

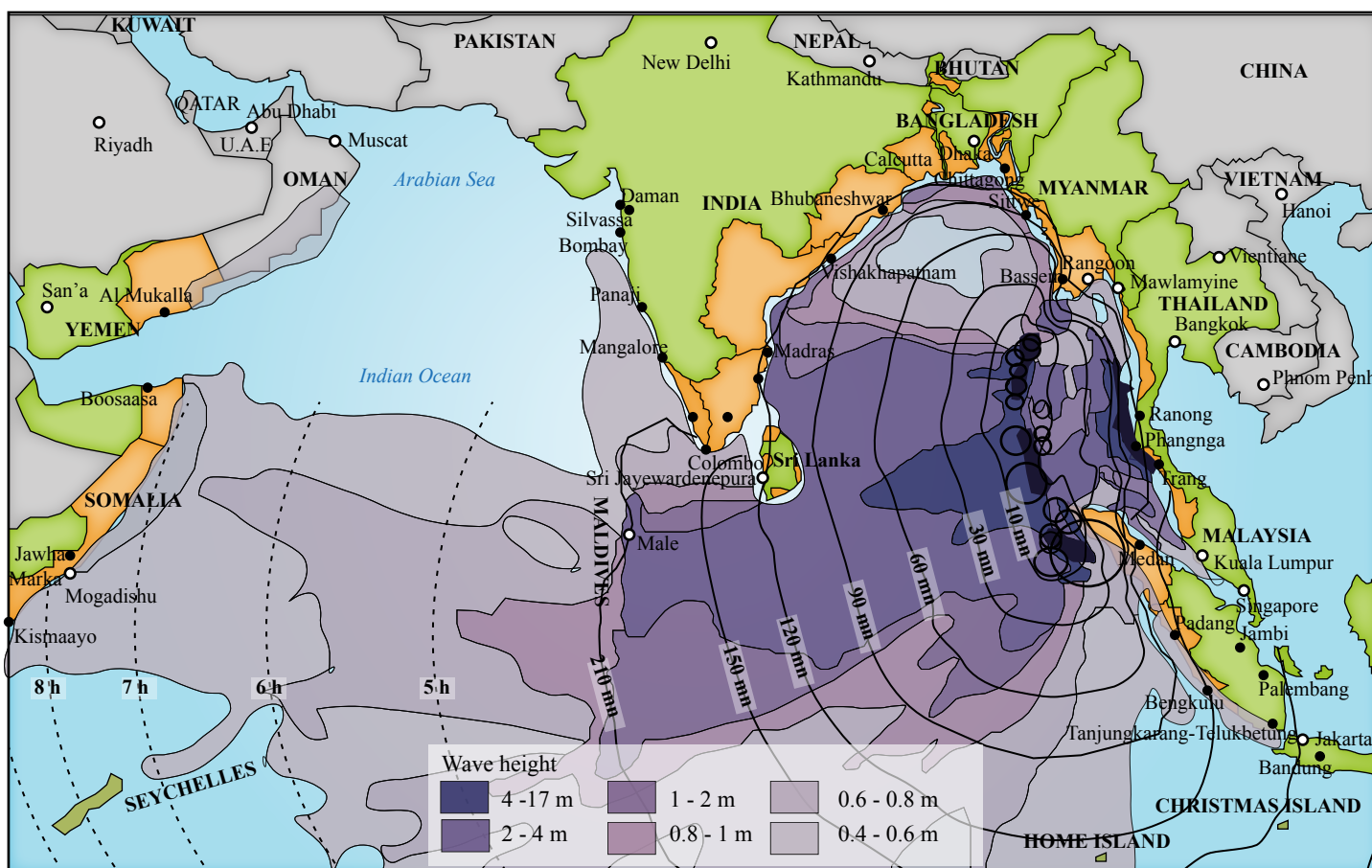


## After the Tsunami: learning the lessons

### Boxing Day 2004

On December 26th, 2004, an earthquake registering 9.1 on the Richter Scale (MM) occurred off the North - West coast of Sumatra. It triggered a tsunami wave train which spread out across the Indian Ocean towards Indonesia, India and Sri Lanka. (Figure 1.)

Figure 1. The Indian Ocean Tsunami



Two hours later the eastern and southern coast of Sri Lanka was a disaster zone. The statistics make for grim reading.

- more than 35,000 dead
- 552,641 people displaced or injured
- over 100,000 houses partially or totally damaged
- around 130,000 jobs in fishing and tourism lost
- 50,000 wells abandoned and a further 12,000 damaged due to salt water contamination.

