A resulting action plan led to mothers producing life vests for children, and flood evacuation drills with children using life vests in local swimming pool were initiated. Disaster preparedness education messages are conveyed through banners in each of 7 neighborhoods (Luneta, 2007).

B.2. DISASTER RESISTANT SCHOOL CONSTRUCTION

The very first priority for school building safety is for every *new* school to be a safe school. This is inexpensive when implemented consciously and diligently during design and construction of each new school.

Uniform building codes provide a higher standard for the performance of school buildings than for normal buildings. An international rule of thumb is that school buildings be normally designed to be 1.5 x the strength of regular buildings. Engineered buildings can be designed for higher standards of performance – such as being able to be immediately occupied after a severe earthquake, to be used for shelter or for emergency operations. Whether new schools are built by local communities, through projects or programmes of government agencies, and / or with support from external donors, there is a need for clear and

comprehensible site planning and building guidelines provided with support from relevant government authorities. This usually requires cooperation between ministries of education and a public works or construction standards authority as well as with local authorities and communal groups.

This shoddily constructed residential school in Bingol collapsed in a moderate earthquake, killing 84 students. Steel dormitory lockers hold up some of the beams.

The broader policy context for disaster-resilient construction involves:
- A comprehensive site analysis and site selection to include identification of related natural hazards by hazard type, impact history, hazard zone location (preferably a zonation that includes intensity and/or frequency of occurrence)
- standard building codes relative to hazard conditions
- a transparent process for planning, design, regulation and enforcement decisions
- qualification requirements for professionals engaged in engineering and design and construction of school facilities (may be based on standard designs)
- independent assessment of design, construction and maintenance of school facilities
- technical support for all phases, and skill training for builders where needed.
- active public stand against corruption, and liability for all contractors. This may include a "zero tolerance" policy, well-publicized campaign, and severe penalties for infraction.
- independent ombudsman programme for investigation of citizen concerns.
- public awareness and consumer/community involvement in monitoring

WARNINGS!	**ASSESSING SCHOOL SAFETY** **Bogotá, Colombia:** In 2000 the Directorate of Prevention and Attention of Emergencies in Bogotå, Colombia commissioned a study that found 434 of 710 schools vulnerable to earthquake damage, 3 in flood areas and 20 in landslide-prone areas. In 2004 the 201 most critical were prioritized and structural reinforcement incorporated into 2004-2008 the Development Plan of the city (Coca, 2007). **Kathmandu, Nepal:** The 1988 6.6 M earthquake in Udayapur destroyed 6000 schools. Throughout Nepal today more than 6 million children and 140,00 teachers are at risk. (Alam, K., 2007) For Kathmandu Valley in a scenario earthquake and in the absence of prior intervention expected losses include more than 29,000 school children dead or injured and more than 77% school buildings lost (est USD $7 million.) *With* intervention 24,000 lives can be saved and the buildings protected. (Bothara, J. et. al. 2002) **Republic of Uzbekistan:** An assessment of 1,000 school buildings revealed that 51% require demolition and replacement with earthquake resilient buildings. 26% of the buildings require capital repair and reinforcement 27% are life-safe and require no intervention. (Khakimov, S. et. al. 2007)

Flood-resistant school design and students back at school. *Courtesy of ADPC, Cambodia*.

EVERY NEW SCHOOL A SAFE SCHOOL

Uttar Pradesh, India: There are23.5 million children attending school in this moderate to severe seismic risk zone.21,00 new school buildings (30 per day) have been completed in the past two years. In 2006-7 the Elementary Education Department proposed to integrate earthquake resilient design into all new school buildings. To prepare for this, one design of primary school buildings, two upper primary and three additional classroom designs were prepared with detailed construction manuals. The disaster-resilient measures added 8% to the construction costs. To cope with massive scale of the project a cascading approach prepared 4 master trainers for each of 70 districts. These individuals in turn conducted trainings for 1,100 fellow Junior Engineers and Education Officers. 10,000 masons were also trained. This programme means that every new school will be a safe school. Within a relatively short period, most children will be attending safe schools. However, the pre-existing stock of 125,000 school buildings remains unsafe and in need of retrofit (Bhatia, 2006).

B.3. PRIORITIZING AND FINANCING RETROFIT & REPLACEMENT

What is to be done about those existing schools that do not meet disaster-resistant safety standards? For most authorities, detailed assessment of *all* buildings is not practical. A prioritization scheme, using a filtering method needed to identify the highest risk buildings for immediate retrofit or replacement. A careful and scientific strategy for prioritization is important for maximum effectiveness and to manage costs.

A general model for prioritization:
- is based on the vulnerability of the buildings, the existing hazards, and building occupancy.
- uses a transparent and technically based schema.
- begins with a paper review of existing school building stock, selecting those for sidewalk survey.
- uses sidewalk assessment of existing buildings (using, for example the ATC 21 survey or modification of this) to select high priority buildings for detailed assessment.
- uses detailed assessment of these buildings to identify those for priority retrofit (Grant et. al, 2007)

School retrofit in India. *Courtesy of SEEDS, India*

School retrofit in Iran. *Courtesy of IIEES Tehran.*

SCHOOL RETROFIT DEMONSTRATION PROJECTS

India, Shimla: Structural assessment of school buildings was carried out using a filtering method: The first step was low-cost mass scale Rapid Visual Assessment Survey of school buildings for potential seismic hazards. Based on these surveys a smaller number were selected for Simplified Vulnerability Assessment using limited engineering analysis. The highest risk buildings were identified for Detailed Vulnerability Analysis. Retrofitting designs were drawn up for 20 schools and implementation of retrofit carried out in 8 schools. Guidelines developed for retrofit and training of local masons and engineers, and delivery of skill-training. "Non-structural mitigation plans" were carried out in 20 schools. An awareness campaign was designed to reach all 750 schools in the region including nearly 100,000 students, 7,500 teachers and local builders, engineers and officials. (SEEDS, 2006).

Nepal, Kathmandu: A vulnerability assessment of 1,100 buildings in 643 public schools revealed that an alarming 60% of buildings are highly vulnerable even under normal conditions. A rolling demonstration project undertakes retrofit of a school while simultaneously training local builders in techniques of disaster-resilient construction and training teachers, students and parents the basics of risk mitigation and preparedness. "Protection of Educational Buildings against Earthquakes: A Manual for Designers and Builders" documents the rich experiences gained during imple-mentation. Extensive public participation through a district level advisory committee, school management committee, school earthquake safety committee and student club, created a replicable model. Resources must be identified for comprehensive implementation. (UNISDR, UNESCO, 2007).

Peru: One particular structural weakness, "short columns" are a common design fault that compromise the safety of many school buildings. A retrofit solution was developed to partially mitigate this potentially devastating structural defect.(UNISDR, UNESCO, 2007).

Non-structural damage caused by a moderate earthquake in Coalinga, California.

RECENT PROACTIVE COMMITMENTS TO SCHOOL RETROFIT

GOOD PRACTICES

Canada, British Colombia: Responding to advocacy efforts of the local "Families for School Seismic Safety", in 2004 the provincial government committed $1.5 billion Canadian to ensure that BC Schools meet acceptable seismic life safety standards by 2019.

Central America: The Organization of American States began its commitment to school safety in 1992. A coordinated regional action plan was developed to benefit Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama. Contributions from development assistance donors and local organizations contributed to strategies and capacity to carry out retrofitting of educational facilities. School infrastructure experts from each country received training.

Colombia, Bogotá: In Bogota 434 vulnerable schools were identified and 201 prioritized for retrofit or replacement. Between 2004-2008 an investment of $460 m USD in school replacement, retrofit, and risk management promotion has provided structural reinforcement of 172 schools, "non-structural" risk reduction in 326 schools, and the construction of 50 new mega-schools, compliant with earthquake-resistance requirements. Three hundred thousand children have are safer as a result of these measures. (Coca, 2007;Cardona, 2008).

Japan: 78,000 (62% of 127,000) public elementary and junior high school buildings were constructed before 1981, when the current anti-seismic code was enforced. 30,000 are considered safe, but 48,000 of these older school buildings were found needing assessment or retrofitting. 10,000 of these were found to be at high risk of collapse in expected earthquakes. The Ministry of Education, Culture, Sports, Science and Technology (MEXT) of the Japanese government raised subsidies for vulnerable school buildings from 50% to 67% in June 2008. In FY2008 229 billion JPY was allocated to meet the new goal of retrofit of all highest risk school buildings within 4 years. Two publications available in English are MEXT's school seismic retrofit handbook (http://www.nier.go.jp/shisetsu/pdf/e-taishinjirei.pdf) and school non-structural reference book (http://www.nier.go.jp/shisetsu/pdf/e-jirei.pdf).

Turkey, Istanbul: Following the 1999 Kocaeli earthquake, schools 60km away in Istanbul were assessed: 820 of 1,651 schools had sustained some damage. Thirteen were identified for replacement. When retrofit proved too costly 22 more were added. 59 schools were strengthened, and 59 repaired(Wisner, et. al. 2004). The Istanbul Seismic Risk Mitigation and Emergency Preparedness Project (ISMEP) Project (with loans from World Bank and EIB) retrofitted 250 schools and reconstructed 36 schools in 2007-8 with 600 more undergoing assessment and feasibility studies. In 2009 an additional 450 schools are slated for retrofitting. (Turkmen, 2008)

Uzbekistan: Eleven Design Institutes participated in building codes revision for school building construction. Typical designs were created for new schools with different capacities. A database of typical construction and technical decisions for anti-seismic reinforcement were developed. UNCRD provided financial and technical support for demonstration projects on reinforced concrete frame, masonry and frame panel buildings. The incremental cost of seismic reinforcement was shown to be between 3-14% depending on intensity zone, type of construction, number of floors, capacity and ground conditions. (Khakimov et. al. 2007).

Venezuela: After 4 reinforced concrete schools were damaged beyond repair in the 1997 Cariaco earthquake, engineering research found that Old-type schools (50 years old) need retrofitting in moderate and above seismic zones and Box-type schools (20-30 years old) only required retrofit in higher risk zones. Practical retrofitting techniques were developed. 28,000 existing schools are now being surveyed in a national programme for school building safety. (Lopez et. al., 2007)

PART C: MAINTAINING SAFE SCHOOL ENVIRONMENTS

C.1. BUILDING USE AND MAINTENANCE

School physical safety is not continuously assured, by design and construction alone. Once a school building is in use, it falls to staff, students and communities to accept responsibility for ongoing and preventative maintenance and to regularly monitor safety conditions. A chain of command, designated responsibilities, adequate budget, and training are all important in facilitating this. Individuals responsible for building maintenance, and users all need some sensitization. They may, for example, be unaware that the single most damaging element causing degradation of buildings is moisture and therefore that keeping the building in good repair and preventing moisture accumulation is a significant priority.

Similarly, the most common hazard in schools is fire. Fire prevention measures include:

- elimination and prevention of fire hazards
- maintenance of electrical equipment
- standard fire prevention through awareness
- smoke detectors, sprinkler systems

Important measures to mitigating fire risk are:

- doors of classrooms and buildings open outwards for safe evacuation
- exit doors are clearly marked (above and below)
- exit routes are clear
- exit route maps are posted on each corridor and in each classroom
- fire suppression equipment is available on each corridor
- fire suppression equipment is maintained regularly (eg. annual testing)
- staff and older students receive fire suppression training (use of fire extinguishers, blanket, bucket, sand, hose)
- schools conduct regular fire drills

WARNING!

IMPROPER ROUTES TO EVACUATION AREAS

USA, California: According to a teacher in a high school "Improper routes were laid out to follow to assembly areas, ignoring potentially deadly hazards, a 120 foot water tower at the end of the assembly area, high tension lines over the route… paths between high walls and through narrow passages, fences and gates which inhibit ingress to the assembly area, causing crowding and potential for injury and further panic, lack of safety equipment and first aid materials as well as water and food for the minimal time period. (Ross, 1989 p.116)

- For earthquake and strong wind protection:
  - tall and heavy furnishings, bookshelves, cabinets and similar items that may topple and fall, must not block exits, and should be moved to a place where it will not hit anyone, or be fastened to the building so that it moves with it.
  - water tanks, heating, ventilating and air cooling units should be secured to the building to prevent toppling.
  - hazardous materials in labs should be limited, isolated, eliminated or separated and stabilized.
  - computers and other equipment should be secured to stable flat surface and equipment on wheels should be parked fastened to the structure.
  - exterior hazards such as tall trees, utility poles, lightning rods may all pose dangers.

