

Training and Learning Circle





# Community-Based Disaster Risk Reduction

### SAFER SCHOOL TRAINING AND LEARNING CIRCLE







# Introduction to School Safety in India







# DISASTER DEFINITION

• An event that causes sudden disruption to the normal life of a society and causes damage to property and lives, to such an extent that the affected society is not able to cope using its own resources

### **Disaster Risk**

The chance of a particular hazard actually occurring, and the exposure of something of human value to that hazard - the combination of probability and loss. Disaster Risk Equation

Disaster Risk = Hazard X Vulnerability / Capacity

- Hazard: an event or an occurrence that has the potential for causing injuries to life or damage to property or the environment
- **Vulnerability:** a set of consequential conditions, which adversely affect a community's ability to prevent, mitigate, prepare for and respond to events
- **Capacity:** the degree to which a community can intervene and manage a hazard in order to reduce potential impact

### Hazards

 Water and Climate: Cyclone, Hurricane, Floods and poor drainage, Hailstorm, Cloud burst, Heat/Cold wave, Snow Avalanche, ,Drought, Sea Erosion, Windstorm/Lightening and Thunderstorm, Tornado, Hurricane







- Geological related: Earthquake, Tsunami, Landslide and Mudflow, Dam Failure, Volcano, Mine Fire
- Accident-related: Urban/Rural Fires, Mine flooding, Forest/Wild Fire, Oil spill, Major building collapse, Festival/Pilgrimage disasters, Boat capsizing
- Man-made: Terrorism, Refugee situations, Communal Riots, Ethnic Conflict
- CBRN: Chemical and Industrial Disasters, Nuclear Disasters, Epidemics and Biological Disasters, Pest attack, Cattle epidemic
- Other: Fire, Policy-induced disasters, Transport and water related disasters, Drug abuse tragedies, Food Poisoning
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### **Disaster Effects on Schools**

- Direct Effects:
  - Damaged school buildings
  - Injured students, teachers and school staff
- Indirect Effects:
  - Increased drop-out rates
  - Loss of trust in institution
  - Decrease in education quality
  - Increased stress
  - Psychosocial impacts







- Children are among the most vulnerable groups in the population, as they have less physical and mental capacity to protect themselves.
- Schools should be a haven of safety, but the need for more schools has resulted in poor structural and organizational safety.

# Schools Role in the Community

- Normal times: events, fundraisers, clubs, religious organizations, storage for books and technical equipment
- Emergencies: shelter before and after disaster, temporary housing, distributing food, water and supplies







# Hazards Affecting Schools in India

#### • Direct Effects:

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# Earthquake HOW DOES IT OCCUR?

Scientific Information on Earthquake and Steps for Mitigating its Impact

#### Earthquake: Cause and Effect It is important to understand the internal structure of the earth to know how an earthquake occurs.

The earth can be divided into three layers—crust, mantle and core. The crust and the uppermost part of the mantle are rigid and together constitute the lithosphere. The lithosphere is underlain by a partially molten 100-200 km thick part of the mantle, which is known as asthenosphere. The mantle consists of the bulk of the earth. The mantle below the asthenosphere is solid and is called mesosphere. The core can be divided into two parts: a liquid outer core and a solid inner core.



The lithosphere is divided into a number of pieces, known as tectonic plates, which move relative to each other. These plates often collide, exerting stress on rocks. When accumulated strain exceeds the breaking strength of rocks, the stored energy is suddenly released in a series of waves, causing the earth's surface to shake. This shaking is referred to as an earthquake.

The earth experiences a large number of earthquakes everyday. However, most of them pass unnoticed to us, and

> are recorded only by seismograms.



#### Safety Tips for Surviving Earthquake

Do not panic and run during earthquakes. Prompt and proper decision may help to avoid death and injury.

#### When you cannot get outside a building at the time of an earthquake Do's

- · Hide under a heavy table or bed.
- · Stand at the corner of a room or in a doorframe.
- Stand beside a pole or room wall.

#### Don'ts

- Do not stand near gas cylinders and stoves where fire can break out.
- · Do not stay at staircase or in a lift.
- Do not stand near electrical lamps, electrical bulbs, framed big pictures or big mirrors.
- Do not stand near heavy cupboards or glass door windows.

