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Asian Disaster Preparedness Center

Public awareness Sri Lanka
Program for Hydro-meteorological Disaster Mitigation in Secondary Cities in Asia

Safer Cities 18

Case studies on mitigating disasters in Asia and the Pacific

The Boy Who Cried, "Wolf!"

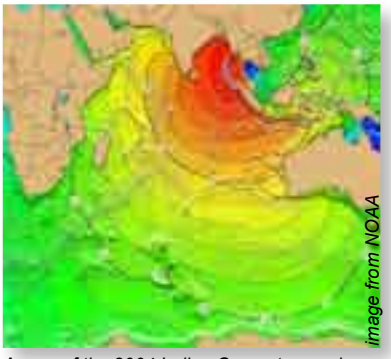
or Why a Community-based Alert System is a good idea.

You must remember the story of a boy whose task was to watch a flock of sheep. The sheep grazed on a hill that gave him a good view of his village. Out of boredom, he shouted, "Wolf! Wolf!" and those who heard him came running to help him drive the wolf away from his sheep. Of course, they only found the boy laughing at them and no wolf. The boy cried, "Wolf!" several more times, just to laugh at the people who tried to help him. One day, a wolf did appear and started to eat the sheep! The boy was terrified and shouted, "Wolf! Wolf! It's eating the sheep!" but no one believed him this time, and the whole flock was lost to the wolf.[1]

The moral of this fable is that even when liars tell the truth, no one believes them. For tsunami disaster management, this fable is useful for understanding the tendency to disbelieve tsunami alerts as more alerts are raised but no tsunami comes. This disbelief is a big problem for tsunami disaster management because tsunami prediction for the Indian Ocean is still under development at this stage. The consequence for not acting appropriately after getting a tsunami alert can be death. How can we assure that an alert is always given credibility by those who receive it?

Introduction: The December 26, 2004 Tsunami

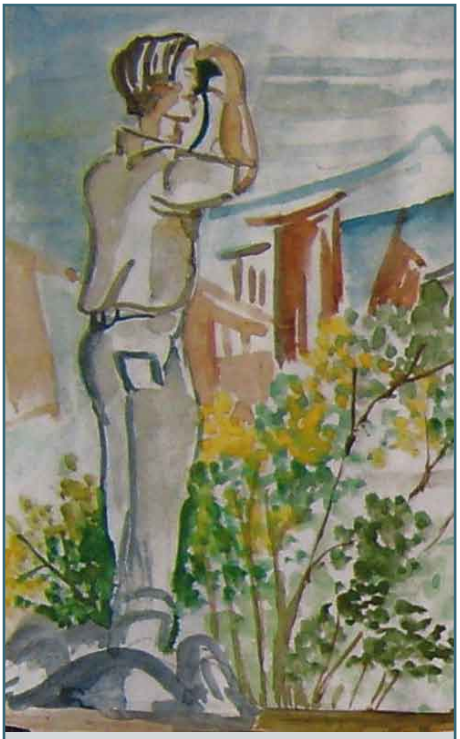
Huge waves poured into coastal areas of Sri Lanka after an earthquake of magnitude 9.0 on the Richter scale occured off the coast of Sumatra. The tsunami claimed 35,386 human lives, and injured 23,033 people. It damaged or destroyed more than 100,000 houses; 380,000 persons were left homeless. Almost two-thirds of the country's coastline was affected, with damage to roads, bridges, railways, water supply system, telecommunication, schools, universities, hotels and private property. The total estimated damage for Sri Lanka is at US$ 1.1 billion, and the total estimated losses are at US$ 310 million.[2]



A map of the 2004 Indian Ocean tsunami impact and times; the distance between each arc represents 15-minute intervals.[3]

It is widely acknowledged that the damage would have been drastically reduced if the communities on the Indian Ocean were made aware that such a disaster was imminent. It took between two to three hours for the tsunami waves to strike the Sri Lankan eastern coastline and parts of the western coastline after the earthquake off Sumatra. No early warning system was in place and the people received no information about the impending disaster or on the need to evacuate. Of course, even if a warning system did exist at national level, there is still a need to disseminate the message to the local level wherein people would have confidence in an oncoming event that nobody had experienced before. Many of the beachside inhabitants had not heard of a tsunami nor experienced similar events. Most did not seek shelter when the sea receded from the coast, and so were struck by the waves shortly after.

After the traumatic experience, people had very bad memories of the tsunami disaster; even the slightest rumor could cause them to panic. Many times, people ran away to due to false tsunami fears. It was noted that even some people experienced minor injuries as a result of such incidents. People feared living close to the sea, especially during the night due to tsunami fears. This is the context within which an alert system had to be placed. This case study next describes the salient aspects of community, hazard, and warning system, then it will describe a communicty initiative called CTEC.



Abstract

A community initiative to provide early warnings to a single disaster, such as a tsunami disaster, can grow into a bridge that connects the national disaster management to the coastal city that is at risk. This case study uses the fable of the boy who cried wolf to describe the components of an alerting system by analyzing the hazard, the community, and the communication mechanism. Finally, case describes one such initiative, the Community Tsunami Early-warning Centre of Peraliya, Sri Lanka.

