ISDR

International Strategy for Disaster Reduction

Lessons for a Safer Future:

Drawing on the experience of the Indian Ocean tsunami disaster

Eleven key actions for building nations' and communities' resilience to disasters

United Nations

Acknowledgements

Foreword

ISDR Lessons for a Safer Future
Drawing on the experience of the Indian Ocean
tsunami disaster

In my role as the UN Secretary-General's Special Envoy for Tsunami Recovery, I have often considered how governments of the world could avoid the type of devastation that we witnessed in the Indian Ocean region on December 26, 2004. Natural hazards are an inescapable part of our world, and poverty, migration to coastal areas, and environmental degradation will only increase the risks to vulnerable communities in the years to come. It is therefore critically important that governments plan and implement a broad range of disaster preparedness measures.

In the tsunami affected region of Asia and throughout the world, we must work harder in the recovery stage to avoid reinstating unnecessary vulnerability to hazards. As I have often said, "building back better" means making sure that, as you rebuild, you leave communities safer than they were before disaster struck.

We must also promote effective early warning, and I am pleased to report that good progress has been made to put in place tsunami warning systems around the Indian Ocean region. Efforts at the regional level and in national capitals must be supplemented by public education, including preparedness training and drills. Many countries and experts have valuable practical experience on how to do this, and this should be widely shared.

As we approach the second anniversary of the Indian Ocean tsunami disaster, I strongly urge governments and organisations to turn these lessons into action, following the guidance contained in the Hyogo Framework for Action, so that today's hazards don't turn into tomorrow's disasters.

William Jefferson Clinton
UN Secretary-General's Special Envoy for Tsunami Recovery
New York, 20 December, 2006

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Photo: International Federation

Lessons for a Safer Future:
Drawing on the experience of the Indian Ocean tsunami disaster

The 26 December 2004 Indian Ocean tsunami was one of the worst disasters in living memory, causing immense suffering for millions of people. Two years on, we can reflect upon what happened and draw lessons about how to reduce the impacts of all natural hazards, lessons that can help build a safer, more resilient future for all people worldwide.

Although the sudden and strong tsunami waves were clearly the initiating factor in the fatalities and damage, we now know that lack of knowledge and inadequate preparation was a major cause of the extensive losses and impacts. The deaths of hundreds of people in the later tsunami that hit Java, Indonesia on 17 July 2006, illustrated the same problem and underlined the need to systematically address the vulnerability of populations to natural hazards.

Everyday, people around the globe are threatened by storms, floods, droughts, landslides, earthquakes and other natural hazards, and suffer because of their social, economic, geographic and environmental circumstances. However, disaster risks can be countered through approaches such as public awareness campaigns, knowledge of hazards and vulnerabilities, community preparedness programmes, early warning systems, evacuation plans, long-term land use planning and environmental protection, and the application of sound building codes. Through these means, governments and communities can help people to become more resilient to hazards and their impacts, and thereby reduce the chance that hazard events turn into disasters.

Generally it is the poorest people living in the poorer parts of the world who are most affected

by natural hazards. Many poor groups such as fishing villages were hit very hard by the Indian Ocean tsunami, firstly by the loss of family and homes, and then by the loss of livelihoods. Reducing people's vulnerability to natural hazards is an essential condition for reducing poverty and achieving the Millennium Development Goals. Policymakers are beginning to recognise that preparedness for natural hazards needs to be an integral part of national and international development policies and practices.

Over recent decades, the number and severity of disasters have steadily increased, and the world is spending more and more to respond with emergency relief for those affected. But governments and other organisations have agreed that concerted efforts are needed to reverse these trends and to reduce the risks. The Hyogo Framework for Action 2005-2015 sets out the required actions – collectively known as 'disaster risk reduction' – measures that must be continuously implemented in order to achieve resilience to future hazards.

