



Bridging the Ocean

India leads relief measures in tsunami-hit areas

December 2004 – January 2005





Front Cover: Indian Coast Guard Helicopter in a rescue operation. (photo courtesy AFP)

Back Cover: Indian Navy Helicopters returning to the base camp after dropping ration at Boossa, Sri Lanka



When Disaster Struck

Giant tsunami tidal waves set off by a massive earthquake off the Indonesian coast on December 26 unleashed a trail of death and destruction in South and South East Asia, killing over 10,000 people in India, and about 1,60,000 in the region. At least five million people have lost their families or homes, and are being housed in refugee camps across the affected regions.

The epicentre of the 9.0 magnitude (on Richter scale) quake was under the Indian Ocean near the west coast of the Indonesian island of Sumatra, according to the US Geological Survey (USGS), which monitors earthquakes worldwide. A violent movement of the Earth's tectonic plates displaced an enormous amount of water, sending powerful shock waves in every direction. Within hours, killer waves radiating from the epicentre slammed into the coastline of 11 Indian Ocean countries, snatching people out to sea, drowning others in their homes or on beaches, and demolishing property from Africa to Thailand. As many as a third of the people who died in the Indian Ocean tsunami were children; most of them would not have been strong enough to resist the force of the water. People were crushed by debris or when the sea hurled them against structures.

The earthquake that generated the great Indian Ocean tsunami is estimated to have released the energy of 23,000 Hiroshima-type atomic bombs, according to the USGS. Tsunamis have been relatively rare in the Indian Ocean.

Across the world, the magnitude of the disaster and the scale of the suffering prompted a new wave – one of sympathy, support, and assistance for the people affected by the tsunami.

“I am deeply distressed by the large-scale devastation that has been wrought. My heartfelt sympathies are with the families of the bereaved, and with all those affected in our country. I have spoken to the Chief Ministers of the affected States, to assure them of all possible Central support and assistance in the relief and rehabilitation effort. The Defence and Home Ministers have been asked to alert the armed forces and paramilitary forces, who are already assisting in providing relief to all those who have been affected in the disaster.”

*Prime Minister Dr. Manmohan Singh on the Tsunami Tidal Wave calamity,
26 December 2004, New Delhi*



Nagapattinam – a former fishing village decimated by the tsunami that ravaged the Tamil Nadu coasts



Women mourning the death of their children



Local inhabitants checking the list of the injured posted at Galle Hospital, Sri Lanka.



Fishermen leaving the flooded areas of Cuddalore in Tamil Nadu



Boats hoisted on by killer waves

“We are facing this unmeasurable tragedy with determination, vigour, resolution, strong-nerves and with the dedicated team of workers under the UN. The year 2004 ended in unparalleled tragedy. 2005 begins with collective hope and sustained action.”

External Affairs Minister K. Natwar Singh at the Special Meeting of Leaders convened by ASEAN in the aftermath of the Tsunami, 6 January 2005, Jakarta



Fishermen trying to salvage their boats



A family in coastal Tamil Nadu shattered by the tragedy

External Aid: Extending A Helping Hand

South and Southeast Asia are a region joined by history and by deep-rooted social and cultural ties. Centuries of interaction have created a natural sense of affinity and empathy amongst the people of the region. It is, therefore, only natural that they come together in the face of this unprecedented disaster. This vividly demonstrates the truth of the ancient Sanskrit saying “Vasudhaiva Kutumbakam”, or that the world is one family.

India, on its part, was among the first countries to contribute to international relief efforts. With confidence in its capabilities of dealing with this disaster, India was able to move very quickly to extend timely assistance to other more affected countries, in particular, of course, to our nearest neighbours Sri Lanka and Maldives. In fact, in Sri Lanka, India was the first to respond virtually on the day the disaster occurred. Quite

a number of assets have been deployed both in Sri Lanka and in Maldives since the time disaster struck in order to provide relief, to rescue people, and to provide relief supplies, ensure ferrying of supplies using aircraft and ships. The Indian High Commissions are actively engaged in providing relief measures in these countries and are identifying, evacuating, assisting Indian nationals wherever they are.

Recognising the key role that India can play in the region, it was invited to be a part of the Tsunami Core Group put together by the United States in order to facilitate a coordinated effort to deal with this disaster. When it was announced, there was the United States, Japan, India and Australia. Later on, it was expanded to include the United Nations, Canada as well as the European Union.