What's inside

What is the Village?

The village represents the urban coastal communities who must face the wolf. Urban coastal communities face several hazards, including fire, traffic accidents, gas explosions, storm surge, tropical storms, flooding, tsunamis, etc. A global-level analysis of the location of multiple hazards found that hazards driven mainly by hydro-meteorological processes-floods, cyclones, and landslides-strongly affect the eastern coastal regions of the major continents, as well as some interior regions of North and South America, Europe, and Asia (Natural Disaster Hotspots: A Global Analysis, 2005).

Tsunamis are very destructive, but floods also need much consideration. Asia has many of the world's largest coastal urban areas located in the flood plains of major rivers (e.g. Ganges-Brahmaputra, Mekong, Yangtze); it also has coastal urban areas within cyclone-prone regions (e.g. Bay of Bengal, South China Sea, Japan and the Philippines). In the period 1994 to 2004, Asia accounted for one-third of 1,562 flood disasters, half of the 120,000 people killed in and 98% of those affected by those floods (Few and Matthies, 2006).

The last point to remember is that coastal areas are more densely populated than other areas. Asia again accounts for eight of the top ten countries (in descending order: 1 - China, 2 - India, 3 - Bangladesh, 4 - Vietnam, 5 - Indonesia, 6 - Japan, 9 - Thailand, 10 - Philippines) with populations in the coastal zone with elevation from 0 to 10 meters (McGranahan, Balk and Anderson, 2007: p. 26). Continuing rapid urbanization and coastal development in hazard-prone regions, slope destabilization after migration from low-lying to upland areas, and the potential for increases in the intensity and frequency of some hazards pose a serious challenge to sustainable development and monitoring of the disaster risk of coastal cities.

What is the Wolf?

The wolf in our story is the tsunami. It is defined as a series of traveling ocean waves of extremely long length between wave crests, often exceeding a 100 km or more in the deep ocean, and by the time between these crests, ranging from 10 minutes to an hour. The tsunami waves propagate across the deep ocean with a speed exceeding 800 kph and a wave height of only a few tens of centimeters or less. Tsunami waves are generated primarily by earthquakes occurring below or near the ocean floor; underwater volcanic eruptions and landslides can also generate tsunamis.[4] The earthquake rupture triggered a sequence of events in the ocean that can be divided into four parts: initiation, split, amplification, and run up (and inundation).[5] A tsunami traveling over the open ocean can be small, perhaps a few feet high or even less; thus detection is difficult, and is the reason why a tsunami early warning system requires a network of ocean-bottom pressure sensors to detect and confirm the generation of a tsunami.

As the tsunami travels over the continental slope, its wave height increases rapidly as the water becomes increasingly shallow, then tsunami run-up and inundation occur. Run-up is the maximum vertical height above mean sea level that the sea surface attains during a tsunami, while inundation is the maximum horizontal distance inland that a tsunami penetrates. Much of the damage inflicted by tsunamis is caused by strong currents and floating debris during inundation as the waters go up the shore and back down to the sea. Tsunamis will often travel much farther inland than normal waves. After run-up, part of the tsunami energy is reflected back to the open ocean.

Contrary to many artistic images of tsunamis, most tsunamis do not result in giant breaking waves (like normal surf waves at the beach that curl over as they approach shore). Rather, they usually come in much like very strong and very fast tides (i.e., a rapid, local rise in sea level). A small number of tsunamis do break, but they often form vertical walls of turbulent water called bores.

In addition, a tsunami can have very complicated behavior. First, different parts of the tsunami wave can travel at different speeds (a property known as wave refraction). Second, a tsunami wave can wrap around objects (a property known as wave diffraction), and this explains why parts of the west coast of Sri Lanka also experienced the 2004 Indian Ocean tsunami. Third, a tsunami can generate a particular type of wave called edge waves that travel back-and forth, parallel to shore. These effects result in many arrivals of the tsunami at a particular point on the coast rather than a single wave. Because of the complicated behavior of tsunami waves near the coast, the first run-up of a tsunami is often not the largest, emphasizing the importance of staying away from the beach for several hours after a tsunami hits, returning only after local authorities have announced an "all clear" to return.

Figure 1. The Initial Tsunami.

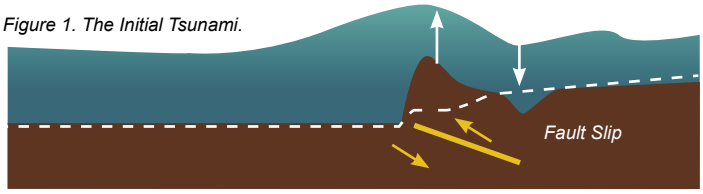


Figure 2. The split.

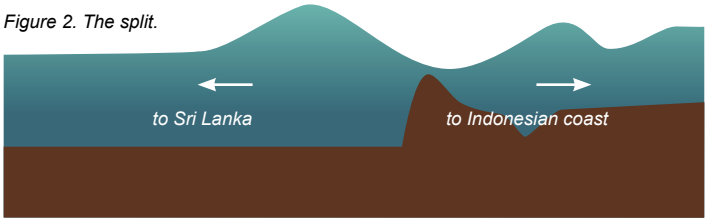


Figure 3. Amplification.