Elsewhere, the United Nations Secretary-General's Special Envoy for Tsunami Recovery, President William J. Clinton, has identified many lessons concerning the tsunami and the recovery of the affected nations and communities. The present report expands on one of his lessons – the need to reduce the risks of disasters. Compiled by the United Nations International Strategy for Disaster Reduction (UN/ISDR) secretariat, the report draws on the experiences of many organisations and individuals during and following the tsunami. The following eleven lessons for a safer future are offered as a contribution to the ongoing process of learning how nations, communities and individuals can become better prepared for and reduce the risk of potential natural hazards:

1. Public awareness is an essential element of preparedness for saving lives and livelihoods.

2. Individuals and communities play important roles in managing risks from natural hazards.

3. Diverse livelihood systems and micro-financial services help poor people to survive disaster events.

4. Traditional knowledge is valuable and can inform and protect communities.

5. Disaster knowledge should be included in formal education curricula.

6. Early warning systems are needed for all hazards and all people.

7. Land use planning and protection of ecological systems can reduce disaster risks.

8. Developing and adhering to building codes can minimise risks and losses.

9. Political and public commitment to reduce the risk of disasters is imperative.

10. Humanitarian and development innovations are needed to reduce disaster risks.

11. Natural hazards span borders and their management requires global cooperation.

Photo: International Federation

1

Public awareness is an essential element of preparedness for saving lives and livelihoods

After the Indian Ocean tsunami many reports confirmed that a major underlying factor to the catastrophe was people's general lack of awareness about the tsunami risks they faced and how to respond appropriately in order to minimise the loss of lives, property and livelihoods. Subsequently, many awareness-raising campaigns have been established at national and community levels. The positive results of these programmes are today starting to show. For example, during the tsunami that hit Java in Indonesia on 17 July 2006 many people living along the coasts were reported to have recognised the signs of the approaching tsunami and fled to safer ground.

Everyone in the community, especially residents living in vulnerable areas, but also the government and key sectors, such as the tourism industry for example, need to understand the basic facts on the risks faced and on the warning and evacuation processes. Public information campaigns and community drills should be coupled with other lifesaving measures such as the placement of warning signs for tsunami and for evacuation routes. The public visibility of such signs becomes a permanent warning of risks for the entire community.

It is also essential to ensure that marginalized groups in the community and people with special needs are taken into consideration when developing and implementing education and awareness strategies.

2

Individuals and communities play important roles in managing risks from natural hazards

People and communities affected by disasters are far from helpless, despite popular thinking to the contrary. Almost all of the initial life-saving actions and emergency services are provided by local people. In the days immediately following the tsunami, many communities demonstrated their ability to cope on their own. Countries are less vulnerable to the effects of natural hazards if their communities and people are directly involved in risk assessments and disaster risk reduction activities and have the capacities to understand and respond to events. These capacities also contribute to improved national preparedness and resilience, and they need to be identified and continuously supported.

The value of such an approach was illustrated by the experience of Samiyarpettai, a village on the south coast of Tamil Nadu in India. Some months before the tsunami, a community-based disaster preparedness and awareness-raising programme for floods, droughts and earthquakes had been established in the village by the government with United Nations support. Substantially lower death tolls occurred in Samiyarpettai compared to neighbouring areas that the programme had not yet reached. This strongly suggests that the villagers' increased level of awareness and preparedness had allowed them to take effective action to reduce losses, despite the absence of formal warning or evacuation orders. More attention should be given to develop community capacities for 'helping themselves', including at times of international response to disasters.

The experience at Samiyarpettai also illustrates the advantages of taking a 'multi-hazard' perspective, where preparedness for frequently occurring events like floods also provides preparedness for infrequently occurring events like tsunamis.

3

Diverse livelihood systems and micro-financial services help poor people to survive disaster events

Access to diverse sources of income, micro-finance, insurance, and property rights strengthen the capacity of individuals and small enterprises to prepare for and recover from the impact of disasters. Microfinance helps increase a household's income-earning and asset-building opportunities and often strengthens the economic roles of women, which in turn help make households less reliant on a single asset or livelihood and better able to deal with disasters. Micro-finance is often made more effective through training in such things as technical skills and enterprise management.

For example, in the Andaman and Nicobar Islands, which were badly affected by the tsunami, a non-governmental organisation provided micro-finance loans to restart or support income-generating activities, and these were coupled with saving schemes, insurance coverage and free skills training for new activities. In the Kanyakumari District, Tamil Nadu, 1,263 self-help groups were provided with micro-credit and training, including for fish processing, coconut shell preparation, embroidery and tailoring.

