



International Strategy for Disaster Reduction



Evaluation and Strengthening of Early Warning Systems in Countries Affected by the 26 December 2004 Tsunami

An initiative supported through the UN Flash Appeal for
Indian Ocean Earthquake – Tsunami 2005



United Nations

The European Commission and the Governments of Finland, Germany, Japan, Netherlands, Norway and Sweden have contributed generously - through the UN Flash Appeal for Indian Ocean Earthquake-Tsunami 2005 - to support the UN/ISDR coordinated initiative: "Evaluation and Strengthening of Early Warning Systems in countries affected by the 26 December 2004 Tsunami"



Auswärtiges Amt



Background

On December 26th 2004, an earthquake measuring 9.0 on the Richter scale struck the western coast of Sumatra in Indonesia triggering massive ocean waves or “tsunamis”. Humans were confronted by an unprecedented catastrophe impacting the lives of people not only in the Indian Ocean region but all over the world. The death toll is believed to be over 270,000 people with billions of dollars in damage cost. While many people are believed to have died in the earthquake, the main cause of death was trauma and drowning from the flux of seawater and waves pouring into coastal areas without warning. It is widely acknowledged that if effective early warning systems had been in place in the Indian Ocean region, the death toll would have been drastically reduced.

Recognizing the urgency to mobilise efforts and resources towards establishing an early warning system for the Indian Ocean region, a multi-partner, multi-donor initiative “Evaluation and Strengthening of Early Warning Systems in countries affected by the 26 December 2004 Tsunami” was launched in early 2005. The initiative has been funded through the UN Flash Appeal for Indian Ocean Earthquake-Tsunami 2005 with US\$ 10.5 million in contributions from the European Commission for Humanitarian Aid and the Governments of Finland, Germany, Japan, Netherlands, Norway and Sweden. It has been coordinated by UN/ISDR Platform for the Promotion of Early Warning (PPEW) and implemented by several international, regional, and national partners.

This initiative has provided an overall integrated framework for strengthening early warning systems in the Indian Ocean, and has been focusing on key components that include core system implementation, integrated risk management, public

awareness and education, community-based approaches, as well as coordination and building partnerships. To date, several activities have been completed and major achievements include:

- ▶ The development of regional inter-governmental processes to support the establishment of tsunami early warning systems in the Indian Ocean;
- ▶ Significant progress towards awareness raising and capacity building in advocacy with more engagement from the media and non-governmental organisations; and
- ▶ Coordination of joint efforts of many key organisations in the UN and the region towards linking tsunami warning systems to other hazard warning systems and to disaster risk management.

A major highlight has been the establishment of partnerships and coordination mechanisms across a wide range of partners and donors and providing an example of an integrated vehicle for supporting the implementation of the Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters. This partnership approach has brought an added value to the diversity of activities and a more coherent and coordinated approach to the issue, thus extending the reach and effectiveness of inputs and resources. PPEW provided the overall coordination of this initiative with emphasis on the strategic overview, planning, monitoring and evaluation, facilitating partnerships, meeting donor requirements, and disseminating information. UN/ISDR secretariat and PPEW also undertook specific activities related to the mandate of ISDR and the overall Hyogo Framework aim of building the resilience of people to disasters.

Progress and Achievements

1 Core System Implementation

A special session on the Indian Ocean disasters: “Risk reduction for a safer future”, was organized on January 20th, 2005 at the World Conference on Disaster Reduction (WCDR), in Kobe, Japan. “Common Statement” by countries participating in this special session of the WCDR, including those affected by the tsunami tragedy, recognised the importance of bolstering national systems and sharing experiences on disaster relief, post-disaster rehabilitation and natural disasters. The statement recommended that necessary regional disaster response mechanisms be established and strengthened as soon as possible for all relevant natural hazards, which should include early warning systems, collaborative regional centres, and use of modern science and technology. The full text of the common statement is available on: www.unisdr.org/wcdr/intergover/official-doc/L-docs/special-session-indian-ocean.pdf



Photo: Franz Dejon, IISD/ENB Reporting Service/ Kimo Goree

► A scoping meeting on the development of tsunami early warning systems was held in Kobe on January 22nd 2005 immediately after the WCDR. Organised by UN/ISDR secretariat and UNESCO/IOC. This ad-hoc technical meeting included national representatives, UN organisations and experts to share information on activities and plans to develop tsunami early warning systems, with particular reference to the countries of the Indian Ocean region affected by the tsunami of 26 December 2004, and in the context of calls to develop more effective tsunami early warning systems globally. The meeting provided a venue for briefings and discussions on the roadmap to establish a tsunami early warning system in the Indian Ocean.

► By 1 April 2005, through the support of UNESCO/IOC, an interim tsunami advisory information system was in place and operating in the Indian Ocean region, consisting of a network of National Tsunami Focal Points receiving advisory information, based on seismic data only, from the Pacific Tsunami Warning Center (PTWC) and the Japan Meteorological Agency (JMA). A nearly completed system should be operational by the end of December 2007. This interim system was partly effective when a major earthquake occurred in Sumatra on 28 March 2005.

► Further activities included the upgrading of the Indian Ocean sea level gauge network, national assessments and coordination meetings, technical training, information product generation, and five major regional coordination meetings organized by the UNESCO/IOC in Paris, France (3-8 March 2005), Grand Baie, Mauritius (14-16 April 2005), Bali, Indonesia (31 July - 2 August 2006), Perth, Australia (3-5 August 2005) and Hyderabad, India, (14-16 December 2005). These meetings were instrumental in laying the foundations for developing the technical specifications and establishing the regional intergovernmental framework for the IOTWS. <http://ioc3.unesco.org/indotsunami/>

► Policy dialogue for high level administrative policy makers on establishing a Tsunami Early Warning System in the Indian Ocean was organised by ISDR secretariat and ADRC on 22-24 February 2005 with twenty-four participants from eleven

countries in the Indian Ocean region.

► A total of 25 out of a possible 27 national focal points for Tsunami early warning are capable now of receiving and distributing tsunami advisories around the clock.

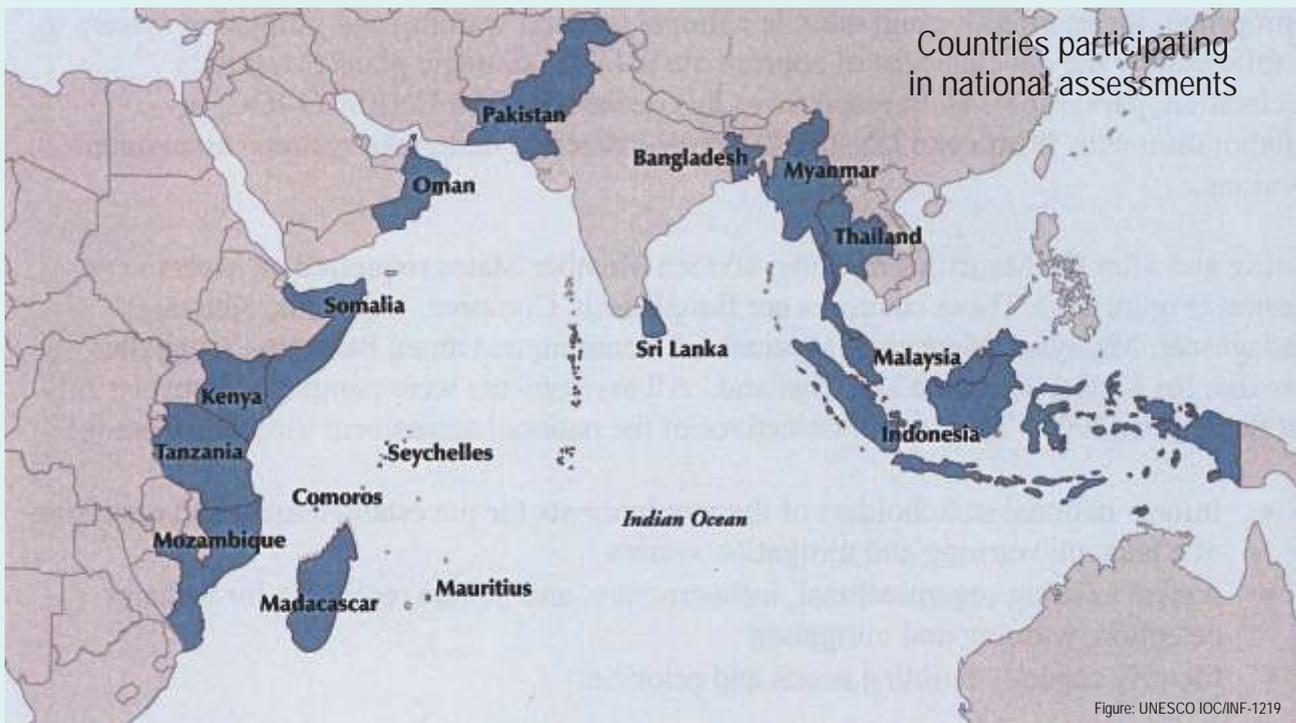
► Study tours for national experts from twenty-six Indian Ocean countries were organised by UNESCO/IOC, ISDR secretariat, and ADRC to allow national experts to visit and observe existing tsunami early warning systems in Japan (11-14 July 2005) and Hawaii (26-29 July 2005). The participants have enhanced their knowledge and capacity to identify requirements for national tsunami warning and mitigation systems. This knowledge is already being put into practice in setting-up national tsunami early warning centres and providing public information products.