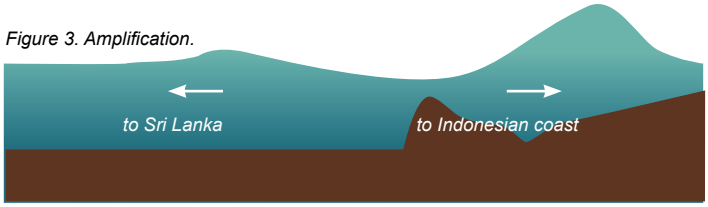
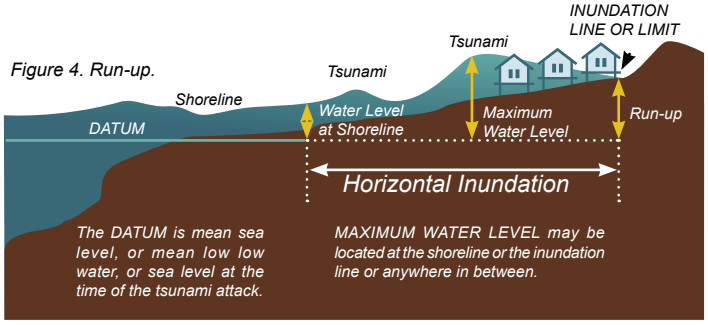


Figure 4. Run-up.



Who is the Boy?

The boy corresponds to the system used to disseminate alerts about oncoming hazards such as tsunamis, windstorms and other detectable hazards. The boy embodies two components of a warning system. First is the technical component, in that it must be able to detect a hazard and give an appropriate warning. Second is the societal component, wherein it must inspire both confidence and appropriate responses from the villagers who listen to the boy.

The end-to-end early warning system approach

An early warning system (EWS) is described as end-to-end if it connects the technical (upstream) and societal (downstream) components of warning through identified institutions. The effectiveness of an early warning system will depend on the detection technology, as well as socio-economic factors that dictate the manner in which people at the local level can understand and react to disasters.

The end-to-end multi hazards early warning systems approach is the provision of timely and effective information, through identified institutions, that allows individuals exposed to a hazard to take action to avoid it, or to reduce their risk and prepare for effective response.

1. Technical components.

The technical components of an EWS are: (1) the understanding and mapping of hazards and vulnerabilities (risk mapping), and (2) monitoring and forecasting of impending events (technical monitoring and warning, including information and communication technology).

One of the essential components of comprehensive early warning system is its capability for predicting and detecting hazards. Detection of hazards may need the collection of various types of data like weather data, seismic data, ocean-bottom pressure, and water height.

The community can monitor hazards by monitoring and recording water height gauges in rivers, rain gauges showing the amount of precipitation over fixed time intervals, and by constantly monitoring alerts from the government over radios and other communication equipment.

Early and accuracy of detection also requires an efficient communication system, because the lead-time for early warning (for example, the time between the detection of a tsunami until the time it hits a coastal area) varies widely from a few months (drought, monsoons, and ENSO), to a few days (cyclone/typhoon and volcanic eruptions), to a few minutes only (as in a tsunami or landslide).

2. Societal components.

The societal components are: (1) processing and disseminating understandable and actionable warnings to political authorities and the population at-risk (dissemination), and (2) undertaking appropriate and timely actions in response to warnings (knowledge and preparedness to act). This will be initiated by identifying the institutions involved in disaster management, describing the flow of information from the detection of a tsunami by instrumentation, to the distribution of the alert to the relevant authorities, to identifying communities who are exposed to tsunami waves, preparing action plans for mitigating tsunami impacts, evacuation drills, and emergency response.

An early warning system should provide communities with timely information, enabling them to prepare for anticipated hazards to minimize the impact on lives, livelihoods and property. This communication should proceed in a way that easily understandable for people, and causes them to react appropriately to disasters. Community participation in the formation of effective early warning messages can improve the communication process.

Comprehensive EWS should have an "end-to-end" approach, addressing all stages of early warning from initial hazard detection and warning to community-level response to warning messages. Also it should address to multi hazards in that it will simultaneously address tsunami hazard and number of other critical hazards such as cyclones, floods & earthquakes.

There should be a single authority (national or regional) to originate the hazard warning in a given area in order to avoid confusion. For example, the Disaster Management Centre is the authority responsible in Sri Lanka for issuing Early Warnings. In addition, there are specific agencies who issue warnings with their specific technical capacity (see Table 1).

Official Sources of Hazard-specific Warning **Table 1**

Hazard Monitoring	Lead Agency
Meteorological Observation & Forecasting	Department of Meteorology
Flood Monitoring & Forecasting	Irrigation Department
Land Slide protection & Early-warning	National Building Research Organization
Drought Monitoring & Forecasting	Department of Agriculture
Cyclone Tracking & Storm Surge	Department of Meteorology
Seismic Monitoring (earthquakes and tsunamis)	Geological Survey &Mines Bureau
Early Warning System for Major Dams	Mahaweli Authority of Sri Lanka
Oceanographic Monitoring System	National Aquatic Resources & Research Development Agency
Radiological Monitoring	Atomic Energy Authority

Source: Towards a Safer Sri Lanka: Road map for Disaster Risk Management. Disaster Management Centre, Ministry of Disaster Management and Human Rights: 2005, pp. 28-30.