#### If you are outside, go to open place like a ground

#### **Hazardous** places outside home

- Do not stand near multi-storeyed buildings.
- Do not stand under balconies.
- Do not stand near big signboards and glass windows.
- · Do not stand near electricity poles.
- Do not stand under, or on, bridges.
- Do not stand under high-tension and other electrical lines.

#### ALL INDIA DISASTER MITIGATION INSTITUTE

E-mail: bestteam@widmi.org 1 Website: www.aidmi.org



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# Hazards effecting schools in India: Earthquake, Cyclone, Tsunami, Fire / Accidents, Flood

### Earthquake:

- Earthquakes are the vibrations of the earth that happen as a result of the release of energy that occurs when the Earth's tectonic plates move toward, away from, or against each other at their boundaries
- High amounts of energy are released when rocks in the Earth's crust bend and break, releasing radial waves of vibrations
- Rapid onset disaster no effective warning
- 1 main quake with before and after shocks
- The point of origin is called the 'epicenter'
- Estimated that 57% is earthquake prone
- Kashmir and Western Himalayas
- Central Himalayas (including) Nepal
- North East India
- Indio-Ganetic basin and Rajasthan
- Combay and the Rann of Kutch
- Peninsula India and Nicobar Islands







#### 2001 Gujarat Earthquake

08:45, 26th January 2001 – Earthquake magnitude 6.9, or 7.7 on the Richter Scale. Damage to schools across Gujarat:

- 9,500 schools destroyed, 5,500 damaged total of 15,00 half the schools in the state
- 5m children effected, 1.5 2.5m under-14's lost family, home or school
- Schools are highly vulnerable:
- Located in crowded areas, near tall buildings that can fall
- Lack of evacuation and emergency plans
- Overcrowding of schools and classrooms
- Corridors and surroundings are too narrow for children and Emergency Services







Science in the Service of School Stefety Qumpses of Joyful Learning Initiatives on scientific Awareness by AIDMI

#### Mitigation through Joyful

**Cyclone: Cause and Effect** 

**Can Cyclone Be Stopped?** 

A cyclone occurs when a low pressures area starts

to turn around a centre, the cyclone's eye. A

cyclone's strength is increased when it moves over

warm seawater, on which it feeds. Strong winds

No - but the storm's direction and intensity can be

predicated fairly reliably. This can reduce the loss

of life during cyclone by taking safety measures.

and heavy rain occur as a result of cyclones.

Learning

### Cyclone How DOES IT OCCUR? STEPS TO MITIGATE ITS IMPACT

Scientific Information on Cyclone: Steps for Mitigating its Impact

#### Safety Tips for Surviving a Cyclone

- Learn from your parents about what a cyclone is and what may happen during a cyclone.
- Do not be afraid of cyclones. If you follow your parents' advice you will survive from cyclones.
- When cyclone is predicated, do not leave the house without your parents permission.
- If you are in school during a cyclone, follow the instructions of your teachers.
- If you are in home during a cyclone, close all windows and doors.
- Do not go in the opposite direction of the wind.
- Quickly go to a safer place if you are outside during a cyclone.
- If you are standing near, trees or electric poles, quickly move to, a safer place.

Dear children let us learn lessons of safety during a cyclone, Let us make necessary preparedness against uncertain disasters, When cyclone strikes, it blows roof of the houses, Cyclones uproot big trees and electric poles, Do not panic and go to safer place, Dear children let us learn lessons of safety during a cyclone...

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#### ALL INDIA DISASTER MITIGATION INSTITUTE E-mail: besttoam@aidmi.org

nail: bestteam@aidmi.org 🖣 Website: www.aidmi.org









# Cyclone

• Cyclones form when a low-pressure storm increases in size by collecting energy and moisture from warm oceans. The Earth's movement and wind currents spin and move the storm, making it more powerful and increasing the wind speeds

- Can reach beyond 300km in width and 20km in depth
- Strongest winds at the 'eye wall' can reach beyond 300kmph
- Energy dissipates when the cyclone travels over land, but damage can reach 60km inland
- Slow onset disaster
- 7,516km of coastline is vulnerable
- Orissa, Andhra Pradesh, Tamil Nadu and West Bengal are worst hit areas
- Occurs in 2 seasons: pre-monsoon (April and May) and post-monsoon (October to December)
- Indian sub-continent is worst effected part of the world







# Sunami HOW DOES IT OCCUR?

Scientific Information on Tsunami: Steps for Mitigating its Impact

#### **Tsunami: Cause and Effect**

#### What is a tsunami?

The word tsunami is derived from Japanese language, 'tsu' meaning harbour and 'nami' meaning wave. Tsunamis occur due to submarine earthquakes, volcanoes and landslides as well as meteoritic impact on seas, causing tidal waves.

