



United Nations Educational,
Scientific and Cultural Organization



United Nations Environment Programme

Awareness and Preparedness for Emergencies at the Local Level (APELL)



APELL for Earthquake Risk
A community-based approach for disaster reduction



Bam Earthquake, Iran 2003,
more than 25 000 deaths and
the citadel (world's oldest mud
brick structure) destroyed
Photo: B. Rouhban, UNESCO



**Bourmedes Earthquake, Algeria
2003, more than 2 250 deaths**
Photo: Chris Black, IFRC*



Gujarat Earthquake, India 2001,
more than 20 000 deaths
Photo: Andrew MacColl, IFRC*

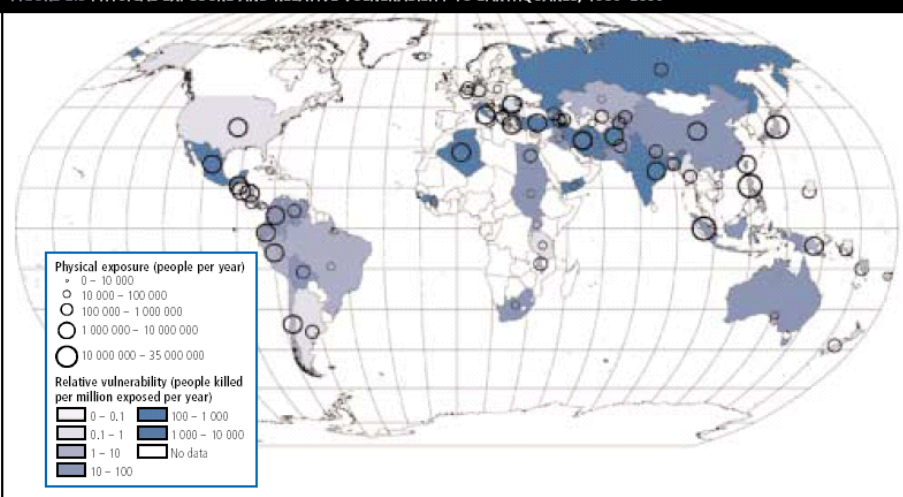


**El Salvador Earthquake, El
Salvador, 2001,**
more than 800 deaths
Photo: IFRC*



**Izmit (Kocaeli) Earthquake,
Turkey 1999, more than 17 000
deaths and 30% of the affected
industrial park severely damaged**
Photo: Mikkel Oestergaard,
IFRC*

FIGURE 2.5 PHYSICAL EXPOSURE AND RELATIVE VULNERABILITY TO EARTHQUAKES, 1980–2000



Source: Université Catholique de Louvain: The EM-DAT The OFDA/CRED International Disaster Database (victims); Council of the National Seismic System (CNSS): Earthquake Catalog (earthquakes extent); CIESIN, IFPRI, WRI: Gridded Population of the World (GPW), Version 2 (population); Compilation and computation by UNEP/GRID-Geneva

From UNDP Publication: *Reducing Disaster Risk: A Challenge For Development*, 2004

In recent years many earthquakes such as those pictured opposite have caused widespread loss of life and destruction of property, and have caused devastation for people and damage to the environment.

Earthquakes have always occurred and they always will, but the patterns of modern life are exposing more communities to danger than ever before. At no time in history have so many people lived in cities, often with little controlled planning, that are so close to seismic areas. Disasters will, unfortunately, occur, and the mitigation of their impacts—linked with efforts to alleviate poverty—is undoubtedly one of today's major global challenges. It also forms part of the United Nations Millennium Goals.

Disaster inevitably leads to crisis and, once a crisis situation is established, it is the degree to which people are prepared for disaster that determines how vulnerable or resilient their community will be. Experience throughout the world has shown, time and again, that it is local people who are best placed to prepare for and respond to disasters, including earthquakes.

This brochure gives some background information on earthquakes and then highlights options for making communities better prepared through a bottom-up, community-based, participatory approach known as APELL. APELL, standing for Awareness and Preparedness for Emergencies at the Local Level, is a process designed to create public awareness of hazards and to ensure that communities and emergency services are adequately trained, coordinated and prepared to respond to and cope with disaster.

*IFRC – International Federation of Red Cross and Red Crescent Society – Photos taken from IFRC website at: <http://www.ifrc.org/index.asp>

Emergency action

Before an earthquake

- Potential earthquake hazards in the home and work place should be removed or corrected.
- Top-heavy objects and furniture should be fastened to the wall; the largest and heaviest objects should be placed on lower shelves.
- Special attention should be paid to emergency equipment such as radio transmitters and medical equipment.
- Emergency supplies and equipment should be set aside.
- All family members should know First Aid and how to turn off electricity, gas and water.