Approximately 27,000 fatalities were fishermen, and two-thirds of the nation's fishing boats were wrecked, destroying many jobs. Farming was affected by the incursion of large amounts of salt water and marine sediment to fields and wells. Tourism was suspended in the middle of its peak season, and many coastal hotel rooms were destroyed and additional jobs lost.

Overall, the tsunami affected two-thirds of the coastline of Sri Lanka, over 1,000 kilometres in total. Seawater penetrated from tens to

hundreds of metres inland (in places thousands of metres), and typically drained away within 30 minutes.

### Tsunami: key points

- tsunami waves move fast in the open ocean; upwards of 800 km/hour.
- as the waves enter shallow water they slow down to around 80 km/hour and increase in height but may not break (except for the very largest tsunamis). Instead they resemble a tidal bore which can drive inland for considerable distances.
- Tsunami trains usually consist of several waves arriving at the coast with significant time between the individual wave crests. The first wave is not always the highest.
- The height of the wave as it struck Sri Lanka was between 10m and 30m.
- check out this YouTube footage to get an idea of what the impact was like: [https://www.youtube.com/watch?v=b9DMiy\\_DVok](https://www.youtube.com/watch?v=b9DMiy_DVok)

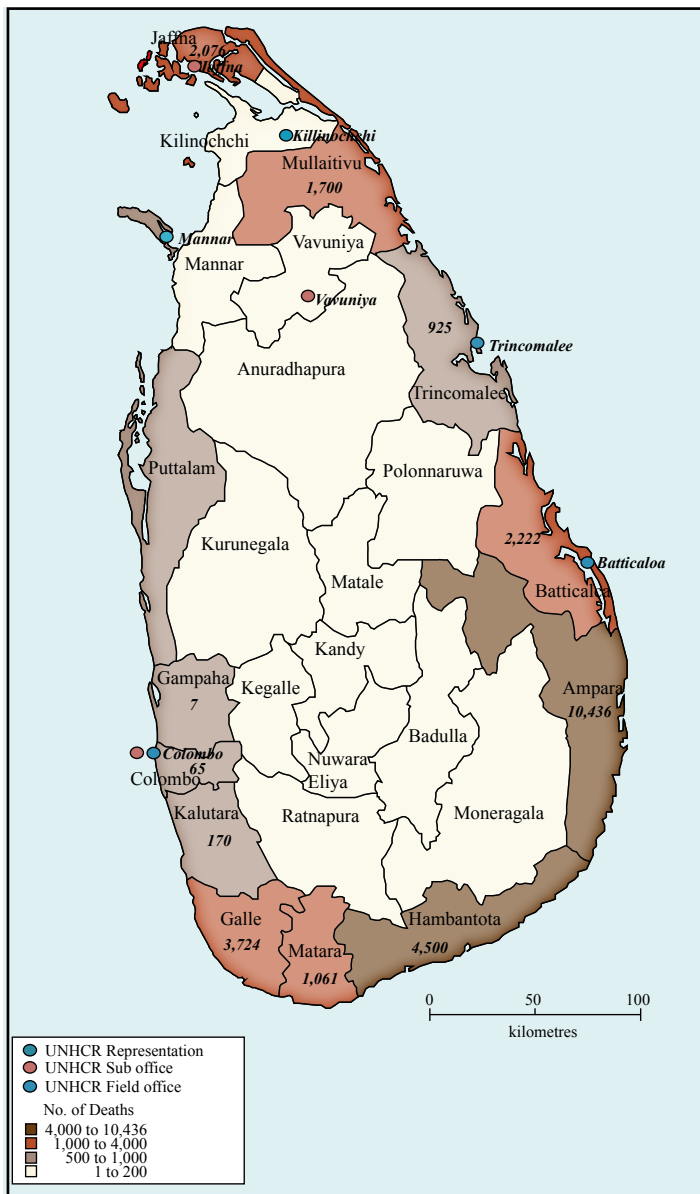
Sri Lanka was not alone in bearing the impact of the Tsunami, but it was the second worst affected country after Indonesia.

**The Impact of the Tsunami**

As you might expect almost all of the eastern coast was affected along with the southern coast. However, the wave also bent around the southern coast of the island and travelled up the west coast breaking up into mini waves as it did (diffraction).

What that meant was that some areas were hit by the waves whilst others escaped with all but minor damage.

**Figure 2. Sri Lanka: deaths caused by the tsunami by district**



As you can see, the East coast bore the brunt of the damage not just in terms of deaths but also in terms of houses damaged (46%).