NON-STRUCTURAL RISK REDUCTION
(Fastening building contents and building non-structural elements to avoid deaths, injuries and material losses in earthquakes and other hazards.)

India, Delhi: NGO partners SEEDS and GeoHazards International (GHI), working with the Government of Delhi, have demonstrated non-structural risk reduction in a public school. The school welfare committee comprised of faculty, staff and local community members learned to identify the non-structural building elements and building contents that could fall, slide or collide during a likely Delhi earthquake, as well as fire and evacuation hazards. They were exposed to simple low-costs techniques for reducing these risks (moving some items, fastening others) and came up with innovative solutions of their own. The logic of regular fire and earthquake drills became readily apparent to these new stakeholders. A handbook for schools on Non-Structural Risk Reduction developed by the NGO partners, published by the Government of Delhi provides a new resource for generalizing these lessons (UNISDR, UNESCO 2007).

USA, California: The 1994 Northridge earthquake happened at night when no children were in school, but the damage caused by fallen cabinets, bookcases, equipment, lighting fixtures and broken glass made it clear that during a school day, children, teachers and staff would have been injured and killed by falling, sliding and colliding objects. The Los Angeles Unified School District amongst others, embarked on a project of non-structural mitigation of school classrooms, fastening furnishings to prevent both injuries and to preserve school assets. This effort continues today and is the responsibility of each school and school maintenance personnel.

C.2.   SCHOOL DISASTER MANAGEMENT

The purpose of school disaster management is to protect the lives of students and staff, and to ensure educational continuity for students. Administrators, teachers and staff act "in loco parentis", taking the place of parents and bearing both moral and legal imperatives to stay with and to protect children. All are expected to serve as "disaster services workers" during times of emergency, and are responsible for safely reunifying children with their families. This responsibility makes school disaster management planning a necessity for every school system and school site.

School disaster management planning is an ongoing and participatory process that involves administration, faculty, students, local community & parents in three primary activities to empower them as agents in the development of a culture of safety:

- *Assessment and Planning* moves from identification of hazards, vulnerabilities and risks as well as resources and capacities to an active plan to reduce these risks and an operational plan that describes the moves, procedures and reflexes needed for disaster response. Schools must plan for the safe reunion of students and families as well as for educational continuity and recovery.

- *Risk Reduction* involves taking preventative and precautionary measures against fire, flood, wind, ground-shaking and other dangers. The measures may focus on the building itself, the contents and use of the building, the surrounding environment, education, the ability to respond to early warning signs and communication.

- *Response Capacity Development* addresses the skills and provisions to be able to organize effectively in response to emergency to minimize remaining disaster impacts.

School disaster management plays an important part in child protection, as well as an important role in overall community disaster risk reduction. When children rely on public or special transportation to and from school, transportation planning becomes an important part of disaster management. Following an emergency, children cannot be safely sent home by the usual means of transportation. Urban school authorities even have to develop plans and train transportation personnel what do if a disaster were to occur during the period of a school commute.

School Disaster Management Plan.
Courtesy of the Government of India.

<table>
<tr><td rowspan="2">GOOD PRACTICES</td><td><p align="center">URBAN AREA EMERGENCY
TRANSPORTATION & COMMUNICATIONS PLANNING</p><p>California, USA: If a major earthquake occurs during the school day, parent's first instincts are to call and run to their children at school, jamming roads and telephone lines needed for emergency response. In the San Francisco Bay Area emergency transportation planning begins at schools where parents annually provide a list of people authorized to pick up their children in case of emergency. Families send each child with a bag with change of clothing, bottle of water, long-life snack, small comfort item and family photo, which are usually returned unused at the end of the school year. Parents learn that their children will be safe and well-cared for at school, even if it takes days for them to arrive. Adults can therefore plan to help those immediately around them, leaving roads and telephones free for emergency response.</p><p>Istanbul, Turkey: A pilot project demonstrated that school bus routes could be mapped, and nearest schools along the way marked. All schools would be safe havens for school children and drivers would be taught to walk with children to the nearest school. Parents would also have confidence in being able to reunite with their children in the big megalopolis.</p></td></tr>
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Drills

One of the important ways that schools develop response capacity skills and raise awareness of the need for assessment, planning and risk reduction is by conducting regular emergency drills. Drills offer the opportunity to identify training needs, establish new reflexes and teach through action and repetition.

Drills are appropriate to both sudden onset disasters and early warning situations:

- drop, cover and hold (for earthquake)
- building evacuation (for fire, earthquake)
- putting on life jackets and practicing water safety (for flood, tsunami)
- moving to higher ground (for tsunami)
- take shelter (for windstorm, tornado)
- extinguishing small fires
- stop, drop and roll (when on fire)
- conducting light search and rescue

- shelter-in-place (for some hazardous materials release and violence)
- administering mass casualty non-medical triage and first aid
- protocols for student release
- emergency communications
- flexible organization of response roles
- availability of response provisions
- public relations, communications and documentation

School drills are an important opportunity for student learning, beyond evacuation and other protective behaviors themselves. In Japan, students participate in games such as "bucket brigades" with teams of children competing to move the contents of a barrel of water from one end of the play yard to the other passing buckets as they would if they were helping to extinguish a real fire. Students also practice fire suppression with empty fire extinguishers. In Iran students learn and practice techniques for safely transporting injured students. These activities can also be incorporated into regular sports day events.

Drill games to practice fire suppression skills in Japanese schools. *Courtesy of Misaki High School*

Three types of drills are all useful: simple drills that focus on specific skills and behavior that may at first seem unnatural; table-top exercises especially for management and school-based leadership that emphasize a range of coordination tasks; and full-scale scenario drills that involve all members of the community. Scenario drills provide a chance to practice coordination of functional organization of response as well as operational skills such as light search and rescue, fire suppression, hazardous materials control and logistics skills to facilitate life-saving, security, nutrition, shelter and sanitation, and psycho-social support.

BUILDING EVACUATION

Simple rules for building evacuation:
Don't push
Don't run
Don't talk
Don't go back

GOOD PRACTICES

DISASTER DRILLS

Philippines: Using participatory risk assessments, parents and children in an urban neighborhood began to think about flood risks. Parents made life vests for the children, and initiated drills at a nearby swimming pool.

Peru, La Libertad Provincia de Trujillo: The Centro de Capacitatión y Prevención para el Manejo de Emergencias y MedioAmbiente S.O.S. VidasPerú developed a training programme to increase the effectiveness of building evacuation in response to many hazards.

Colombia, Bogotá: A simultaneous earthquake simulation drill is held on International Disaster Reduction Day, promoting risk management planning in the city's 400 schools. A teacher's guide explains fundamental concepts, risk scenario construction and risk management tools. School Committees includes principal, teachers, students, and staff and organize and train a recommended 10% of the school community in brigades focusing on response skill development.

Iran: A pilot effort in 2 schools was initiated in 1996by the Public Education Department of International Institute of Earthquake and Engineering (IIEES) By 2008, the 10th National Earthquake and Safety Drill reached more than 14 million students in over 124,000 schools the country. The Ministry of Education, Ministry of Interior (National Committee for Natural Disaster Reduction), IIEES, Iranian Red Crescent Society, and Iran National Television and Radio Broadcast cooperate to support the drill. An Earthquake Safety Alarm is broadcast on national and local radio. Voluntary School Earthquake Safety Councils involve teachers and parents in risk reduction and preparedness efforts at school sites.

El Salvador: A project known as "Youth Participate in Disaster Prevention" reached more than 5,000 school centers where school-based emergency committees were organized and capacitated. Disaster prevention has been introduced into the national school agenda.

India: The Global Open Learning Forum on Risk Reduction has created an Online Certificate Course in Disaster Management for school teachers based on case-studies, email discussion and contact workshop at the end of the course. More than 200 teachers had completed training by mid-2008.

Nepal, Malawi, Haiti, Ghana, Kenya, Bangladesh: International NGO Action Aid embarked on a 5-year project to reduce vulnerability to natural disasters by making schools in high-risk places safer. In the first year of the project in Bangladesh, local NGO Sustainable Development Resource Center worked with ten local non-governmental schools to train students and teachers who participated in school risk reduction, contingency planning and testing of learning materials.

Jamaica: 150 professionals and PTA representatives from an initial 30 target schools have knowledge and skills to develop comprehensive school emergency preparedness and response plans and sensitize community members on how to use a hazard map, community vulnerability assessment, basic disaster management, shelter management and basic first aid. This small-scale programme highlights longer-term needs and priorities.

Turkey: The Ministry of Education calls for evacuation drills to be held in all schools. Provincial or district civil defense officer(s) provide support. A Family Disaster Plan is distributed to students to take home and share with family members. Students are encouraged to convey risk awareness and preparedness information to their family members as homework (Turkmen, 2007).

USA: In California, schools are expected to conduct a full emergency simulation drill annually. Teachers are trained in a flexible "incident command system" with a variety of skills in light search and rescue, fire suppression, first aid, and safety measures for child-family reunion. (See school disaster drill model and templates http://www.riskred.org/schools.html)

C.3. PROTECTING EDUCATIONAL ACCESS WITH CONTINUITY PLANNING

The issue of children's access to education following a disaster is fundamentally the same as access to education at any time. It is incumbent upon education authorities to "expect the unexpected" and to have adequate contingency plans for educational continuity in the face of a variety of known hazards.

School interruption makes milestones extremely challenging to reach and standards difficult to achieve and enforce. Disasters prematurely end the education of many students for several interrelated reasons:
- school does not quickly resume
- students fall behind and cannot catch up
- economic disruption to families forces students to help at home or join the workforce.
- life continuities are disrupted, many students find it difficult to relate to their previous plans or to the visions they had for their futures.

DANGERS	**SCHOOL INTERRUPTION AND SCHOOL DROP-OUT** **Cambodia**: Seventy-eight percent of school principals in disaster prone areas report that their schools are affected by flooding for more than 3 months every year. Sixty percent of these schools are subject to closure for up to 2.5 months but only 10% have an alternative location for school arranged. Sometimes the school year can be extended, but often teachers return to their hometowns in other areas. The disruption to education results in lower quality education. The rainy season occurs at the beginning of the school year and children who miss school have little hope of being able to catch up. Road damage and river crossings result in greater time and money for transport resulting in high absenteeism rates especially among poor students. Principals estimate that half of students drop out due to financial problems and other difficulties caused by floods. Use of schools as emergency shelters for people, livestock or storage can also be damaging and disruptive (ADPC, 2008).

The key features of continuity planning for schools involves:
- alternative school locations identified in advance.
- off-site back-up kept of key student records.
- plans for continuity of student learning in the event of school closures (e.g. instruction via local radio or television, distance instruction, telephone trees, mailed lessons and assignments).
- plan for continuity of core operations: staffing and communications.

The Inter-Agency Network for Education in Emergencies has developed a series of Minimum Standards to safeguard a minimum level of educational quality and access to education. The table below summarizes these standards, which are elaborated more fully with indicators and implementation guidance. The full INEE Minimum Standards can be found at: http://www.ineesite.org/standards

INEE Minimum Standards for Education in Emergencies, Chronic Crises and Early Reconstruction		
Common	Standard 1: **Community Participation**	Emergency-affected community members actively participate in assessing, planning, implementing, monitoring and evaluating the education programme.
	Standard 2: **Local Resources**	Local community resources are identified, mobilized and used to implement education programmes and other learning activities.
	Standard 1 **Initial Assessment**	A timely education assessment of the emergency situation is conducted in a holistic and participatory manner
	Standard 2 **Response Strategy**	A framework for an education response is developed, including a clear description of the problem and a documented strategy for action.
	Standard 3 **Monitoring**	All relevant stakeholders regularly monitor the activities of the education response and the evolving education needs of the affected population.
	Standard 4 **Evaluation**	There is a systematic and impartial evaluation of the education response in order to improve practice and enhance accountability.