► Critical to the success of the Tsunami Warning System (TWS) and Multi Hazard Early Warning System (EWS) is the availability of reliable international telecommunication mechanisms. WMO's Global Telecommunication System (GTS), which includes its satellite based telecommunications sub-systems and the data-collection services of meteorological satellites, interconnects all National Meteorological and Hydrological Services (NMHSs) and provides reliable, around the clock operational capabilities. A multidisciplinary workshop organized by WMO on the exchange of early warning and related information, including tsunami warning in the Indian Ocean took place in Jakarta, 14-18 March 2005. The participants endorsed the WMO "Action Plan" and developed the technical and operational plan, including immediate, short-term and longer-term actions, for making GTS fully operational in all Indian Ocean countries to support tsunami early warning systems. The meeting also identified the Indian Ocean countries, which need assistance for GTS upgrade.

► WMO Expert team missions were carried out for on-site assessment for upgrading national GTS components to Sri Lanka, Bangladesh, Maldives, Myanmar, Pakistan, Djibouti, Kenya and Tanzania. A Coordination meeting on GTS upgrade in the Indian Ocean to support multi-hazard EWS, including TWS (17-19 October 2005, Geneva) reviewed and consolidated the proposed projects for ensuring a consistent GTS upgrade and implementation plan for the whole Indian Ocean rim. GTS project requirements for each Indian Ocean country were delivered. Some donors announced their firm or imminent decision to fund several projects including France and the USA.

► The GTS demonstrated its effective support for the 17th July 2006 Tsunami in Java, with watch messages from Pacific Tsunami Watch Centre (PTWC) and Japan Meteorological Agency (JMA), received by several Indian Ocean centres, including Jakarta, in less than 3 minutes.

► A Workshop on Multi-Hazard Early Warning Centres' Concept of Operations for the Indian Ocean Tsunami Warning System (Singapore, November 2005) was held to share knowledge and experience of the established WMO Regional Specialized Meteorological Centres, and those of existing TWS to further promote and develop the concept of operations of multi-hazard, multi-purpose early warning systems supported by the GTS.



▶ Sixteen countries have officially requested needs-assessment: Bangladesh, Comoros, Indonesia, Kenya, Madagascar, Maldives, Malaysia, Mauritius, Mozambique, Myanmar, Oman, Pakistan, Seychelles, Somalia, Sri Lanka, Tanzania, and Thailand. These needs-assessment missions to Indian Ocean countries were mainly organised between May and September 2005 by UNESCO/IOC, ISDR secretariat, WMO and supported by multidisciplinary expert teams. The missions consulted with a wide range of parties and reviewed national capabilities for tsunami early warning and mitigation, public awareness and risk reduction needs, and technical requirements. Recommendations and brief training were delivered directly to, and negotiated with, national authorities and will be used to guide technical plans and national and regional strategies. The complete consolidated report was published in December 2005, and is available on: <http://ioc3.unesco.org/indotsunami/nationalassessments.htm>

▶ Twenty-three real time sea level stations have been deployed by UNESCO/IOC, in close coordination with Hawaii Sea-Level Centre, to complete the upgrade of the Global Sea Level Observing System (GLOSS) network in the region. The sea-level stations deployed in countries of the Indian Ocean represent core elements of the GLOSS network, which constitutes a fundamental basis for the monitoring and detection of tsunamis in the Indian Ocean.

▶ UNESCO/IOC conducted a sea level observation and data analysis-training course for participants from the Indian Ocean at the Japan Meteorological Agency, 15-26 May 2006. A second course took place at the IOC office in Oostende, Belgium in November 2006, primarily for Western Indian Ocean participants.

▶ A series of scientific training courses, have been conducted by the UNESCO/IOC and its partners, relating to each core area of the IOTWS (hazard assessment, hazard mitigation, and warning guidance). Seismology and Tsunami Warning one-week training courses took place in Sri Lanka, (3-7 April 2005, 20 participants), Indonesia (8-17 May 2005, 47 participants), Thailand (15-22 May 2005, 27 participants), Malaysia (21-25 August 2005, 51 participants) and Maldives (27-31 August 2005, 14 participants). A total of thirteen participants from nine Indian Ocean countries have received a two-week training course on GIS and Territorial Planning for Coastal Zones in Belgium (2-12 May 2005). Finally, UNESCO/IOC organized a two-week training courses on Tsunami Numerical Modelling in Philippines (7-19 November 2005, 17 participants), Malaysia (8-19 May 2006, 9 participants) and Belgium (6-16 June 2006, 24 participants).

Progress and Achievements

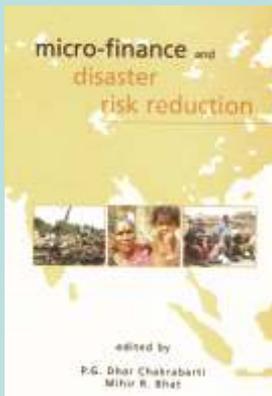
2 Integrated Risk Management

UNEP has supported national efforts to adapt and deliver integrated assessment instruments in Indonesia, Sri Lanka and Maldives. Based on consultations with national environmental authorities, different approaches have been adopted, which resulted in three separate types of integrated assessment instruments:

▶ In Sri Lanka, work on integrating disaster risk concerns into strategic environmental assessments (SEA) has proceeded rapidly owing to a large extent to strong ownership on the part of national government. Cabinet approval was granted to direct all governmental agencies to undertake SEAs for all national policies and programmes and for Central Environmental Authority to prepare SEAs. UNEP has facilitated a technical training and provision of guidelines for SEAs development in Sri Lanka.

▶ In Indonesia, work has focused on integrating environmental and disaster risk information into Spatial Planning for Recovery and Risk Reduction. Intensive consultations with national partners led to better understanding and strong commitment on environmental disaster reduction. However, final institutional arrangements to integrate environmental considerations in government structures are still pending and are being followed up by UNEP with the Ministry of Environment.

▶ In the Maldives, recognizing that environmental change directly affects risk and vulnerability, and that coastal erosion and climate change play an exceptional role in the country, UNEP has supported the Ministry of Environment, Energy and Water (MEEW) in identifying vulnerable locations at the island scale. Such an assessment has directly contributed to the capacity of MEEW to design appropriate interventions and thereby support the Government's efforts to establish safe islands.