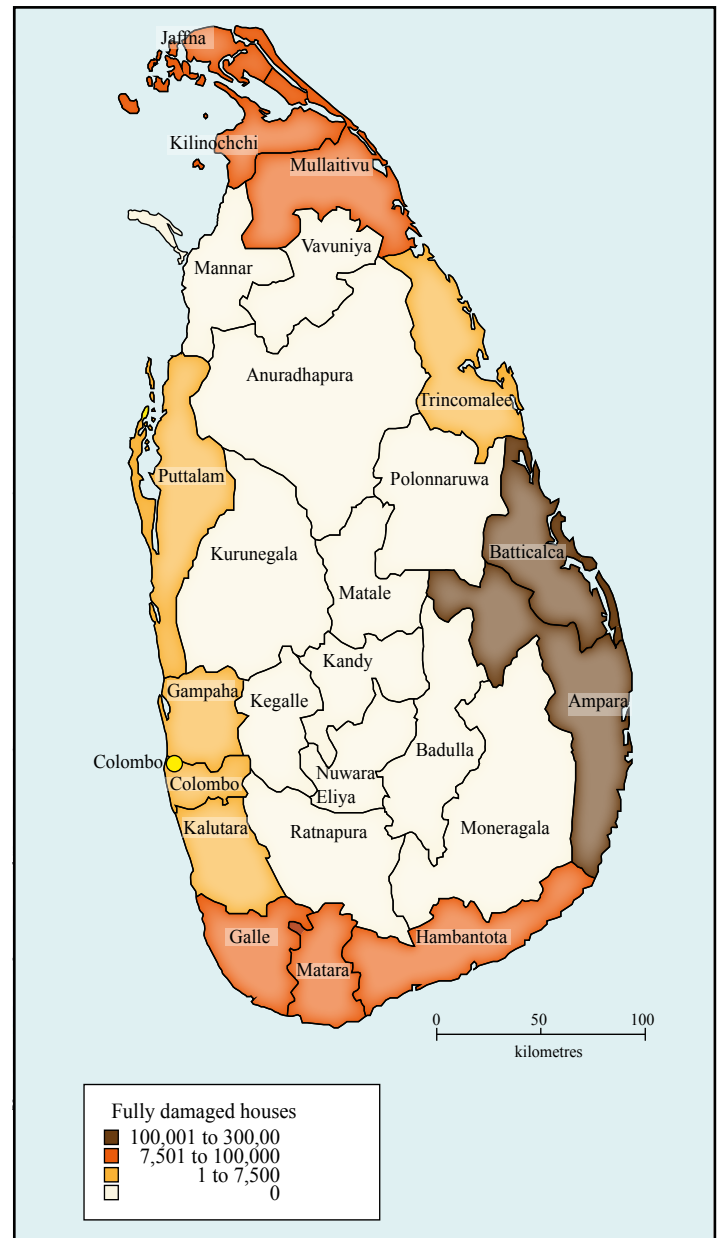
**Exploring vulnerability; why was Sri Lanka so badly affected**

**Understanding the impact of the tsunami**

Impact can be assessed in a number of ways:

- The physical (environmental) impact of the wave on the coastline.
- The social/human impact in terms of lives lost, families broken, houses destroyed, effects on the mental well being of the population

**Figure 3. Sri Lanka: the impact of the tsunami on housing**



- The economic impact as in the cost of damage and recovery; livelihoods lost; damage to local industries and employment and the effect on the GDP.
- Impact can also be viewed in terms of both the immediate or short term and the longer term.

The severity of the tsunami results from:

1. The nature of the wave and the coastline.
2. The vulnerability of the population.

**Physical Factors**

- the East coast and to some extent the Southern coast lay directly in the path of the wave.
- the coastal zone is low lying and the offshore gradient is relatively shallow, allowing the wave to increase in height as it came onshore.
- the wave itself was around 10 metres in height and was able to penetrate significant distances inland.
- There was limited protection from reefs and mangroves.

