The Asian tsunami: why there were no warnings

Peter Symonds
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As the horrifying toll of death and destruction continues to mount in southern Asia, it becomes ever more obvious that lives could have been saved if a tsunami warning system had been in place. With just 15 to 30 minutes notice, and clear directives to flee, many people who had no idea what was happening, or how to react, could have escaped to safety.

The tsunami and the earthquake that triggered it are natural phenomena. While earthquakes cannot be forecast they can be quickly pinpointed. Moreover, if the appropriate scientific equipment is in place, the formation of a tsunami can also be detected and its likely path predicted and even tracked.

A tsunami warning system has existed in the Pacific Ocean since the late 1940s. It was substantially upgraded after a tidal wave, triggered by a massive earthquake, killed more than 100 people in Alaska in 1964. In addition to seismological instruments that register tremors, a network of sea level gauges and deep-sea sensors or "tsunameters" linked by satellite to round-the-clock monitoring stations is based in Hawaii, Alaska and Japan. Using computer modelling, scientists can predict the likely propagation of tsunamis and their probable impact.

There is no such system in the Indian Ocean. Of the 11 countries affected by last week's calamity, only Thailand and Indonesia belong to the Pacific Ocean tsunami warning system. Most of the nations have seismological units that detected the earthquake. Not all quakes, however, generate tsunamis. In the absence of planning, preparation and additional equipment, it is difficult to make accurate predictions. And time is of the essence, since tsunami waves travel at speeds of up to 800kmh, depending on the depth of the water.

The December 26 earthquake registered 9 on the Richter scale, making it the largest since the Alaskan quake and one of the most massive in the last century. The epicentre of the initial tremor was off the northwest coast of the Indonesian island of Sumatra, followed by a series of aftershocks that ran north through the Andaman and Nicobar Islands in the Bay of Bengal. Two tectonic or continental plates—the Asian and Indian—shifted along a 1,000km fault line by as much as 20 metres, releasing energy equivalent to more than 20,000 nuclear bombs of the size dropped on Hiroshima in 1945.

The quake occurred just before 8 a.m. Sumatran time [1 a.m. GMT]. Eight minutes later, an alarm was triggered at the Pacific Tsunami Warning Centre in Hawaii by seismic signals transmitted from stations in Australia. Three minutes after that, a message was sent to other observatories in the Pacific. At 8.14 a.m., an alert notified all countries participating in the network about the quake, indicating that it posed no threat of a tsunami to the Pacific.

An hour later, the centre revised its initial estimate of the size of the tremor from 8 to 8.5, and issued a second alert, warning of a possible tsunami in the Indian Ocean. Frantic phone calls were made to issue warnings. But without procedures in place for the Indian Ocean, it was hit and miss. "We started thinking about who we could call. We talked to the State Department Operations Centre and to the military. We called embassies. We talked to the navy in Sri Lanka, any local government official we could get hold of," geophysicist Barry Hirshorn told the *Honolulu Advertiser*.

In the countries in the path of the tsunami, the response was disorganised and lethargic. The few who were aware of the dangers were hampered by lack of preparation, bureaucratism and inadequate infrastructure. Others either did not know how to interpret the warning signs, or were indifferent to them. None of the countries surrounding the Bay of Bengal issued an official warning, leaving millions of people completely at the mercy of the approaching waves.

Indonesia

Northern Sumatra was closest to the quake's epicentre. The huge tremor, which immediately destroyed buildings throughout the province of Aceh, was followed within half an hour by the tsunami that hit the west coast. It then curled around the northern tip, flattening the provincial capital of Banda Aceh, and proceeded down the east coast. Everyone was caught unaware, including the police and the military.

While an official warning may have come too late for many on Aceh's west coast, the lack of basic education probably lifted the toll by thousands. After the tremor, the sea suddenly retreated hundreds of metres, but no one knew what this meant. Intrigued by the phenomenon, villagers, particularly children, followed the water out, picking up stranded fish, only to be engulfed by the wall of water that followed. Many simply stood there transfixed and uncomprehending.