Access and Learning Environment	Standard 1 **Equal Access**	All individuals have access to quality and relevant education opportunities.
	Standard 2 **Protection & well-being**	Learning environments are secure, and promote the protection and mental and emotional well-being of learners.
	Standard 3 **Facilities**	Education facilities are conducive to the physical well-being of learners.
Teaching and Learning	Standard 1 **Curricula**	Culturally, socially and linguistically relevant curricula are used to provide formal and non-formal education, appropriate to the particular emergency situation.
	Standard 2 **Training**	Teachers and other education personnel receive periodic, relevant and structured training according to need and circumstances.
	Standard 3 **Instruction**	Instruction is learner-centered, participatory and inclusive.
	Standard 4 **Assessment**	Appropriate methods are used to evaluate and validate learning achievements.
Teachers and Other Education Personnel	Standard 1 **Recruitment & Selection**	A sufficient number of appropriately qualified teachers and other education personnel are recruited through a participatory and transparent process based on selection criteria that reflect diversity and equity.
	Standard 2 **Conditions of Work**	Teachers and other education personnel have clearly defined conditions of work, follow a code of conduct and are appropriately compensated.
	Standard 3 **Support and Supervision**	Supervision and support mechanisms are established for teachers and other education personnel, and are used on a regular basis.
Education Policy and Coordination	Standard 1 **Policy Formulation & Enactment**	Education authorities prioritize free access to schooling for all, and enact flexible policies to promote inclusion and education quality, given the emergency context.
	Standard 2 **Planning & Implementation**	Emergency education activities take into account national and international educational policies and standards and the learning needs of affected populations.
	Standard 3 **Coordination**	There is a transparent coordination mechanism for emergency education activities, including effective information sharing between stakeholders.

GOOD PRACTICES	**EDUCATIONAL CONTINUITY & RESUMPTION PLANNING** **Iran:** The Ministry of Education and UNICEF have worked together to transform a disaster response programme into a school-continuity and resumption-planning programme. One project builds capacity of officials and experts at provincial and district levels to provide psycho-social support before and during emergencies at school. A second project has developed new safety standards for prefabricated school structures that can be built quickly, are adequate for different climates, and using locally produced materials. These designs originally developed for early recovery may serve as models for permanent rural schools (UNISDR, UNESCO, 2008). **U.S.A., Los Angeles:** School continuity plans include options for extending the school year to make up for lost instructional days, alternate school sites, half-day schedules, development of take-home self-study packets, online learning tools, and remote back-up of educational records.

C.4.   TOOLS FOR MAINTAINING SAFE LEARNING ENVIRONMENTS

A sample checklist is provided below as a straightforward guide to school disaster management.

School Disaster Prevention & Preparedness Checklist
ACTION STEPS
1. *Convene local school safety committee representing administration, faculty, staff, students and parents, and local community.*
2. *Study the school safety planning and action steps below together.*
3. *As needed assign sub-groups or individuals to be responsible for investigating and making recommendations for each task.*
4. *Create plan based on task group recommendations.*
5. *Implement the plan, involving the whole school community, setting milestones and taking action steps to achieve risk reduction and response preparedness.*
6. *Communicate and coordinate as needed with education authorities using the resources and support available, and advising them of resource and support needs.*
7. *Review and revise the plan as necessary, at least annually.*
8. *Be sure to keep all staff, parents/guardians, and students advised about the plan.*
ASSESSMENT & PLANNING
☐ An ongoing school safety committee has been established to lead disaster risk reduction and disaster response planning in our school. We hold regular meetings (including staff, parents/guardians, students and local community leaders) to develop and review our mitigation, preparedness and response plans.
☐ We have learned about local resources and assets (eg. fire extinguishers, first aid kits, people with response skills, generator, ladder, search & rescue equipment) available in the community nearby from private and public sources, and discussed shared use of resources post-disaster.
☐ We have researched historical events and current scientific studies and considered all of the different hazards that could affect us. We are aware of the needs of vulnerable groups or individuals such as young children, students with disabilities, and language minorities, as well as the concerns of staff, students, parents and community.
☐ We have site and neighborhood maps and have identified alternate staging and evacuation locations.
☐ We have assessed and are addressing physical risks posed by buildings, building non-structural elements and building contents, and hazards in our neighborhood.
☐ We have evacuation plans, including safe assembly areas, evacuation routes, safe havens and alternatives, buddy system. Student transportation systems have plans to take students to nearest safe school in case of disaster during student commute. Parents/guardians are informed of location of all possible safe havens for reunification. The evacuation plan has been shared with the nearest police, fire and hospital officials and established communication and understanding in advance of emergency situations.
☐ We have established a communication system for emergencies, including a warning system wherever appropriate. All necessary contact information is available for emergency response and family reunification.
☐ We have established student release procedures to ensure that children are released only to adults approved by parents/guardians.
☐ If needed we have planned to provide emergency shelter for our local community.
☐ We have a plan for educational continuity for our students including alternate locations to continue classes, alternate schedules and methods of instruction as needed and secure back-up of educational records.
☐ We have plans and regular contact with local news media (radio, newspapers, television) to communicate planning and emergency messages to families, and to use our school-based activities to promote risk reduction community-wide.
☐ We provide significant practical local disaster risk awareness and reduction activity at all age levels, through school-based activities and projects and/or through the formal curriculum.
☐ We encourage staff and students to prepare for disasters at home and provide support material for doing so.
☐ We have insurance coverage to pool economic risks.

PHYSICAL & ENVIRONMENTAL PROTECTION	
☐	Our building has been located appropriately, designed and built according to current building codes/safety standards for disaster safety, and inspected by a qualified structural engineer.
☐	The building has been checked by local fire department for fire safety.
☐	If our school required repair or retrofit, this has been completed without minimal disruption of education.
☐	We practice preventative maintenance on our buildings, protecting them from damp and other damage, and repairing damage when it occurs.
☐	*Earthquake, windstorm:* We have fastened tall and heavy furniture, secured computers, televisions and other electronic equipment, hazardous materials, supplies, propane gas tanks, water tanks, lighting fixtures, roof elements, railings and parapets, heating and cooling devices, storage tanks and other items that could kill, injure, or impair educational continuity. We have put latches on cabinets, and hung pictures securely on closed hooks to protect ourselves from injury and financial losses.
☐	*Flood, storm, tornado:* We know about early warning systems in use in our community and have plans to respond to these in order to move people and assets to safety.
☐	We have smoke detectors, fire alarms, automatic sprinkler systems, fire hoses, fire extinguishers, and automatic emergency lighting, and maintain these. Our building exit routes are marked.
☐	We have limited, isolated, and secured any hazardous materials to prevent spill or release.
☐	We have off-site back-up of critical information, including student emergency contacts and release permissions.
☐	School transportation is inspected for safety and drivers and students are trained in respective safety skills. Seat belts, helmets and other transportation safety measures are advocated and promoted.
RESPONSE CAPACITY: SUPPLIES & SKILLS	
☐	We have guidelines for and we hold post-disaster drills to practice safety skills with all staff and students at least twice a year. We have a buddy system for those needing help. We follow basic building evacuation rules: "Don't talk. Don't run. Don't push. Don't go back". We hold simulation exercises at least once a year where operational teams practice response organization as well as procedures and skills in damage assessment, information-sharing, light search and rescue, first aid, fire suppression and family reunification. We discuss and improve on our practice.
☐	We have skills and practice building evacuation drills twice yearly as well as applicable drills for the threats faced (eg. first aid skills for life safety, drop, cover, and hold for earthquakes, water safety and swimming skills for floods, shelter-in-place for violent threats).
☐	We have access to reliable external information sources on disasters and to an internal communication system. We have practiced receiving updates on emergency situations, warning our community and informing the relevant authorities.
☐	We have emergency supplies for students and staff to last for at least the first 72 hours (including at least 12 liters of water per person, food, first aid supplies, emergency power, emergency lighting, alternate communications, alternate transportation, shelter and sanitation supplies) (Students can be asked to bring emergency supplies bag at the beginning of each year, and take it home again at the end of the school year).
☐	School staff and older students have and learn response skills including: first aid, mass casualty triage, light search and rescue, fire suppression, wireless communication, pychological first aid, emergency power operation, student release procedures, shelter, nutrition, and sanitation skills.
☐	School staff know how to turn off our electricity, water and gas.
☐	We have a standard organizational system and know the principles for organizing post-disaster self-help.
☐	We have identified resources for psychosocial support if needed.
☐	We have plans to use our resources for mutual aid and to support local community response.

PART D: TEACHING AND LEARNING DISASTER PREVENTION AND PREPAREDNESS

D.1. GETTING TO THE HEART

Children are extremely vulnerable when it comes to the impacts of disasters – whether physically less protected from death, disability and injury, left orphaned, at risk due to impoverishment, or their education irrevocably disrupted. Yet children are also the most receptive to incorporating new knowledge to make themselves and future generations safer and are advocates and catalysts for safety in their homes and communities. Children have specific vulnerabilities and needs to be addressed in risk reduction and they have the capacity for active participation in risk identification, risk reduction, preparedness and response (Benson & Bugge, 2008). Our responsibility is to ensure that the breadth of their horizons includes knowledge of hazards and the many feasible measures to protect themselves and reduce the impact of these events.

Students participate in community risk identification and local government planning in France.
Courtesy of Memorisk

In this documents the term *'formal curriculum'* is used to refer to the regular classes through which children learn the wide range of knowledge skills and values conveyed in primary, secondary, and vocational. The term '*co-curricular education*' is reserved for educational activities delivered outside the regular curriculum through assemblies, after-school activities, community meetings, exhibits, special events, drills and scenario exercises. These may employ some of the same tools used in formal curriculum such as cultural arts, drawing and writing competitions, games, hands-on activities as well as making use of mass media learning channels.

The earliest roots of disaster risk reduction education are found in science and geography education throughout the world, addressing the so-called "natural" hazards such as earthquakes, volcanoes, floods, landslides and tsunamis. Two things have traditionally been missing from such lessons; the relationship between these worldwide phenomenon and hazards faced locally and the many practical measures available to provide physical and environmental protection from these hazards. It is incumbent upon us to address this gap by engaging children in local assessment of risk and vulnerabilities, resources and capacities and exploring problem-solving to learn how to reduce risk in the context of both sustainable economic development and environmental stewardship.

Many curricula jump from "hazards identification" to "response-preparedness" with important disaster drills and practical curricula in first aid. It is of vital importance not to skip over the all-important disaster

avoidance measures such as safe construction, appropriate land-use planning, livelihood contingency planning and effective early-warning communication systems. Response-preparedness should be understood as the last resort thing that we do to make up for our shortcomings in prevention. Since "risk reduction" is often misused to refer to "response-preparedness, this document prefers "disaster prevention" so that there is no temptation to skip over the specific learning that is needed to minimize vulnerability and risk.

Child-focused non-governmental organizations have pioneered in trying and testing strategies and methods for child-focused disaster risk reduction with extremely promising results (Save the Children, 2007). Disaster prevention education is most relevant when it is directly related to local risks, when it stresses local experience, builds long-term action and can be accomplished at an acceptable cost (Schick, 2007). It is essential to convey to students the assessment and planning processes for risk reduction, specific measures for risk reduction, organizational systems and skills for disaster response, community linkages, and the problem-solving skills to put it all together. It is especially important to introduce the many ways that students can be involved in these processes. More and more countries are moving from simple introduction of hazards to adoption of curricula that incorporates risk reduction and disaster management content (BRI/GRIPS, 2007).

Disaster prevention education is important at all ages, not just once during a child's school career. This participation can provide lifelong benefits in terms of analytical thinking, problem-solving, empowerment and good citizenship. It can be the inoculation against death, injury, trauma, loss of home and livelihood, and cultural heritage.

D.2.   FORMAL CURRICULUM FOR DISASTER PREVENTION AND PREPAREDNESS

Integration or infusion of the values and competencies for disaster risk reduction and environmental stewardship within the school curriculum is the single activity that ensures the long-term emergence of a culture of safety, and enables people to understand that in future major hydro-meteorological events need not mean loss of life, limb or livelihoods. There is no substitute for policy guidance in order to formulate an appropriate strategy for disaster education at every level where curriculum is being developed, and to build the capacity to sustain it.

There is a continuum of options for how to integrate disaster risk reduction into school curricula. At one end are stand-alone courses devoted to the subject-matter and at the other end is the infusion of lessons, activities and problems into a broad range of course material at every grade level. In between are specially developed units, modules or chapters designed for integration into specific course curricula, at specific grade levels, for a specific duration ranging from one class period to a sequence of over the course of several weeks.

Stand- alone courses: single subjects	*Curriculum units: several subjects*	*Curriculum integration or infusion: many subjects*
course, text	module, unit, chapter	lessons, activities, problems, readings

Stand-alone courses refers to specialized course curricula focused on disaster risk reduction. For example, Maiko High School in Japan offers a series of course in disaster management to a small group of students in high school on an elective basis. A course in seismic-resilient construction is being developed as a requirement for building trades majors in vocational high schools in Turkey. Since school curricula are already "full", these courses tend to be found either only for particular groups of students or only as electives. While these courses have an important role to play imparting important in-depth knowledge they reach only a tiny number of students. These become most meaningful in a context in which the entire school-age population is exposed to a strong foundation in disaster risk reduction.

