



International Strategy
ISDR
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

Progress Report – March 2006



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PARTNERSHIPS FOR BUILDING RESILIENCE TO TSUNAMIS

B A C K G R O U N D

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 mobilize 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 is funded through the *UN Flash Appeal for Indian Ocean Earthquake-Tsunami 2005* with generous contributions from the European Commission for Humanitarian Aid and the Governments of Finland, Germany, Japan, Netherlands, Norway, and Sweden. It is being **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 were 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 organizations; 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 management and policy planning.

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 problem, thus extending the reach and effectiveness of inputs and resources. UN/ISDR-PPEW provides the **overall coordination** of this initiative with emphasis on the strategic overview, planning, monitoring and evaluation, facilitating partnerships, meeting donor requirements, and disseminating information. PPEW also undertakes specific activities related to the mandate of ISDR and the overall Hyogo Framework aim of building the resilience of people to disasters.

Partnerships and coordination have been strengthened across many UN agencies, regional and national organizations, research institutes, and local communities. Partners include the UN Educational, Social, and Cultural Organization (UNESCO), the UNESCO-Intergovernmental Oceanographic Commission (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 (UN-ESCAP), 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 Center (ADPC), the Asia-Pacific Broadcasting Union (ABU), the Center for Research on the Epidemiology of Disasters (CRED), the All India Disaster Mitigation Institute (AIDMI), and the University of Geneva.

PROGRESS and ACHIEVEMENTS

I. Core System Implementation:

- **“Common Statement”** by countries participating in a special session¹ of the World Conference on Disaster Reduction (WCDR), including those affected by tsunami’s tragedy, recognized the importance of bolstering national systems and sharing experiences on disaster relief, post-disaster rehabilitation and natural disasters. The statement also recommended that necessary regional disaster mechanism be established and strengthened as soon as possible for all relevant natural hazards, which should include early warning systems, collaborative regional centers, and use of modern science and technology. The full text of the common statement is available on: <http://www.unisdr.org/wcdr/intergover/official-doc/L-docs/special-session-indian-ocean.pdf>
- A **scoping meeting** on the development of tsunami early warning systems was held in Kobe on January 22nd, 2005 immediately after the WCDR. Organized by ISDR secretariat and UNESCO-IOC, this ad-hoc technical meeting included national representatives, UN organizations 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 discussion on the roadmap to establish a tsunami early warning system in the Indian Ocean.
- Set-up of an **interim tsunami advisory information system** involving the exchange of seismic data and tsunami advisory information to twenty-six national focal points in the Indian Ocean receiving advisory information from Japan and Hawaii tsunami centers. This interim system was partly effective when a major earthquake occurred in Sumatra on 28 March 2005.
- Designation of **national focal points for tsunami early warning** in twenty-six countries in the Indian Ocean, which contributes to the enhancement of national coordination mechanisms, and the strengthening of an effective regional early warning system.
- **Regional agreement** has been reached on the general design and management of a regional early warning system for the Indian Ocean. This major achievement was the result of a series of international intergovernmental meetings convened by UNESCO-IOC in Paris (March 2005) and Mauritius (May 2005), which generated necessary consensus and regional agreement on building a distributed, interconnected tsunami warning system.
- **Policy dialogue** for high level administrative policy makers on establishing a Tsunami Early Warning System in the Indian Ocean was organized by ISDR secretariat and ADRC in February 2005 with twenty-four participants from eleven countries in the Indian Ocean region.
- **Study tours for national experts** from twenty-six Indian Ocean countries were organized by UNESCO-IOC, ISDR secretariat, and ADRC to allow national experts visit and observe existing tsunami early warning systems in Japan and Hawaii during July 2005. Participants have enhanced their knowledge and capacity to identify requirements for national tsunami warning and mitigation systems, and the knowledge gained is already being put into practice in setting-up national tsunami early warning centers and providing public information products.

¹ 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.

- Review and strengthening of the **Global Telecommunication System (GTS)** – coordinated by WMO – is ongoing to support the exchange and distribution of Indian Ocean Tsunami Warning System alerts and related information, including for the interim tsunami advisory information. WMO expert teams carried out assessment missions in several countries to upgrade the national GTS components. This will have the added long-term advantage of providing the basis for an all-hazards information exchange system in the future. More funds have been requested from donors for full implementation of the GTS.
- 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 IO countries to support tsunami early warning system. The meeting also identified the IO countries needing assistance for GTS upgrade.
- **Sixteen needs-assessment missions²** to Indian Ocean countries were organized by UNESCO-IOC, ISDR secretariat, WMO and other organizations between May and September 2005, 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 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 Center – 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 is a fundamental basis for the monitoring and detection of tsunamis in the Indian Ocean.