Next, the hazard warning should disseminate quickly to the population at risk. In order to make sure the success of the system, the message should be easily understood and delivered on time. A good communication network/system is vital in disseminating warning messages on time especially for a disaster that has a low lead-time. Broadcasting communication systems such as radio and television can be used to reach the warning to the public as well as the relevant officials. Telephones, mobile phones, satellite phones, and two-way radios can be dedicated for alert systems. It is also effective to use local community warning systems such as loudspeakers and sirens. However, all these are useful only if there is constant monitoring of the alert system, if the equipment is

well-maintained, and if names of contact people and the relevant telephone numbers are available and kept up-to-date. This is one area where trained community members can contribute their time and ensure that the "last mile" in the communication relay is closed.

Developing locally-relevant and actionable messages

Communities in tsunami-risk areas need to be prepared to receive and use the warning messages. Of course, the seismic monitoring services and related institutions could also be involved to provide the technical knowledge on the hazard, and to provide the foundations for the local risk communication strategy and plan. However, communities should determine the formulation of the warning message to ensure that they will be familiar with the messages, and therefore are more likely to accept a disseminated hazard warning and respond accordingly. An effective warning message should include:

- Characteristic of hazard (location, time, strength)
- Identification of the general area at risk
- Recommended action to be taken

Community-based Disaster Risk Management

When developing an end-to-end EWS, it is a good idea to form and train a local technical working group in each member community to facilitate the community processes for promoting a culture of safety. The working group's main task would be to guide the community to assess local risks for and by themselves, with support from experts. Training in community-based disaster risk management are intended to raise the capacity of community members to identify the hazards they face and the vulnerabilities they have, to sum these up as the risks of their community, and to plan and implement risk reduction activities. These activities are collectively called participatory risk assessment.

The communities receiving the alerts should be encouraged to prepare a sustainable risk reduction plan. Resources will be mobilized to augment community resources for implementation of local mitigation activities as prioritized in their risk reduction plans. Effective relationships and communication between all the stakeholders can lead to an effective early warning system in practice.

Capacity building of the community enters the picture to make the connection between disaster information and appropriate action. The community should be made aware of their risk and helped to understand and accept warning messages. Based on a participatory risk assessment, capacity building programs could be developed to raise awareness on tsunamis and other hazards faced by the local community that were identified in the risk assessment, and to familiarize them on their local disaster management system. They should be educated on the warning messages used, and anyone disseminating a warning message should follow the agreed system. Finally, for a warning to be effective, the community should perform the recommended action. The community should therefore be involved in their evacuation planning and emergency drills.

Evacuation Planning

Local authorities must coordinate evacuation planning. This covers the designation of safe places, the assessment of risks, the designation of evacuation routes, and the scheduling of emergency drills. Evacuation planning can ensure an orderly system for all the communities in their area of responsibility. Evacuation routes should be planned and created from all areas that may be reached by hazards to designated safe places within the anticipated evacuation times. The route planning should include an estimation of evacuation times from different points of human activity or residence.

The local authority should ensure that signs marking the evacuation routes should be posted at visible points. The local authorities can periodically schedule emergency drills or exercises to test if people are familiar with the routes, if people and emergency personnel can respond quickly to alerts, and to make sure that the evacuation routes are always kept clear in times of emergency.

Land Use Planning

Finally, local authorities can use land use planning as a valuable tool for both disaster mitigation and disaster preparedness. In the case of tsunami disaster mitigation and preparedness, there are techniques to determine risks based on the anticipation of how high the run-up could go, identifying various degrees of exposure to the tsunami waves, surveying the vulnerability of people and infrastructure, and combining these all into risk maps. Risk maps can be converted into zoning, where the zone with the high risks must have regulations that require evacuation routes leading to safe places, building codes that require the anchoring of heavy structures when the risk is high, and the use of protection and evacuation strategies.[6]

The Story of the Community Tsunami Early-Warning Centre

Peraliya was one of the worst damaged urban areas from the 26th December tsunami, located in the Hikkaduwa Divisional Secretariat Area of Galle District in the Southern Province of Sri Lanka. It is situated close to the picturesque beach of Hikkaduwa, the well-known beach resort. Peraliya drew much media attention during the 2004 tsunami disaster due to the train accident that claimed over 1270 lives, including 249 from the village. This case study is about an intervention for a safer coastal urban community that began as a local initiative, and later integrated in the national disaster management system, and continued to grow.

The beginning of CTEC

Hikkaduwa in Sri Lanka was one of the most devastated locations from the 26 December 2004 tsunami. A Community Tsunami Early-warning Center (CTEC) was established in Peraliya, the village that lost 2000 lives who were on board a train that was swept away by the pounding waves. CTEC started from one of the rehabilitation activities carried out by the community, backed by a group of volunteers both Sri Lanka and abroad. A mechanism was needed to obtain, analyze and disseminate information about tsunamis and other natural disasters to the community. CTEC was born as a solution for the above problem, after consultation of the community members and other stakeholders.