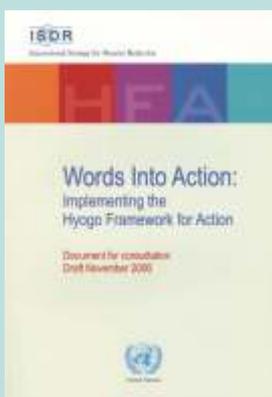


An international workshop on the role of micro-finance in tsunami risk mitigation and recovery was coordinated by AIDMI and the ISDR secretariat in New Delhi 14-15 October 2005, bringing together key stakeholders in microfinance and disaster risk reduction fields. Participants learned about experiences of the role of micro-credit in tsunami recovery from the Philippines, Japan, Sri Lanka, Bangladesh and India. The event represented a platform for the launch of a global debate on how microfinance can reduce the impact of disasters and the potential use of it for tsunami recovery. It was the first time that the concepts of microfinance and disaster risk reduction have been addressed concurrently at conceptual and operational level. The meeting results have been published in a workshop report (http://www.unisdr.org/eng/public_aware/world_camp/2005/events/iddr-india-workshop.pdf) and AIDMI 2006 publication Experience Learning Series 36 "The

Application of Microfinance for Disaster Risk Reduction in Tsunami Recover", pp. 54. A more in-depth view has been provided in the 225 page book titled "Micro-Finance and Disaster Risk Reduction - Proceedings of International Workshops on Disaster Risk Mitigation: Potential of Micro-Finance for Tsunami Recovery, New Delhi October 14-15, 2005" <http://www.akhilbooks.com/frmsingleproductDet.aspx?id=12883>

► UN/ISDR Regional Outreach Office for Africa has provided technical assistance as well as partnership fostering for the development of fishing boat owner's and farmer's insurance schemes in the Seychelles. In the aftermath of the 26 December 2004 tsunami, the Government of Seychelles provided direct financial support to fishing boat owners and farmers who had experienced losses. Recognising that the provision of post-disaster compensation is not sustainable or economically sound, the Government is accommodating a shift from ex-post to ex-ante disaster financing. A scheme of insurance coverage for fishing boats already exists but must be made more attractive, particularly to small boat owners, while agricultural insurance will be an entirely new product in the Seychelles. For more information please read disaster reduction in Africa - ISDR Informs, Issue 6, 2006, p. 7-9.

<http://www.unisdr.org/africa/af-informs/issue6/Issue6-2006-english-ISDR-informs.pdf>



The initial consultation process to develop a guideline document for the implementation of the Hyogo Framework has been supported by the Flash Appeal Funds. This guideline is being developed to support national and local authorities as well as other stakeholders implement the priorities for action agreed in Hyogo towards building the resilience of nations and communities to disasters. The guidelines are designed as a "getting started" package focusing on a step-by-step "how-to", illustrated through examples, case studies and lessons learned. After the initial consultation process the guidelines have been further developed into the consultative document "Words Into Action" in November 2006. The document will be presented and discussed at the Global Platform for Disaster Risk Reduction held 5 - 7 June 2007 in Geneva, Switzerland.

<http://www.unisdr.org/eng/hfa/docs/words-into-action-consultation-draft.pdf>

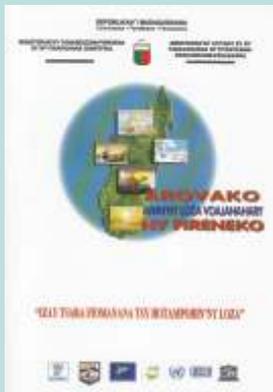
Progress and Achievements

3 Public Awareness and Education

▶ Two media-targeted regional workshops were jointly organised by Asia-Pacific Broadcasting Union (ABU) and the ISDR secretariat from 13-16 June 2005, bringing broadcasters together with technical experts from the tsunami and weather warning fields to improve dialogue and understanding in respect to warning dissemination and public education. The first workshop titled “Emergency Information Flows From Meteorological Organisations to Broadcasters” has been more technical in nature and involved Technical or News Directors from broadcast companies and Operational Directors from meteorological, oceanographic and disaster management organisations. The second workshop, titled “Public Awareness, Preparedness and Response of Individuals and Communities”, focused on the broadcasters capacity and responsibility to educate audiences and raise awareness of the dangers of and appropriate responses to natural disasters through the use of public service announcements, educational documentaries, current affairs programming and other content. This workshop involved Programming and Production Directors from broadcast companies from the 12 tsunami-affected countries (<http://www.abu.org.my/public/compiled/p586.htm>).

► To perpetuate the discussion on the role of broadcasters regarding disaster prevention, reduction, awareness and response, ABU organized a professional forum during its Annual General Assembly, which was held in Hanoi, Vietnam 26-28 November 2005 and which was attended by more than 400 high-level broadcast executives and heads from more than 100 broadcast companies. <http://www.abu.org.my/public/compiled/p641.htm>

► UN/ISDR Regional Outreach Office for Africa organized a two-day consultative meeting on Media and Disaster Reduction for Countries along the East Coast of Africa from 13 to 14 June 2006 in Nairobi, Kenya. Participants were journalists from Tanzania, Comoros, Mauritius, Madagascar, Somalia, Zambia, Djibouti, Seychelles and Kenya. The workshop focused on how the media can respond to disasters - before and after they happen - and influence governments and policy makers in giving priority disaster risk reduction and management at national level. Journalists agreed to report more on DRR in their own countries and meet periodically to train other journalists as well. In addition, participating journalists expressed interest in becoming actively involved in national platforms.



A regional workshop on tsunami, related coastal risks and education in Africa has been organized by UN/ISDR Regional Outreach Office for Africa from 11-13 May 2006. Head teachers and officers from the ministries of education of the 10 East Coast countries were

invited to this meeting. A draft school manual was developed to serve as a base for the elaboration of national school manuals in each country. Participating teachers organized as a follow-up further teacher's training on tsunami and related coastal risks. Kenya, Seychelles, Mozambique, Madagascar, Djibouti, Tanzania, and Comoros have completed the development of a school manual and teacher's handbook.

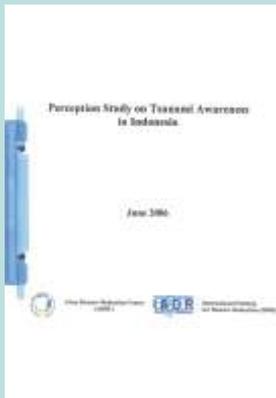
► A public awareness and education workshop was coordinated by the UN/ISDR secretariat in Bangkok hosted by ESCAP in Bangkok, Thailand, 7-8 September 2005 involving 40 participants from UN agencies, IFRC, national institutes, broadcasting agencies and NGOs to share experiences and devise plans to implement public awareness campaigns and identify synergies for further coordination.



The booklet "Inamura no Hi", or "Fire of Rice Sheaves", is a Japanese tale based on the true story of a man who saved his village from an imminent tsunami. The production of Inamura no Hi, which also includes basic facts about tsunamis and has been translated into local

languages, was originally funded by the Government of Japan and involves the collaboration of a network of NGOs for disaster reduction and response belonging to the Asian Disaster Reduction and Response Network (ADRRN). With support from UN/ISDR, ADRC printed 5,000 copies of the tsunami awareness booklets, and those have been sent to Malaysia, Singapore and Sri Lanka. 30,000 copies of the English version and 20,000 copies of the French version were printed and delivered to the ISDR Africa Office for wider dissemination. The booklets have been sent to the national focal points for disaster risk reduction in the respective countries for further dissemination. In collaboration with UNESCO/IOC and ADRC, 16,000 copies of the booklet Inamura no Hi were produced in nine languages and distributed throughout eight Indian Ocean countries. The materials have also been introduced to different levels of stakeholders through pilot workshops. For more information:

www.adrc.or.jp/publications/inamura/top.html
www.adrc.or.jp/publications/inamura/list.html



A perception study in Indonesia was carried out in three areas: Nias Island, Simeule Island and West Coast Aceh from December 2005 April 2006. ADRC team in collaboration with local researchers, schools, government officers, and local residents, have carried

out surveys and local interviews to identify facts on communities' and students' experiences and perceptions on tsunami. The perception study has also served as a pilot project to educate 5th and 6th grade school children about tsunami and other natural disasters including simulations for evacuation in schools. In coordination with the Ministry of Education, ADRC is promoting the replication of this project in other areas within Indonesia towards enhancing students' knowledge and education on disaster risks. More information on the perception study and surveys in the three areas in Indonesia is available on:

- http://web.adrc.or.jp/publications/Indonesia_Survey/WEST%20ACEH/en/index.html
- http://web.adrc.or.jp/publications/Indonesia_Survey/SIMEULUE/en/index.html
- http://web.adrc.or.jp/publications/Indonesia_Survey/NIAS/en/index.html



ISDR-Biblio: Issue 1: Tsunami 2006, produced by UN/ISDR secretariat 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. The first

edition of ISDR-BIBLIO is on tsunami literature in commemoration of the devastating earthquake of 26 December 2004. This catalogue lists major academic, technical and scientific publications on tsunami as well as reports produced by United Nations agencies.