According to an article in the scientific magazine *Nature*, the only seismological equipment in Indonesia capable of providing an early warning was on the island of Java. It was installed in 1996 but had no telephone line following an office relocation in 2000. According to Nanang Puspito, head of the earthquake laboratory at the Bandung Institute of Technology, officials in Jakarta were alerted to the earthquake, but the absence of data from the specialised Java station prevented them issuing a tsunami warning.

Thailand

Seismologists in Thailand registered the Sumatran earthquake soon after it took place. Thai Meteorological Department officials were attending a seminar when the news came in. They immediately convened an emergency meeting, which was chaired by the department's director-general, Suphareerk Tansrirat-tanawong. The *Nation* newspaper, citing

unnamed sources at the meeting, reported that the danger of a tsunami was discussed, but the gathering decided not to issue a warning.

With no tidal and other sensors in place, the meteorologists had no means of confirming whether a tsunami was on its way. Moreover, they knew there would be repercussions from both government and business if they issued a false warning. This was peak tourist season and the hotels were full. As one official explained to the *Nation:* "If we issued a warning, which would have led to evacuation, [and if nothing happened], what would happen then? Business would be instantaneously affected. It would be beyond the Meteorological Department's ability to handle. We could go under if [the tsunami] didn't come."

The meeting was convened nearly an hour before the tsunami battered the coastline of southern Thailand, along with the tourist resorts of Phuket and Phangnga.

Sri Lanka

Although Sri Lanka is not part of the Pacific tsunami warning system, through the efforts of the Hawaii station some officials were informed that a tsunami could be developing. The wave took about two hours to cross the Bay of Bengal and hit the island's east coast.

Sarath Weerawarnakula, director of Sri Lanka's Geological Survey and Mines Bureau, told the *World Socialist Web Site* that his organisation received an alert from international bodies about the quake. Asked about his response, Weerawarnakula became defensive. It took time to decipher the meaning of the messages, he said, but refused to divulge when they actually arrived. Likening an earthquake to a heart attack, he declared: "No one can predict it." When asked about tsunamis, he acknowledged that sometimes warnings could be made. He insisted, however, that on December 26, it had been "impossible" and hung up.

In comments to the *Lankadeepa* newspaper, Weerawarnakula justified the failure to issue a warning. While claiming that his department's facilities and international connections were adequate, he explained that earthquake data had to be sent to a centre in California for processing. "That takes at least one hour. However such information cannot determine how serious the tidal effect of a particular earthquake is.... Whatever the allegations about our work our organisation works round the clock efficiently. Therefore I reject the allegations."

What has been conclusively established is that the warning systems in Sri Lanka and throughout the region are totally inadequate. Weerawarnakula's attempt to justify the unjustifiable simply demonstrates that, in the face of evidence of a massive earthquake and possible tsunami, authorities on the island were paralysed. Exactly who knew what, and when, will probably never be investigated. Even after the tsunami hit the east coast, no official action was taken to alert people elsewhere. In relatively shallow water, the wave took up to an hour to sweep around the island and hit the south and west coasts.

India

The Indian authorities confronted many of the same obstacles as their counterparts in other countries. But they had one advantage: the Indian airforce maintains a base on the remote Andaman and Nicobar islands—Indian territory in the middle of the Bay of Bengal situated close to the earthquake's epicentre. It was not a matter of guessing whether or not a tsunami would form. Shortly after the earthquake, the wave swept over the islands and the airforce base.

According to a report in the *Indian Express*, the airbase in Madras received communications from the Nicobar Islands an hour before the tsunami struck southern India. Air Force Chief S. Krishnaswamy told the newspaper: "The last message from Car Nicobar base was that the island is sinking and there is water all over." The chief instructed his assistant to alert New Delhi, which he did—by fax—to the home of the former science and technology minister. No further action was taken and no tsunami warning was issued for Madras or for other southern Indian towns and cities.

Why was there no Indian Ocean warning system?

In the wake of the disaster, calls are being made for a tsunami warning system to be established for the Indian Ocean. Everyone—from the Indian and Thai governments to their counterparts in Canberra and Washington—is pledging to set one up. According to the UN, the necessary steps could be taken within a year. But the obvious question is: why was a system comparable to the one in the Pacific not established previously?