**Vulnerability**

Sri Lanka was exceptionally vulnerable because:

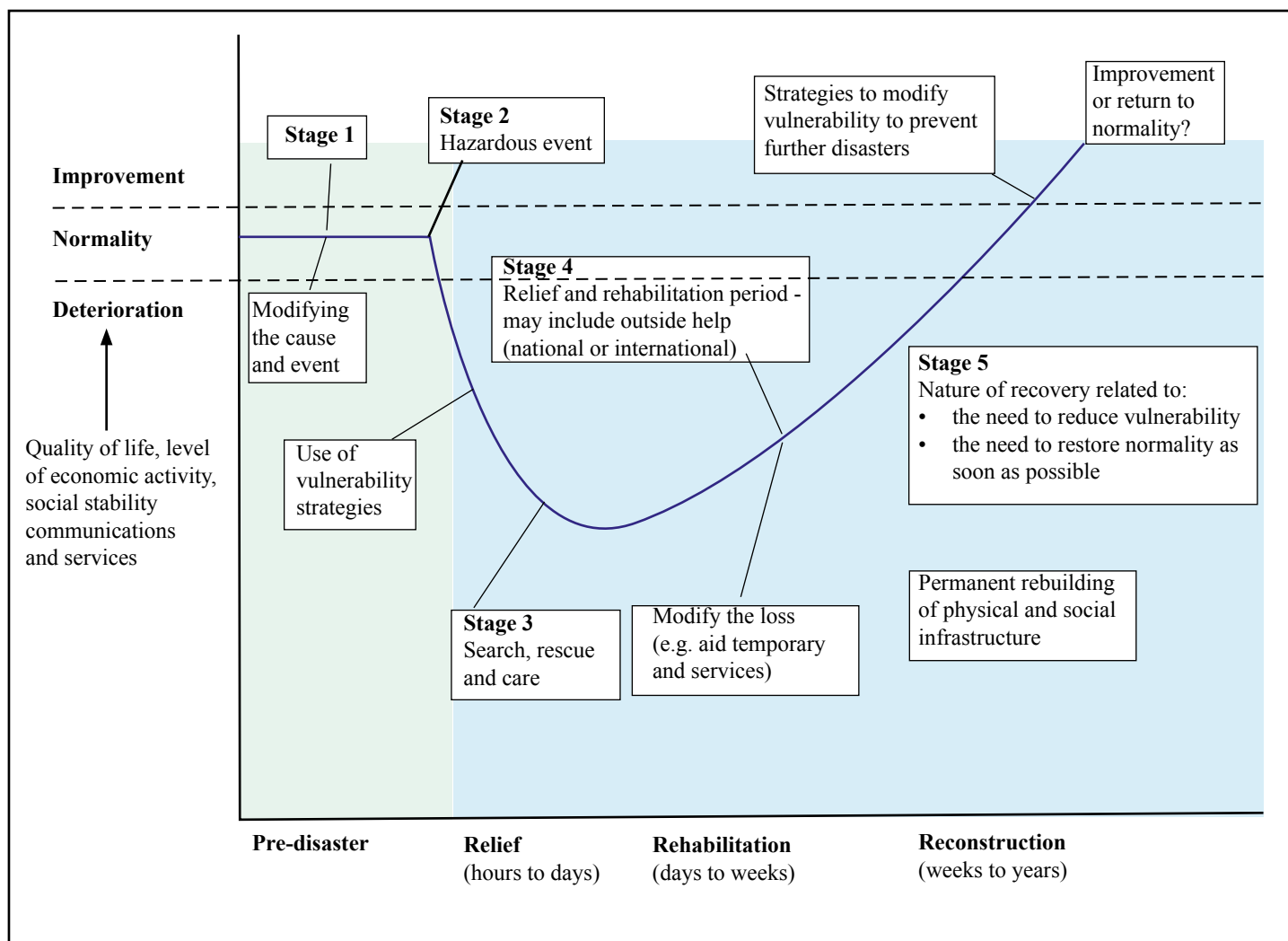
- there was no past experience of a tsunami affecting the coast
- the population were unaware of the threat and not prepared for it
- there was no early warning system anywhere in the Indian Ocean, and no contingency plans in place for the evacuation of the population or for dealing with the aftermath of the tsunami
- Although overall the population density of the East and South coast is not particularly high, most people live close to the coastline
- The population in the South and East is predominantly poor and in many cases was already displaced by the long standing civil war which only ended in 2009. As a result, the people were ill-equipped to cope with a natural disaster on this scale
- The local economy was highly dependent upon fishing and tourism, both of which were extensively damaged by the tsunami
- Relief and recovery operations were hampered by poor communications, and the relative inaccessibility of the Eastern and Southern provinces due to poor road surfaces
- The ongoing war between the forces of the Sri Lankan Government and the de facto government of Tamil Eelam in the North and East led to a lack of co-operation between the forces, which created problems in getting relief to the stricken areas in the North and East
- The government at the time lacked the experience and capability to handle such a complex rebuilding task

**Relief and Recovery**

**1. A timeline**

You are probably familiar with the disaster response curve; see Fig. 4.