<http://www.unisdr.org/eng/library/biblio/isdr-biblio-1-tsunami-2006.pdf>



In order to support governments and communities in implementing effective people-centred early warning systems a checklist "Developing Early Warning Systems: Checklist" has been developed by UN/ISDR secretariat and the Platform for the

Promotion of Early Warning. The checklist was presented at the Third International Conference on Early Warning held in Bonn, Germany, 27-29 March 2006. The Checklist was prepared through consultation with organizations and experts involved in early warning and disaster risk reduction in the United Nations international system and beyond. Through the Tsunami Flash Appeal Funds, the English checklist version has been translated into 19 languages (four United Nations and 15 Indian Ocean languages). <http://www.unisdr-earlywarning.org>



The publication "Learning from disaster recovery guidance for decision makers" produced by the International Recovery Platform (IRP) has been supported by ADRC, UN/ISDR secretariat and UNDP. This book claims to be a

groundbreaking project, constructed on an 'evidence based' examination of international experience to determine the nature of successful disaster recovery. This study is the first to be published by a consortium of UN Agencies, based on a systematic analysis of disaster recovery experiences. It is also the first book aiming to provide practical advice for disaster recovery managers. The book was written during ongoing recovery operations following three epic-scale disaster events: the Indian Ocean Tsunami of December 2004, Hurricane Katrina of August 2005 and the India/Pakistan earthquake in October 2005 and these, and other operations have yielded vital data for the book concerning the recovery process.



A 10 minute video clip on disaster risk reduction, “Everybody's Business”, has been produced by UN/ISDR secretariat in 2005 to emphasise that disaster risk reduction should be an integral part of every day decision making and to explain how the Hyogo Framework with its concrete guidelines can support these activities. About 100 copies were produced in English for distribution to major partners and the media. In collaboration with UNESCO, the clip has been translated in French and Spanish for wider dissemination. The video “Everybody's Business” is available in English, French and Spanish on: <http://www.unisdr.org/eng/media-room/media-room.htm>.

The power of knowledge: Story of a little boy from Semilieu, Indonesia: When the Indian Ocean Tsunami hit in December 2004 over 250,000 people were killed throughout Asia, but on one small island, just 40km from the epicentre of the earthquake, almost the entire population survived, thanks to the people's inherited knowledge of tsunamis, handed down from each generation to the next. The 26th December 2004 looked like just another normal day on Simeulue. Eleven-year-old Anto Suryanto and his friends were on the beach playing football when the island was hit by a major earthquake. Anto

tells his story and how traditional knowledge saved his life. The video clip (3 minutes) was produced by UN/ISDR and is available in English on UN/ISDR website: <http://www.unisdr.org/eng/media-room/mr-videos.htm>.



Lessons save life: Story of Tilly Smith: Tilly Smith, an eleven-year-old schoolgirl was on holiday in Thailand with her family when the tsunami hit in December 2004. She recognized the signs of the receding sea and warned her parents of the impending tsunami, which led to hotel guests

being rapidly cleared from the beach and saved the life of dozens of people. Tilly's story highlights the critical importance of basic education in preventing the tragic impacts of natural disasters. The video clip (5 minutes) was produced by UN/ISDR and is available in English, French and Spanish on UN/ISDR website: <http://www.unisdr.org/eng/media-room/mr-videos.htm>.

Documentaries in collaboration with TVE

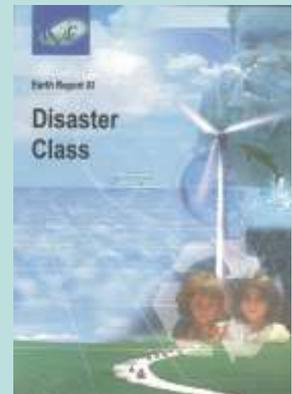
Together with TVE, Television Trust for the Environment, the International Strategy for Disaster Reduction produced three documentaries that have been broadcast by BBC Earth Report in fall 2006. The documentaries have been aired by BBC WORLD, which has a current audience of 140 million people.

1. BBC Earth Report "Disaster class"

has been broadcasted on BBC World November 18 and 19, 2006.

Over the last two decades, an average of 200 million people has been affected by disasters every year. With the impacts of climate change now being felt around the world, the next generation will have to deal with increasing numbers of severe disasters. Will they know what to do to when the next disaster strikes? Earth Report visits disaster hotspots in South East Asia, Central Asia and the Caribbean, to see how education, both in the classroom and in the community, can make the difference between life & death.

www.tve.org/earthreport/archive/doc.cfm?aid=1809



2. BBC Earth Report "After the wave"

has been broadcasted on BBC World October 28, 2006.

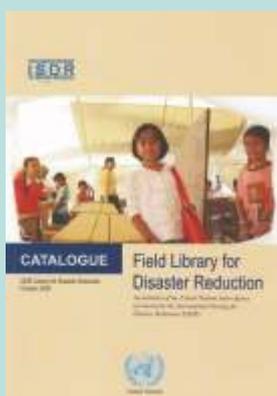
Earth Report, with the support of ISDR secretariat, travelled to three of the worst affected countries (Thailand, Indonesia and Sri Lanka) to examine the recovery process. With so much funding flowing in to the region, are these countries re-building better than before or are they making the same old mistakes?

www.tve.org/earthreport/archive/doc.cfm?aid=1801

3. BBC Earth Report "Before the Tsunami Part 1 & 2"

The scale of the death and destruction brought by the Tsunami in Asia has shocked the world. Few disasters of this magnitude have ever been recorded. Though earthquakes are difficult to predict, questions are being asked. How many lives could have been saved if people had been more aware and better prepared? Two episodes of Earth Reports assess what is being learned from the disasters that affect the lives of some 200 million people every year. And we find that even in the poorest nations, the loss of life and damage can often be reduced by modest investment in early warnings and public education. Earth report visits the city of Goma from Congo, Cuba and Bangladesh and in the second episode Japan, Iran and the French Alps.

www.tve.org/earthreport/archive/doc.cfm?aid=1659 & www.tve.org/earthreport/archive/doc.cfm?aid=1661



The Disaster Reduction Field Library initiative has been coordinated by the UN/ISDR secretariat to enhance basic knowledge on tsunami, early warning and disaster risk reduction. This initiative is built on the model of the "Blue Trunk Library" of the World Health Organization, and it aims to support communities most affected by the Indian Ocean disaster, by providing existing books and practical, technical information on disaster risk reduction to practitioners, researchers, local leaders and communities. Three sets of libraries were handed over to Indonesia and India in October 2005. By June 2006, 35 Field Libraries were dispatched to Indian Ocean countries.

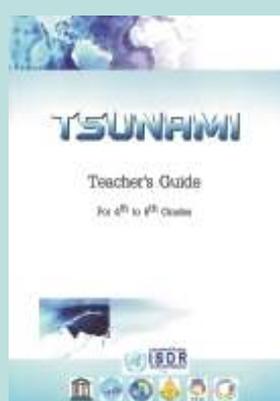
More information: <http://www.unisdr.org/eng/library/field-lib/fl-introduction.htm> & <http://www.unisdr.org/eng/library/field-lib/field-library-catalogue.htm>





UN/ISDR secretariat produced the online game “Stop Disasters” to engage and teach children, ages 13-18, how to protect cities and villages against natural hazards through disaster risk planning and management as part of its advocacy activities. The interactive game includes five natural hazard scenarios (flooding, tsunami, wildfire, hurricane and earthquake) with different levels of difficulty that require critical decision-making and strategic planning. The game has been developed by Playerthree Limited, a UK production company with substantive input and educational material supplied by UN/ISDR. Currently, the game is being translated into several languages with the support of additional donors. In collaboration with IFRC, ACTION AID, UK PLAN INTERNATIONAL, EMA, USAID, and SEEDS schools in Jamaica, Australia, India, Vietnam and Africa have tested the on-line game.