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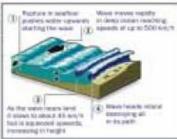


#### How do tsunamis differ from other sea waves?

Tsuriamis have certain characteristics that make them different from other sea waves. Tsunamis originate when ocean water is vertically displaced during large earthquakes or other phenomena. In open water, the waves may travel at speeds as great as 800 km per hour, and the distance between successive crests may exceed 100 km. Wave heights in deep water may be less than 1 m, but when the waves enter shallow coastal water and feel the surface, they slow to less than 60 km per hour, and wave heights may increase to more than 15 m.

#### What happens when a tsunami approaches the land?

The heightened waves of tsunamis can be overwhelmingly devastating on coasts. They wash away almost everything in their way. They can topple buildings and other constructions, root out trees and cause erosion of coastal sand.



#### When Tsunami Come?

#### How to mitigate the impacts?

- Do not destroy coastal vegetation that forms a natural buffer to tsanamis.
- Promote natural vegetation like mangroves and coconuts. They can act as natural barrier to tsunamis
- Keep sand bags on coasts
- Keep rescue and relief teams ready for effective response.
- Be prepared to shift low-lying communities to safer places
- Develop a people-centred warning system
- Keep water purifying medicines (chlorine tablets), dry snacks, milk powder for children, first aid kits and other important materials properly so that they would easily be available in an emergency

#### In the immediate aftermath

- On- and less-affected individuals should join rescue and relief efforts
- Do not use wet electrical appliances
- Do not try to swim and walk in accumulated water

#### After a tsunami

- Op not eat food that has come in contact with tsunami water
- Drinkboiled water
- Take special care of the elderly women and children
- Make water supply accessible to all.



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E-mail beatteam@aidmi.org Website: www.aidmi.org







## Tsunami

• Tsunami (meaning 'harbour wave' in Japanese) are slow onset disasters caused by submarine earthquakes, landslides, volcanoes or meteoric impacts

- These displace the seabed and thus displace the large body of water directly above
- The energy forces the water out in a series of radial waves. In deep water the waves travel with high speed but low wave height. Once the water reaches land and shallower points, it slows down and thus the wave height increases dramatically as it reaches the shore – as high as 15m or more

### Tsunami Effects

#### **General Effects**

- Injury and death (drowning, force of the wave, debris, etc)
- Destruction of plant life, trees uprooted
- · Coastal sand and earth eroded
- Destruction of buildings
- Flood waters and their related risks (contamination, electrocution, etc)







#### **Worsening Factors**

- Lack of natural protection (e.g. mangroves, coral reefs)
- Gently sloping beaches
- Land subsidence
- Coves and Bays
- River and creek mouths

#### Effects of the 2004 Indian Ocean Tsunami

- Tamil Nadu:
  - 252 schools needed complete reconstruction
  - 19 needed major repairs
  - 49 in needed minor repairs
- Andaman and Nicobar Islands:
  - 78 teachers dead or missing

- 25% of primary, 33% of upper primary and 31% of senior secondary schools seriously damaged







# Accidents

- Accidents can occur at any school large or small scale
- Non-disaster-prone schools have better awareness about accidents their knowledge must be shared

#### Key Issues:

- Road accidents and other related hazards on children's way to and from school
- Keeping of dangerous substances used for science class and school maintenance
- Safety of trees and bushes on-site (sharp plants, falling branches, etc)
- Resistance to monsoon rains
- Safety of electrical equipment
- Tripping and falling hazards
- Adequate hygiene and sanitation
- Safety on school trips, e.g. Kerala boat tragedy







# Fire

- In schools, losses occur due to:
  - Overcrowding made worse by poor design of stairs, corridors and exits
  - Poor structural quality and lack of fire-proofing
  - Lack of fire safety and procedure knowledge (do's and don'ts, drills, alarms)
  - Lack of fire safety equipment (blankets, extinguishers, detectors)
- Localized effects, but frequency is increasing in India
- Most common in slums, squatter settlements and high-rise buildings in urban areas
- Higher frequency in rural areas in the summer
- Rapid onset on small scale 'Rising tide' on larger scale