Governments and local authorities should support the expansion of these initiatives, for example by establishing appropriate frameworks that link micro-financing and disaster risk reduction, by promoting effective markets for new livelihood products, and by assisting in the exchange of experience following the tsunami, training of trainers, and development of demonstration projects. These steps need to be done as part of ongoing national development and social policies that seek to reduce the vulnerability of the most disadvantaged people.

Photo: International Federation

4

Traditional knowledge is valuable and can inform and protect communities

Thanks mainly to the power of traditional knowledge the tsunami that struck on 26 December 2004 killed only seven people out of a population of approximately 83,000 on Simeulue Island in Aceh Province, Indonesia. Oral histories recall a massive tsunami that hit the island in 1907, leaving many people dead and hundreds of houses destroyed. The message is very simple – after 'significant' shaking of the ground, watch the sea, and if the water recedes, immediately run to the hills because a tsunami will follow. Survivors of the 1907 disaster told the story to their children to prepare them in case the same thing happened again, and the story was passed on to the present generation. Simeulue Islanders credit this traditional knowledge for saving many lives in the tsunami.

Likewise, based on traditional knowledge the elders of Thailand's Moken tribe, a small community of fishermen, ordered a hilltop evacuation just before the tsunami hit. They warned villagers after observing unusual movements in the Bay of Bengal. As a result only one of the 200 members of the tribe perished in the tsunami. It is important to incorporate traditional wisdom and local knowledge into future disaster risk reduction strategies and to ensure that such knowledge continues to be communicated through generations and to migrants and newcomers to the affected areas.

5

Disaster knowledge should be included in formal education curricula

Studies that interviewed children and adults in the tsunami-affected areas showed that most of them wanted disaster-related topics, including tsunamis, to be incorporated into school curricula. They considered that education was one of the most effective ways to inform the population of tsunami risks. A large fraction of the children said that they discuss what they have learned at school with other family members.

Education fosters awareness and better understanding of the immediate environment in which children and their families live and work. In addition, formal education can help children make sense of the experience of a large disaster and assist them to respond appropriately in future hazard events.

Many tourists visiting a Thai beach resort owe their lives to a ten-year-old girl on vacation from England who warned her parents and other guests to flee to safety, moments before the tsunami engulfed the beach. Having learned about tsunamis in her geography class just a few weeks before visiting Thailand, the girl recognised the signs of the approaching tsunami. Citizens of all countries need a basic education on the different types of natural hazards.

6

Early warning systems are needed for all hazards and all people

As the horror of the devastating tsunami of 26 December 2004 unfolded, the world was shocked to learn that many thousands of lives could have been saved if effective tsunami early warning systems had been in place in the region. An early warning system for tsunamis in the Pacific Ocean had been operational for some decades. In the years before the disaster scientists knew of the risks of tsunami in the Indian Ocean but their concerns were largely ignored. Public and official interest in tsunamis was low.

Informal early warnings did save some lives. For example upon learning of the devastation in Indonesia via his television in Singapore, a concerned relative was able to warn his family in the Indian village of Nallavada in time for the entire village of over 3,000 people to be evacuated with no loss of life. Communities on the western coasts of Sri Lanka that were hit first by tsunami were able to call and warn and save some relatives on the south and eastern coasts of the country, which were hit about twenty minutes later.

Indian Ocean countries have now developed a regional tsunami early warning system, as well as their own national warning systems, with the assistance of United Nations organisations. In Thailand this includes a national all-hazards warning centre and an array of tsunami sirens along populated beaches. Indonesia has undertaken an evacuation exercise in the city of Padang, Sumatra, where the risk of future tsunamis is high.

In many parts of the world, communities do not have effective early warning systems for the hazards they experience. Early warning systems need to be 'people-centred' – i.e. based on the risks that people face and designed to provide understandable information to all of those at risk. This can enable people to act promptly and in a manner that reduces injuries, loss of life and damage to property. Early warning systems need a strong scientific and technical basis. They can be linked to bring efficiencies and economies of scale and to help secure the sustainability of systems for rare hazards like tsunamis.

Photo: International Federation

7

Land use planning and protection of ecological systems can reduce disaster risks

Nearly 3 billion people, or almost half the world's population, live in coastal zones. The sea provides food and sources of income, such as from fishing, tourism and transportation facilities, but the coast is also exposed to natural hazards like tropical cyclones, storm surges, floods and tsunamis.