**Figure 4. A Disaster Response Curve (after Park 1991)**



A good question to ask is how does Sri Lanka fit into this model

A country's response to a disaster will be influenced by a number of factors, and each country is to some extent different. In this section we can examine how Sri Lanka progressed through Park's five stages, summarised in the following table: (Table 1.)

**Table 1. Stages on the road to recovery**

Stage	Description	Time	What happened	Comment
1	Modifying the cause	n/a	<ul style="list-style-type: none"> <li>no early warning system</li> <li>no contingency planning</li> <li>no dedicated government department to deal with emergency</li> </ul>	a state of unpreparedness
2	Tsunami strikes	24/12/04	<ul style="list-style-type: none"> <li>major wave incursion along coastline</li> <li>massive damage to housing, fishing fleet, tourist hotels, road and rail network (135km of track)</li> <li>major loss of life, property and livelihood</li> <li>Significant damage to agricultural land in East</li> </ul>	impact the result of the high level of vulnerability especially in the north and east due to the on-going civil war
3	Relief	2/3 days	<ul style="list-style-type: none"> <li>World Bank makes \$75 million for emergency relief effort</li> <li>Government mobilised army for search and rescue</li> <li>medical aid and emergency food and shelter made available</li> <li>displaced population housed in public buildings or tents</li> <li>major foreign governments and NGOs promise aid</li> </ul>	<ul style="list-style-type: none"> <li>* By and large successful operation</li> <li>* No outbreaks of disease or infection reported</li> <li>* emergency aid deployed within 3 days</li> </ul>
4	Rehabilitation	1 year	<ul style="list-style-type: none"> <li>Government declared buffer zone prohibiting building on coastline</li> <li>transitional (temporary) housing programme started within 5 weeks</li> <li>transitional housing erected and in some cases upgraded</li> <li>Damaged roads and railways repaired and reinstated: Southern Highway open within 1 week;</li> <li>East coast highway re-opened by end 2005.</li> <li>Colombo - Galle railway repaired in 57 days</li> <li>contaminated wells cleaned or replaced</li> <li>NGOs arrive and contribute to rehabilitation programme</li> <li>fishing fleet replacement programme (but not always with the right boats)</li> <li>reclamation of agricultural land commenced</li> </ul>	<p>Mainly successful but some issues.</p> <ul style="list-style-type: none"> <li>* Buffer zone was unpopular and in the end abandoned in 2007</li> <li>* Foreign NGOs accused of not listening to or engaging with local populations; result some NGO programmes seen as inappropriate</li> <li>* ongoing civil war slowed down rehabilitation in the North and East</li> </ul>
5	Reconstruction	2006 – mainly done by 2009	<ul style="list-style-type: none"> <li>Most owner house rebuilding completed</li> <li>donor-led housebuilding was slower</li> <li>fishing fleet replaced 2006 and 70% of fish catch restored by 2006</li> <li>most tourist hotels rebuilt by 2006</li> <li>land reclamation continues; 3/4 back in production by end 2006</li> <li>Early warning system installed in Indian Ocean</li> <li>Community awareness programmes in place</li> <li>Tsunami escape routes mapped out</li> </ul>	<ul style="list-style-type: none"> <li>*The pace of reconstruction was uneven: much quicker in the South than the war torn North and East.</li> <li>*issues with donor led reconstruction due to land ownership issues, slow bureaucracy</li> <li>*tensions surface between the Government and donor agencies over pace of reconstruction</li> <li>*not all pledged aid arrived</li> </ul>

### 1. The Relief Effort

There were a number of players involved in the immediate aftermath of the tsunami and going forward into the reconstruction phase. In general terms they were:

1. The Government of Sri Lanka (GOSL)
2. The World Bank
3. The United Nations
4. The World Bank
5. Major foreign Non Government Organisations (NGO's) from a number of mainly European countries
6. Local NGOs
7. Wealthy individuals and small groups
8. The local population (often forgotten)

## Case Studies

### a. Ampara

The district of Ampara is located on the east coast of Sri Lanka. It took the full force of the 2004 Tsunami. (See Figures 2 and 3).

The fishing village of Panama was devastated by the tsunami. All 40 canoes were damaged and the fishermen lost their livelihoods.

In the early months following the tsunami, many organisations responded to the disaster by providing boats and fishing gear. However, the fishing boats provided were not suitable. The side of the canoes were too high to throw their nets over the side. Additionally their fishing lagoon is infested with crocodiles, and the fishermen said that the canoes given were not safe.

It was at this point that an NGO, *Practical Action*, came on the scene. They took the time to discuss with the fishermen what they needed. As a result the local fishermen salvaged one of the wrecked canoes which was used as a template to construct 40 new canoes suitable for fishing in the lagoon.