Prior to last week's catastrophe, the handful of scientists advocating such a system were generally regarded as crackpots. Seven years ago, Samith Dhamasaroj, then director general of the Thai Meteorological Department, warned of the possibility of a devastating tsunami hitting the country's southern coast. Some branded him "crazy" and he was sidelined.

Dhamasaroj told the *Australian*: "I suggested an early warning system be put in place for tidal waves, such as alarm sirens at beachside hotels in Phuket, Phangnga and Krabi, the three provinces which have now been hit. I alerted senior officials in these provinces, but no one paid any attention." He said that some provinces had banned him from entering their territories as "they said I was damaging their image with foreign tourists."

Other scientists have made similar proposals, which have been shelved or stalled for lack of funds. According to *Nature*, "The need for a similar system in the Indian Ocean [to the Pacific] has been discussed at regular intervals by the Intergovernmental Oceanographic Commission, the UN body that runs the Pacific network, since at least 1999." Vasily Titov, a tsunami researcher in the US told the magazine: "It is always on the agenda... Only two weeks ago it would have sounded crazy. But it sounds very reasonable now. The millions of dollars needed would have saved thousands and thousands of lives."

As recently as October 2003, Australian-based seismologist Dr Phil Cummins called on the International Coordination Group for the Tsunami Warning System in the Pacific to extend its reach to the Indian Ocean. According to the *New York Times*, the meeting in Wellington, New Zealand rebuffed him and declared in the minutes that such an expansion would mean redefining the group's terms of reference. Instead, it voted to establish a "sessional working group" to study the problem.

The costs associated with Cummins' proposal are relatively minor. One academic cited in the *Los Angeles Times* estimated that a hi-tech system covering not just the Indian Ocean, but all of the world's oceans, could be set up for as little as $150 million. Sea-level gauges cost as little as $5,000 each. The better ones, linked to high-speed communications, are more expensive—about $20,000. So-called tsunameters, which detect the passage of a tsunami in deep water, cost $250,000 each and require regular maintenance.

All of the sensors, including seismological input, have to be linked to round-the-clock monitoring stations manned by trained scientific staff. Equally important is a program of training and education designed to make officials and the public aware of the dangers and what to do in the event of a warning.

The failure to establish such a system is bound up with shortsightedness, inertia and outright contempt—especially on the part of the major powers—for the lives of the oppressed masses of southern Asia.

Destructive tsunamis are actually more common in the Indian Ocean than in the Pacific Ocean, but none of the G-8 countries borders the region. Both Japan and the United States have spent millions on a string of tsunameters and monitoring stations in the Pacific to protect their coastlines, but, prior to last week's disaster, neither country offered to pay for its extension to the Indian.

Last week's catastrophe also raises broader questions. The absence of a tsunami warning system for southern Asia is symptomatic of the general state of affairs regarding disasters, such as flooding and cyclones, that occur regularly throughout the region. The very scale of the tsunami tragedy has provoked the sympathy of ordinary people around the world, compelling governments to respond, even if insufficiently and belatedly. Yet every year thousands of impoverished people die or become homeless as a result of natural disasters in Asia, and the events barely rate a mention in the international media.

Commenting on the current crisis, Indian scientist Roddam Narasimha caustically asked: "Even if we had the two-hour warning for tsunami, based on scientific data, what would the [Indian] administration do about it? Who would have called whom, and how would they have conveyed the warning to the people?" He pointed out that New Delhi had failed to learn anything from the cyclone that devastated the Indian state of Orissa several years ago. "The administration had a two-day advance warning about the Orissa supercyclone, but what happened? So, could they have done in two hours what they couldn't do in two days?"

While Narasimha's indignation is justly directed at the Indian administration, his comments constitute an indictment of other regional governments and the major capitalist powers, which routinely wash their hands of any responsibility for the plight of the masses of South Asia. The cost of establishing a tsunami warning system in the Indian Ocean is a pittance compared to the huge profits amassed by US, European and Japanese corporations through the exploitation of the region's cheap labour. In the final analysis, the absence of adequate disaster management systems is a product of the same social and economic order that condemns billions of people to wretched daily poverty and treats their sufferings as inevitable and unavoidable.