### 2004 Kumbhakonam School Fire Tragedy

• 16th July, 2004 – 94 children, all under the age of 11, die in a school fire

• Fire started in the kitchen - teacher of 3rd floor class left them to go and investigate – but could not return

• When the burning thatched roof could no longer be supported by the faulty construction of the walls, the children were unable to escape, as they were too young to open the only emergency exit

• Rescue was hampered by narrow streets and a large crowd outside





# Floods

### Types:

- Flash flood (due to build up of surface runoff water)
- Due to snowmelts
- Failure of flood defenses (e.g. dams, sea walls)
- Raising of natural groundwater / poor drainage in urban areas
- Coastal effects (e.g. tsunami, cyclone, storm surge)
- Most frequent and destructive hazard in South Asia 93% of flooding deaths occur in Asia
- 75% of annual rain occurs in 4 months (Monsoon season), which overloads rivers
- Can be 'rising tide' (e.g. heavy rains slowly making the situation worse), slow onset as a secondary effect of other hazards (e.g. tsunami, cyclone) and rapid onset (e.g. dam busting)
- Estimated that 11.2% is flood prone 40m hectares
- Brahamputra and Gangetic Basin
- NW of west-flowing rivers (e.g. Narmada and Tapti)
- Central and Decan regions with east flowing rivers (e.g. Mahandi, Krishna and Cavery)
- States:Uttar Pradesh, West Bengal, Assam, Orissa, Andrha Pradesh, Gujarat, Karnataka, Kerala, and Tamil Nadu.







### **Effects on Schools**

- Structural damage and water damage to interior property forced long closures
- Structures may be permanently weakened
- Poor attendance as floodwaters hamper journey to school and children's homes and families may be effected
- Unsafe environment higher numbers of biting insects and animals, contaminated water leads to spread of disease
- Higher risk of electrocution
- Risk of drowning and injury







# Conducting a School Safety Audit





# School Safety Context in India

• Unsafe schools are a reality – vulnerable to many hazards, and children are most vulnerable...

- Fire at a school ceremony in Dabwali, Harjana in 1995, killed 435
- Gujarat Earthquake 2001, killed 971 children in Bhuj alone
- South Indian Tsunami 2004, 320 schools in Tamil Nadu needed repair or reconstruction
- Kumbhakonam School Fire Tragedy 2004, killed 93 children
- Kashmir Earthquake 2005 killed, 17,000 children
- Kerala boat tragedy 2007, killed 15 children and 3 teachers
- Baroda bus tragedy 2008, killed 47 children
- Government reaction to Kumbhakonam emphasis on including scientific awareness of school safety within universal basic education
- It is the responsibility of schools end their role as victims of disasters, and to become centers for building disaster and safety capacity







# Case Examples of School Safety Initiatives in India







### Contents

I. Gujarat School Safety Initiative (GSSI) – by SEEDS India and the Gujarat State Disaster Management Authority (GSDMA)

II. Child's Right to Safer Schools Campaign – by All India Disaster Mitigation Institute (AIDMI)
III. School Safety Programme – by Gol National Disaster Management Division

IV. Disaster Management Activities in Schools - by Kolkata Municipal Corporation

### I. Gujarat School Safety Initiative (GSSI)

- Implemented by SEEDS India, supported by the Gujarat State Disaster Management Authority (GSDMA)
- Covering 150 schools in Ahmedabad, Vadodra and Jamnagar + 1 in each of Gujarat's 25 regions

• Following Gujarat 2001 Earthquake, in which many school children and teachers died and school buildings collapsed

• The project addresses two issues:

1. Understanding and preparedness amongst school children, teachers and parents reduce disaster risk in schools and to be prepared to act appropriately in an emergency

2. Disaster management appreciation amongst teachers so that they are able to impart disaster education to children more effectively





### **School Disaster Management Plans**

- Raising awareness of disaster issues among stakeholders
- Identifying and listing structural and non-structural hazards and vulnerabilities in and around school
- Identifying and listing ways of reducing vulnerabilities
- · Identifying the roles and responsibilities of stakeholders
- Training teachers on preparing a school evacuation plan
- Building emergency response capacity, e.g. first aid
- Listing the **contact information** of all facilities and resources for **emergency management**
- · Conducting a mock drill to demonstrate skills acquired by students
- Keeping targeted schools informed through a newsletter
- Promoting School Safety Clubs to sustain risk education







### II. Child's Right to Safer Schools Campaign

- Implemented by the All India Disaster Mitigation Institute (AIDMI) with support from the American Jewish World Service
- Initially covered 5 schools in Gujarat but has now expanded to over 300
- Campaign started following the Kumbhakonam Fire Tragedy in 2004 in which 94 children died
- Key objectives:
- to provide direct support action to the victims, schools, school boards, and city authorities primarily serving the children of the poor
- to spread awareness about children's right to safer schools across various stakeholders in India.