An Indian Navy helicopter disembarks the relief supplies at Meulaboh, Indonesia

The fact that India was invited to be a part of this Core Group was precisely because of the recognition that India had the capabilities, the resources, and the necessary ability to help out with the relief efforts. This Core Group is not functioning any more because that role for coordination has now, quite appropriately, been taken over by the United Nations, which is now fully engaged in terms of coordinating the relief efforts.

Indonesia

On receipt of a request for assistance from Indonesia, the Indian Navy immediately mobilised two ships and these reached Indonesia on January 4. The ships carried 40

tonnes of relief supplies and three tonnes of medical stores. The ships have been deployed off the west coast of Indonesia. They have already disembarked all their relief supplies.

One of the ships is a hospital ship, with one embarked helicopter and it has been placed off the coast of Aceh, Indonesia – the worst hit area. This ship is providing emergency rations, medicines, tents and first aid kits. It is also equipped to set up on-shore medical facilities. The Indian relief effort at Meulaboh is in full operation. An onshore field hospital has been set up in this devastated town and relief supplies are being delivered and distributed to the victims. India is ready to do more to assist Indonesia in the required areas.



Surgery in progress on board the INS Nirupak, the hospital ship



A child being treated at the Indian Naval Medical Relief Camp ashore Meulaboh



Evacuation by INS Rajput – Hutbay

In Indonesia, particularly in Medan which has 5,000-strong community of Persons of Indian Origin and 500 NRIs, extensive work has been done by the Indian Consulate. Control rooms have been set up and all assistance is being provided.

Maldives

A composite relief package of Rs. 5 crore (around US\$1.1 million) for Maldives has already been announced. Two Indian naval ships have set up medical camps in the Maldives. A naval tanker with drinking water and a water purification plant is also in place. The four aircraft that carried supplies to the Maldives are

now stationed there to assist with rescue and relief operations.

The Indian Navy has also deployed four ships along with four helicopters for ferrying supplies and providing assistance. A maritime coordination centre has been established at Male to coordinate the relief effort with the Maldives Government. The ships have ferried tonnes of relief supplies including food, water, communication sets and medicines. The embarked helicopters have flown several sorties to lift supplies to outlying islands and have evacuated 15 medical casualties. The Indian naval ships and aircraft have also been tasked for ferrying approximately 200 tonnes of relief supplies received from international aid agencies from the Hulule airport to various outlying islands.

Diving ships have provided assistance to the Maldives Government for clearing obstructions along the coast. In addition, naval ships and coast guard ships have repaired the generators and operationalised power supply in seven



Distribution of relief supplies in Maldives

islands. The Indian Navy is also running four medical camps at various locations and has treated about a thousand persons.

The Indian High Commissioner undertook an extensive aerial survey over remote islands where Indian teachers were living to identify them and see what assistance could be provided.

Sri Lanka

India was the first country to send relief through its navy to Sri Lanka – within hours of the disaster – and at least a week before the US marines reached there. Two naval vessels are berthed at Trincomalee in Sri Lanka and are undertaking clearance work at the harbour. One of them, after discharge of supplies, has been converted into a hospital ship. Another two naval vessels anchored off the Galle port are heli-lifting supplies. Two Ilyushin 76 aircraft carrying military field hospitals have reached Sri Lanka. Seven helicopters and two other aircraft are operating from Colombo.

There has also been a natural increase in the relief being provided to Sri Lanka because of the close proximity. One is dealing with a situation where every day brings new challenges. From relief and rescue tasks, the focus is shifting to initial stages of reconstruction. For example, the harbour in Trincomalee was blocked by debris. So, a lot of work had to be done for debris clearance. The deployment of personnel, or



Indian High Commissioner to Sri Lanka Mrs. Nirupama Rao handing over relief material to Swami Chidrupananda of the Ramakrishna Mission at Jaffna



Disembarkation of stocks at Bossna Naval Base, Sri Lanka



Trincomalee-Ashroff Jetty – handing over relief material to Sri Lankan Authorities



A child being treated at the Indian Naval Medical Relief Camp at Batapola, Sri Lanka



LCU (Landing Craft Utility) lifted on jetty



Sri Lankan Prime Minister Mahinda Rajapakse being received onboard Sukanya

deployment of teams has to be commensurate with the requirements.