At the same time, four local fishermen were given training on fibreglass canoe building and repair.

Communities in Ampara and Hambantota were also faced with the need to rebuild houses. Once again, *Practical Action* worked with local communities and local NGOs to help communities rebuild their lives.

The houses were single storey rebuilds based on drawings supplied by the beneficiaries of their original homes. In all, over 160 homes were rebuilt in this way.

You can find more for yourself via google; here is one link to follow see also <http://www.thesundayleader.lk/2011/03/27/seven-years-after-the-tsunami/>

### b. Kalutara District

Kalutara District is on the West coast just over 70 km south of Colombo. It was badly hit by the Tsunami waves (see Figures 2 and 3).

- In response to the disaster the Belgian Red Cross funded a housing reconstruction project to build 495 houses. Of those 250 were rebuilt on the owners' original plot with the rest being built on resettlement sites on land donated by the Sri Lankan government.
- The majority of rebuilt homes used a model where the beneficiaries received cash in instalments and rebuilt their homes themselves with support and technical supervision from the Belgian Red Cross.
- Infrastructure such as roads, boreholes and wells, drains, streetlamps, and community infrastructure such as community centres and children's play parks, was also given consideration in the resettlement sites.
- The new settlements were also given support to help set up new community organisations. These organisations represented the newly formed neighbourhoods on matters relating to power supply, water supply, sanitation and garbage disposal.

### Benefits of the Owner Driven Approach

This worked well particularly where beneficiaries were rebuilding houses on their original plots for many reasons:

- Quicker implementation.
- Beneficiaries were active participants in their own recovery. This gave them a greater sense of ownership of the project.
- Built on existing skills and knowledge as most beneficiaries had built their own homes in the first place, so they knew where to go for supplies and for skilled labour.
- This approach supported the local economy because it used local builders and materials.

- Rebuilding on the original plots in particular, meant that the services such as electricity and water supply were already in place.

With the resettlement sites, re-building was more problematical because basic infrastructure such as water, sanitation, electricity, roads and communal buildings had to be installed, but the owners were fully engaged building their houses, so that work fell to the NGO to complete.

For full details you can read the report:

<http://www.ifrc.org/docs/Evaluations/Evaluations2009/Asia%20Pacific/SLtsunamiReconstructionBelgianRC.09.pdf>

### The Buffer Zone

An early government response to the disaster was to create a "no build" zone along the affected coastlines. This was to be 100m along the South and West coasts and 200m along the East Coast. This was accepted by the affected communities, but soon became unpopular and was relaxed in 2009 having been largely ignored from 2007. The problem was that many of the affected people were relocated inland away from their livelihoods (mainly fishing) and there was not enough land for them to keep animals, or grow vegetables. In other words, they were a lot worse off.

### The Role of the NGOs

There is extensive literature analysing the work of the NGOs in Sri Lanka. What follows is a summary of the main points made in the various publications.

By 2005, a conservative estimate placed the number of NGOs operating in Sri Lanka at 180. It was closer to 400 in reality. Some were major international agencies including various United Nations agencies, International Red Cross organisations, government sponsored organisations with the EU, plus many of the organisations we are familiar with in the UK (ActionAid, British Red Cross, CAFOD, CARE International UK, Christian Aid, Concern, Help the Aged, Islamic Relief, Merlin, Oxfam, Save the Children, Tearfund and World Vision).

Well intentioned and prompt as the response was there were co-ordination issues:

- The sheer number of agencies made co-ordination difficult.
- There were large and small NGOs all with different agendas and different practices and very little co-ordination between them.
- There existed a feeling that some NGOs were openly hostile to any controls placed upon their independence by the government of Sri Lanka.
- Some writers suggest that the presence of so many NGOs led to competitive behaviour between them, when they should have been co-operating so as not to duplicate projects. Competing for attention, for instance over housing became a tangible way for NGOs and others to show donors that they were really making a difference and become eligible for more funding.
- Even now there are many examples of where resettlement projects, fishing boats, and community centres have been branded by the aid agencies concerned.
- There was a sense of antipathy between the local and international NGOs.
- The international agencies had experience and funding on their side. However, at times they appeared to impose their view of aid on local communities. Perhaps they were guilty of taking a paternalistic; "we know best" view when it came to rebuilding settlements and livelihoods.