Curriculum units refers to an approach that inserts specially developed units, modules or chapters with an emphasis on disaster risk reduction into existing courses. Ideally these are designed to fit into several specific course curricula, at specific grade levels, for a specific duration. The introduction of disaster management modules at three age levels, by India's Central Board of Education is an example of this. In spite of the many demands of primary and secondary school curricula, disaster risk reduction is considered so fundamental to India's future, that this is now becoming a requirement and standard for all students and has a prominent place in the curricula. This has the clear advantage that the topic has a reserved place in the curriculum where it can be sustained and its richness and local content developed over time. Development and introduction of this curriculum can take place rapidly because it does not require the labor-intensive audit of every course at every grade level. A small group of teachers can be supported with teacher training to develop competence. In order to become also become sustainable it is important that this becomes included in any examination system. For many countries, there seems nothing that could be squeezed out in order to squeeze in these special modules.

In many places educational materials have been developed by disaster risk reduction advocates designed to link or aligned to existing curriculum standards and learning objectives. In those educational systems where teachers are permitted flexibility to select materials, creative teachers can voluntarily access and integrate these materials into their lesson plans or use them as supplementary resources for students interested in exploring further. Disaster risk reduction specialists (from universities, fire departments, civil protection agencies, local branches of Red Cross/Red Crescent Societies often make themselves available as guest speakers to support lessons in schools.
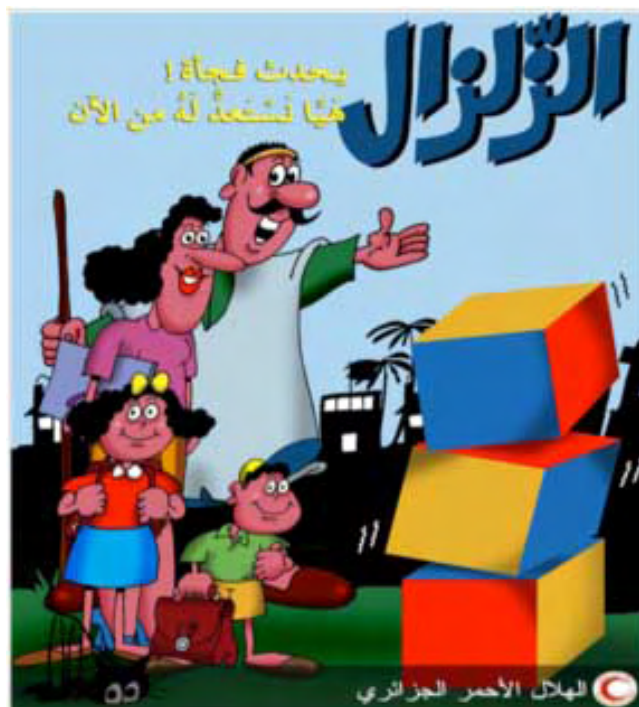
Disaster awareness introduced in extra-curricula education in Algeria. *Courtesy: Algerian Red Crescent Society*.

Curriculum infusion is an approach that seeks to distribute disaster risk reduction content throughout the curriculum, using lessons, readings, activities and problems, enriching the existing curriculum rather than displacing it. High-level policy commitment and guidance is needed to initiate a process that would likely take just a little longer than the full curriculum adoption cycle and requires dedicated resources and the collaboration of curriculum and content experts.

The quality of curriculum development depends on consultative multi-stakeholder process that begins *before* the curriculum adoption cycle with two complementary activities:

1. Articulation of scope and sequence of skills and competencies for disaster risk reduction for all grade levels.
2. Full curriculum audit by a expert group encompassing specialists in disaster risk reduction education, regional hazards, risk reduction technology and disaster management to identify where the content needed fits naturally into existing curriculum.

Then in conjunction with the curriculum adoption changes approved
3. Develop new learning materials to support the curriculum.
4. Strategy is developed for staff training

And finally
5. Impact evaluation is designed and implemented consistent with the goals of the programme.

Disaster risk reduction content can appropriately be infused into all the natural science courses, geography, social studies, physical health and safety education, literature and language arts, civics, and even mathematics. The content distributed in this way, must of course be carefully linked in order to be complementary and to make sense. In most countries general education on natural hazards can be found somewhere in the science or geography curriculum. While this may be an effective starting place to begin to familiarize children with the hazards and risks

Courtesy: Algerian Red Crescent Society.

affecting their own communities, care must be taken that this is not one-time content but rather that it be built upon systematically throughout the school years. (BRI & GRIPS, 2007).

COURSE	Examples of disaster risk reduction integration
Language Arts	Read literature, news articles, concerning disasters, hazards, risks. Read critically, explore myths, use persuasion. Research, write essay, proposal, letter to elected officials regarding disaster risk reduction.
Mathematics	Solve problems related to assessment and solutions to natural hazard induced risks.
Geography	Explore climate, habitats, geology and human/environmental interactions producing disaster risk, vernacular architecture, urbanization, livelihood impacts of disaster.
Sciences	Learn mechanisms of geological and hydro-meteorological phenomena. Investigate local measures for environmental protection. Conduct experiments to learn principles of disaster resistant construction. Learn home and industrial hazardous materials safety. Explore and practice environmental stewardship.
History and Humanities	Explore historic impact of natural hazards on civilizations, indigenous knowledge for settlement and livelihood protection.
Civics	Meet with elected officials and participate in community planning, local disaster risk reduction and advocacy.
Health & Life Skills	Basic first aid, family disaster planning, response preparedness, health hazards and pandemic prophylaxis.
Vocational training	Learn non-structural mitigation measures and tools. Learn principles of disaster-resistant design and construction.
Foreign Languages	Read passages about natural hazard threats and community-based risk reduction.
Arts	Select disaster risk reduction as a theme for visual and performing arts projects and community exhibits.

As environmental education, citizenship, and life skills are infused into school curricula, disaster risk reduction education provides a natural fit, enriching these subjects in personal and compelling ways.

GOOD PRACTICES

DISASTER PREVENTION AND PREPAREDNESS THROUGH THE FORMAL CURRICULUM

Colombia, Bogota: The Educational Secretariat reviewed and redesigned the curriculum guide on risk and disasters according to national standards, providing both theoretical and practical pedagogic guidance. Four basic steps cover: natural phenomena (event knowledge), identification of the human actions that convert hazards to risks and the necessity for avoidance, reduction and mitigation, self-protection and response-preparedness. More than 1,000 teachers have been trained in the curriculum and in implementation of school risk management plans. A complementary communication campaign aimed at all school children uses posters, video clips, risk calendar, stories and games to support teachers in their cultural work on the topic. Tens of thousands of children are engaged in complementary project activities. (Coca, 2007).

India: Central Board for Secondary Education. Disaster management has been introduced as a frontline curriculum for Standard VIII (2003-4) (focus on preparedness measures), IX (2004-5) (focus on mitigation) and X (2006-7) (focus on government policy, science and technology and voluntarism). Activities included module development, textbooks, and teacher manuals, circular on school safety, awareness generation with painting competitions, exhibitions, debates and essay competitions. (http://www.cbse.nic.in)

Bangladesh: Since 1997 children from grades 6-8 read a chapter on Disaster Management.

Cambodia, Lao PDR and Philippines: These three countries have "priority implementation partnerships" to mainstream disaster risk reduction in the education sector by integrating relevant modules into their secondary educational curriculum. This collaborative project brings together National Disaster Management Organizations, Ministries of Education, Asian Disaster Preparedness Center, UNDP and other government and non-governmental stakeholders drafting curriculum and teacher training manual.

Iran: Earthquake awareness and preparedness is taught directly all levels of education in Iran. In primary school the emphasis is on the natural hazards and decisions and activities for safety during and after an event. In secondary and high school students learn response skills. Formal methods include a series of textbooks and films. Textbook materials on earthquakes are found in science books for 4th, 5th, 8th, and 12th grades and in geography books for 8th and 10^{th}grades (Izadkhah and Hosseini 2005). An "Earthquake Preparedness" book is provided for 8th and 9th grades and Technology and Careers book for 8th grade. Technical and engineering aspects of safe building are included for construction majors in technical high schools.

Madagascar: With 38 natural hazard events internationally recognized as disasters over 35 years, Madagascar began efforts to make school buildings cyclone resilient and has now successfully mainstreamed disaster risk reduction into school curricula with a students' manual and teachers' guide.

New Zealand: The Ministry of Education contracted with an educational consultancy to work with both teachers and Civil Defence Officers in planning, developing and testing a teacher and child-friendly curriculum. "What's the Plan, Stan?" features Stan the dog and 5 children who model what to do before, during and after 6 types of disasters. It can be used to incorporate disaster risk reduction and content across all areas of the curriculum for students aged 8-12. Components include teacher's handbook with unit plans, activities, simulations and information for school planning, CD-ROM for teachers and students including stories, interactive games, hazard map, research material, tips and resources. There is also a storybook and accompanying audio-CD, poster, and website with information and interactive activities and templates. www.whatstheplanstan.govt.nz Workshops introduced this resource to teachers.

Turkey: Basic disaster awareness is included in the national education curriculum of primary school: from 1st grade to 12th grade. Its goal is to help students to identify the many small steps that can be taken to reduce disaster risks, to assist families in risk reduction and preparedness, and to help ourselves and those around us following a disaster. It covers: Hazard and Risk Awareness, Before a Disaster, During and After a Disaster, and Next Steps. (Turkmen,2007) http://www.ahep.org

USA: School curricula in the US is highly decentralized. However, curriculum materials development has been underway for more than 20 years with contributions from the National Science Teachers Association, the Federal Emergency Management Agency, the US Geological Survey, and the American Red Cross. FEMA's teacher pack-ages include Seismic Sleuths (Grades 7-12) and Tremor Troops (Grades 1-6). http://www.fema.gov/kids/fematce.html . The American Red Cross "Masters of Disaster" curriculum materials addressing all major disasters in the US in a package for teachers of children ages 5-14. The programme was piloted in 43 school districts with 380 local Red Cross chapters providing volunteers to help reach more than 5 million school children over 6 years. The content has been aligned to Strands, Standards and Benchmarks found in the National Curriculum Standards, allowing teachers to integrate disaster safety into regular core subjects such as math, science and social studies. www.redcross.org/disaster/masters/intro.html. The US Department of Homeland Security has developed the Ready Kids campaign for integration into school curriculum. http://www.ready.gov/kids/home.html

D.3. CO-CURRICULAR EDUCATION IN DISASTER PREVENTION AND PREPAREDNESS

Co-curricular education can take many forms, and in most cases can offer a low cost and quickly mounted introduction to disaster prevention. It often provides the opportunity to introduce and to reinforce important and consistent lessons. The most obvious of these are disaster drills of several kinds depending on the hazards faced. The skills to respond to drills are taught ahead of time during school assembly and in the classroom. Theses drills, conducted throughout the school year, ideally take place at different times of the school day, and without warning, allowing practice, reflection and improvement.

An annual School Safety Day may be observed on International Day for Disaster Reduction (during the second week of October) or in remembrance of a major national disaster. These can become an important event for the whole school community and create space for a wide range of awareness activities. Assemblies offer the opportunity to reach all children through announcements, short didactic sessions, theatrical skits, oral history, story-telling, puppetry, magic, videos, learning rhymes or songs, providing take home material, announcing competitions, playing games, practicing drills, and hosting guest speakers. Guest speakers can include survivors of disasters who can provide live lessons, civil protection staff, fire department educators, Red Cross/Red Crescent Society representatives, local non-government programme staff or volunteers. News coverage of disasters in other places, and support campaigns can be opportunities to engage in discussion and proactive measures at school.

After-school activities offer the opportunity to engage smaller groups of children in skill-building and voluntary service activities through "safety clubs", scouting badges, and similar ongoing efforts. After school programmes provide an opportunity to develop awareness materials and displays, plan games and engage in performances and art projects to communicate with others. Voluntary drawing and writing competitions engage many children. Small-scale models including, for example, shake table demonstrations are also powerful hands-on tools. Documentary videos, storybooks, comic books, activity books, toys and games will engage others. Knowledge Competitions generate student, community and mass media interest.

Parent meetings, parent-teacher association or school welfare committee meetings, wider community fairs and "open house" can be important opportunities for co-curricular education. Displays of student-created risk and capacity maps, student art work and essays generate interest. Community members may also engage as volunteers helping to secure furnishings against earthquake shaking or dig channels to direct rainwater away from building.