1. **Vision**.
The vision for CTEC is to create a disaster preparedness culture at the community level in Sri Lanka through community participation and empowerment, with special emphasis on the protection of vulnerable groups, while sharing the benefits of information technology with rural communities for culturally appropriate and sustainable development.

2. **Linking to the government's alert system**.
While CTEC was growing, a lot was done at the national level in the field of disaster management. The Disaster Management Act No. 13 of 2005 was passed. Under this Act, a Disaster Management Centre was established, and a Disaster Management Coordinator was assigned to the each district. The Geological Survey and Mines Bureau (GSMB) was assigned as the national focal point for issuing tsunami warnings. All these developments were bringing a lot of importance and weight to the activities of CTEC because the Act recognized and promoted community-based initiatives for disaster management.

CTEC has worked closely with the District Disaster Management Coordinator, the Department of Meteorology, and the Geological Survey and Mines Bureau. The Hon. Mahinda Samarasinghe, Minister of Disaster Management and Human Rights, extended his fullest support for CTEC and has agreed to integrate it to the national tsunami warning system. CTEC links with the Disaster Management Centre through the District Disaster Management Coordinator. A number of community awareness and capacity building programs were conducted in collaboration with the District Disaster Management Coordinator.

For its part, CTEC does not issue any warning on its own. CTEC is in constant contact with the Department of Meteorology for weather updates, and connects its technological and human communication network to disseminate such warnings issued by the government to the community level, hence the adjective "community" in its name. Tsunamis are monitored by the GSMB. In addition, it promotes a tradition of community-level vigilance, which can turn into a cycle of safety that grows from the grassroots going up to government. CTEC observes the best practices and guidelines advocated in the District Disaster Preparedness and Response Plan for Galle.

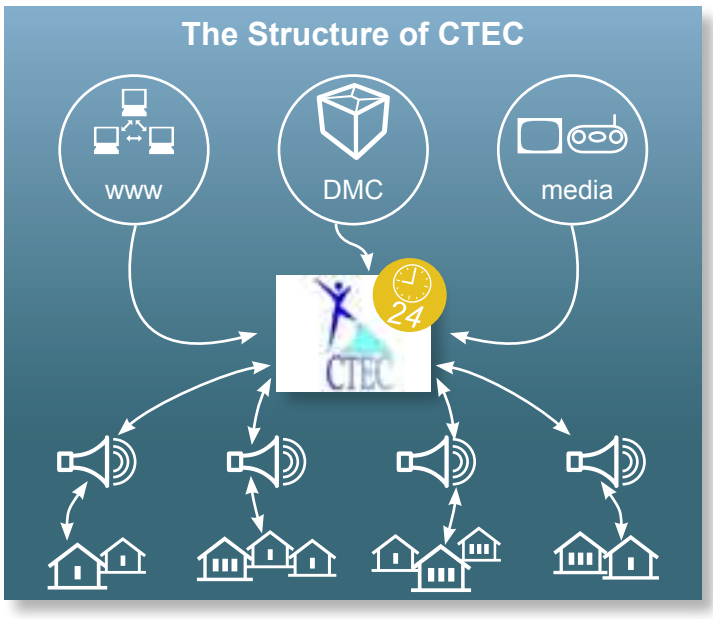
GSMB worked closely with CTEC since its inception. The GSMB installed an automated siren at the CTEC premises which could be controlled from Colombo. Later, the GSMB contributed to the public address system of CTEC. In addition, CTEC and GSMB have conducted joint community awareness programs.

Development of the system

The CTEC Office is operational for 24 hours a day, seven days a week. Youth volunteers continuously monitor for emergency information/warnings issued by international and national warning agencies, and for news from the local and international media. They follow procedures for verification with the Disaster Management Centre and subsequent emergency response.

Source: CTEC

1. **Set-up**.
CTEC has simple information communication facilities such as television, radio, telephone, satellite television, Internet access and email facility. Fifteen loud speakers connected into a public address system are set up over an area covering three villages; the speakers link the center to the community.



The youth volunteers were selected from the community in Peraliya have been trained on topics such as: concepts of disaster preparedness and disaster mitigation; the role of the community in disaster preparedness; the Indian Ocean Tsunami Warning System; and public relations, team work and time management.

2. **Community Focal Points**.
CTEC has extended its services to the whole of the Galle District through its concept of the Community Focal Point (CFP) network. In communities that are too far from the speaker system, a Community Focal Point is the point of contact with CTEC for a cluster of houses. The people living in the houses around the focal point may get together and call CTEC to ask for disaster information.

CTEC has established CBDRM teams in line with its CFPs. The volunteers of these teams have been trained with regard to the action to be taken in an emergency situation. In addition, they are equipped with important skills such as basic life support, first aid and fire preparedness. Evacuation areas have been identified and tsunami signs have been established as a part of the community contingency plan. Educational and awareness programs are continuous throughout the year to keep the CFP volunteers up-to-date.