During an earthquake

- Protect head and face.
- Remain calm. Do not rush for exits.
- If inside, stay inside; if outside, stay outside.
- If inside a building, stand in a strong doorway or get under a desk, table or bed.
- Move away from windows, glass doors, heavy mirrors, pictures, bookcases, hanging plants and heavy objects.
- Watch for falling plaster, bricks, light fixtures and other objects.
- Try to remain calm and reassure others.
- If in a store or shop, move away from display shelves containing bottles, cans or other objects that may fall.

After an earthquake

DO'S

- Check for injuries—administer First Aid.
- Check for fires.
- Check utilities—shut off if necessary.
- Check your house for serious damage—evacuate if there is threat of collapse.
- Be prepared for additional earthquake shocks.
- Collect water and clear up hazardous materials.
- Assist others. Remain calm.
- Turn on a transistor radio for emergency bulletins.
- Stay away from landslide prone areas.
- Stay away from buildings that might have been weakened by the earthquake.

DON'TS

- DO NOT light a match or turn on a light switch. Use a flashlight!
- DO NOT touch fallen power lines.
- DO NOT collect children from school.
- DO NOT use telephone lines.
- DO NOT go to the beach to watch for giant waves.
- DO NOT go sightseeing—keep the streets clear for rescue services.

What is an earthquake?

An earthquake is a sudden motion or trembling of the ground produced by the abrupt displacement of rock masses. The Earth's crust is actually made up of huge separate masses of rock called tectonic plates. These move very slowly and, when they rub together, the movement forces waves of energy to come to the earth's surface, resulting in the tremors and shakes that we experience as an earthquake. It is the shaking motion which does the most damage, causing buildings and bridges to sway perilously or collapse.

Every year, around half a million earthquakes affect some part of the planet's surface, but the great majority are so small as to be detectable only by seismometer. Potentially headline-grabbing earthquakes occur, on average, twice a week and mega-earthquakes—with a magnitude of more than 8 on the Richter scale—only once or twice a year.

Why an earthquake can become a disaster

Natural phenomena do not automatically spell disaster, and earthquakes themselves do not kill. It is the presence of human construction which is the primary agent of earthquake disaster, with badly constructed buildings on unsound foundations causing death and injury when they collapse.

Over the past fifty years, engineers and seismologists have acquired first-hand knowledge and know-how that can save lives if acted upon by politicians and other decision-makers. There is now more scientific knowledge and technical know-how than ever before to help assess the potential effects of an earthquake before it strikes, and seismological observation networks and systems give us a better understanding of the distribution in time and space of earthquake hazards and of their intensity.

That is not to say that seismological data can act as a 'crystal ball'—earthquake prediction still eludes us. But governments and communities can use data to limit risk by, for instance, ensuring that strict building codes are set and enforced, and by organizing training and awareness-building campaigns.

How a community-based programme can help

Local communities often have the technology or knowledge required to reduce their own vulnerability, but some key community or social structure may be missing, preventing them from realizing the benefits of vulnerability reduction at the community level. APELL is a process that helps to empower local people so that they can organize, act together and overcome barriers to successful community action.

What can be done to reduce earthquake risks?

Several broad strategies—such as reducing structural vulnerability, land use regulation and public information programmes—may be incorporated into a general national seismic safety programme. These programmes cannot guarantee that there will be no loss of life from an earthquake, but they can reduce casualties and property damage. The strategy plan should:

1. Define vulnerable geographic zones and vulnerable structures through risk assessment and damage information.
2. Establish an extensive public awareness programme that disseminates information about earthquakes and related hazards and institutes disaster mitigation and preparedness measures.
3. Establish a technical assistance programme that: includes architectural and engineering input to improve building design, construction and siting; demonstrates techniques; and trains local residents.
4. Raise awareness of the fact that to retrofit an existing house or build a new house with earthquake proof structures adds only 5–20 per cent to total building cost.

How the APELL process can be used

Community awareness and participation are important elements of earthquake mitigation. The APELL process is a community-based approach developed to support this type of action.

UNEP developed the APELL programme in the 1980s, in association with the chemicals industry, with the intention of addressing public hazards from fixed industrial installations. It has since been widened to encompass port areas, transport, mining, industrial estates and natural disasters.

APELL means community preparedness—and community preparedness is vital for mitigating earthquake impact. The most effective programmes are formal and are initiated at the community level with support from local or national governments.

When communities and emergency services are fully informed about possible hazards, and when they have been educated about risk management and crisis management plans, the impacts of disasters can be substantially reduced. Community awareness and involvement are key factors in mitigating and limiting the impacts of disaster, they are also key aspects of the APELL process.

The outcome of this process is an emergency plan to which the community has provided substantial input, and which ordinary citizens can understand.

What does prevention and preparedness for an earthquake mean in practice?