Sometimes the aid received, particularly early on was simply inappropriate;

- “the immediate operations were largely ‘gender blind’. Few organisations considered providing women with sanitary needs, underwear or culturally appropriate clothing.” Guardian, May 2005.
- Little respect was given to what the local fishing tradition had been like and little control as to who received assistance. Inappropriate boats were donated to local communities, fishing boats were given to people who were not fishermen, and an increased number of boats led to a degree of overfishing. But every agency wanted to be seen to be spending the money it had been given and to get as much visibility for their efforts as possible.

Local, smaller NGOs, by comparison, may have lacked experience in disaster management, but they did have local knowledge and they were able to more accurately respond to the needs of the local communities.

### Weaknesses within government

The government of Sri Lanka was simply not equipped in 2004 to deal with a disaster on this scale or to deal with the massive influx of aid that poured into the country in its aftermath; what many refer to as “a lack of capacity”. This was not surprising, given nothing like this had happened before. Several weaknesses, however, have been pinpointed:

- Co-ordination between government departments, government agencies and NGOs was complicated and difficult.
- Reconstruction strategies and policy objectives lacked clarity.
- There were constant policy shifts by the government.
- Much of the government bureaucracy was slow acting, institutionalised and politicized making it an unwieldy instrument.
- Organisational structures were poorly defined and quite often a number of different departments would be involved, not necessarily all with the same agendas. There was no single agency in overall control.
- There were increasing tensions developing between the government and the NGOs with large budgets, over human rights issues particularly in the North and East of the country, which exacerbated the growing hostility between them.

### The ongoing civil war

The on-going conflict in the North and East of the country hampered relief and rehabilitation efforts in a number of way

- there was conflict and tensions between the Sri Lankan government, the Tamil Tigers, and Foreign governments and aid agencies; this made co-operation and co-ordination of relief problematical and slow.
- Therefore reconstruction in the East was much slower. Whilst the vast majority of the losses was in terms of lives, much of the damaged housing occurred within the war zone. Therefore less than 10% of houses were reconstructed by end 2005 as compared with 90% along the South coast (see Table 2.):

**Table 2. House completions**

Province	Homeowner Driven		Relocation	
	Required	Completed	Required	Completed
Southern	18992	16343	10483	8327
Western	5603	4824	4685	2012
Eastern	44481	23257	9554	2605
Northern	10228	2107	5108	1544
Total	79184	46531	29830	14488

### Looking to the Future

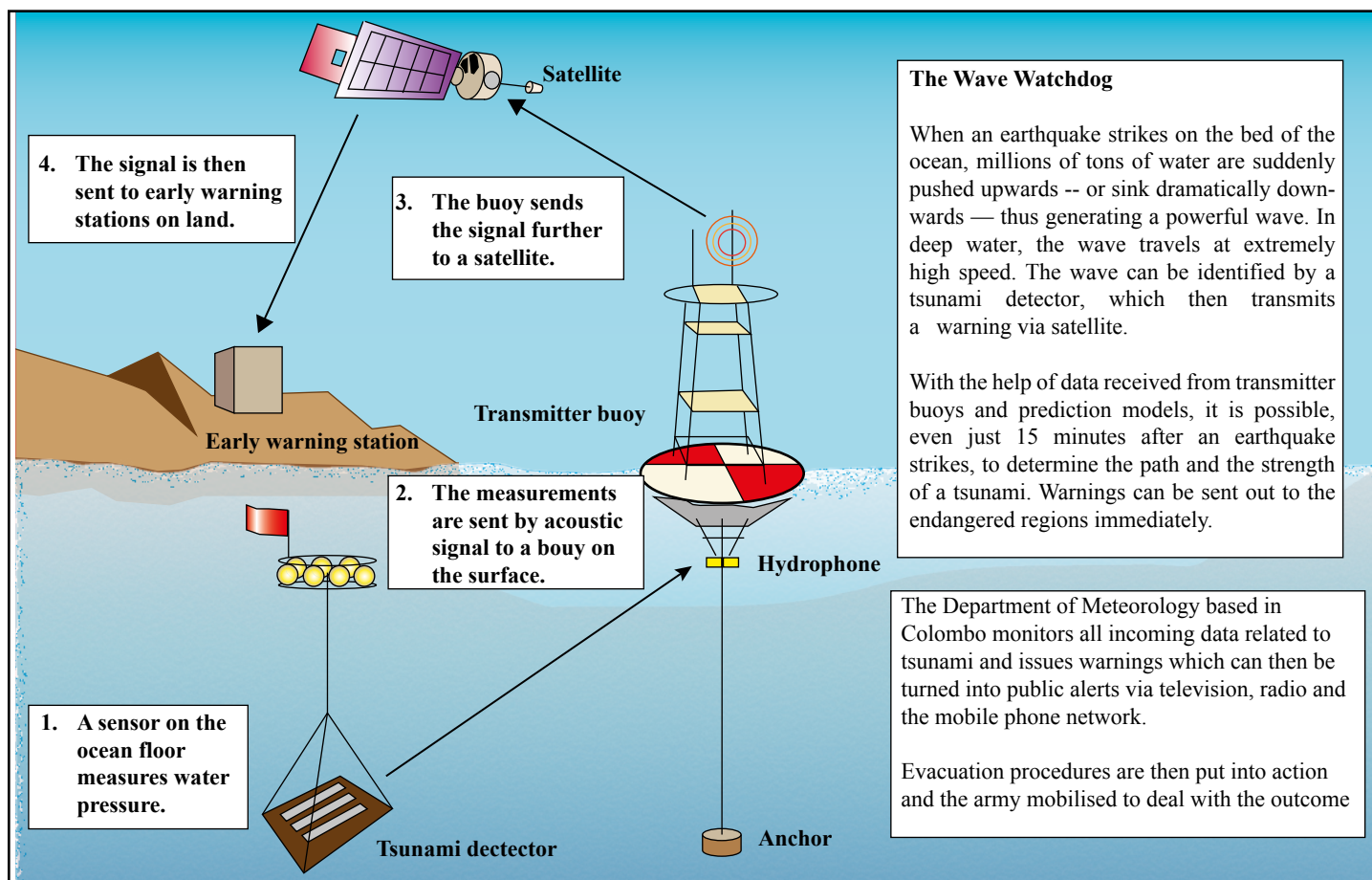
The Boxing Day Tsunami of 2004 was a wake up call for a nation to be better prepared to face a similar threat in the future.