3. **Moving into the multi-hazard scope**.
Any urban community is prone to more than one type of hazard. At the beginning, CTEC was an effort to find a possible solution to obtain reliable information about tsunamis. The approach was later modified from the single-hazard type (tsunami) to multiple-hazard.

A fire destroyed about 50 temporary houses about 8 months after the tsunami disaster in the Thelwatta area of Peraliya. The CTEC public address system was instrumental in evacuating the people from the fire area while the fire was on going. In addition, it was noted that people had grab bags or emergency supply kits ready in their houses as a result of the tsunami awareness program that was done a few weeks prior to the fire.

Following this event, fire was identified as another hazard in the wooden temporary shelters for tsunami survivors. Thus with funding from another source, a fire preparedness

program was conducted in 15 temporary shelter areas. Community fire awareness programs were conducted along with tsunami preparedness in the above camps. Unsafe bottle lamps were identified as a hazard in these temporary shelters. A safe bottle lamp has been developed by Dr. Wijaya Godakumbura. The community members were educated on the benefits of the safe bottle lamp over the traditional bottle lamps. The participants were requested to bring all the unsafe bottle lamps in their homes and each was replaced with a safe bottle lamp. A fire extinguisher kit was handed over to each tsunami survivors camp committee. A group of volunteers from each community was given a special training on the use of fire fighting and the use of fire extinguisher kits with the participation of an official from the fire brigade and the CTEC staff.

Other potential hazards were identified in Peraliya, and may be areas for CTEC to monitor in the future. These hazards coastal erosion, floods, storm surges, tornados, oil spills from ships, and coral mining. Without this broadening, a community eventually loses interest in disaster preparedness as time passes from the last tsunami event. Thus it is gradually moving on to cover other disasters.

Community-level activities

In most disasters, community members are the first to respond before any outside assistance can reach the disaster site. Community mobilization through community disaster preparedness can reduce loss of life and property and at the same time, build confidence in self management. CTEC believes that the community should monitor reports of seismic activity and other natural disasters using the data in the public domain should be a key component of effective community based disaster risk management process. This approach promotes the development of a community database on natural disasters and strengthens the community knowledge on such disasters. This kind of community-based monitoring for natural disasters can operate either as a complementary or as a parallel system to the government system.

Community Participation Workshop Guide Questions

- What are the natural disasters that can affect our community?
- What are the special groups that can be affected by such disasters?
- Draw a map of your area and mark the hazards. In addition mark, the potential evacuation areas.
- Discuss the measures that you can take to prepare for disasters.

1. Awareness-raising Workshop Series.

Well-informed communities will respond before, during and after disasters in a more effective manner. The Peraliya community had little or no prior knowledge of tsunami or its mechanism, thus enhancing the awareness amongst the community members about tsunami was very important. The CTEC Community Awareness Team conducts awareness and educational programs to equip the public with knowledge, skills and attitudes with regards to emergency preparedness. Workshops and campaigns, identification of tsunami evacuation areas and routes, putting up of tsunami evacuation sign boards have been among some of such awareness activities. A community library has been established to share information with the community members.

The presentations are made simple by using pictures and diagrams. Tectonic plates, earthquake activity and the generation of tsunami are explained with the use of models. A role play is used to introduce to the emergency kit or the grab bag. The participants of the workshop are distributed pamphlets/stickers containing

Topics for a Tsunami Awareness Workshop

- What is a tsunami?
- How does it occur?
- What are the natural warning signs of a tsunami?
- Can warnings be issued for tsunami?
- Describe in Indian Ocean and the national tsunami warning system.
- What is the role of CTEC in the above systems?
- What are the myths prevalent in the community about the tsunami?
- What can be done to prepare better for natural disasters?

the emergency numbers of the national warning agencies as well as of CTEC. Tsunami-related myths are then discussed with the community members. Each myth is presented to the community members and they are asked about their perception about the myth. The scientific background of the myth is explained.

Community participation is enhanced through interactive workshops. The participants are divided into groups, and are given guide questions to discuss. After some time, representatives form each group present their findings to the rest of the community.

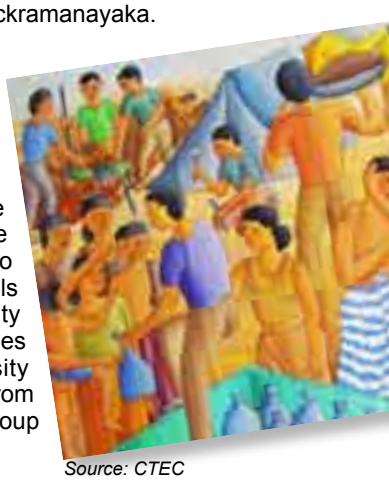
The CBDRM Workshop presents videos of successful CBDRM initiatives to the community, specifically the Bangladesh Tidal Wave preparedness program and/or the Viet Nam flood preparedness program. The lessons learnt from above videos are then discussed. The community also plays a game to illustrate how rumors can spread and can be bad as a method for spreading tsunami alerts. The awareness program ends with the community selecting and appointing a Village Committee to work further on the disaster preparedness activities. CTEC maintains continuous contact with this group for further disaster preparedness activities.