Experts from the Conseil en communication ludo-éducative in Paris have also provided their inputs. The game can be accessed for free at: <http://www.stopdisastersgame.org>.

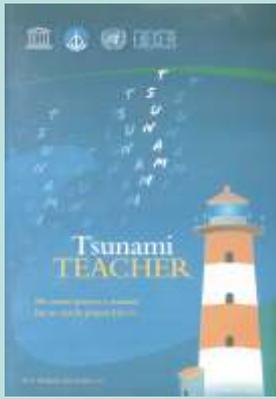


Through the Flash Appeal Tsunami funds, UNESCO/IOC's International Tsunami Information Centre (ITIC) has revised and updated its most popular educational materials and additionally made them available in an easily customisable electronic format for

localisation by countries. The publications include Tsunami the Great Waves, Tsunami Warning! Children's Book, Tsunami Glossary and a Tsunami Safety Poster. Massive reprints of “The Great Wave” and the “Tsunami Glossary”, along with safety posters and flyers prepared by ITIC in Hawaii, were distributed directly to Tsunami Warning Focal Points (TWFP) all across the Indian Ocean. The ITIC also worked with TWFP of four countries (Indonesia, Maldives, Sri Lanka, and Thailand) to translate and customize its Tsunami Warning awareness booklet. The booklet illustrates the procedures followed by tsunami warning centres and emergency response agencies subsequent to a large earthquake, as well as before, during, and after a tsunami striking the coast off western Sumatra, Indonesia. Over 10,000 copies of Peringatan Tsunami have been printed and distributed cooperatively with the Indonesia

Meteorological and Geophysical Agency (BMG). ITIC educational material is available on: <http://ioc3.unesco.org/itic/>.

- ▶ The Asian Disaster Reduction Centre (ADRC), in collaboration with the UNESCO/IOC and other concerned UN and government agencies reviewed and compiled over 150 primary school educational materials on tsunami and other natural disasters for translation into local languages.
- ▶ To promote education for disaster preparedness in schools, the ADRC and the Government of Thailand organized two three-day workshops in Phuket and Phang-Nga provinces aimed at teaching children about tsunamis and other hazards, and the appropriate action to take, such as school evacuation drills.



An information kit "Tsunami Teacher" Information and Resource Toolkit has been developed by the UNESCO/IOC and its International Tsunami Information Centre (ITIC). This information kit provides a consolidated resource of new and existing,

reliable and verified tsunami warning, response, and mitigation information and training modules. Materials available online help build awareness and the capacity to response to and mitigate the impact of tsunamis. "TsunamiTeacher" is available as both an on-line, dynamic resource, and an off-line set of DVDs.

<http://ioc.unesco.org/TsunamiTeacher/>

► The "Disaster Reduction in Asia - ISDR Informs"; Issue I was published by ADPC in English (3,000 copies) with translated versions in Chinese, Bahasa Indonesia and Russian (2,000 copies each). The translated versions constitute a part of the effort to make the newsletter accessible to larger audiences. The newsletter has become an important channel to disseminate news and knowledge on disaster risk reduction. Issue II has been planned and written in consultations with members of the ISDR Asia Partnership and the ISDR Asia office. This particular issue contains a 23 page special section on "The 2004 Indian Ocean Tsunami: One year after". <http://www.unisdr.org/asiapacific/ap-informs/ap-informs.htm>



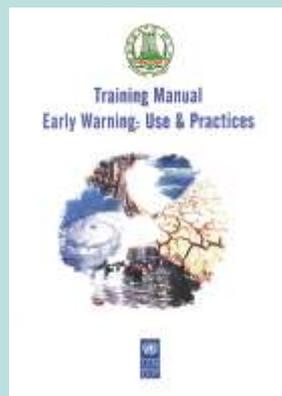
Progress and Achievements

4 Community-based Approaches

► Panadura Urban Council of Kalutara district in Sri Lanka has been the pilot site for UNEP's Strategic Environmental Assessments (SEA). UNEP supported the National Building Research Organization (NBRO) of Sri Lanka and the Sri Lankan Central Environmental Authority to carry-out a pilot strategic environmental assessment for urban development planning and programming in Kalutara district. The community benefited from identification of priority concerns related to mangroves, wastewater quality management systems, tsunami risks, and implication on coastal zone development plans. This pilot exercise has led to a process of institutionalising SEA in Sri Lanka with strengthened active engagement of Urban Development Authorities across the country.

► Cuddalore district in Tamil Nadu, India, a pilot site for testing community-friendly technological options for disaster management and early warning. UNDP country office in India, in collaboration with disaster management committees (DMCs) and disaster management teams (DMTs) of Tamil Nadu, has implemented a pilot testing of technological options and community-level training in Cuddalore district, one of the worst tsunami-affected districts of the state. The project has benefited the community from enhanced exchange of information with relevant local authorities and strengthened dissemination mechanisms of early warnings through institutionalisation of early warning within DMCs and DMTs.

► Community of Kudawella, district of Hambantota in Sri Lanka, a pilot site for community-based hazard mapping and training of trainers. UNDP country office in Sri Lanka, in collaboration with Sri Lanka Disaster Management Centre, has carried out a training of trainers programme targeting the community of Kudawella in the district of Hambantota. Trainees were volunteers of the community early warning and evacuation Disaster Management Committee. The exercise developed a community hazard map, marked evacuation paths and gathered demographic data for each household in the hazard prone area. An evacuation drill was carried out after the dissemination of information to the community, and has demonstrated improvements in the early warning system for the pilot site. This exercise will be replicated in other communities in the country.



To facilitate learning at all levels; a training manual (Early Warning: Use & Practices) has been developed and produced by UNDP India, focusing on Early Warning for hazards such as Cyclone/Flood/Tsunami/Drought and Epidemics. The manual aims at understanding

the nature of hazards, corresponding early warning messages and their interpretation and the response strategies. The training manual was introduced and used by the trainers during training of the government officials, staff of NGOs and the members of the community (13 - 14 July 2006). To facilitate easy understanding and usage of the manual by the disaster management teams at the villages, the training manual has also been translated to the local language and circulated.



UNESCO country office in Jakarta, Indonesia, implemented a community-based disaster preparedness project focusing on 3 high-risk and highly dense community sites in Padang, Bengkulu, and Aceh Besar district. The communities targeted benefited from

enhanced level of community preparedness following a comprehensive assessment of critical factors related to community-based disaster preparedness. The knowledge, attitude and behaviour (KAB) surveys of participants in targeted training activities showed a drastic improvement in their KAB. Standard Operating Procedures (SOP) developed for disaster management in Padang through this project are in the process of becoming a city regulation and further adopted by other provinces and/or cities. In collaboration with the Indonesian Institute of Sciences, the project developed a website on community-based disaster preparedness in Indonesia at: <http://www.siagabencana.lipi.go.id/>. Currently, all outcome documents are being translated from Bahasa into English.