II. Integrated Risk Management:

- A new working group on **disaster mitigation, preparedness and response** has been formed 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 in December 2005. The working group started a consultation process to propose recommendations to the ICG on how to integrate tsunami early warning systems in disaster management and national development processes for the next ICG meeting in June 2006.
- To address environmental dimensions of disasters, UNEP is coordinating a review of **environmental risk assessment methods** to identify environmental factors contributing to risk in coastal areas vulnerable to tsunamis. This initiative targets the capacity strengthening of environmental authorities in Indonesia, Sri Lanka, and Maldives towards the integration of environmental assessment and monitoring systems in national disaster risk reduction and early warning systems.
- **Linkages** and synergies are promoted and strengthened between tsunami warning system, other hazard warning systems, and disaster management institutions through advocating integrated disaster risk management approaches, and promoting coordination mechanisms at regional, national and local levels.

² Sixteen countries have officially requested needs-assessment, and all those countries received a needs assessment mission and completed a national report. (Bangladesh, Comoros, Indonesia, Kenya, Madagascar, Maldives, Malaysia, Mauritius, Mozambique, Myanmar, Oman, Pakistan, Seychelles, Somalia, Sri Lanka, Tanzania, and Thailand)

- **Guideline** document for the implementation of the Hyogo Framework for Action 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.

III. Public Awareness and Education:

- Two **media-targeted regional workshops** were jointly organized by ABU and ISDR secretariat in 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. Further workshops at the national levels are planned, and broadcasters committed to producing locally-targeted public information material. Similar contacts have been developed with the European Broadcasting Union (EBU).
- A **public awareness and education workshop** was coordinated by ISDR secretariat in Bangkok in September 2005 involving participants from UN agencies, IFRC, national institutes, broadcasting agencies, and NGOs to share experiences and devise plans to implement public awareness campaigns and identified synergies for further coordination.
- The development of **tsunami awareness booklets** using an old Japanese tsunami educational story “Inamura-no-hi” in 8 countries in Asia is ongoing. Target countries include: Bangladesh, India, Indonesia, Malaysia, Nepal, Philippines, Singapore, and Sri Lanka. Five thousands booklets will be produced by ADRC in local languages tailored to adults and to children.
- A **perception study** in Indonesia is coordinated by ADRC to survey the level of tsunami awareness at the community level, schools, and national institutions. The study will build on ADRC perception studies for Sri Lanka and Maldives, and will be carried out between December 2005 and April 2006.
- A **video clip on disaster risk reduction**, “*Everybody’s Business*”, has been produced for TVE to emphasize that disaster reduction should be an integral part of every day’s decision making process and explaining how the Hyogo Framework for Action 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 will be translated in several languages for further dissemination in 2006. The video “*Everybody’s Business*” is available on: <http://www.unisdr.org/eng/media-room/media-room.htm>
- The **Disaster Reduction Field Library** initiative is being coordinated by 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 reduction to practitioners, researchers, local leaders and communities. Three sets of libraries were handed over to Indonesia and India in October 2005, with the goal of delivering 20 additional libraries throughout 2006.
- An information kit “**Tsunami Teacher**” is being finalized by UNESCO-IOC International Tsunami Information Center (ITIC). This information kit will provide a consolidated resource of new and existing, reliable and verified tsunami warning, response, and mitigation information and training modules aimed at stakeholder groups affected by or responsible for mitigating against tsunamis such as the media; education systems; government agencies; community groups; and the private sector. First module will be available by early 2006.

- The UNESCO-IOC/ITIC has revised and updated its most popular **educational materials** and additionally made them available in easily customizable electronic format for localization by countries. Those are available for download from the ITIC website. The publications include Tsunami the Great Waves, Tsunami Warning! Children Book, Tsunami Glossary, and a Tsunami Safety Poster. ITIC educational material is available on: <http://ioc3.unesco.org/itic/>
- 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 are 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 the disaster reduction. Issue II has been planned in consultations with members of the ISDR Asia Partnership and the ISDR Asia office, and will be published in March 2006.

IV. Community-based Approaches:

- With a focus on **community-based approaches**, UNDP country offices in India and Sri Lanka, and UNESCO country office in Indonesia started pilot initiatives to assess community-based mechanisms for disaster risk preparedness and to strengthen the dissemination mechanisms of early warnings to communities. In addition, those pilot initiatives will document and disseminate the lessons learned and good practices to inform other community-based preparedness and early warning systems in the Indian Ocean region.
- To inform policy for early warning and preparedness, **an epidemiological study of the human impact of the tsunami** in Tamil Nadu, India was carried out by CRED jointly with the University of Delhi and the Tamil Nadu Voluntary Health Association to develop better preparedness and mitigation policies through collecting evidence on risks factors related to the Indian Ocean tsunami and to contribute to the evidence-base for the global disaster reduction community on the human impacts of disasters. More information is available on: <http://www.cred.be/cred1/project/tsunamiintro.htm>
- Field studies of disaster risk management and **vulnerability assessment** were carried out by UNU-IEHS in Sri Lanka including the development of rapid vulnerability assessment techniques for the city of Galle. In addition, support has been provided to the Sri Lankan Technical Advisory Committee on Early Warning and Disaster Preparedness, including technical assistance in policy design, planning, mapping and duplicating experiences.
- The Danish Government hosted an international workshop in Copenhagen in 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.
- An international workshop on the **role of micro-finance in tsunami risk mitigation and recovery** was coordinated by AIDMI and ISDR secretariat in New Delhi in October 2005, bringing together key stakeholders in microfinance and disaster risk reduction fields. Participants learned about experiences of micro-credit role 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 is the first time that the concepts of microfinance and disaster risk reduction have been addressed concurrently at conceptual and operational level.