India has announced a total assistance of about Rs.100 crore (around US\$22 million) for Sri Lanka. Part of it has been used for immediate relief. However, in the days and weeks to come, much of that assistance would also be required for the rehabilitation and repair work that will have to follow urgently.

Helping itself, helping others

India has displayed a maturity in its management of the ravages caused by the tsunami – helping other countries in the region and in helping itself – leading to a changed perception of the country in the eyes of the international community.

Clearly, the overseas aid should be channelled to those countries which need it more, India has suggested, and has also said that it would go

back to the donor countries' friendly offers if and when necessary. This is a logical distribution of available aid, and a pragmatic acknowledgement of the long, hard road to rehabilitation that lies ahead, when aid from other countries may become necessary.

India's decision not to accept international aid, initially criticised as being "false or misplaced pride," is now being grudgingly saluted by the press and the international community. In fact, on January 5, French Defence Minister Michelle Alliot-Marie attributed criticism of India's decision to refuse international aid to "a lack of knowledge about India and the country's economic, technological and financial capabilities." She said India's decision was a gesture of solidarity towards countries that needed it most.

What India felt from the start was that given the enormity of the damage suffered by friendly

countries, particularly Sri Lanka, Thailand and certainly Indonesia where the scale in fact seems to be expanding every day as more damage comes to our notice, whatever international effort is being launched – of which India would of course be a part – is perhaps better directed at those who really need the assistance the most.

As Prime Minister Dr. Manmohan Singh said: “If and when we need their help (international aid), we will inform them. Several countries have offered assistance to us. The President of the United States spoke to me; several other countries’ statesmen have also spoken to me. I have told them that, as of now, we feel we have adequate resources to meet the challenge.” India’s refusal however, does not include UN agencies and non-governmental organisations already working in the region.

Disasters such as this leave highly localised effects and require localised responses. The local administration, with the help of national disaster relief institutions, are in a better position to know what is required by the people of, say, Cuddalore than an international agency or an ‘outside’ country that has its own generalised idea of how to provide relief.

Over the past few years, India has put in place a very efficient disaster management system, a system which consists of various arms of the Government. It includes, for example, the Ministry of Home Affairs, and the Ministry of Defence, particularly, the Service arms of our Armed Forces. It includes also the State Governments and there are specific disaster management units, which operate at the state government level. There are mechanisms for the release of funds instantly when such disasters strike. There is already in place a system of coordination amongst the different agencies. Also, people have been trained in disaster



Indian Navy uses ship's crane to clear debris at Galle Channel



Indian Navy salvaging Sri Lankan boats at Galle Harbour

management. There is a National Institute of Disaster Management in India, which not only looks into better methods of management of disasters but also carries out training of personnel in disaster management.

There is need to deal with both emergency relief issues as well as with later phases of rehabilitation and reconstruction. India is committed to continuing its support and assistance in every possible way, including providing trained search and rescue teams, setting up web-based disaster management information systems, and human resources development for disaster management.

India: Providing Support, Restoring Normalcy

India, the tsunami caused extensive damage in the Andaman and Nicobar Islands, the states of Tamil Nadu, Andhra Pradesh, Kerala, and Pondicherry. The death toll is at 10,151 and is likely to go up further as more than 5,600 persons are still missing. Of the missing persons, about 5,500 are from the Andaman and Nicobar Islands and are feared dead.

The region is still sensitive and prone to more quakes. Between December 26 and January 11, 123 aftershocks have been reported (112 between >5.0-6.0< and 11 were > 6.0 on the Richter scale).

The Government of India, along with those of the affected Indian States and Union Territories, has mounted massive relief and rescue operations. Initially, the focus was on search, evacuation and relief efforts. The situation in Tamil Nadu, Andhra Pradesh, Kerala and Pondicherry has stabilised, and is returning to normalcy. It is stabilising rapidly in various islands in Andaman district. The focus now is on establishing the communications network, preventing outbreaks of epidemics and relief and rescue operations in the Nicobar Group of islands, which are the worst affected.



