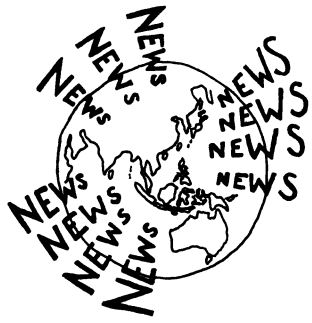
ASIA-PACIFIC
Insights from the Region



Mangroves and reefs offer lesson in tsunami protection

When the Indian Ocean tsunami struck on Boxing Day, the festive mood of many took a dramatic swing.

Images of destruction unfolded across the mass media as the daily death tolls and casualty numbers climbed. The world watched and listened — stunned by the extent of the havoc brought about by a natural seismic movement of tectonic plates.

It was a catastrophe that will not be easily forgotten as it is without doubt one of the worst disasters the world has seen for a long time. The human suffering has been immense, with an estimated 287,993 casualties to date[1] and a higher final death toll likely from diseases and those seriously injured. Millions across ten nations lost their homes and livelihoods in less than an hour of deluge.

This is a natural disaster that has prompted warring parties to lay down arms to work together to deal with the calamity. It has also sparked the compassion and generosity of the international community which has poured donations through humanitarian aid organisations.

The high profile of the disaster has seen corporations pledge large sums and forced governments into giving more than their original meagre offers. Consequently over $7 billion has been raised. Massive international operations, together with local relief efforts, are taking on the daunting task of providing relief to the millions affected, rebuilding towns and cities and helping to re-establish livelihoods.

Amidst the sea of reports on the human sufferings and destruction caused by the tsunami, there has been some heartening news.

When the tsunami struck the southern Indian state of Tamil Nadu, areas in Pichavaram and Muthupet with dense mangroves suffered fewer human casualties and less damage to property than areas without mangroves.

'The mangroves protected us'

The MS Swaminathan Research Foundation has already collected field data throughout the Pichavaram mangrove wetland area. This is an area of about 1400 hectares, located 280 kilometres south of Chennai, India.

Fishing and farming communities belonging to 17 hamlets utilise the resources of these mangrove wetlands. After the tsunami, the Foundation found that there was no damage to six hamlets that are physically protected by the mangroves: 172 families were saved. But villages located on or near to the beach have been totally devastated.

Mangrove trees in rows close to the sea were uprooted due to the impact of the waves, but beyond that there is no damage. Mangrove forest appears to have reduced the impact of the tsunami in two ways. First, the velocity of the water greatly reduced after it entered the mangroves due to friction created by thick mangrove forest. Second, the volume of water reaching the human settlements was greatly reduced since the tsunami water, after entering the mangroves, was distributed to the adjoining canals and creeks.

One of the locals put it well, saying: 'we saved the mangroves by restoring them and it saved our life and property by protecting us'.

In the worst hit area of Aceh in Indonesia, where about 166,000 people were killed, similar sentiments have been expressed by Hasballah Daud, chief of Aceh's Office of Environmental Management. 'If there had been mangrove, there would have been fewer victims', he said.[2]

In Thailand, the ring of coral in the crystal waters around the Surin Island chain off Thailand's west coast formed a sturdy defence against the sea. When the tsunami struck it punched a few holes in the reef, but the structure mostly held firm and only a handful of islanders perished.

While mourning the deaths of thousands in his country, Thai marine environmentalist Thon Thamrongnavasawadi is also heartened by the lesson in ecology that the tsunami delivered. 'It's a very clear point: coral reefs save lives', he said.[3]

Indeed, officials in the Maldives said extensive reefs smothered the tsunami and, though 69 people are confirmed dead so far, the loss of life there could have

REFERENCES

1. *The Australian* (Sydney), 16 February 2005.

2. Hugh Dellios, 'Mangroves Lost to Development May Be Replenished as Natural Wave Barrier', *Chicago Tribune* (Chicago) 15 January 2005.

3. Andrew Browne, *The Wall Street Journal* (New York), 31 December 2004; A5

been far greater. These so-called 'coastal greenbelts' of fringing coral reefs and mangrove forests are also believed to have helped mitigate damage and save thousands of lives in India, Malaysia and Sri Lanka.