Cultural arts, whether music, song, poetry, dance, puppetry, magic, street theatre, improvisation, pantomime, or artwork are appealing, engaging and creative ways to introduce this important subject area. Sports Day activities are an excellent time for drills and demonstrations, as well as for games that introduce cooperative response skills (eg. water bucket brigade competition, fire extinguisher target practice, injury transport relays, and knowledge games)

Dissemination of written materials, use of posters and signage, displays and artwork are more subtle but important ways to share disaster risk reduction messages. Awards and commendations and media coverage can acknowledge these activities and help to generate enthusiasm for reproducing them.

Cultural arts are a vehicle for formal and informal disaster prevention education. *Courtesy of SEEDS, India*

GOOD PRACTICES

DISASTER PREVENTION AND PREPAREDNESS THROUGH EXTRA-CURRICULAR EDUCATION

Armenia, Kapan: In 2006 and 2007 a cooperative project between the National Survey for Seismic Protection and the Asian Disaster Reduction Center of Japan trained and certified 125 principals and teachers and 250 students as trainers and practitioners in the identification and assessment of seismic risks and priorities for action. In the future other regions and communities will benefit from this training.

Cape Verde, Prala & Santo Domingo: Almost 7,000 students in two cities participated in a project of the National Civil Protection Service with the Ministry of Education and other governmental organizations, learning risk awareness and prevention and practicing evacuation drills.

France: A 2004 decree by the Ministries of National Education, Health and Interior made it mandatory to sensitize students on risk prevention, rescue services and training in first aid. A national project to develop risk reduction plans in every school and sensitize 12 million students was launched in 2006 with 40% of primary schools meeting the target within the first year.

Grenada: A teaching guide for grades 3, 4, and 5 students has led to increased participation and increased knowledge revealed during three rounds of the annual "National Disaster Awareness Week Primary School Quiz" held in front of a large audience at the beginning of hurricane season. Feedback from Hurricane Ivan survivors helped expand the curriculum to include psychological first aid.

India, Uttar Pradesh: School communities in Uttar Pradesh have made extensive use of street theatre, magic shows and puppetry to convey disaster risk reduction messages. Collaboration between performing artists and disaster risk reduction experts has led to creative and engaging educational scripts.

India, Central Board for Secondary Education: Primary schools introduce disaster management through extra-curricular performing and visual arts activities. Formal education in disaster management begins in Standard VIII.

India, Gujarat: The Gujarat School Safety Initiative undertaken by the Gujarat State Disaster Management Authority, in conjunction with the state education authority, and in cooperation with NGO, SEEDS addresses

awareness and preparedness. Working with 175 schools in the region, 100 teacher trainers have reached 9,000 teachers in 25 districts, who in turn reach 100,000 students.

India, Gujarat, Tamil Nadu & Jammu/Kashmir: The Right to Safer Schools Campaign begun in 2001 and is ongoing, led by the All India Disaster Mitigation Institute. Initial efforts reached 40 schools, more than 18,000 children, and 450 teachers and administrators. The programme fosters a culture of safety with fire safety equipment demonstration and installation, first aid kits, insurance policies, awareness materials, training for teachers and staff, mock drill training, as well as need-based support to schools and student families and research activities. The programme will be expanded to four more states.

India, Pune: In early 2008, 360 children from 36 schools participated in a 2-day event on the premises of the Film and Television Institute of India. Activities included inter-school competitions, demonstrations, debate, essay and drawing competition, knowledge hunt, and using evacuation routes. Follow-up activities include theme-based calendar, summer camp and developing a child ambassadors' programme.

India, Shimla: In 2005, more than 10,000 participants from 20 schools took part in school safety activities, learning basic disaster awareness and participating in mock drills. Capacity-development addressed non-structural risk mitigation and school disaster management planning. Outreach materials reached 750 schools.

Iran: Co-curricular education complements formal education with a safety campaign and annual drill, art, painting, drawing and writing competitions. These benefit from maximum participation from educational, social, cultural, media and NGOs. Books and stories, posters, brochures, workbooks and educational aids targeting different age groups supplement textbook materials.

Japan: Supplementary reading materials designed to pass down lessons from the Great Hanshin-Awaji Earthquake Disaster have been created for students at all grade levels. Teacher training materials and emergency management manuals support this.

Mali: The Ministry of Education and Directorate of Civil Defence introduced disaster prevention messages to build resilience to drought, locust invasions and flood by introducing messages on the covers cover and 1 internal sheet of children's exercise books (providing a total of 8 sides of information). This simple and cost-effective way of raising awareness in schools has already reached more than 25,000 students with the help of the Young Business Owners' and Managers' Federation, even before mainstreaming disaster risk reduction into the curriculum is implemented.

Mozambique: Combating cyclones, floods, landslides, drought, and epidemics, the Mozambique Red Cross provided training to 99 teachers from 76 schools, reaching 4,400 students directly. It is noted that having visiting experts support special school-based meetings and activities provides several advantages: more students can benefit, the audience can include community members, and more depth can be achieved.

South Africa, Eastern Cape Province: A school competition enables students to demonstrate their knowledge on disaster risk reduction through art, music and drama. This best practice was selected for replication in two other provinces. Multi-stakeholder cooperation and local media interest supports children in reaching the entire community.

PART E: EDUCATIONAL MATERIALS & TEACHER TRAINING

E.1. EDUCATIONAL MATERIALS

Materials exist in many languages from dozens of countries, often developed by Civil Protection agencies, national Red Cross/Red Crescent Societies, scientific research organizations, and non-governmental organizations and sometimes supported by civic organizations. Most existing materials are presented as supplementary to the curriculum without clear links to where they can fit in. Many existing materials have not had the benefit of design with teachers and curriculum in mind, and have not been tested with students in the target age group. Some have good content but poor graphics or design and visa versa. Some out-of-date or unattractive materials may contain valuable content but in an ineffective form. We are slowly seeing new materials development being initiated education authorities and tailored to the existing curriculum, making them more likely to be used by teachers and by students and to have the desired impact.

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<td rowspan="1">CHALLENGES</td>
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Effective Materials and Programmes

The challenges as new educational materials are developed are:
- To make certain that the advice being offered is technically accurate
- To switch the emphasis from passive "public awareness" to active "public learning"
- To test the effectiveness of these in terms of changes in individual, family and community risk reduction and preparedness.
- To shift the focus of education from 'individual learning' to 'community learning and adaptation'
- To tailor approaches to public learning are socially acceptable and culturally appropriate. (Izadkhah 2004)

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<td>WARNING!</td>
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MATERIALS THAT SKIP "DISASTER RISK REDUCTION"

Most of the existing educational materials cover hazard awareness, and sometimes the science of natural hazards. Many even tackle the important starting point of risk assessment. However, most of the materials designed for children leap forward to "response-preparedness" glossing over or failing to introduce some of the specific measures for physical and environmental protection that are fundamental to disaster risk reduction. This can leave students with the very wrong impression that disasters are inevitable. (Petal, 2007)

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<td>GOOD PRACTICE</td>
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CHILD-CENTERED STRATEGIES AND MATERIALS

France: Cities and students are brought together in a programme called "Memo Risks". Called upon by their Mayor, students 11 years and older lead an inquiry about a natural hazard that concerns their city. The project is a trans-disciplinary school project anchored locally and in daily life. Students are invited to start simple actions such as drawing a risk maps, uncovering memories by interviewing the elderly, questioning the population about its level of information and preparation, asking local workers, businessmen and shop-keepers about the possible consequences of a disaster. Adult awareness is raised at the same time. The finished work is present at the city-hall open to the public, and recognized in local newspapers and radio. (http://www.prevention2000.org/memorisks/index.htm)

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The ISDR Thematic Platform for Knowledge and Education with the support of UNESCO, UN/ISDR, Risk RED and enthusiastic advocates from at least 50 countries has collected and compiled both a comprehensive physical library (housed with UNISDR in Geneva) and a digital catalogue and library of educational materials for the public, for children and for teachers. The Global Online Disaster Reduction Education Materials Library Collection ("DREAM Collection") is part of Prevention Web's online professional resources and is intended to assist countries and education authorities to access models on which to base their own materials hands-on materials. The searchable database describes key information about the materials, the format, target audience, hazards, themes and settings for the materials. Submissions are encouraged from anywhere in the world.

In the future, user ratings and comments will also be incorporated, and dissemination and evaluation information will be collected. An online portal is also proposed to help to share and rapidly adapt materials for different languages and settings.

The very wide range of possible materials, to make learning disaster risk reduction fun and challenging is limited only by our commitment of resources. Everything is possible from computer games to cut-out models, from board games to picture books, from make your own shake tables to videos of shake-table research. By sharing creative ideas, content and artwork efficiencies can be achieved and the range of materials broadened in order to engage students.

Many of these materials are available for adaptation. Materials will be more readily accepted if there are consensual messages from multiple trusted sources, co-logoing the same documents rather than a large amount of competing information.

Some existing materials are exceptionally well-conceived and can serve as models for use in other places. However, it is not advisable to use existing materials without review and adaptation to address local hazards, adapted to make sense in local languages and in their cultural contexts. The guidelines below for adaptation and localization suggest a process to enable the development of high quality materials, and to enhance their credibility and legitimacy so that they can be used with confidence and will make a difference.

E.2. TOOLS FOR ADAPTING EDUCATIONAL MATERIALS

ADAPTATION and LOCALIZATION

Since the development of high quality educational materials is labor intensive, it makes sense to build upon each other's work, rather than to "reinvent the wheel". These guidelines are suggested for a responsible approach to adaptation, localization and development of educational materials for disaster risk reduction.

WHAT

Excellent educational materials for disaster risk reduction have been developed all over the world, for the general public, for special target groups, and for school children.

The information contained in many of these should become general shared knowledge, part of a "culture of safety", just as personal hygiene measures like washing hands and brushing teeth are to health.

Many existing materials are copyright free, or the organizations that developed them are willing to share them. These guidelines are intended to facilitate permission and access to these materials and encourage responsible adaptation.

A proposed online portal for adaptation and development of materials will make it easier to share, re-tool, and develop these materials for wider and faster distribution in the future.

WHY

For educational materials to have credibility, legitimacy, and strong impact, they should be backed by a consensus of key stakeholders, and based on the best knowledge at the time.

The specific hazard conditions, some recommended risk reduction measures, and local experience and wisdom vary in each location. It is extremely important to demonstrate understanding and respect for these local conditions, exercise cultural sensitivity, use existing terminology and consistently introduce new terminology, based on wide consensus of stakeholders.

Materials developed in one location should not be translated and transplanted without very careful consideration and adaptation.

WHO

A good working group has 5-10 people, representing key stakeholder agencies and groups including, ideally:

- the National Red Cross/ Red Crescent Society
- highly respected academic/scientific experts
- Ministry of Education and/or other government agencies directly involved in the subject matter
- representative of other ngo's or professional organizations involved in disaster risk reduction
- skilled public educators
- representatives of target audience groups.

At least 1 or 2 members of the group should have fluent knowledge of the source language and most should be native speakers of target language.

HOW?

1 THE TEAM

Identify a team leader who will manage and guide the adaptation effort. Obtain commitment from participating organizations and confirm names, titles and contact information for team members. These individuals will put their names and organizations in the adaptation. Ideally partners will agree to add their logos too.

2 THE DRAFT TRANSLATION

Provide the team with these guidelines and with a professional draft translation of the materials in target local language, as well as the original. Translator and team leader should prepare by compiling a list of key terms in both source and target languages for discussion.
Team members should prepare by reading through the material and making notes.

3 THE REVIEW

Clarify the purpose and target audience for the materials. Consider the document as a whole and then review section by section, paragraph by paragraph, and line by line as necessary.

Discuss and agree on terminology. Consider using parenthetical synonyms or examples as needed to explain new or unfamiliar vocabulary.

Ask original authors of the material to clarify reasons for anything that isn't clear or you are considering radically revising.

Plan to eliminate and/or replace sections that do not apply. Identify additional materials needed.

Consider the epistemology and syntax of the target culture and language, and how to build upon it's strengths.

4 CONSIDER THE TEXT

Wherever appropriate and possible, adapt the contents to refer to local:
- hazards
- maps
- laws
- historical data
- examples
- experiences
- quotations
- fictitious place, street and people's names
- measurements
- materials
- solutions
- contact information

Consider the semantics of risk communication in the target language and culture.

Divide labor as necessary for development of additional materials. These additions should be subjected to similar full team review and revision.