Prime Minister Dr. Manmohan Singh interacting with tsunami-affected people at Campbell Bay Relief Camp in Port Blair on 8 January 2005



People affected by tsunami evacuate from Nagapattinam on 1 January 2005

Large quantities of food, drinking water, medicines, tents, torches and generator sets have been delivered, and more are ready for delivery. Supplies to inaccessible areas are being air-dropped. For the Andaman and Nicobar Islands, an Integrated Relief Command has been constituted for effective coordination and operationalisation of relief and rehabilitation measures. As of January 4, the Government of India had incurred an expenditure of Rs 1,125 crore (about US\$250 million) on the relief and rehabilitation effort within India. Due importance has also been given to alleviating the psychological impact of the disaster through trauma counselling, early reopening of schools and providing access to TV sets.

Following a tour of the affected areas on December 30, Prime Minister Dr. Manmohan

Singh announced a Rs 236-crore (about US\$52 million) relief package for Kerala, including Rs 106 crore (about US\$23.5 million) as 'extraordinary assistance'. He also said the government would focus on improving its disaster forecast and warning systems. Earlier on December 27, the government had announced an immediate allocation of Rs 500 crore (about US\$111 million) from the National Calamity Contingency Fund towards relief and rehabilitation in the affected states, with the Cabinet authorising the home ministry to make a special assessment of the Nicobar Islands.

On its part, the country's central bank, the Reserve Bank of India, issued a directive to all banks asking them to immediately initiate relief measures for the affected states. The relief measures include consumption loans for

“We must work towards learning the right lessons even from this disaster so that our future can be safe.”

*Address by President
Dr. A P J Abdul Kalam at
the 25th Convocation of
National Institute of
Design,
5 January 2005,
Paldi, Ahmedabad*

“We have not refused. We are very grateful to the friendly countries for their gesture but we feel that we can cope up with the situation on our own and we will take their help if needed.”

*Prime Minister
Dr. Manmohan Singh
29 December 2004,
New Delhi*

“I think it would be fair to say that the experience of the last several days has shown that in fact India has been very successful in overcoming the consequences of this disaster. We have more or less completed Phase-I of relief; we are now going to be moving into Phase-II where there would be accent on bringing back normal life to the affected areas of the country.”

*Foreign Secretary
Shri Shyam Saran
5 January 2005,
New Delhi*



Medical relief provided by the Indian Medical Association to the tsunami-affected people in Nagapattinam



A medical team to attend the tsunami-affected people at Karunagapally hospital in Kollam, Kerala on 31 December 2004



The Minister for Youth Affairs and Sports Sunil Dutt distributing relief items to tsunami victims at a relief camp in Chennai, on 6 January 2005

sustenance, and waiver of margin requirements. Banks have also been asked to convert, reschedule and restructure existing loans in the case of crop failure due to the tsunami tragedy.

The Ministries of Civil Aviation, Railways and Shipping have issued instructions for transporting relief material to the tsunami-affected areas free of cost, if the consignees are the Relief Commissioner/District Magistrate of the affected States/UTs and the relief material is in the form of donation and is at no cost to them. On these terms, the facility of free transport can also be availed of by the NGOs, trusts and other organisations, including the corporate sector, to provide the relief material, including material for rehabilitation and reconstruction.

The Indian Government has sharply increased its relief aid to the tsunami-devastated Nicobar Islands lying south of the Bay of Bengal outpost as hopes fade for more than 5,500 people swept from their homes. Visiting the area on January 8, Prime Minister Dr. Manmohan Singh announced an extra allocation of Rs 200 crore (about US\$44.5 million) for food, temporary housing and other immediate aid.

India's relief infrastructure kicked into life from Day One of the terrible disaster. The armed forces not only have done sterling work to recover the dead, save the living and provide survivors with basic requirements such as food and water, but they have also been joined by various other institutions to see to it that affected people do not continue to suffer because of lack of aid.

India has deeply appreciated the offers of help, which poured in from several countries. But, the country's experience of handling natural disasters has enabled it to develop well-

defined institutional mechanisms for disaster management at all levels.

The lessons learnt from the Orissa cyclone of 2000, the Gujarat earthquake of 2001 and other disasters have helped effect a paradigm shift in the country's approach to disaster management, proceeding from the conviction that development cannot be sustainable unless disaster mitigation is built into the development process at all levels. There are designated officers to coordinate the entire disaster response at the national, state and district levels. These institutions swing into action immediately in the aftermath of any disaster. Standard operating procedures for different disasters have been developed and regular drills are organised.