The Sri Lankan Government have set up a Ministry of Disaster Management, to cover the threat of flood, landslide, drought and tsunami. The Ministry works with partners to create a culture of safety which integrates:

- early warning systems in place in the Indian Ocean
- regional disaster management centres
- a 24/7 emergency operations centre
- a comprehensive contingency plan; the Road Map for Disaster Risk Management with detailed risk assessments, vulnerability analysis
- efficient and rapid communications established
- engagement of local communities, education and training programmes in schools. Plus there is a National Safety Day on 26th December each year
- early warning towers along the coast
- the establishment of a Catastrophe Draw down Fund of \$102 million from the World Bank, to make immediate funds available.



Figure 5. Indian Ocean Early Warning System



## Conclusion

In the early stages of the disaster the response was effective, unlike, for example the protracted problems experienced in Haiti after the 2010 earthquake. The country mobilised quickly and aid flooded in. The response of the international community was impressive.

Indeed, all the way through 2005 and into 2006 the transition from emergency relief into the rehabilitation phase seemed to go well, but the rehabilitation and reconstruction phase started to run out of steam in 2007.

Weaknesses in government and the aid agencies (already highlighted) slowed down the recovery process. The ongoing conflict within the country meant that the government's priorities were focussed not so much on Tsunami relief, but more on bringing the conflict with the Tamil Tigers to an end.

Since the ending of the conflict in 2009 political and economic stability has prevailed and by 2015 there is very little evidence in the West and South of the country of the damage wrought by the tsunami. However, the East is still catching up.

Whilst, with hindsight, we might be tempted to be critical of the Sri Lankan government for not being ready; they are now. They could not have foreseen the disaster, neither could they be expected to be able to deal with the deluge of aid and aid agencies that came almost as a second tsunami shortly afterwards.

## What works best?

We can, however, reflect on the nature of the aid and what works best in the context of a country such as Sri Lanka. In particular, international agencies have much on which to reflect:

- In the future will NGOs need to give more thought to how they can co-operate and co-ordinate with one another rather than try to “out do” one another, so that projects are not duplicated?
- There is no doubt that the paternalistic approach of imposing relief strategies on the local population needs a rethink; the projects which worked best took into account the needs, wishes and skills of the local communities. However well meaning, the money raised needs to be spent wisely not wastefully.
- Smaller scale projects using local knowledge and resources worked best.
- Foreign NGO personnel in particular need to be more mindful of the impression they create within the host community and to work with it rather than over the top of it.
- Above all, aid has to be appropriate to the needs of the local community.

Is Sri Lanka ready to deal with a Tsunami in the future? Only time will tell. However, it is in a much better place than it was on December 26th 2004.

## Acknowledgements;

This Geo Factsheet was researched and written by **Phil Brighty** who worked as a Head of Geography in Sri Lanka.

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