Nature's early warning system

All of the worst hit countries in Asia have for the past few decades been racing to become the next 'economic miracle'. Strong economic growth has been based on rapid and massive industrialisation and large-scale exploitation of the region's once rich and abundant natural resources. The region has been plagued by economic growth fever. Until the tsunami struck, many would have scoffed at the suggestion that ancient knowledge of and connection with nature and wildlife could save lives.

The tribes of India's Andaman and Nicobar islands, who fled into forests and higher areas of the islands before the tsunami struck, could have received an 'early warning system' from nature. The six Andaman and Nicobar tribes trace their ancestry back 30,000 to 40,000 years. Some still live the life of hunters and gatherers. The folklore of the island tribes makes reference to a huge deluge that saw the islands shrink dramatically.

Similarly the islanders of Simuelue, just 42 kilometres south of the epicentre of the tsunami-causing earthquake[4] were reported to have escaped death by fleeing to higher ground in the forest through nature's warning system. Here, local people noticed unusual behaviour by local wildlife and fled to higher grounds before the tsunami hit.

Tragically, across much of Asia's coastal communities such protective shields have been removed in the last few decades. Government development policies coupled with corruption, in some cases, have facilitated the expansion of mass tourism, shrimp farms, coastal development and industrialisation. This in turn has resulted in massive migration and settlement in coastal regions.

The reefs, sand dunes and mangroves that look out toward the Indian Ocean in a broad arc from Sri Lanka to Bangladesh and Indonesia have all suffered the same fate. In their place are hotels, shrimp farms, coastal highways, housing and commercial developments.

The emphasis on economic-led development has seen the region use its legal and institutional infrastructure to facilitate and promote growth, rather than to protect the natural environment and basic social needs.

Coastal development has spread unregulated. Where regulations exist they have been largely ignored or not enforced as long as profits were to be made.

Corruption has added to this economic-centred man-made deluge. For example, the Thai government imposed few controls on tourism. There were haphazard zoning rules for construction and some developments allegedly benefited key politicians. Developers built on one island after the next, ever seeking new pristine sites. Though a few Thai journalists and environmental groups warned that this unregulated construction could have dire effects, they were largely ignored.

In the wake of the disaster, the natural protective barriers and warning systems have started to be recognised and acknowledged by key development policy and decision-makers.

Governments vow better coastal planning

Ironically, the traditionally pro-growth World Bank is leading the debate. Its country director for the Pacific Islands, Papua New Guinea and Timor-Leste, Xian Zhu, wrote:

> Managing risks needs to be accepted as a socio-economic priority and not just an environmental problem. It has to involve communities in the form of education of children so they know what to do when a disaster occurs — better building codes, better designed coastal structures and better management of coral reefs and mangroves to protect against wave impact and high Seas.[5]

Mr Zhu's statement is quite unprecedented, coming as it does from an institution that has often been criticised for allowing countries to become burdened by huge debts in the name of development. Then, to repay the debts, countries are compelled to exploit their environment and their people to earn export dollars.

Pasi Rinne, who is heading the United Nations Environment Program's response to the disaster agreed with conservation groups that the swamps and reefs not already destroyed by humans may have reduced some of the damage caused by the tsunami.[6]

At the national level, governments of tsunami-affected countries have imposed more stringent measures to ensure better coastal planning and development. In Thailand, some government officials have called for a re-evaluation of tourism planning in Phuket and other islands, vowing that the rebuilding of hotels and other facilities will take into account the impact on local ecology.

In India, the government has called for a comprehensive re-evaluation of the country's coastal management policies. It is now reviewing the implementation of regulations, frequently flouted, that bar all development within 1650 feet of the sea in areas where mangroves and coral thrive.

In Aceh, the top priority for environmental groups after relief and resettlement efforts are completed is to encourage the Indonesian Government to take seriously the calls for restricted housing development along coastlines and for replanting the mangroves.

It is hoped that lessons can truly be learnt so that some hope will come from horror. And those who lost their lives and suffered have not suffered in vain.

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ACF works in earthquake-prone Papua New Guinea and East Timor, through local organisations, to protect coral reefs, mangroves and forests and to promote more ecologically sustainable livelihoods <www.acfonline.org.au>.

4. US Geological Survey, National Earthquake Information Center, <neic.usgs.gov/neis/bulletin/neic_slav_ts.html> at 4 February 2005.

5. *The Australian* (Sydney), 14 January 2005, 11.

6. UNEP website, 11 January 2005.