Several studies after the tsunami showed that people and livelihoods were much less affected by the tsunami where healthy coastal ecosystems existed. An assessment made for the Batticola district, Sri Lanka, found that the mangroves, coconut plantations and scrub forest reduced the incoming tsunami, estimated to be 6 metres high, to about 40 cm height by the time it reached the village of Nasiva, one kilometre inland. Along the Thailand shore in Ranong Province many villagers were reported saved because the mangroves were thriving and dense in this area. The report also noted that houses and schools built behind the mangrove forests in Phang Nga Province were the only buildings that withstood the tsunami. In coastal zones where coral reefs were destroyed by mining for lime and cement production or where mangroves had been cut down for shrimp farming, the damage caused by the tsunami was reported to be considerably worse than elsewhere.

A technical workshop in Khao Lak, Thailand in August 2006 agreed that forests can act as "bioshields" to protect people and other assets against tsunamis and other coastal hazards, but their effectiveness depends on many factors and is not guaranteed. To maintain this defence role, forests and reefs need to be protected from damaging and unsustainable economic exploitation.

Integrated coastal zone management plans provide a good basis for linking livelihood and economic gains of shoreline developments with the long-term health of vulnerable ecosystems. Governments and local authorities need to undertake long-term land use planning to minimise disaster risks for all types of natural hazards.

8

Developing and adhering to building codes can minimise risks and losses

Dwellings, hotels and commercial buildings are numerous along the coastal areas of the Indian Ocean and house millions of people. If properly constructed, buildings can provide effective shelter from natural hazards such as earthquakes, tsunamis and tropical cyclones. But if poorly constructed, they are often observed to be the cause of injuries and deaths.

The safety of a building depends on its engineering design, the nature and quality of building materials and the building techniques employed. A remarkable case that demonstrated the virtue of appropriate design concerned the mosque at Banda Aceh in Indonesia. The mosque was one of very few buildings still standing in Banda Aceh after the tsunami – because the open ground-floor design allowed the tsunami water to easily run through the building.

To ensure the required safety, standardised building codes should be developed – and enforced – for the hazards present. For example, multi-story reinforced structures can offer good refuge from tsunamis, windstorms and floods.

9

Political and public commitment to reduce the risk of disasters is imperative

Societies need to better acknowledge that natural hazards such as tsunamis, floods and earthquakes are part of human existence and need to be faced and dealt with. Strong government commitment and community involvement are needed to build a safer future for both present and future generations. This has been recognised by the Government of Bangladesh, for example, which since the 1970's has worked in partnership with local organisations to reduce the nation's vulnerability to tropical cyclones. With international support, it has successfully developed an action programme that combines an early warning system and increased preparedness among the communities situated in high-risk areas.

In all countries there is a need for legal and institutional frameworks that establish mandates and responsibilities for risk assessment, risk reduction and disaster management. These need to be understood by all parties and to be re-examined on a regular basis in order to know 'who is doing what' before, during and after a disaster. In India, successive improvements in government policy followed major disaster events. After the cyclone disaster in Orissa in October 1999, there was a move toward a multi-disciplinary and multi-sector approach and the incorporation of risk reduction in development plans and strategies. A review following the Bhuj earthquake in Gujarat in January 2001 led to a transfer of responsibility for disaster management from the Ministry of Agriculture to the Ministry of Home Affairs and to the amendment of the relevant Government Rules in February 2002.

The tsunami highlighted the lack or inadequacy of national disaster preparedness plans in many countries. Some existing plans were not based on a wide enough assessment of the hazards and vulnerabilities present or of the capacities to handle events at the various national, local and community levels. In response to the tsunami, the Government of Sri Lanka developed a comprehensive 'Roadmap' for disaster management that includes new legislation and the establishment of a disaster management centre.

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Photo: DKKV/M. Malsch

Humanitarian and development innovations are needed to reduce disaster risks

Humanitarian organisations are normally very clear about their main role – to save lives and to provide relief in the aftermath of a disaster. But they can also play other important roles, including as advocates for reducing the vulnerability of populations, which lies at the root of disasters. The global cost of responding to disaster has increased over the years. Governments and individuals contributed an exceptional total of over 6 billion US dollars to help the victims of the Indian Ocean tsunami disaster. More recent disasters show it will be difficult to sustain this level of contribution.