2. Essay and Arts Competition.

The message of disaster preparedness needs to be implanted deep in the minds of the younger generations. Thus CTEC has conducted an Essay and Arts Competition amongst the school children of the Galle District. While stimulating the school children to research about and think on the field of disaster preparedness, this provided special opportunity to obtain the students' perceptions of disasters and disaster preparedness. The best essay was published in the CTEC first year anniversary publication, while certificates and prizes were distributed for the winners of the both categories by the Governor of the Galle District, Mr. Kingsley T. Wickramanayaka.

3. Health Issues and Disasters Capacity Building.

CTEC conducted a capacity building program for its community volunteers in collaboration with the Disaster Management Core Group of the Faculty of Medicine Colombo. The objective of the program was to enhance the level of knowledge, skills and attitudes among the community volunteers with regards to health issues in disaster preparedness. University teachers and the Medical Students from the Disaster Management Core Group

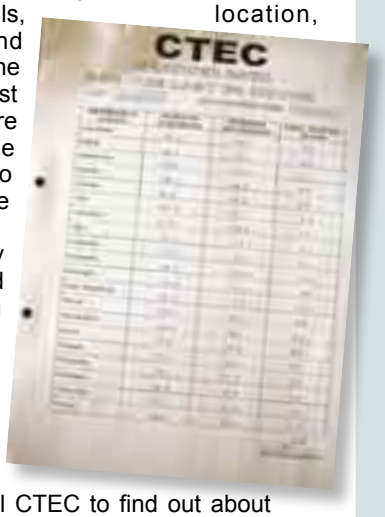


Source: CTEC

of the Faculty of Medicine Colombo participated in the activity while CTEC provided the networking and logistical support. The participants were awarded certificates of participation.

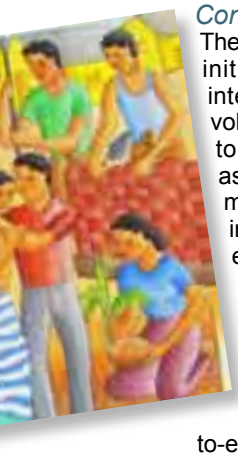
4. **Community database**. CTEC keeps a Community Database where specific disaster information are translated into Singhala (the local language) and displayed on a public notice board. The community is informed that the Community Database is updated daily, and anybody interested in it can come can to use it. The Community Database has few components:

- Seismic Activity: Every 15 minutes, the duty officer looks at web sites and records in the Centre Logbook the earthquakes with a magnitude more that 5. All earthquakes that occur in the Indian Ocean Region are extracted every 24 hours and are displayed in the CTEC notice board.
- Weather Information: The daily weather report issued by the Meteorology Department is read and recorded by the Duty officer. The Daily weather Report is also displayed in the CTEC notice board so that any body interested can drop into the centre and obtain the weather information.
- Community Inquiries: The inquiries made by the community members are recorded in the incoming call book. The date, time, name of the person who calls, location, contact telephone number, and the inquiry are recorded. Later the action taken also recorded. This list helps to identify the areas where "rumors" are generated, and the Center officers could reach out to these areas to educate the people about their fears.
- Disaster Information: The duty officer records the disaster related local and foreign news in the Log Book. In addition, important and relevant news paper articles with regards to natural disasters are collected.



Developing the organization

People from other districts also call CTEC to find out about emergency situations, thus CTEC is planning to expand its activities to other areas of the country. It is planning to adopt the multi-hazard approach for CBDRM. In line with the National Road Map for a safer Sri Lanka, it is planning to establish CBDRM resource centers. It is also networking with national and regional organizations with experience in the field of CBDRM to develop itself into a CBDRM training centre and a national centre of excellence in the field.



Conclusions

The story of CTEC in Peraliya is one of how a community initiative can grow into a viable and sustainable intervention against the threat of disaster. From a voluntary organization in one village, it has expanded to cover three villages in Galle, and has helped assuage fears of tsunamis in other districts. It has moved from supplying monitoring tsunami alerts to include more hazards in its concern. In its desire to educate people about tsunamis and disasters, CTEC has trained community members in other aspects of community based disaster risk management, including community-based hazard, vulnerability and risk assessment.

The story of CTEC is at the beginning of an end-to-end early warning system. CTEC has shown that a community initiative is the final bridge that connects the national disaster management agencies such as Sri Lanka's Disaster Management Centre, Geological Survey and Mines Bureau (GSMB) and Meteorological Department with the very people who will need to prepare for a disaster. It is now up to the Sri Lankan government to encourage such initiatives.

Finally, we must keep in mind the story of the boy and the wolf. There may be false warnings from time to time, especially while the Indian Ocean Tsunami Warning System is still being installed. Community initiatives like CTEC will also be important to reinforce the value of always heeding warnings, and to explain why false warnings can happen. One day, the little boy will be able to consistently tell the truth about the wolf. Until then, at least Peraliya has CTEC.