### **Disaster Risk Insurance**

- Non-physical measure to make schools safer
- · Covers accident risks occurring to students and staff
- · Covers before and after school hours also
- 4 of AIDMI's first 5 supported schools received policies 6,223 students and 180 staff
- Municipal controlled schools already have insurance policies provided
- Initially, policies last 1 year AIDMI is extending them and providing more schools in multi-hazard areas with policies







#### III. School Safety Programme

- Designed by the Government of India's National Disaster Management Division, within the Ministry of Home Affairs (MHA)
- District-wide Programme targets education departments, administrators, emergency officials, teachers, students and the wider community.
- School building-level Programme focuses on school specific measures
- Recent disasters such as the Gujarat Earthquake and Kumbhakonam Fire Tragedy emphasised the vulnerability of children at school
- Goal "promote a culture of disaster preparedness in the school community"
- Basic Components:
  - Promoting Awareness and Education Activities
  - Demonstrating Disaster Risk Management
  - Training and Capacity Building
  - Annual Safety Assessment

### **Hazard Hunt and Evacuation Plans**

Hazard Hunt

- Simple exercise to mitigate risks
- · Children go around the school looking for hazards







 Many of these can be mitigated simply within existing capacity and reduce risk of ill effects of disasters

**Evacuation Plans** 

- Floor-wise evacuation plans are devised by building-level School Safety Teams
- Plans are displayed all over school in corridors and mock drills are conducted soon after to test effectiveness

### **IV. Disaster Management Activities in Schools**

- UNDP and Gov. of India Disaster Risk Management Programme Urban Earthquake Vulnerability Reduction Project
- Kolkata is one of 38 cities covered by the project
- City schools targeted proneness of urban areas to hazards due to overcrowding
- Main Actions:
  - Awareness Generation
  - Development of Preparedness and Response Plans at Community and Administrati levels
  - Training and Capacity Building at all levels
  - Development of Techno-Legal Regime (e.g. building regulations)
  - Networking of Knowledge and Best Practices, Nationally and Internationally





### **School Disaster Management Teams**

Consist of Senior Students, Teachers and Non-Teaching staff

At least 5 teams of 15 members:

- Awareness Generation, Warning, Information Collection and Information Dissemination Team
- Emergency Evacuation and School Security Team
- Search & Rescue Team
- Fire Prevention and Control Team
- First aid Team

Undergo trainings, e.g:

- Warning and Information
- Emergency Evacuation
- Search and Rescue
- Fire Fighting
- First Aid







# Guidelines for Integrating Disaster Education





# Why teach DRR in Schools?

• UN's International Strategy for Disaster Reduction – Hyogo Framework for Action 2005-15, 3rd Priority for Action states that education must:

• "Promote the inclusion of disaster risk reduction knowledge in relevant sections of school curricula at all levels and the use of other formal and informal channels to reach youth and children with information..."

• "Promote the implementation of programmes and activities in schools for learning how to minimize the effects of hazards."

### **Further Reasons**

• UNISDR –

"Schools are the best venues for forging durable collective values; therefore they are suitable for building a culture of prevention and disaster resilience"

- UN Millennium Development Goal universal primary education
- Schools as community centre protection and DRR
- School buildings are often unsafe disaster risk reduction education will help to make them safer
- Children under 15 are most vulnerable







# Scientific Knowledge

- Many schools teach disaster preparedness the same is true for earth sciences
- Rarely are the two combined better understanding of disasters will result in better preparedness measures
- DRR education can be easily included in existing classes should be combined with risk awareness and action
- Local hazards and disasters should be discussed to provide relevance for the students in the area

## Strategies for Integrating DRR into Curricului

- Begin with broad scientific disaster education then focus down. A journey from worldwide context to school and community level
- Forge links with local educational institutions. Assistance from higher education and sharing knowledge and practices is beneficial
- Regional government programmes provide a good starting point develop those ideas for your context and feed back into regional schemes
- Difficult to integrate in "teach for exams" culture National Disaster Management courses for standards 8, 9 and 10 run by CBSE can help
- Consider using materials in local languages