Clearly, it makes sense to invest in risk-reducing activities that will bring down the scale and costs of disaster events. Disaster risk reduction measures are particularly important in the post-disaster recovery stage, to ensure that we do not resurrect the past risks but instead 'build back better' as recommended by the United Nations Secretary-General's Special Envoy for Tsunami Recovery, President William J. Clinton.

There is good evidence that investments in disaster risk reduction can pay off handsomely in terms of avoided or reduced disaster losses and social impacts. Development banks and ministries need to factor this lesson into their policies. They also need to ensure that development investments are protected from natural hazards. The United Kingdom has recently acted on this understanding by committing to invest in disaster risk reduction an amount equal to ten percent of its allocations to disaster response. If all countries – donors or otherwise – followed this lead, the vulnerable communities of the world would become much better prepared and resilient to future hazard events.

11

Natural hazards span borders and their management requires global cooperation

Natural hazards do not respect national borders and frequently affect multiple countries. The Indian Ocean tsunami directly affected 12 countries, 5 severely, and killed tourists or expatriates from a further 39 countries. For distant Sweden, the loss of 543 citizens was its worst catastrophe in modern time. Globalisation and the growing inter-connectedness of society through trade, finance, travel and migration have increased the potential for hazard events to affect lives and livelihoods across the globe. Global urbanisation and environmental change, especially climate change, will increase vulnerability to natural hazards in many countries.

Regional and international cooperation and coordination are essential to reduce disaster risks and to manage disaster events. There were many instances of countries quickly providing assistance to affected neighbouring countries in the aftermath of the tsunami. Cooperation is fundamental to the regional early warning system for tsunamis that was subsequently established by Indian Ocean countries. This involves the systematic sharing of data, alerting advice and risk assessments, cooperation on developing national systems, and an intergovernmental coordination mechanism under United Nations auspices. Many governments outside the region and technical organisations contributed to the system's development by providing expertise and funding.

Countries can also cooperate to reduce disaster risks and increase preparedness. Cooperation ahead of time is needed for such things as developing policies and procedures for information exchange, strengthening linkages between scientific and technical institutions, and building mutual understanding between national and local authorities. Another good example is the cooperation by the Association of South-East Asian Nations on formal procedures to deal with regional haze from forest fires.

Governments have stated in the Hyogo Framework for Action, which was finalised in January 2005 shortly after the tsunami, that cooperation is essential for achieving coherent action to reduce future human, economic and social losses from disasters.

Further information

Hyogo Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters (HFA)
Also contained in the Report of the World Conference on Disaster Reduction, A/CONF.206/6, 16 March 2005. Available in English, French, Spanish, Chinese, Arabic and Russian at web site http://www.unisdr.org/eng/hfa/hfa.htm

Living with Risk: A Global Review of Disaster Reduction Initiatives
2004 version, Inter-Agency Secretariat of the International Strategy for Disaster Reduction (UN/ISDR), Geneva. 430pp. See http://www.unisdr.org/eng/about_isdr/bd-lwr-2004-eng.htm

Joint Evaluation of the International Response to the Indian Ocean Tsunami: Synthesis Report, John Telford and John Cosgrove, and Rachel Houghton, Tsunami Evaluation Coalition, July 2004, 176pp. A synthesis of five detailed reports by the multi-stakeholder Tsunami Evaluation Coalition covering humanitarian coordination, needs assessment, impacts on local and national capacities, funding processes, and links from relief, rehabilitation and development. See http://www.alnap.org and http://www.tsunami-evaluation.org

United Nations Office of the Special Envoy on Tsunami Recovery.
See http://www.tsunamispecialenvoy.org/ for reports, press releases and other materials.

Lessons save life: Story of Tilly Smith and *The power of knowledge: Story of a little boy from Semilieu, Indonesia*, videos produced by UN/ISDR, 2005. Available on CD as Video file in English at http://www.unisdr.org/eng/media-room/mr-videos.htm

ISDR-BIBLIO 1: Tsunami, UN/ISDR Library for Disaster Reduction, April 2006. ISDR-BIBLIO is a bibliographic compilation of publications available at the ISDR System Library and related to a specific hazard or aspect of disaster reduction. See http://www.unisdr.org/eng/library/lib-biblio.htm

More information and links concerning disaster risk reduction and the International Strategy for Disaster Reduction may be found at http://www.unisdr.org

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