Topics for Health Issues and Disasters Capacity Building

- *Basic first aid*
- *Health measures in disaster situations*
- *Environmental health*
- *Needs of Children and Women in disaster situations*

Learning how bad rumors can be…

Rumors can do much harm when it comes to early warning with regards to tsunami and other natural disasters. The following icebreaker has been used in the community awareness program to enlighten the community members about the unreliable nature of rumors:

1. Participants make a line or a circle.
2. A message is whispered from one end.
3. The message is passed down the line or the circle as a whisper.
4. At the end of the line, the last message is compared with the first message, and usually there is a big difference from the original message.
5. The participants can also trace from the last message back up to the original message to discover when the changes occurred.

Community members then learn that at the end, often the message is often distorted.

Lesson to Learn: We have to be careful not to be misled by rumors.

Lessons Learned

- *Local champions bring results.* Having a group of volunteers emerge from a community can make an effort that starts small but then grows. They can be maintained at a lower cost and can have a bigger impact upon vulnerability and risk levels than expensive infrastructure and telecommunication networks.
- *National disaster early warning systems must connect with local-level counterparts.* Only by networking with communities and other local initiatives that can set up denser contact points will such early warning systems be truly end-to-end.
- *Multiple-hazard warning systems are more effective.* For hazards of rare occurrence like a tsunami, setting up a system for it alone will not sustain interest in disaster preparedness, and tend to generate false warnings. Addressing other hazards that occur with frequency and regularity are more effective at keeping people alert.

Further References

ADPC. *Regional Analysis of Socio-Economic Impacts of the December 2004 Earthquake and Indian Ocean Tsunami*. Bangkok: ADPC, 2006.

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Endnotes

1 Based on *Aesop's Fables. A new translation* by Laura Gibbs (2002) and on George Fyler Townsend's 1867 translation of the fables

2 *Regional Analysis of Socio-Economic Impacts of the December 2004 Earthquake and Indian Ocean Tsunami*. Bangkok, ADPC: 2006.

3 *http://www.ngdc.noaa.gov/seg/hazard/img/2004_1226.jpg*

4 *The Great Waves*, jointly published by the U. S. National Oceanic & Atmospheric Administration (NOAA), UNESCO/ Intergovernmental Oceanographic Commission (IOC), International Tsunami Information Center (ITIC), and Laboratoire de Geophysique, France (LDG), 2002.

5 *http://walrus.wr.usgs.gov/tsunami/basics.html*

6 *Reduce Tsunami Risk: Strategies for Urban Planning and Guidelines for Construction Design*. A handbook developed by the Italian Ministry for the Environment, Land and Sea and the Asian Disaster Preparedness Center (ADPC). Thailand, March 2006.

Other Relevant Safer Cities Studies

Safer Cities 6. *Promotion of Disaster Mitigation in Sri Lanka*
Safer Cities 8. *Channels of communications - A challenge, Public awareness in flood preparedness in Bangladesh*
Safer Cities 14. *Public Awareness and Social Marketing: Experiences from AUDMP*

About CTEC

The Community Tsunami Early-warning Centre (CTEC) aims to help protect the villages of Hikkaduwa and create a culture of preparation in case of a future disaster.

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Safer Cities *is a series of case studies that illustrate how people, communities, cities, governments and businesses have been able to make cities safer before disasters strike. The series presents strategies and approaches to urban disaster mitigation derived from analyses of real-life experiences, good practices and lessons learned in Asia and the Pacific. This user-friendly resource is designed to provide decision-makers, planners, city and community leaders and trainers with an array of proven ideas, tools, policy options and strategies for urban disaster mitigation. The key principles emphasized throughout Safer Cities are broad-based participation, partnerships, sustainability and replication of success stories.*

PROMISE

During the implementation of the Asian Urban Disaster Mitigation Program (AUDMP), ADPC recognized the importance of interventions in urban areas and accordingly identified Urban Disaster Risk Management as one of its core thematic areas of work, experiences from which have also guided the selection of the target secondary cities. ADPC has developed 'Strategy 2020 for Urban Disaster Risk Mitigation in Asia' which aims to reach 200 cities by the year 2020.

The need to minimize the destructive impacts of these hydro-meteorological events on the vulnerable communities, particularly the urban communities and the economic infrastructure through enhanced preparedness and Mitigation is therefore the main trust of the present intervention in implementation of the Program for Hydro-Meteorological Disaster Mitigation in Secondary Cities in Asia (PROMISE).

ADPC considers PROMISE program as an opportunity to associate with many communities living in Asian cities vulnerable to hydro-meteorological hazards with the aim of reducing the impacts of such events and demonstrate innovative applications for community preparedness and mitigation.

This case study documents the efforts under a specific program objective to increase stakeholder involvement and further enhancement of strategies, tools and methodologies related to community preparedness and mitigation of hydro-meteorological disasters in urban communities.

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The Asian Disaster Preparedness Center (ADPC) is a regional resource center dedicated to safer communities and sustainable development through disaster risk reduction in Asia and the Pacific. Established in 1986 in Bangkok, Thailand, ADPC is recognized as an important focal point for promoting disaster awareness and developing capabilities to foster institutionalized disaster management and mitigation policies.

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