5 CONSIDER THE GRAPHICS

Graphics should be appealing to target culture, easy to identify with, and accurately understood. They will be remembered better than text. Determine if graphics can be adapted, or must be started anew. Test all graphics with target group to discuss details of meanings derived from illustrations.

Do not use pictures of "what *not* to do" relying upon text to explain the mistake. Clearly mark these with 'X' or frown or similarly understood symbol. Check to be sure that symbols are widely understood.

8 TESTING, REVISING, CREDITING

Give your document a version number and date, test it with your target audience and revise. The next one will be "new and improved".

Make special effort to acknowledge the source of all original materials, and retain original credits relating to authorship or sponsorship. Check these with the original authors or publishers to obtain their consent. Include logos of partners, esp. public education and disaster prevention authorities.

Send original authors some copies of your new version, and stay in touch.

E.3.   INCLUDING ALL CHILDREN

There are many groups of children who are particularly vulnerable and for whom special outreach programmes will be needed. Appropriate and engaging age-appropriate interventions for all levels of schooling are possible. Hazard awareness and safety skills have successfully been introduced to **preschoolers and kindergarteners** in using songs, board games, puppets, role-play and performance activities. Research has shown that when carefully undertaken, children are empowered rather than anxiety-provoked (Izadkhah, 2007).

Each **linguistic minority group** will need access to specially-produced educational materials in their own language. **Children who are out of school** will require outreach through drop-in centers and through **apprenticeship** programmes. Similarly, students in **vocational programmes** will need to be included through comprehensive efforts to reach them through training programmes and occupational health and safety curricula. Students in construction and similar trade schools are especially important to educate with programmes that include understanding of disaster-resistant design and construction principles and practices. These will soon be the adults that have to implement the measures to keep all of us safe, and yet without proper understanding of the "whys" we cannot expect them to successfully implement the "how tos".

Children and staff with disabilities must be considered due to their specific risk reduction and preparedness needs as well as specific learning consideration. Making sure that educational materials makes use of clear pictorial images and videos, and that some uses auditory channels (songs, radio messages, drama), and is available at all reading levels, and in Braille are all important means of reaching vulnerable individuals and their families.

Several countries have conducted model programmes of outreach to and inclusion of children with disabilities through the design of special educational materials of all kinds, and through careful consideration to planning evacuation and drills in partnership with people with disabilities. Evacuation planning for people with disabilities has been well-studied and specific guidance for different disability types have been articulated helpfully.

The key element to successfully including outreach to vulnerable populations is to include members of the target groups in the planning process from the outset, and to learn as much as possible from those efforts that have gone before. Many materials for disaster planning with people with disabilities in mind can be found at: http://www.jik.com/disaster.html.

Deaf children engage through puppet shows. *Courtesy of ADRC*

OUTREACH TO CHILDREN WITH DISABILITIES

Indonesia: Arbeiter-Samiter-Bund (ASB), in partnership with the Provincial Department of Education, Yogyakarta, has conducted earthquake preparedness training for teachers and students at all of the province's 60 special needs schools. Teaming with deaf colleagues at a local NGO they developed multimedia earthquake preparedness materials including an educational drama involving deaf children. Audio based materials for blind children were also developed. The project also provided teachers with communicative training, including simple sign language and mime techniques. Trainings are supported by visual prompts including oversized game cards. New materials will cove multi-hazards for disabled children in and out of schools.

Iran: Pilot outreach to deaf students in 2006 has showed a high level of interest among students. In an exploratory needs assessment workshop, deaf child survivors of the Bam earthquake conveyed their own experiences and parallel discussion sessions involved 180 students parents and teachers in exploration of core notions of school safety for deaf children, appropriate methodologies for conveying earthquake education to them, and identification of their basic needs following a disaster. The results will inform the design of outreach programmes to deaf students in the future.

France, Rochefort & Merleau-Ponty: Schools in France have incorporated risk education for several years. In order to motivate students to understand and be involved in solutions to local risks of flood, industrial accidents and hazardous materials transportation, a programme of "Student Risk Ambassadors" was launched in a local high school to stimulate risk education, reach out with these messages to others, and simultaneously prepare for year-end "communications" examination. The project drew local and national attention and is being replicated in other schools.

E.4. TEACHER TRAINING& CAPACITY DEVELOPMENT

The discovery and transmission of disaster risk reduction knowledge flourishes where multi-disciplinary exchange and discovery are taking place. Joining the concerns, the questions, and the approaches to disaster risk reduction with related needs for the development of sustainable livelihoods and environmental protection and resource conservation is a complex endeavor that future generations require us to embark upon now. A foundation in disaster risk reduction knowledge is a necessity for those training for professions in public administration, public health, public safety, business administration, earth sciences, engineering, architecture, and many other fields, not least of which is in pedagogy itself.

Long-term and sustainable capacity-building for disaster-resilient education and safe schools relies upon embedding these competencies in higher education programmes for teacher-training. Partnerships with pedagogic institutes will be vital to the success of these efforts.

Three complementary approaches are all important for long-term sustainability and mainstreaming of disaster prevention education.

1. Partnerships with teacher-training institutions and support for faculty-training and seeding.
2. Development of distance-learning self-study tools to support widest low-cost dissemination of education.
3. Development of in-service and continuing education curricula for training of existing pool of teachers.

The support that teachers can provide to one another should be considered as a tremendous asset.

Higher education and vocational training programmes are also important areas for capacity development for disaster prevention education and safe schools. A list of available tools and information resources on capacity assessment may be helpful. http://www.capacity.undp.org/.

Teacher training programme launch in Gujarat. *Courtesy of Marla Petal*.

EDU4DRR TEACHERS NETWORK

This site provides a social network for teachers interested in teaching and sharing experiences and materials for disaster prevention education: http://edu4drr.ning.com

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TEACHER TRAINING FOR DISASTER RISK REDUCTION

Fiji: The first ever 3-day disaster management training courses for teachers were held in Fiji in 2006; a collaboration between the South Pacific Applied Geoscience Commission, the Asia Foundation and the National Disaster Management Office.

Iran: Teacher guides are prepared to support teachers in the transfer of disaster risk reduction knowledge, and teacher training is organized through continuing education courses designed to reach head teachers.

Japan: In 2008 MEXT, the Ministry responsible for education, started a pilot project to encourage municipalities to implement disaster risk education for students and communities. This project aims at creating teaching materials and implementing practical programmes on disaster risk education.

Sri Lanka: Following the 2004 Tsunami under leadership of the Ministry of Education and the National Institute of Education and with the support of the German Technical Cooperation, an effort began to integrate disaster risk reduction into the teacher training curriculum and prepare teachers country wide for its implementation. India's National Institute of Disaster Management provided initial expert support and contributed to the development of a practical, skills-focused curriculum. Through the National Colleges of Education all future teachers are reached during their pre-service training and acquire basic Disaster Management know-how and relevant skills for implementing School Safety programmes.

Turkey: A Basic Disaster Awareness Instructor Training Programme sponsored by the Ministry of Education with support from USAID offered teachers a distance learning course as a pre-requisite to applying for Master Instructor Training. Two Instructor-trainers per province were selected to receive a week-long training. Teachers returned home to deliver a 1-day training to more than 15,000 classroom teachers and school administrators. These teachers in turn delivered extra-curricular seminars to more than 5 million students, teachers and parents by 2005. Monitoring of training received and training provided was conducted through an online portal.

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The Capacity for Disaster Reduction Initiative (CADRI) a joint programme of the United Nations Development Programme´s Bureau for Crisis Prevention and Recovery (UNDP/BCPR), the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA), and the secretariat of the International Strategy for Disaster Reduction (ISDR) has recently compiled a searchable database where more than 100 post-secondary programmes in disaster risk management, as well as certificate

programmes, online courses, and other means for professional capacity-building can be found. http://www.unisdr.org/cadri/activities/index.php.

Training modules are also available on general disaster management, disaster preparedness, disaster response, disaster risk reduction and conflict mitigation. http://www.unisdr.org/cadri/dmtp-modules-eng.html.

Mason and other builder-training programmes are clearly also vital to all disaster prevention efforts. Pioneering work has been done in Nepal, India, Pakistan and the Caribbean and these resources are being added and made available through the DREAM collection.

While capacity development programmes for teachers, builders, and school administrators have been piloted as of yet little of this is available for study or replication, and this remains among the priorities to be addressed to support the realization of the globally shared goal of achieving a culture of safety.

PART F: DEVELOPING A CULTURE OF SAFETY

F.1.   CHILDREN AS DISASTER REDUCTION CATALYSTS

The UNISDR worldwide awareness campaign "Disaster Risk Reduction Begins at School" in 2006-7helped disaster prevention advocates to discover an important axiom; "Let the Children Teach Us!" (Wisner, 2006).As many social change-oriented efforts have long-known; children are important catalysts for carrying public health and safety messages home to families. Linking school and community-based education helps to foster self-efficacy, action-oriented coping and strengthens the community networks needed for resilience and survival. These links assure the sustainability of school safety efforts.

School-wide activities open to the public (assemblies, fairs, festivals, exhibits, competitions) engage parents and local communities. School-based initiatives can engage ad provoke local government (Schick, 2007).Iran's national school earthquake drills are preceded by radio, television and news coverage reaching virtually every household. As a result of their commitment to children, school communities are uniquely positioned to adopt a leadership role in determining their own futures (ActionAid, 2007).

The idea behind "child-led" efforts is the belief that children can play an active role in community affairs relevant to them, including disaster prevention, especially if they are appropriately trained and supported by adults. Rather than being seen as victims, children who learn disaster risk reduction can help adults to protect community members.

GOOD PRACTICES	**CHILDREN AS DISASTER RISK REDUCTION CATALYSTS** **Cuba:** "A Prepararnos" is a project implemented in pilot schools and communities throughout the 14 municipalities of Holguin province, to develop environmental and disaster education through formal and co-curricular means. The project focused on the relationship between schools and communities. It adapted a number of methods based upon the local environment, existing problems, natural and human disasters and their prevention. It established follow-up mechanisms to pursue desired results. **Thailand:** Local partners innovated with a "Child-Led Disaster Risk Reduction in Thailand" supported by Save the Children Sweden, a child-focused NGO. Youth trainers reached hundreds of children in dozens of schools to be catalysts taking the lead in DRR activities. Children took community trips, conducted risk and resource mapping, and developed a disaster risk reduction education campaign. http://www.eldis.org/assets/Docs/38480.html

F.2.   LOCAL ORGANIZATION – FOCUS ON SCHOOL-COMMUNITY INVOLVEMENT

There are many potential partners at the local school level ready to be involved in joint efforts: beginning with staff, students and parents. You may also find many of the following ready to provide support at the local level:
- staff, students, parents and their organizations
- branches of national Red Cross / Red Crescent Societies
- scouting and other after-school and school-break programmes
- government departments and individuals responsible for disaster management including civil protection and fire departments
- health clinics and public health outreach programmes
- academic, scientific and technical experts
- non-governmental organizations and activists in disaster risk reduction
- intergovernmental and bilateral economic development, environmental protection, and humanitarian assistance programmes and organizations
- international and regional advocacy coalitions
- senior citizens
- local businesses and employers

Schools can benefit by banding together in their local districts, crossing both age-divisions and public and private boundaries. The heterogeneity between and among schools can be used as strengths through both collaborative cross-age group efforts as well as competitive and fun activities.

Common attributes of successful community-based programmes include cross-sectoral collaboration, working with established groups, and targeting vulnerable populations. They involve flexibility and local decision-making, volunteer support and plenty of public exposure. They also need to be based on simple and achievable projects, have a designated coordinator, dependable funding and to be evaluated for lessons learned (Finnis, 2007). What can be achieved depends upon the partnership of the education sector and disaster prevention activists.

F.3.   SUB-NATIONAL ORGANIZATION – FOCUS ON SUSTAINABILITY AND SCALING-UP

Programmes that reach only a small fraction of the intended audience do not have the momentum needed to bring about a culture of safety. A critical mass must be reached, and therefore scaling-up must be multiplicative, institutionalized and sustained. There are four pre-requisites for scaling-up:
- Intervention programmes should be quality-tested, and amended as necessary to identify high-impact programmes and materials
- Stakeholder involvement must be expanded and diversified and partnerships established at the national and local levels
- Enabling policy must be enacted to ensure sustainability
- Leadership capacity must be developed to carry this forward

Creating and maintaining safe school environments, and mainstreaming disaster risk reduction education requires enabling and promotion by enlightened national and sub-national level policies. This is necessary but insufficient. A broad range of actors are required to bring these to fruition: the education authorities that prioritize school safety, the engineers that develop building codes, the public officials that adopt them, the builders that adhere to them, and the consumers that demand them. Sub-national and national efforts to bring together the many actors who can make scaling-up possible are a necessity for long-term success.