Within the community, individuals should:

- know what to do before, during and after an earthquake
- know which information and communication services are appropriate before and after an earthquake
- know if their property is in an earthquake prone area and what prevention measures should be taken
- know if their houses can withstand an earthquake and, if not, seek to retrofit

Rescue services need:

- equipment and training for earthquake response
- maps of local earthquake hazards and vulnerable areas
- to implement local emergency plans
- to mobilize community resources
- to assess immediate needs for evacuation, shelter, medical care, diversion of routes, etc.
- to have channels by which they can communicate with the public during crisis
- to perform evacuation drills with public participation

Government authorities should take steps towards:

- defining national legislation for the design and retrofit of buildings to withstand earthquakes
- strengthening and enforcement of building codes
- acquisition of property in earthquake zones, to prevent housing development
- relocation of residents from high-risk areas
- establishment and enforcement of legislation and safe land-use planning to regulate development in earthquake prone areas
- creation of economic incentives
- making relevant available hazard information public
- training emergency services and communities in earthquake preparedness and response
- making medical services ready for a crisis
- improving local preparedness by fostering links with national disaster management programmes

International agencies should:

- coordinate international and regional cooperation on disaster management
- support effective early warning alerts and assessment studies
- encourage governments to adopt and enforce suitable legislation and policy on disaster management, including national contingency plans
- support the promotion of prevention and preparedness procedures at the local level.

How does APELL operate?

The APELL process is a management tool that helps local people develop the information and decision-making structures they need to address the hazards facing their community.

APELL can be useful in any situation that requires joint planning for disasters by several parties

By engaging stakeholders in a process of structured dialogue and coordination, APELL's 10-step approach leads to the development of a single, unified emergency response plan for the entire community. Implementing the process not only develops the crisis plan, it also fosters awareness raising and feedback within the community.

UNEP and UNESCO

The mission of the **United Nations Environment Programme (UNEP)** in the field of disaster reduction is to address the immediate and long term human, social, health, economic and environmental impacts of natural and human-induced disasters, minimizing the resulting environmental emergencies that they cause. UNEP's approach is to promote disaster management to reduce vulnerability and enhance coping-mechanisms through capacity building, and activities in the field of early warning and assessment, prevention and preparedness, emergency response mechanisms, post-disaster assessment and post-conflict assessment, and environmental rehabilitation.

UNESCO is the **United Nations Educational, Scientific and Cultural Organization**. UNESCO's aims in the field of natural disasters are: to promote a better understanding of the distribution in time and space of natural hazards and of their intensity; to help set up reliable early warning systems; to support rational land use plans; to encourage the adoption of suitable building designs; to promote the protection of educational buildings and cultural monuments; to enhance preparedness and public awareness through education and training; and to foster technical post-disaster investigation, recovery and rehabilitation.

UNEP - Division of Technology, Industry and Economics - DTIE

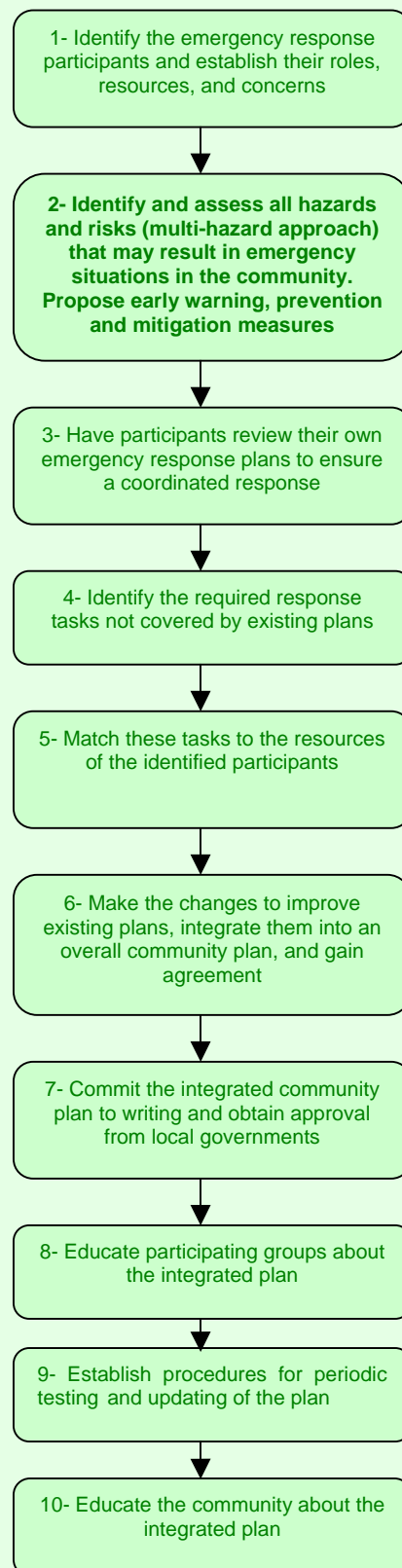
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APELL 10-step approach



Brochure Bibliography:

UNDP Publication (2004). *Reducing Disaster Risk: A Challenge for Development*
Several publications from the UNDP Disaster Management Training Programme
ISDR Publication (2002). *Living with Risk*
UNESCO (1993). *Environment and Development Briefs*
UNEP Publication (1988). *APELL Handbook*