The study carried out by Centre for Research on the Epidemiology of Disasters (CRED) in Tamil-Nadu focused on 25 most-severely affected hamlets by the tsunami disaster in the Nagapattinam District (worst affected district in Tami Nadu with more than 6,000 deaths). The

household surveys and the scientific analysis of data by CRED and its partners in India (the University of Delhi and the Tamil Nadu Voluntary Health Association) have yielded very useful results and documented major findings that provide an evidence-base on the impacts and vulnerabilities linked to tsunami. Those findings have been communicated to relevant authorities nationally and locally, as well as shared regionally with policy makers and scientists from Indian Ocean countries in a regional workshop facilitated by UN/ISDR to highlight the human impacts of tsunamis. The study was also translated to Tamil and Hindi languages for further dissemination and knowledge sharing with local authorities and communities. (English version available on: <http://www.em-dat.net/documents/publication/RiskFactorsMortalityInjury.pdf> <http://www.em-dat.net/documents/TsunamiTamilNaduSurveyPressRelease.pdf>)

► United Nations University-Institute for Environment and Human Security (UNU-EHS) completed two vulnerability assessments in the cities of Galle and Batticaloa, Sri Lanka, in collaboration with local researchers and universities. The findings from the research and vulnerability data has been widely disseminated across the country, regionally as well as in international meetings highlighting patterns of vulnerabilities and recommendations to policy makers on planning policies. UNU-EHS team, in collaboration with Sri Lankan social scientists, have developed rapid vulnerability assessment techniques for disaster preparedness and risk reduction for coastal cities in Sri Lanka at risk from tsunamis based on the vulnerability assessment conducted in Galle and Batticaloa. (Study summary available on: <http://www.unisdr.org/ppew/tsunami/highlights/Summary-UNU-EHS-VulAss.pdf>)



Figure: UNU-EHS

A thorough analysis of the early warning capacities and resources in Galle has been completed by UNU-EHS, in collaboration with the Disaster Management Centre of Sri Lanka (DMC) and the Sri Lankan Technical Committee for Disaster Early Warning (TCDEW), and the UN Humanitarian Information Centre of OCHA in Galle. The analysis resulted in the development of an early warning plan for the city of Galle taking into accounts findings from the risk and vulnerabilities assessments. Efforts are underway by the local authorities, DMC, and TCDEW to replicate this early warning planning exercise in other coastal cities based on the model of Galle. (Elements of Galle early warning plan available on: <http://www.unisdr.org/ppew/tsunami/highlights/TEWS-in-SL-UNU-EHS-v3.pdf>)

► The Danish Government hosted an international workshop in Copenhagen (16-18 November 2005) on "Strengthening the resilience of local communities to cope with water related natural hazards". In an effort to support the implementation of the Hyogo Framework for Action, participants from disaster risk management authorities, practitioners, and community-based NGOs from Bangladesh, India, Indonesia, Malaysia, Sri Lanka and Thailand focused on identifying practical steps to ensure that community concerns will be better integrated into public policies. Participants worked on developing environmentally sound and sustainable coastal zone management tools that integrate natural hazard risk reduction. Good practices were identified, suggesting ways forward and identifying potential stakeholders who would be expected to integrate these good practices into their activities. Press release: <http://www.unisdr.org/eng/media-room/press-release/2005/pr-200534-Building-Safer-Coastal-Communities.pdf>

► National public awareness workshops on disaster risk reduction for community leaders have been facilitated by UN/ISDR Regional Outreach Office for Africa and were conducted in Comoros, Kenya, Madagascar and Tanzania. The workshops were held in the period between April and August 2006. In Comoros, three community awareness trainings have been on tsunami and related coastal risks. A total of 121 people representing various social layers: chief of village, permanent member of village associations, fishing, and coastal supervisors benefited from the two-day training. Similar training took place in Madagascar. Regional Officers from various local ministries, Central Government and journalists from the written press, national television and radio have participated in this training as well. A drill on tsunami evacuation was conducted on the last day and aired on national television for general public information. In Tanzania, 28 primary school teachers have been trained on the risk posed by tsunami disasters. Finally, IGAD Climate Prediction and Application Centre (ICPAC) in Kenya has produced a booklet for primary students on Coastal and Marine Disasters.



National workshops on disaster risk communication have been organized by ADPC in Myanmar (17-18 July 2006), Maldives (11 June 2006), Sri

Lanka (21-22 September 2006) and Thailand (16-18 August 2006) with the goal to improve community response to warnings. The workshops brought together stakeholders involved in communicating disaster risks. Discussions during the workshops focused on 1) describing the status of communicating risks for enhancing disaster prevention, mitigation, and preparedness; and 2) identifying constraints and needs of institutions involved in communicating risks. Participants also recommended a set of actions including a risk communication strategy. Follow-up activities were undertaken to practically apply the introduced disaster risk communication concepts.

<http://www.adpc.net/ews06/ewsJul06.htm>

The project "Building Citizens' Knowledge Resources for Disaster Preparedness" was developed and implemented as part of SEEDS' post-Tsunami intervention in the Andaman and Nicobar Islands. A Citizens' Resource Centre in the capital city of Port Blair and Village Knowledge Centres in the coastal villages were established to serve as satellites to the Citizens' Resource Centres. Profiles of local risks, vulnerabilities and standard operating procedures for disaster preparedness and response has been compiled and organized spatially in a customized platform titled - Community Based Information



Photo: SEEDS India



Photo: SEEDS India

System

(CBIS). A portable earthquake shake table has been acquired and has been utilized in raising awareness on affects of earthquake on building structures. The ISDR Field library has become popular among local students and researchers. Further highlights of the project include the preparation of emergency kits, introduction of community-level preparedness activities, initiation of school-focused safety programme, establishment of a facility for showcasing disaster knowledge for awareness and learning, conducting mock-drills at schools and production of radio programmes. <http://www.seedsindia.org/>



Progress and Achievements

5 Coordination and Partnership-building

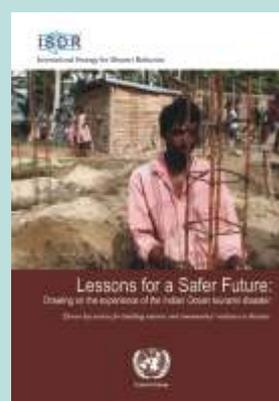
▶ A regional consultative meeting on early warning for the east coast of Africa was organised by UN/ISDR Regional Outreach Office for Africa in Nairobi from 17-19 October 2005, to inform participants from the region on tsunami matters, share best practices and lessons learned on early warning, and to identify early warning gaps in the east coast of Africa. The meeting resulted in increased knowledge of disaster risk reduction, particularly on early warning among participants and fostered enhanced regional cooperation on early warning in the African countries on the Indian Ocean. For more information please read "Disaster Reduction in Africa - ISDR Informs", Issue 6, 2006, p 47-49.
<http://www.unisdr.org/africa/af-informs/issue6/Issue6-2006-english-ISDR-informs.pdf>

▶ With support of UN/ISDR Regional Outreach office for Africa, the African Union Commission organised the first Ministerial Conference on Disaster Risk Reduction at the AU Conference Centre, Addis Ababa, 5-7 December 2005. The Conference built on important work to address disaster risk reduction in Africa, led by the African Union Commission, the NEPAD secretariat in collaboration with the African Development Bank, and support of ISDR secretariat, UNEP, UNDP and other UN Agencies. The Programme of Action for the Implementation of the African Regional Strategy for Disaster Risk Reduction was adopted. For more information please read "Disaster Reduction in Africa - ISDR Informs", Issue 6, 2006, p 49-51.
<http://www.unisdr.org/africa/af-informs/issue6/Issue6-2006-english-ISDR-informs.pdf>

▶ The Second Consultative Meeting on National Platform for Disaster Risk Reduction in Africa was held from 13 to 17 March 2006 in Nairobi, Kenya. Over 50 participants attended the workshop including national focal points, representatives from the Ministry of Education and representatives from red cross/red crescent national societies from the 18 countries, UNDP, UNDP/DDC and UN/ISDR Africa. The workshop included training on disaster risk reduction and mainstreaming disaster risk reduction into school curricula.

▶ Seychelles, Tanzania, Kenya, Madagascar and Mauritius have conducted national stakeholder meetings to discuss the national project proposal for the Indian Ocean Tsunami Early Warning Systems with the support of UN/ISDR Africa. National action plans have been developed and submitted to the Indian Ocean Consortium initiative coordinated by UN/ISDR-PPEW in coordination with the UN Special Envoy's office.

▶ UN/ISDR Regional Outreach Office for Africa has documented the impacts and lessons to be learned from the tsunami in Africa, resulting in a public documentary. Filming, news footage compilation, and interviews have taken place in Djibouti, Kenya, and Seychelles, as well as remote information gathering and interviews for Somalia. Lessons to be learned include not only activities during the tsunami, but disaster risk reduction and early warning measures now being implemented. The final product is currently being edited.