A Calamity Relief Fund has been set up in each State to enable State Governments to incur immediate expenditure on response and relief operations in the event of a disaster. This is supplemented by a National Calamity Contingency Fund at the Central Government level. Eight battalions of para-military forces have been equipped as Specialist Search and Rescue Teams. This holistic approach was extremely useful in dealing with the aftermath of the tsunami.

India can deal with the challenges, insofar as they affect India, with its own resources. New Delhi would, of course, be in touch with the international community in case any specialised requirements were to come up. The outpouring of compassion – and funds – has indeed been tremendous. However, more funds may be required in the months to come. Equally important are steps to ensure a long-term coordinated and sustained response and an effective relief distribution mechanism which is transparent and sustained.

Collective Steps: Protecting the Future

India whole-heartedly supports the efforts of the United Nations and the presence of the UN Secretary General in the Indonesia summit is a testimony to the UN's important role in coordinating international relief, and in finding ways and means to address the gaps in the relief process.

UN Secretary-General Kofi Annan made an impassioned appeal for nearly a billion dollars of immediate aid for countries stricken by the Asian tsunami disaster as the head of the world body took charge of coordinating the world's response to the tragedy. Addressing a one-day summit of world leaders organised by the ASEAN in the Indonesian capital, Jakarta, and

called to organise what would eventually amount to several billion dollars in relief and long-term reconstruction aid for the Indian Ocean region, Annan said the sum of US\$977 million was needed immediately for specific projects to help five million people. Annan warned that without rapid action, disease in devastated areas could send the death toll soaring above the 160,000 fatalities already confirmed in the 11 countries hit by the December 26 tsunami.

While individual governments had already made up to US\$ 4 billion in general longer-term aid pledges to stricken countries, Annan said it was essential they come up with hard cash for the immediate relief effort over the next six months.

India's partnership with ASEAN is matter of mutual satisfaction. This partnership will be deepened by efforts to jointly address the tragedy. India and ASEAN have agreed to cooperate in the field of space technology and its applications for weather forecasting and



External Affairs Minister K. Natwar Singh meeting UN Secretary-General Kofi Annan in Jakarta

“As we address current disaster relief priorities, it is also time to look at medium to long-term objectives. An evaluation is needed of the various long-term warning systems for different disasters that we need to put in place. Even more important will be mechanisms to be able to disseminate early warning signals obtained from these systems to the public.”

External Affairs Minister K. Natwar Singh at the Special Meeting of Leaders convened by ASEAN in the aftermath of the Tsunami, 6 January 2005, Jakarta



Prime Minister Dr. Manmohan Singh interacting with tsunami-affected people at Kakana Relief Camp in Car Nicobar on 8 January 2005.

disaster mitigation. They have also established a BIMSTEC Centre on Weather and Climate in New Delhi. The Indian Ocean Rim Association for Regional Cooperation could also have a role to play. There is great merit to activating a regional approach that complements national efforts to handle natural disasters. This allows us to pool together our respective strengths and complementarities effectively and efficiently.

This is the greatest humanitarian emergency of our time. Such an unprecedented disaster requires an unprecedented response at all levels from the UN through to local authorities and communities. It has been encouraging to see aid was getting to affected communities in spite of many obstacles. Relief workers are facing huge challenges. Many of the areas are pretty remote,

communication lines have been down, roads have been blocked, and electricity cut off.

As current disaster relief priorities are addressed, it is also important that medium to long-term objectives are defined. An evaluation is needed of the various long-term warning systems for different disasters that we need to put in place. Even more important will be mechanisms to disseminate early warning signals obtained from these systems to the public.

Reconstruction

After the immediate aid effort, the process of reconstruction will have to take place. The most devastated areas are in Sri Lanka and Indonesia,



Relief workers facing huge challenges in restoring normalcy

with the northern Indonesian province of Aceh by far the worst hit area. Companies estimate insured damage due to the tsunami at between US\$ 5 to 10 billion. However, many uninsured properties in towns and villages in remote areas have also been virtually wiped off the map. The towns and villages in the region around Meulaboh in Aceh are among the worst hit. In other badly-hit areas, like Southern Thailand and Southern India, reconstruction can be expected to be relatively rapid. In Thailand, in particular, funding for much of the reconstruction will come from either insurers or the tourism industry.