Partnerships needed at the sub-national and national levels include:
- Educational authorities
- Disaster management authorities
- Local government authorities with responsibilities for schools

- Parent, teacher, administrator and professional and staff associations and unions
- Red Cross/Red Crescent society chapters
- Non-governmental organizations including child-focused organizations and civil associations involved in disaster-risk reduction
- Scientific and technical experts and researchers
- Teacher training institutes
- School architects and planners
- International donor
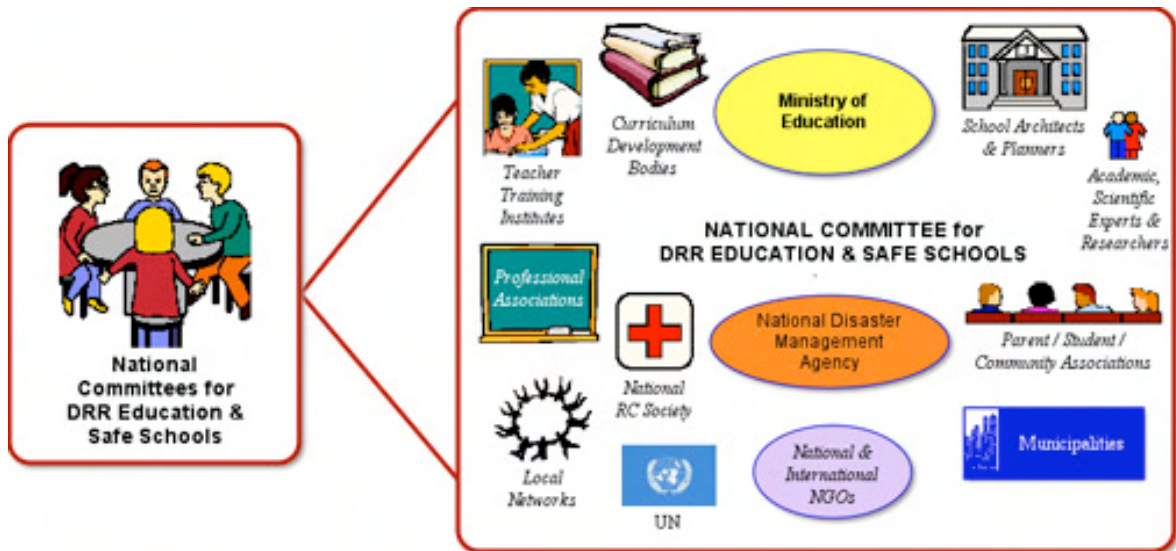
F.4. NATIONAL LEADERSHIP – FOCUS ON POLICY-SETTING

At the national level, school disaster prevention forms an important part of the national agenda for disaster risk management. The collaboration of several high-level government bodies is required for success. Educational and national disaster management authorities, bodies responsible for public infrastructure investments, construction and planning standards bodies, curriculum and content experts, and organizations representing administrators, teachers, parents and students are of vital importance in articulating challenges and solutions.

The highest level educational authorities are expected to take the lead in a policy agenda designed to:

- Set goals and objectives for vulnerability and risk reduction in the education sector.
- Define policies and priorities for vulnerability reduction and acceptable level of risk.
- Create a national guidance committee including all relevant organizations to guide implementation of a vulnerability reduction plan.
- Ensure quality control chain so that every new school is a safe school.
- Assess the vulnerability of existing school buildings and prioritize replacement and retrofit.
- Develop mechanisms to incorporate vulnerability reduction into the school planning process.
- Propose investment projects for structural mitigation.
- Develop school disaster management guidelines.
- Propose support mechanisms for adoption of non-structural mitigation measures.
- Provide training to technical personnel for conformity with quality control standards.
- Promote mainstreaming of disaster prevention education through extra-curricular policies.
- Initiate review of scope and sequence of knowledge, skills and competencies in disaster prevention based on a national perspective.

- Initiate audit of national curriculum in order to embed disaster prevention education in the curriculum during the regular curriculum review process.

F.5. REGIONAL AND GLOBAL SUPPORT – FOCUS ON KNOWLEDGE SHARING

The International Decade for Natural Disaster Reduction in the 1990s led to the establishment of an ongoing partnership known as the International Strategy for Disaster Reduction (ISDR). In 2005, 168 countries approved the Hyogo Framework for Action 2005 -2015: Building the Resilience of Nations and Communities. This ten-year strategy identifies five priority areas for action. "Priority 3" is to" Use knowledge, innovation and education to build a culture of safety and resilience at all levels." Activists have interpreted this broad mandate to include the requirement that schools themselves be safe places to study and be recognized for their importance as a community resource in pre-disaster risk reduction planning and in post-disaster recovery.

The ISDR System works actively to support nations in establishing their own coordinating and multi-stakeholder and multi-sectoral participatory mechanisms referred to as "National Platforms for Disaster Reduction". Often an initiative like this already exists at the national and/or at sub-national levels or is nascent in the education sector. Ideally these two initiatives would be linked.

To the left model is a model for how the work of global, regional, national and local coalitions for disaster risk reduction education and school safety can be linked. In each of these places where knowledge and education is being addressed, Ministries and Departments of Education, school districts, pedagogic leaders, and committed teachers should be found in leadership roles.

A national committee for disaster prevention education and safe schools can serve to link and guide various sub-national initiatives. Ideally the National Committee is linked to the National Platform for Disaster Risk Reduction, and is also represented in a Regional Platform for Knowledge and Education and Safe Schools. Regional Task Forces in turn feed their experiences and priorities into global level mechanisms for mutual support.

The Thematic Platform for Knowledge and Education, The Coalition for Global School Safety and Disaster Prevention Education and associated Networks

The Thematic Platform for Knowledge and Education (TPK&E) and the Coalition for Global School Safety and Disaster Prevention Education (COGSS&DPE) are partner networks supporting the implementation of Priority 3 of the Hyogo Framework for Action with a Joint Workplan. They envision a world in which knowledge and education are successfully applied for disaster prevention at all levels of society and in which every student receives their education in a disaster-resistant school. Their shared mission is to identify gaps and priorities and to support the development of knowledge-sharing strategies and political will to ensure that every school is a safe school, and that every child and community has access to high quality, audience-targeted disaster prevention education knowledge, experience and expertise to build a culture of safety.

The Platform (TPK&E) is led by the ISDR system and brings together representatives of large international agencies and systems, regional task forces, and networks.
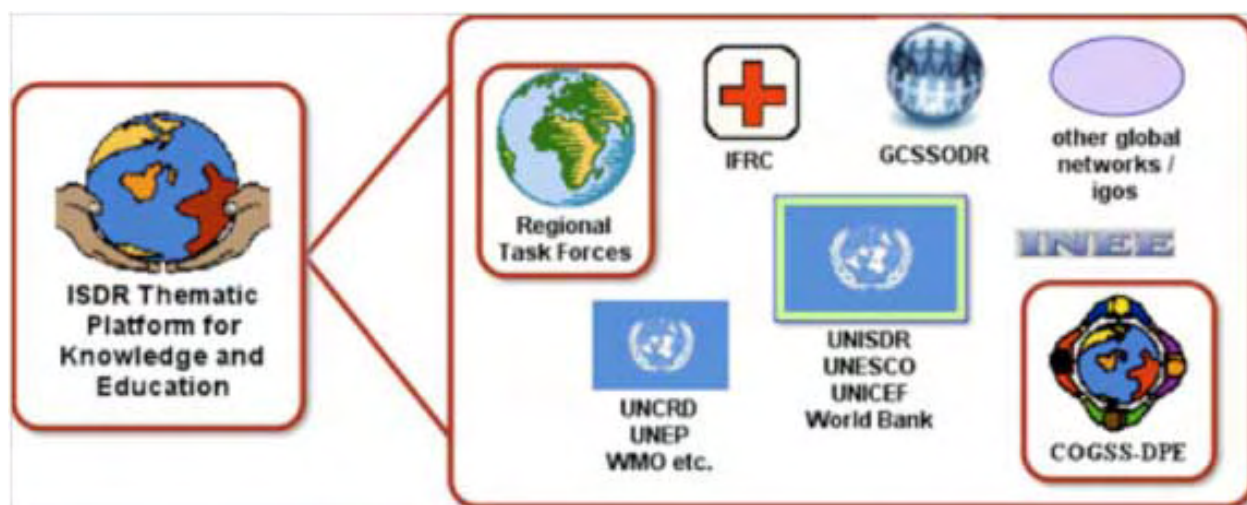
Both mechanisms recognize the benefits of sharing information, working collaboratively, harnessing collective intelligence, minimizing duplication of effort, marketing ideas collectively, presenting a united front and exerting influence over key policy processes. Goals are shared for the realization of (1) Disaster-resistant school infrastructure, (2) Disaster prevention education in schools, (3) School-based disaster management, and (4) Community-based disaster awareness and reduction education.

The Coalition (COGSS&DPE) is an open group of organizations and individuals actively engaged in core working groups to advance each of these four goals. Additional working groups address specific areas of interest such as child participation, capacity-building and young researchers, edu4drr teacher's network, disaster-resistant universities, and outreach to people with disabilities.

Any organization and any individual can become an active member. COGSS especially invites teachers, school principals, teachers, parents, young researchers, students, as well as practitioners, advocates, activists, artists and designers, and academic, scientific, and technical experts. COGSS hopes to engage the concerns of many involved in cross-cutting issues of sustainable development, environmental education, gender, disability, child protection, human rights, humanitarian response, and disaster recovery. Partners and donors are represented on the Steering Committee.
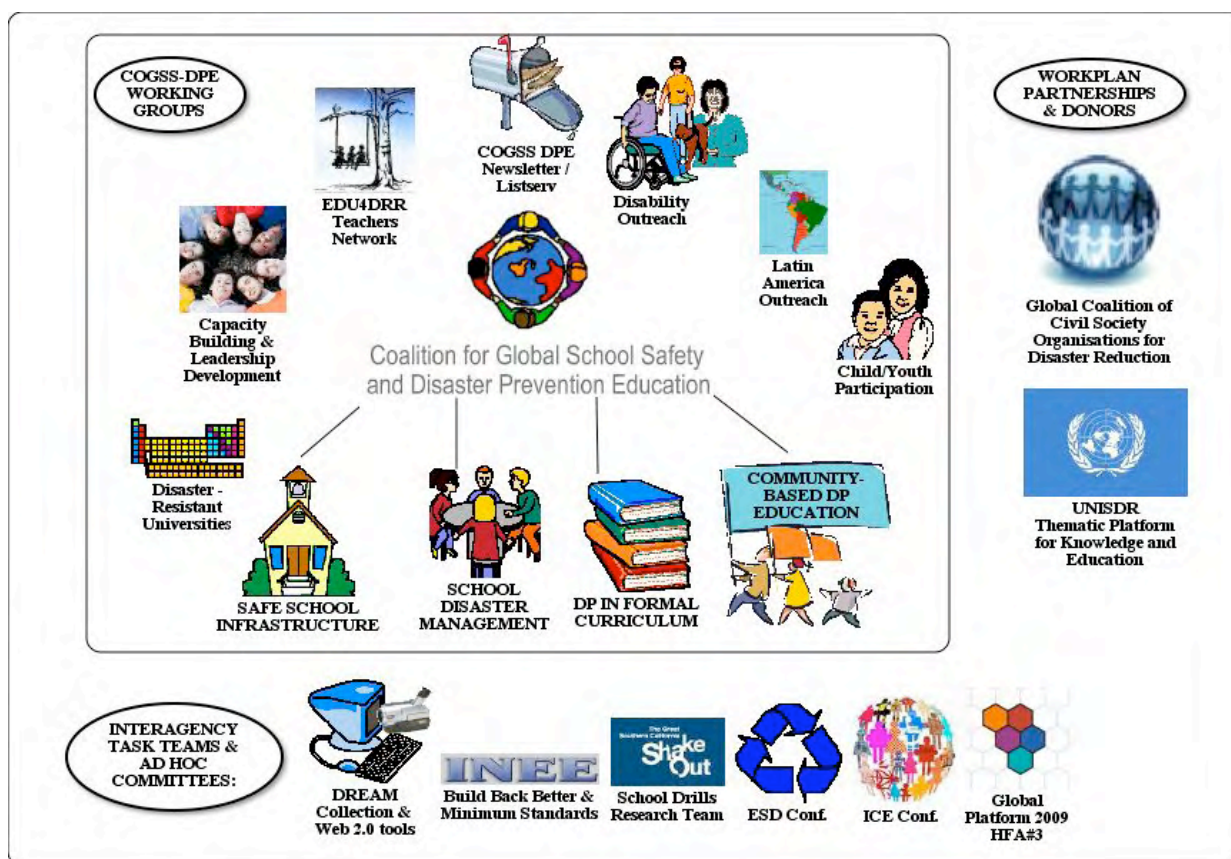
There are important wider networks that any interested individual can join, in order to stay informed and contribute. One is the DRR Education Network Listserv a general forum for sharing news and information, and the other is the Edu4DRR Teacher's Network.