"Lessons for a Safer Future" was developed and produced by UN/ISDR secretariat in 2006 and it draws on the experiences of numerous organizations and individuals during and following the tsunami disaster of the Indian Ocean. The report offers eleven

lessons as a contribution to the ongoing process of learning how nations, communities and individuals can become better prepared for reducing the risk of potential natural hazards.
<http://www.unisdr.org/ppew/tsunami/pdf/Lesson-for-a-safer-future.pdf>

- ▶ Since July 2005, support has been provided to the Office of the UN Special Envoy for Tsunami Recovery by providing a liaison officer working on advocacy and public information issues as well as providing advice to the Special Envoy, President Clinton, on areas requiring his intervention and promotion in support of the development of tsunami early warning system and disaster risk reduction in the Indian Ocean region within a multi-hazard global framework. The Special Envoy's period of service ended 31 December 2006.
- ▶ A set of recommendations to the UN Special Envoy were submitted jointly by WMO, UNESCO/IOC and the UN/ISDR secretariat for activities to be undertaken in relation with early warning systems and tsunami. The recommendations urged the Special Envoy to take action in support of strengthening linkages between science and policy for disaster risk reduction with particular focus on recovery and development. The recommendations urged the Special Envoy to advocate at high political level to encourage effective international and regional cooperation and real-time availability and sharing of data and information policies.
- ▶ A Tsunami Coordination Unit was created within the UNESCO/IOC Secretariat to organize, plan and secure resources to implement the IOC Tsunami Programme. This unit was able to respond rapidly to the considerable demand on the UNESCO/IOC while maintaining other IOC priority activities during 2005. This initiative supported the strengthening of the capacity of UNESCO/IOC through the secondment of a senior tsunami warning system expert from Japan Meteorological Agency (JMA) for two years.
- ▶ UN/ISDR Regional Outreach Office for Asia and the Pacific was established in Bangkok to support multi-partner activities in Asia, which are targeted at national disaster risk reduction efforts and Hyogo Framework implementation. The office is operational as of June 2005, and the team is actively supporting tsunami early warning activities through network building, information provision and advocacy. In 2006, ISDR-Asia supported activities to assist local tsunami-affected schools in celebrating the International Day for Disaster Reduction.
- ▶ UN/ISDR secretariat, in coordination with UNEP-Division of Early Warning and Assessment (DEWA) and the Global Resource Information Database (GRID-Europe), has partnered with the University of Geneva to update and maintain the on-line hazard profiles, maps and vulnerability information displayed at the global, regional and national level. Specifically, on-line maps with information on natural hazardous events have been updated with the following time series: (i) 1979-2000 for earthquakes and tsunami (including the Indian Ocean Tsunami in December 2004); (ii) 1980-2004 for volcanic activities, cyclones and floods; (iii) 1980-2001 for droughts; and (iv) 1997-2003 for wild land fires. More information is available on: <http://www.unisdr.org/eng/country-inform/introduction.htm>
- ▶ A side-event on tsunami early warning in the Indian Ocean was organized during the Third International Conference on Early Warning (EWC III), which took place in Bonn 27-29 March 2006. Presentations by ISDR-PPEW, UNESCO/IOC, CRED, UNU, the meteorological department of Sri Lanka, and a Tsunami research expert highlighted the progress towards strengthening tsunami early warning systems in the Indian Ocean, and provided a forum for information exchange with regard to the implementation of activities and delivery of results at the regional, national, and local levels. Participants have discussed future prospects for partnership towards building resilience to tsunamis in the Indian Ocean region.
- ▶ UN/ISDR secretariat facilitated and coordinated the launch of the Indian Ocean Tsunami Consortium during the Third International Early Warning Conference held in Bonn 27-29 March 2006. A Roundtable on Indian Ocean Tsunami Warning and Response Systems was convened by UNESCO/IOC and UN/ISDR secretariat on March 27th, 2006 in the presence of President Clinton, the UN's Special Envoy for Tsunami Recovery. The Roundtable brought together key players, including Governments from the Indian Ocean region, donor countries and technical agencies, to take stock of on going efforts and progress, and to discuss what needs to be done in order to make an end-to-end early warning system operational without delay.

▶ On the occasion of the Roundtable Indian Ocean Tsunami Warning and Response Systems, the Indian Ocean Consortium was launched on March 27th, 2006. UN/ISDR secretariat has been coordinating the development and set-up of the Consortium with seven participating ISDR system partners namely: UNESCO/IOC, WMO, UNOCHA, UNDP, UNEP, IFRC, and the World Bank. Consortium partners agreed on a common goal to strengthen national capacities for tsunami early warning and response systems through a coordinated package of support to those governments seeking help, aimed at securing the principal national capacities required in policy, infrastructure, and technical support for an effective end-to-end multi-hazard early warning system at the country-level.

▶ Eleven countries have requested capacity-building support from the Indian Ocean Consortium namely: Comoros, Madagascar, Maldives, Mauritius, Mozambique, Pakistan, Seychelles, Somalia, Sri Lanka, Tanzania and Thailand. National governments have submitted official requests with detailed budgeted proposals to receive financial and technical assistance from the Indian Ocean Consortium. The Consortium partners have started direct dialogue with their national counterparts with respect to the needs and the resources available. UN/ISDR secretariat supports the mobilization of resources to address the needs and gaps raised by the 11 national plans submitted to the Consortium for accelerated implementation.

▶ A new working group on disaster mitigation, preparedness and response was proposed during the 2nd meeting of the UNESCO/IOC Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning System (ICG-IOTWS), which was held in Hyderabad, India, 14-16 December 2005. The working group started a consultation process and prepared recommendations to the ICG on how to integrate tsunami early warning systems in disaster management and national development processes for the ICG to endorse and to be followed-up by national implementation. The sixth Working Group on Mitigation, Preparedness and Response has been officially adopted at the ICG-IOTWS-3 in Bali, August 2006.

▶ UN/ISDR secretariat and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), in cooperation with UNESCO/IOC and the members of the ISDR Asia Partnership, convened a Regional Workshop on Mitigation, Preparedness and Development for Tsunami Early Warning Systems in Bangkok, 14 - 16 June 2006. Over 130 Experts from the fields of technical tsunami early warning systems, disaster risk reduction and the development sector shared experiences in relation to integrating tsunami early warning systems into disaster risk reduction and development processes. Workshop outcomes helped to define the draft terms of reference for Working Group 6 of the ICG on Mitigation Preparedness and Response. The outcomes and the proposed terms of reference were endorsed by the ICG in its meeting in Bali, Indonesia, 31 July - 2 August 2006
http://www.unisdr.org/ppew/tsunami/pdf/Workshop_outcome_report14-16_June.pdf

▶ Workshop on the Human Impact of Tsunami and Disaster Risk Reduction was held in Bangkok from 16-17 June 2006, co-organized by ISDR secretariat, United Nations University-Institute for Environment and Human Security (UNU-EHS) and the Centre for Research on the Epidemiology of Disasters (CRED). Researchers presented studies on human vulnerability to tsunamis addressing the existing gaps in risk and vulnerability assessments. Researchers, policy-makers, and disaster management experts shared research findings and experiences from their work in tsunami-affected countries. The workshop also identified national and regional needs and priorities for future research and policy initiatives in order to sustain long-term disaster risk reduction work in the region.
http://www.unisdr.org/ppew/tsunami/pdf/Workshop_outcome_report.pdf