Warning systems

Work has already begun among the Indian Ocean countries to create an early warning system for the Indian Ocean region to ensure that the death toll from the savage tsunami would never be repeated. Such a system already exists for the Pacific Ocean region, where tsunamis occur far more frequently than in the Indian Ocean basin. But while the technical side

of the system would be easy to put in place in the Indian Ocean region, it will still be a major challenge to make it work. Experts say that to make such system effective, a major task will be training the public around the region on how best to respond to warnings.

Community-building and trauma support

Besides requiring immediate aid and assistance, long-term support will be needed in rebuilding shattered communities and broken lives. Like the reconstruction efforts, these are likely to be major tasks. Some governments have started to fly in trauma-counsellors and also to look for lessons from elsewhere in the world about how to rebuild communities shattered by disasters, whether natural or man-made.

The Indian Ocean tsunami is a wake-up call, a powerful reminder of the need for coordinated and cooperative efforts to alleviate human suffering in an era of growing international interdependence.

“...taking charge of their own destiny”

(Some comments by the International Media)

“Indian Prime Minister Manmohan Singh sparked national pride when he refused aid offered by the US and other countries. Thanks but no thanks, he said politely, we can help ourselves. That refusal boosted the relief effort from within India – a psychological shift marked by Indians deciding to take charge of their own destiny.”

– **Business Week**

“With being a regional power comes responsibilities to respond to these kinds of crisis. India is accepting that responsibility.”

– **Bloomberg**

“Overall, India has managed the crisis well. ... Better, India has used the catastrophe to affirm its status as a regional superpower.”

– **Le Figaro**

“New Delhi is seeking to project the image of a self-reliant major player in the Indian Ocean region, which can help shape the region’s security and economic affairs.”

– **Korea Herald**

“India’s government says it turned down offers of international aid after the tsunami struck because it didn’t need them – not to prove a point.”

– **CBC News**

“To help is formidable; to know to help is better.”

– **L’Humanité**

“Our job was not to compete with anyone or make political points at a critical time, but to mount search-and-rescue operations. Our first and foremost thought, our immediate motivation was to rescue people. When someone is sinking in water, you rush to help, you think later.”

– Ronen Sen, India’s Ambassador to Washington,
reported by the **Washington Post**



A Chetak helicopter operating in Nagapattinam Area

Regions Most Affected

Indonesia: Aceh

Aceh is a small province located in the Northwest of Sumatra Island and is formed of coastal flatlands with a more mountainous interior. It is about 12 per cent of the size of Sumatra and consists of 119 islands, 73 major rivers and 2 lakes. Aceh is surrounded by Malacca Strait in the north, North Sumatra Province in the east, Indian Ocean in the south and the west. The western coastal areas of Aceh, including the cities of Banda Aceh and Meulaboh, have been devastated by the tsunami. Banda Aceh, previously known as Kutaradja is the capital of Aceh.

India: Andaman and Nicobar Islands

The Andaman and Nicobar are a group of picturesque islands, big and small, a total of 572 islands – 36 inhabited, lying in the south-eastern part of the Bay of Bengal. They lie along an arc in long and narrow broken chain, approximately north-south over a distance nearly 800 kms. They are home to some of the world's oldest and most remote communities like the Stone Age Shompen aborigines who have lived for up to 60,000 years without being touched by modernity. The Andaman and Nicobar islands, mainly the more southerly Nicobar group, were one of the worst hit areas and account for almost half the deaths in India.



Eastern Sri Lanka

Sri Lanka, also called the Pearl of the Orient, is an island in Indian Ocean located to the south of India and separated from peninsular India by the Palk Strait. It is a multi-ethnic, multi-religious country with a diverse and rich culture. Sri Lanka is a tourist paradise with an abundance of tourist attractions like the sunny beaches and glorious ancient cities. Eastern coastal areas in the country are unfortunately the worst affected by the Tsunami.



Southern Thailand

Thailand lies in the heart of Southeast Asia, and comprises 76 provinces. Bangkok is the capital city. The tsunami hit six provinces in the the peninsular South of Thailand off the Andaman Sea — Phang Nga, which was worst-hit, Phuket, Ranong, Krabi, Trang and Satun. Almost two million people live in the provinces which cover almost 8,000 square miles. Phuket island led the way in tourism and is now one of Asia's most popular resorts.