> **JOIN THESE COMMUNITY-of-PRACTICE NETWORKS!**
>
> **Coalition for Global School Safety & Disaster Prevention Education www.cogssdpe.ning.com**
> **Disaster Risk Reduction Education Network Listerv (ENDRR_L)**
> **http://www.preventionweb.net/go.php/DRRedNETWORK**
> **Edu4DRR Teacher's Network www.edu4drr.ning.com**

F.6. RESEARCH AND EVALUATION

In an ideal world, everyone knows their risks, knows exactly how to reduce their risks, makes reasoned choices, and acts on available information. For the past 40 years however, researchers have noted that in spite of basic information about risks, most cultures and countries have focused their concerns on emergency-response rather than on disaster prevention. This emphasis is no longer viable for the larger populations at increased risk – and yet it persists. It has become ever more important that each programme and effort be evaluated to learn whether it has succeeded in making the desired impact. Small variations in setting, language, approach, target audience, visual content, repetition, sponsorship, may all be important. Educators, community practitioners, researchers and students together can adopt this scientific and experimental approach to draw out lessons learned, rather than the more typical self-congratulatory reports.

What we know

A modest body of social science research in "risk communication" and "decision-making" now provide some important models and starting points. For example, we know that we have to first get people's attention and that disasters (even in other places) do that easily. In order to make the problems their own, people need to do their own information-seeking – at which time consistent information from multiple credible and respected sources is important(Mileti & Fitzpatrick, 1993). (Lindell & Perry, 1992)(Turner, Nigg, & Heller Paz, 1986). Repetition and variety are both important, and so is specific guidance on hazard adjustments. Prior experience certainly makes a difference, however, in an information age literate people and cultures with strong oral history traditions have made even low-frequency, high-impact events salient. Too much focus on death and destruction makes people give up. In general people will do whatever they know to do. What is sometimes disparagingly described as "fatalism" seems really to be "measuring respondents' lack of awareness of [hazard] adjustments at all." (Lindell & Prater, 2000).

When it comes to personal behavior change, most important seem to be awareness, perceived effectiveness of specific risk reduction measures and feeling capable of implementing the measure. Cost and effort are also factors(Davis, 1989; Edwards, 1993; Russell et al, 1995). Forming intention is a positive prerequisite for action. Respected role models (similar to "early adopters") may also play an important role. Interestingly, attitudes do not always predict behaviour (Mileti, 2008). People's belief about the effectiveness of their own action has greater influence than their belief about the specific disaster threat(Lindell & Perry, 2000 p.476). In other words we must put much more emphasis on the specific solutions required rather than the general threats. We need to be able to assert more credible claims about the utility of specific adjustments and behaviors.(Lindell & Whitney, 2001, p.14).

In communicating disaster risk reduction it can be helpful to divide the potpourri of advice and recommendations into some systematic areas that can be addressed by individuals and households, by organizations, institutions and neighborhoods, and by policy-setting and government bodies. These can be broken down, for example into:

- Assessment and Planning
- Risk Reduction Measures (physical and environmental protection
- Response Capacity Development.
    (Petal, 2008).

Recent research identifies some of the factors that can enhance the effectiveness of disaster risk reduction education programmes. These include: integration of these programmes with wider community-based disaster risk management initiatives, interactive design which emphasizes the "doing" of risk reduction and preparedness, interactive components that actively encourage students to share what they have learned with parents/guardians (Ronan & Johnson, 2005; Schick, 2007).

What We Don't Know

There are many unanswered research questions that only the education sector can help to answer. Systematic research on how to move from knowledge to action for disaster prevention is very much needed. Our collective learning will be strongest if research and practice go hand-in-hand, and if all stakeholders have an opportunity to pose their questions. These are some questions that have already been articulated, but each national and local education effort may find its own questions.

Student disaster reduction awarenes s campaign Banner. *Courtesy of FSSSBC, Vancouver, B.C.*

Creating Safe Learning Environments:
- What are the most efficient means of prioritizing and funding school replacement and retrofit, and what are the incremental costs compared to natural attrition?
- Can engineers be brought out into the field to exchange knowledge with builders during school construction?
- Who needs to be on site to oversee new school construction, what training can this person be given and how?
- Can community members help facilitate construction-monitoring with using photography and expert review from via internet?

Maintaining Safe Learning Environments:
- How effective are school disaster reduction measures at saving lives, limiting injuries, and protection school continuity?
- How effective is response skills training and drill practice in saving lives and building resilience?
- What are the most efficient and effective means of providing comprehensive disaster response training to school staff and older students.

Teaching and Learning Disaster Prevention:
- What kinds of community-based risk projects are student catalysts most effective in?
- What are some of the most effective experiential activities for different ages of students and in different subject areas?
- What are some of the most effective extra-curricular activities for students of different ages?
- How can modern marketing methods be applied to promoting family and school household risk reduction and adjustments?
- What are the most effective elements in moving from knowledge to action?
- What roles do fear and anxiety play in either promoting or inhibiting risk reduction action?

Building a Culture of Safety:
- How can communities become more engaged in ensuring that their schools are safe?
- What are the most positive impacts on family and school risk reduction as a result of specific school-based interventions?
- How can momentum be sustained even in the face of hazards with long return periods?
- Which strategies and approaches are the most critical in achieving a "culture of safety"?

The communities of practice networks described above, and the online resources at both http://www.preventionweb.net/go.php/edu-materials/ and http://www.preventionweb.net/english/professional/publications/ all provide useful starting points for research and evaluation into disaster reduction education and safe schools.

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APPENDIX 1: Milestones in School Safety and Disaster Risk Reduction Education

Milestones In School Safety and Disaster Risk Reduction Education

2009: INEE to revise Minimum Standards for Education in Emergencies to include DRR.

2009: ISDR Thematic Platform for Knowledge and Education and Coalition for Global School Safety and Disaster Prevention Education develop joint work plan.

2008: November UNISDR publishes Disaster Prevention for Schools: Guidance for Education Sector Decision-Makers.

2008, November: 48th session of the International Conference on Education (ICE) "Inclusive Education: The Way of the Future" Geneva and **2008, May**: ICE regional preparatory meeting, Bali "Inclusive Education: Major Policies Issues in the Asia and Pacific Region". Preventing mass exclusion of children from schools introduced as a part for discussion.

2008, July, Bangkok: Education for Natural Disaster Preparedness in Asia-Pacific in the context of Education for Sustainable Development (ESD). A forum for coordination and exchange of information between key stakeholders in the region created. Eight countries targeted.

2008, May: Islamabad Declaration on School Safety adopted at the **Islamabad International Conference on School Safety** urges resilient schools as a matter of regional and national priority.

2007, November: Delhi Declaration on Disaster Risk Reduction in Asia 2007 adopted by Second Asian Ministerial Conference on Disaster Risk Reduction in New Delhi. National governments are urged to integrate disaster risk reduction in school education and make the schools safer for children.

2007, October: Bangkok Asia-Pacific Regional Workshop on School Safety and Disaster Risk Reduction Education organized by the regional Disaster Risk Reduction Education Task Force and partners. Review of progress in advancing Priority 3 of the HFA and promoting political commitment to disaster risk reduction in school curricula and safer school construction.

2007, October: Paphos: European And Mediterranean Major Hazards Agreement (EUR-OPA) Workshop on Disaster Reduction - Building Safer Schools Communities.

2007, January: Ahmedabad Action Agenda adopted at the **International Conference on School Safety** identified immediate and mid-term priorities: Disaster Reduction Education in Schools, Disaster-Resilient School Infrastructure, Safe School and Community Environment and Advocacy and Government Policy on School Safety. It also identified stakeholder roles and responsibilities.

2007, June: Global Platform for Disaster Risk Reduction. Knowledge and Education Cluster met to establish intention to form ongoing **Thematic Platform on Knowledge and Education**.

2007: Asia Regional Consultative Committee on Disaster Management - Consultation on Guideline 6.1

2006, June: Disaster Reduction Begins at School 2006-2007 World Disaster Reduction Campaign launched by UNISDR, UNESCO, UNICEF and partners. **Knowledge and Education Cluster formed** with Interim Steering Committee.

2006, June, Bangkok: Regional Workshop on Educational Materials for "Education for Natural Disaster Preparedness in Asia Pacific in the context of Education for Sustainable Development (ESD)". UNESCO and ADPC co-hosted this workshop in order to present, promote and disseminate illustrative examples of useful educational materials developed during the project.

2005: Hanoi RCC 5 Statement on "Mainstreaming Disaster Risk Reduction in Development (MDRD) and Enhancing Regional Cooperation (2005) adopted by 26 member countries calls upon member countries to undertake Priority Implementation Partnerships in thematic areas, regional support for support for these including development of guideline documents.

2005, April: Coalition for Global School Safety establishes international network of advocates and activists.

2005, January: World Congress on Disaster Risk Reduction, Hyogo Framework for Action adopted by 168 countries.

2000:United Nations World Disaster Reduction Campaign "Disaster Reduction: Education and Youth" aimed to continue and develop a culture of prevention through education. Objectives included integration of disaster reduction in education curricula and promote youth participation in disaster reduction activities.

1999: UN International Strategy for Disaster Reduction established.

1994: Yokohama Strategy and Plan of Action for a Safer World adopted mid-way during IDNDR.

1990-2000: International Decade for Natural Disaster Reduction (IDNDR).

Ahmedabad Action Agendafor School Safety

The International Conference on School Safety held in January 2006 in Ahmedabad, Gujarat, India reaffirmed both the HFA Priority for Action 3 " Use knowledge, innovation and education to build a culture of safety and resilience at all levels" and the UN Millennium Development Goal2 to "Achieve universal primary education" by year 2015. Recognizing that every child has both the right to education and the right to safe and sustainable living, set the goal to achieve "Zero Mortality of Children in Schools from Preventable Disaster by the year 2015". The Ahmedabad Action Agenda for school safety covers:

I. DISASTER REDUCTION EDUCATION IN SCHOOLS

Top Priority
- Include disaster risk reduction in the formal curriculum at both primary as well as secondary levels
- Promote disaster risk reduction through co-curricular activities in school acknowledging that children in schools need to develop "survival/life skills" first, along with 'academic inputs"

By 2015
- Promote exclusive initiatives among children in schools that make them leaders in risk reduction in the community
- Ensure effective partnership among schools to share risk reduction education and achieve higher levels of school safety.

II. DISASTER RESISTANT SCHOOL INFRASTRUCTURE

Top Priority
- Complete risk assessment and safety measures must be undertaken to ensure zero potential damage to new school building
- Mandatory safety audit of all existing school buildings with respect to their location, design and quality of construction and prioritizing them for demolition, retrofit or repair.

By 2015
- Develop, implement and enforce codes with the performance objective of making all new school buildings ready for immediate occupancy following any disaster to serve as shelters of safe havens for the community as well as to restore educational functions in the shortest possible time.
- Implement a systematic plan to retrofit and/or repair existing schools to meet minimum standards for life safety in the event of known or expected hazards. Demolish unsafe irreparable school buildings and replace them.
- Implement routine checks to ensure schools adhere to minimum standards and safety measures are not undermined.

III. SAFE SCHOOL AND COMMUNITY ENVIRONMENT

Top Priority
- Mobilize parent, student, local community and school staff to champion school safety.

By 2015
- Schools to prepare and implement school safety plans including measures to be taken both within school premises and in the immediate neighborhood. This must include regular safety drills.
- Promote active dialogue and exchange between schools and local leaders including police, civil defense, fire safety, search and rescue, medical and other emergency service providers.
- Schools children must practice safety measures in all aspects and places of their lives.

IV. ADVOCACY AND GOVERNMENT POLICY ON SCHOOL SAFETY

Top Priority
- A policy on school safety which would eventually be integrated with the existing policies on school education must be framed.

By 2015
- Enforce policy through budgetary allocation, strategic programmes and effective monitoring.