- **ISDR-Africa** is providing 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. Recognizing that the provision of post-disaster compensation is not sustainable or economical, the Government is accommodating a shift from ex-post to ex-ante disaster financing. 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.

V. Coordination and Partnership-building:

- A regional consultative meeting on **early warning for the east coast of Africa** was organized by ISDR-Africa office in Nairobi in October 2005 to inform participants from the region on tsunami matters, to share best practices and lessons learned on early warning, and to identify early warning gaps needs and in the east coast of Africa. The meeting resulted in increased knowledge of disaster risk reduction, particularly on early warning among participants and fostering of enhanced regional cooperation on early warning in the African Countries on the Indian Ocean.
- With support of ISDR-Africa, the **African Union Commission organized 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 and 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. To secure higher political endorsement on the subject, the AU Commission will bring the subject to the next Summit of Heads of Government scheduled in Sudan in January 2006.
- **ISDR-Africa** is documenting the impacts and lessons to be learned from the tsunami in Africa, to result in a **public documentary**. Filming, news footage compilation, and interviews have taken place in Kenya, Seychelles and Tanzania, as well as remote information gathering and interviews for Somalia. Lessons to be learned will include not only activities during the tsunami, but disaster reduction and early warning measures now being implemented. The final product is currently being edited.
- An initiative to document **lessons to be learned** is ongoing and coordinated by ISDR secretariat to identify gaps and draw good practices from the tsunami disaster and how disaster risk reduction can reduce tsunami impact. Reports from numerous organizations and actors have been compiled for review and summary to disseminate the information.
- 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 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 the Hyogo Framework for Action.

- A set of **recommendations to the UN Special Envoy** were submitted jointly by WMO, UNESCO-IOC and 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, and advocacy at high political level to encourage effective international and regional cooperation and real-time availability and sharing of data and information policies.
- Strengthening of UNESCO-IOC capacity through the **secondment of a senior Japanese tsunami warning system expert** from Japan Meteorological Agency (JMA) for two years. This assignment contributes to IOC work on tsunami risk reduction and capacity-building of the tsunami centers.
- **ISDR-Asia** outreach office has been 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.
- The ISDR secretariat, in coordination with UNEP-Division of Early Warning and Assessment (DEWA) and the Global Resource Information Database (GRID-Europe), have 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>

Monitoring - Reporting - Evaluation

In its overall coordinating and oversight capacity for this initiative, ISDR-PPEW has initiated a **monitoring and evaluation process** aiming at documenting accomplishments and challenges, facilitating information sharing and learning, assessing project progress and processes, and planning for future priorities. A reporting system has been introduced to help illustrate an effective and professional management of resources, not only by achieving results on the ground but also by reporting satisfactorily on the outcomes and of the contributions made. 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 with participation of implementing partners and donors. The 2nd review meeting took place on December 7th with the ISDR secretariat project team members including the ISDR-Asia regional team.

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 available on: <http://www.unisdr-earlywarning.org/tewis>

ISDR-PPEW is producing regular 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>

FUTURE STRATEGY

The UN Flash Appeal initiative to strengthen early warning systems in the Indian Ocean has provided a sound basis for the enhancement of early warning systems of the countries in the region. Yet, much more work remains to be done in order to build long-term sustained national capacities for resilience to tsunamis and to ensure the integration of these systems in development and disaster risk reduction strategies.

A “**Strategy for Building Resilience to Tsunamis in the Indian Ocean for 2006-2008**” to sustain a systematic comprehensive people-centred early warning system is being developed by the 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 capitalise 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.

In accordance with Hyogo Framework’s **goal**; “*Development and strengthening of institutions, mechanisms and capacities to build resilience to hazards*”, the future strategy identifies specific outcomes building on the ongoing tsunami early warning initiative, and addressing the needs and gaps identified in the national needs-assessment reports, as well as areas that require further enhancement on a long-term basis.

The **areas of intended outcomes** are:

1. **Disaster management** to support institutional capacity-building in disaster management.
2. **Public awareness** to facilitate the enhancement of public awareness regarding tsunami.
3. **Education** to support the strengthening of the education role in early warning.
4. **Community-based approaches** to support the strengthening of local communities' response capability.
5. **Early warning core system** support to support the completion of the current core system implementation plans.
6. **Tsunami risk assessment and mitigation** to facilitate the coordination of research development and risk assessment.