India: Tamil Nadu

Tamil Nadu is the worst-hit state in India where about 2,260 km of the Indian mainland's southern coastline was battered by the sea surges. Tamil Nadu has an unbroken coastline on the Bay of Bengal, with the interior composed of rocky highlands, farmland and dense forests, rich in wildlife. Its low-lying plain, bounded by the mountain range known as the Eastern Ghats and Nilgiri and Anai Malai Hills, is mostly agricultural dotted with industrial centres.

Tsunami Factoids

- Tsunami (pronounced soo-NAH-mee) is a Japanese word. Tsunamis are fairly common in Japan and many thousands of Japanese have lost their lives due to them.
- An earthquake generates a tsunami if it is of sufficient force and there is violent movement of the earth causing substantial and sudden displacement of a massive amount of water. The December 26 tsunami was caused by slippage of about 600 miles (1,000 km) of the boundary between the India and Burma plates off the west coast of northern Sumatra. The convergence of other plates strains the area, and at the quake's epicentre, the India plate is moving to the northeast at 2 inches (5 cm) per year relative to the Burma plate. The aftershocks were distributed along the plate boundary from the epicentre to near Andaman and Nicobar Islands.
- The result is a deep wave that reaches from the sea's surface to the floor and travels horizontally at speeds up to 500 miles per hour and reaches heights between 50 and 100 feet. The waves travel faster in deeper water and when it approaches shore, they rise further. It is the sharp elevation of the ocean floor near the coast that slows the bottom of the wave while the top keeps moving at the original speed. Vast quantity of water is then piled up into a vertical wall that finally crashes over the seashore with amazing force.
- A tsunami can race from one side of the Pacific Ocean to the other in less than a day. This means that waves started by an earthquake in Alaska, United States, at midnight will strike Hawaii early the next morning and hit Japan a few hours later.
- A tsunami is not a single wave but a series of waves, also known as a wave train. The first wave in a tsunami is not necessarily the most destructive. Tsunamis are not tidal waves.
- Tsunami waves can be very long (as much as 60 miles, or 100 km) and be as far as one hour apart. They are able to cross entire oceans without great loss of energy. The Indian Ocean tsunami travelled as much as 3,000 miles (nearly 5,000 km) to Africa, arriving with sufficient force to kill people and destroy property.
- Since tsunami wave activity is imperceptible in the open ocean, vessels should not return to port if they are at sea and a tsunami warning has been issued for the area. Tsunamis can cause rapid changes in water level and unpredictable, dangerous currents in harbours and ports. Boat owners may want to take their vessels out to sea if there is time and they are allowed to do so by port authorities. People should not stay on their boats moored in harbours. Tsunamis often destroy boats and leave them wrecked above the normal waterline.

- The 2004 Indian Ocean tsunami could rank as the most devastating on record. News reports so far suggest that more than 160,000 people may have lost their lives, many of them washed out to sea. The most damaging tsunami on record before 2004 was the one that killed an estimated 40,000 people in 1782 following an earthquake in the South China Sea. In 1883 some 36,500 people were killed by tsunamis in the South Java Sea, following the eruption of Indonesia's Krakatoa volcano. In northern Chile more than 25,000 people were killed by a tsunami in 1868. North Atlantic tsunamis included the tsunami associated with the 1775 Lisbon earthquake that killed as many as 60,000 people in Portugal, Spain, and North Africa. This quake caused a tsunami as high as 23 feet (7 meters) in the Caribbean. The Caribbean has been hit by 37 verified tsunamis since 1498. Some were generated locally and others were the result of events far away, such as the earthquake near Portugal. The combined death toll from these Caribbean tsunamis is about 9,500. Large tsunami waves were generated in the Marmara Sea in Turkey after the Izmit earthquake of 1999.
- The Tsunami Warning System (TWS) in the Pacific, comprises of 26 member countries, monitors seismological and tidal stations throughout the Pacific region. The system evaluates potentially tsunamigenic earthquakes and issues tsunami warnings. There is no international warning system for tsunamis in the Indian Ocean.



Restoring normalcy after the tsunami – Indian Navy ships Nirupak and Khukri at anchorage off Meulaboh, Indonesia



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