Monitoring - Reporting - Evaluation

- ▶ UN/ISDR-PPEW has launched the Tsunami Early Warning Information System (TEWIS) as a web-based database that contains information, documentation and contact details on the activities and initiatives supported by the current tsunami early warning strengthening initiative. The online information system was launched in September 2005 and is available on: <http://www.unisdr-earlywarning.org/tewis>
- ▶ UN/ISDR-PPEW produced quarterly reports and public information material highlighting general information on the project, selected achievements and progress, role of implementing partners, and acknowledging the contributions received from supporting donors. All progress reports and brochures of the project are widely disseminated and made available on: <http://www.unisdr-earlywarning.org/tsunami>
- ▶ UN/ISDR secretariat has ensured throughout the initiative of this project to keep the public, agencies, national governments, donors and other stakeholders informed of this multi-donor action and its accomplishments. Public information material was developed by the secretariat and widely disseminated in public international and regional meetings, websites and through our regional offices to regional and national networks. The following were produced to specifically highlight this initiative:
 - Brochure on the progress of the tsunami flash appeal initiative (December 2005). It was replaced (online with the updated one below).
 - Brochure on the progress of the tsunami flash appeal initiative (March 2006)
<http://www.unisdr.org/ppew/tsunami/news-events/tsunami-brochure.pdf>
 - Poster on the tsunami flash appeal initiative.
<http://www.unisdr.org/ppew/tsunami/news-events/Tsunami-poster.pdf>
 - Tsunami website at <http://www.unisdr-earlywarning.org/tsunami>
 - Tsunami online database of ongoing activities regarding tsunami early warning <http://www.unisdr-earlywarning.org/tewis>
- ▶ A mid-term review process was carried out to assess progress of the project in relation to its stated objectives and outputs as well as take stock of any challenges, concerns or risks. The 1st mid-term review meeting was held on November 25th, 2005 with participation of implementing partners and donors. The 2nd review meeting took place on December 7th, 2005 with the ISDR secretariat project team members including the ISDR-Asia regional team.
- ▶ UN/ISDR secretariat will coordinate an evaluation process to take place in 2007 following the closure of all Flash Appeal activities on 31 December 2006 and upon receipt of final reports by all implementing partners. The evaluation will be carried out by an independent consultant and will benefit from the contributions and inputs of key stakeholders, donors, and beneficiaries. The findings of the evaluation will be documented and communicated to all partners and donors as well as published publicly in the second half of 2007.

Follow-up Activities

The international, regional, and national efforts in response to the tsunami disaster provided a sound basis for strengthening early warning systems in the Indian Ocean region including substantial progress towards the development of capacities and intergovernmental processes. However, it is recognized that developing and strengthening effective early warning systems require investment and support in both the "hardware", i.e. technical equipment and "software", i.e. understanding and operating the system, understanding the risks and vulnerabilities, capacity building, knowledge transfer and coordination between policy makers, experts and general public specially at the community level.

The tsunami that hit Java in Indonesia on July 17, 2006 is a perfect illustration that Early Warning Systems need to be "people-centred" and that technology alone cannot save people. It is crucial to make sure that the information and alert messages get out to the last persons and that they know what to do. The strengthening of national capacities is of major importance in that respect having in mind that the Indian Ocean Tsunami Early Warning System is dependent on the national capacities for the diffusion of the alert-messages to the population living in the coastal areas.

UN/ISDR secretariat is ensuring a follow-up to this initiative to capitalize on the increased level of awareness by national governments, local communities, and regional intergovernmental organization. Disaster risk reduction is essential to sustain development investments and reduce vulnerabilities of populations to the risk of natural calamities. A "Strategy for Building Resilience to Tsunamis in the Indian Ocean for 2006-2008" to sustain a systematic comprehensive people-centered early warning system has been developed by UN/ISDR secretariat, in its capacity and responsibility to facilitate the implementation of the Hyogo Framework, and in consultations with

partners and donors. The strategy aims to capitalize on achievements to date and ensuring the continuation of collective inter-agency efforts and enhanced linkages and partnerships. It will continue to support the development of the core warning system, while shifting the emphasis toward building resilience to tsunamis in the context of other hazards and disaster risk reduction.

This strategy has been presented to donors in January 2006, which was then followed-up by bilateral negotiations with the EC-Aid Cooperation Office (AIDCO). UN/ISDR submitted a proposal to AIDCO for financing a project on "Building Resilience to Tsunamis in the Indian Ocean", which was endorsed by the EC and a contribution agreement was signed with AIDCO in December 2006 for a 33 month operation that builds on the Flash Appeal initiative but with stronger linkages to disaster risk reduction and sustainable development.

In addition, UN/ISDR continues to provide guidance and support to national platforms, UN Country Teams, intergovernmental organizations, regional coordination mechanisms like UNESCO/IOC and the ICG for the Indian Ocean, UNESCAP and SAARC to ensure coherence and in the approach and effectiveness of collective efforts. UN/ISDR is ensuring linkages with other ongoing ISDR system initiatives such as the ISDR Indian Ocean Consortium, UNDP Regional Programme on Capacity-Building for Sustainable Recovery and Risk Reduction in Tsunami Affected Countries, the ongoing efforts led by UNESCO/IOC and WMO to establish and operate a regional Indian Ocean Tsunami Early Warning System, the UNESCAP Multi-donor Voluntary Trust Fund on Tsunami Early Warning Arrangements in the Indian Ocean and Southeast Asia, and the Global Facility for Disaster Reduction and Recovery, which was launched in September 2006 jointly by the ISDR and the World Bank.

Acknowledgements

Partnerships and coordination have been strengthened across many UN agencies, regional and national organisations, research institutes, and local communities. Partners include the UN Educational, Scientific, and Cultural Organization (UNESCO), the UNESCO-Intergovernmental Oceanographic Commission (UNESCO/IOC), the World Meteorological Organization (WMO), the UN University Institute for Environment and Human Security (UNU-EHS), the UN Economic and Social Commission for Asia and the Pacific (UNESCAP), the UN Environment Programme (UNEP), the UN Development Programme (UNDP), the UN Office for Project Services (UNOPS), the Asian Disaster Reduction Center (ADRC), the Asian Disaster Preparedness Centre (ADPC), the Asia-Pacific Broadcasting Union (ABU), the Centre for Research on the Epidemiology of Disasters (CRED), the All India Disaster Mitigation Institute (AIDMI), Sustainable Environment and Ecological Development Society (SEEDS), and the University of Geneva.

Other partner organizations and institutes at the regional and national level have collaborated closely towards achieving the results of this initiative:

International Federation of Red Cross and Red Crescent Societies (IFRC), UN Office for Coordination of Humanitarian Affairs (UNOCHA), The World Bank, and UNESCO/IOC Intergovernmental Coordination Group for Tsunami Early Warning System in the Indian Ocean.

In Asia

UNESCAP; UNDP Regional Centre in Bangkok; UNESCO-International Tsunami Information Centre in Hawaii; Disaster Management Center of Sri Lanka; Geological Survey and Mines Bureau of Sri Lanka; National Disaster Management Institute of India; the State of Tamil Nadu-India; the city and district of Galle-Sri Lanka; National Coordinating Body for Disaster

Indonesian Institute of Sciences (LIPI); Indonesian Center for Disaster Mitigation Institute of Technology Bandung; local Padang-Indonesia community based organization (KOGAMI); University of Delhi-India; Tamil Nadu Voluntary Health Association-India; University of Colombo-Sri Lanka; the Sri Lankan Technical Committee for Disaster Early Warning; National Disaster Management Center of the Maldives; Telecommunication Authority of the Maldives; Maldives Department of Meteorology; Department of Meteorology and Hydrology of Myanmar; Meteorology and Hydrology of Myanmar; National Disaster Warning Center of Thailand; Asia Disaster Reduction and Response Network (ADRRN); and the environmental authorities of Indonesia, Maldives and Sri Lanka.

In Africa

IGAD Climate Prediction and Application Centre (ICPAC); Disaster Management Department, Tanzania; Local Authorities from Dar es Salaam, Tanga, Coast, Lindi and Mtwara, Tanzania; Federal Tanzania Meteorological Services; Ministry of Education, Tanzania; Civil protection Department, Comoros; Ministry of Education, Comoros; Geo-Physics Observatory Institute of University of Antananarivo, Madagascar; National Council of Emergency, Madagascar; National Meteorological Department, Madagascar; Ministry of Education and Scientific Research, Madagascar; National Disaster Secretariat in the Office of the President, Seychelles; Ministry of Education, Seychelles; Wildlife Club of Seychelles; Seychelles Meteorological Services; National Office for Disaster Risk Reduction, Djibouti; Ministry of Education, Djibouti; Red Cross, Mozambique; Ministry of Education, Mozambique; Ministry of Special Programmes, Office of the President, Kenya; Kenya Meteorological Department, Kenya Institute of Education; and National Disaster Management Centre, South Africa.



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