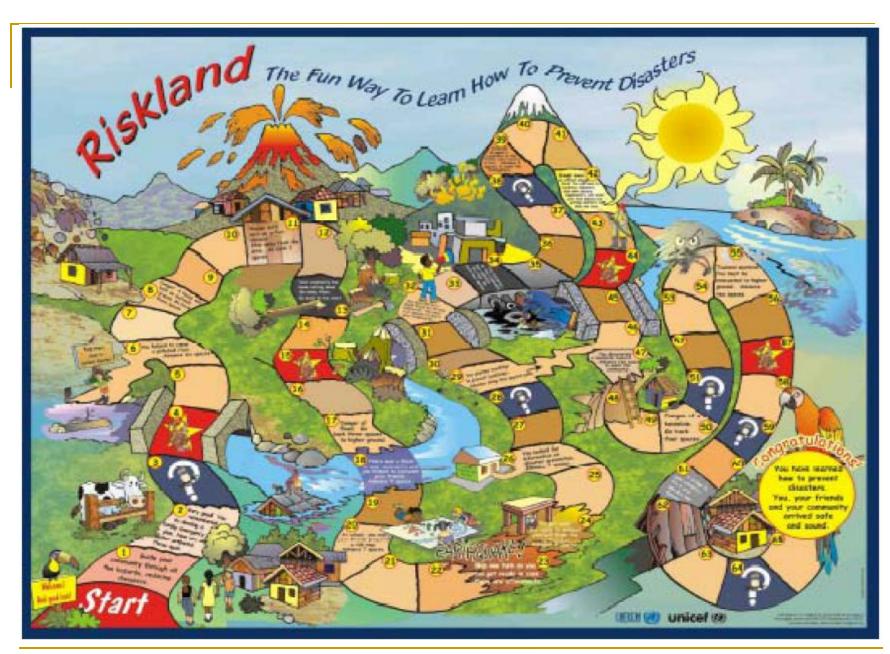
# Empowering Girls and Women

- School-based DRR work should have a focus on girls
- Empower them as disaster managers for the future
- Example methods:
  - Girl-only disaster management teams
  - Mothers' disaster planning groups
  - Literacy sessions for local women
  - Involve head girl and boy in development of plans
  - Promote female self-worth
  - Equality in essential skills development, e.g. swimming lessons
  - DRR education relevant for home and work environments
  - Assess male/female disaster knowledge address differences
  - Escorts for girls school journeys
  - Systems for reporting abuse
  - Help with psycho-social effects of disasters















# Connecting at Play

• Games, activities, music, video, comics, plays, etc, are a key part of young life – opportunity to teach DRR

- Active learning is more effective than Passive, i.e. hands-on, creative 'doing'
- Children's clubs for environmental stewardship untapped resource of innovation and change for good
- Disaster Museums and fun Internet resources

#### Example – "Go Bags"

- Short fun activity provided by Risk RED, involving children and their families
- Encourages children to think about what materials they would need if disaster struck
- Provides preparedness information for the family to take home and act upon

#### Example - "Riskland"

- UNISDR/UNICEF game that encourages children to think about disaster situations and learn while having fun
- Games are effective as an active learning experience
- Adaptable to different hazard conditions
- Available in multiple languages UNISDR will respond to requests for more translations







#### Example – "Let's Learn to Prevent Disasters"

- Accompaniment to 'Riskland' series of games and activities suitable for children aged 8-12
- Covers earthquake, flood, cyclone, landslide, volcanoes and other hazards
- · Designed for easy inclusion within existing school curricula
- Includes scientific education, disaster risk concepts and environmental management

#### Example – Masters of Disaster

- American Red Cross "Masters of Disaster" educational series
- Aims to empower children and reduce fear of disasters via preparedness education
- Materials for both teachers and families
- Ready-made lesson plans for 3 different age groups
- Directly addresses psycho-social issues









For more information please contact:



ALL INDIA DISASTER MITIGATION INSTITUTE 411 Sakar Five, Near Natraj Cinema, Ashram Road, Ahmedabad-380 009 India Tele/Fax: +91-79-2658 2962 E-mail: bestteam@aidmi.org, Website: www.aidmi.org, www.southasiadisasters.net









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