Workshop on the Human Impact of Tsunami and Disaster Risk Reduction
Bangkok, Thailand, June 16-17, 2006

Background:

Following the devastating disaster triggered by the December 2004 Indian Ocean earthquake and tsunami, numerous studies were undertaken to better understand the human impact of the disaster and to gather essential data for effective preparedness, mitigation, and response planning. While the predominant focus of these studies have been on geophysical aspects and technological solutions for early warning systems, the need to identify concrete risk factors for death, injury, disease and loss of livelihood has not been adequately addressed. These aspects are essential to informing disaster risk reduction measures and plans as well as strengthening the resilience of communities to disasters.

In response to this gap in research activities and findings, UN/ISDR has facilitated research activities funded by the UN/ISDR-coordinated multi-partner initiative “Evaluation and Strengthening of Early Warning Systems in countries affected by the 26 December 2004 Tsunami”. This initiative has been an integral component of the international community’s response to the tsunami disaster through a UN Flash Appeal project. The UN/ISDR-coordinated initiative received funding support from several donors including the European Commission Office for Humanitarian Aid (ECHO) and the Governments of Finland, Germany, Japan, Netherlands, Norway and Sweden. Aiming at strengthening people-centred early warning systems, this initiative has attempted to address noticeable gaps in risk and vulnerability assessment through targeted studies undertaken by the United Nations University Institute for Environment and Human Security (UNU-EHS) and the Centre for Research on the Epidemiology of Disasters (CRED). Those research activities were carried out in Sri Lanka and in India respectively and in close collaboration and partnership with local universities.

Research findings and studies resulting from the field research activities provide essential information and data for national and local authorities as well as development and disaster management organizations. Such information will help develop long-term strategies integrating the results from research into future disaster risk reduction strategies and development planning to strengthen the resilience of nations and communities to disasters.
Workshop on “The Human Impact of Tsunami and Disaster Risk Reduction”:

In order to ensure valuable use and effective dissemination of the research findings, the UN/ISDR secretariat, UNU-EHS, and CRED have organized a workshop on “The Human Impact of Tsunami and Disaster Risk Reduction”, which was held in Bangkok, Thailand in June 16-17, 2006. Researchers, policy-makers, and disaster management experts were invited to learn about the research findings and share experiences from their work in tsunami-affected countries as a means for strengthening information exchange between the multiple disciplines contributing to disaster risk reduction. By utilizing a multi-disciplinary approach, the goal of the workshop was to produce informed policy recommendations which are essential to sustaining long-term disaster risk reduction plans. In specific, the workshop aimed at:

i) Sharing the main findings of current studies and research on the human impact of tsunami in the Indian Ocean;
ii) Developing policy recommendations based on the results of the studies towards building resilience to tsunamis;
iii) Identifying priorities and needs for future initiatives targeting research and capacity building;
iv) Exploring future collaboration mechanisms between the research community and the policy-making community.

Presentations

The workshop presented four research studies on different aspects of people’s vulnerability to tsunamis. The presented findings formed the basis of the workshop discussions and were translated into recommendations for future strengthening of communities’ resilience to tsunamis.

Jörn Birkmann of UHU-EHS presented findings from the organisation’s research on “Vulnerability Assessment in Sri Lanka at the Local Level”.

Debarati Guha-Sapir from CRED presented findings from a study of “Risk Factors for Mortality and Injury: Post-tsunami Epidemiological Findings from Tamil Nadu”.

Dr. Courland Robinson from Johns Hopkins University presented findings from a study on “Tsunami Mortality and Displacement in Aceh Province, Indonesia”.

Dr. Juan Carlos Villagrán de León (UNU-EHS) presented findings from a study on the “Elements to develop a Tsunami Early-Warning Plan for the City of Galle in Sri Lanka”.

Summaries of the research studies along with the power-point presentations given by each researcher are provided at http://www.unisdr.org/ppew/
Workshop Recommendations:

In order to further strengthen regional, national and local disaster risk reduction capacities and tsunami early warning system implementation, the participants identified priority areas for further research and initiatives towards enhancing community response capabilities and institutional capacity building. The workshop developed the following recommendations:

A – Institutional Capacity:

- Early warning systems that take into count local levels of poverty, literacy, and technology, need to be incorporated into general frameworks of disaster risk reduction.
- Researchers need to distil their findings down to understandable and practical levels of detail (with respect to tools, techniques, models, indicators, assessment) in order to provide digestible action-oriented recommendations which can be translated into action.
- Decisions on funding and policy should where possible be evidence-based and take situation specific data into account.
- As in long-term disaster risk reduction processes media plays a critical role in the dissemination of information in situations of immediate emergency response. Therefore, it is important that such information is accurate and respects the complexity of emergency situations. Relief agencies should support media actors by reporting the facts without sensationalizing their findings and researchers need to be more engaged in preventing ill-informed media coverage that pushes resources into wrong areas.
- Government institutions and the research community need to cooperate more closely in order to establish national-level inventories to identify completed, ongoing, or proposed research on risk and vulnerability. This helps policy-makers identify networks which they can build upon but also ensures that researchers do not duplicate efforts and do not exhaust the communities with excessive studies.
- Reducing vulnerability of critical infrastructure (e.g. schools and hospitals) in the reconstruction process should be acknowledged and promoted as an important goal for disaster risk reduction.
- Government institutions should consider promoting and funding the establishment of scientific research forums on disaster risk reduction.
Universities need to be encouraged to promote research activities in the field of natural hazards.

Cost-benefit analyses of disaster risk reduction should be further promoted and disaster risk reduction initiatives need to become closely linked to regional and national development processes and mechanisms such as PRSPs, CCA/UNDAF etc.

B – Community Response/Public Awareness:

- Governments need to utilize local expertise to identify vulnerable groups (e.g. women, children, elderly) within the community and develop local support structures. Special attention should be given to orphaned children who lost primary caretakers and address their nutrition, morbidity and psychological aspects.
- The level of community awareness needs to be raised by practical training and school education. This includes strengthening of swimming skills, first aid, and knowledge of hazard identification.
- Communities need to participate in the formulation of policies on early warning system development and risk mapping, to ensure accessibility and sustainability. For this reason community-based organizations and non-governmental organizations should be involved in the development of community response capacity programmes.
- Public awareness campaigns need to acknowledge and nurture the existing models for resilience that are found at household level.
- Encourage cooperation between communities, local governments and local experts to assist in identifying communication gaps.
- Government-imposed ‘buffer zones’ need to take into account specific local context.

C – Future Research Needs:

- Need to strive for greater consensus on the definitions and terminology used in respect to risk reduction/vulnerability/mitigation/hazard assessment etc.
- While the need for assistance in sudden onset disasters is most critical within the first 24 hours, the research community needs to identify ways to strengthen local capacity and establish protocols for survivors as first responders.
- There is a need to evaluate the effectiveness of early warning systems and identify gaps in performance or in individuals’ interpretations of warnings.
• Risk assessment needed to prioritize likely impact and frequency of risk. Preparedness measures tend to be effective across different hazard types.
• There needs to be an assessment of community-based disaster recovery programs because often better than urban. Research policy differences between urban and rural.
• There is a need for a multi-hazard approach to identify which and how many communities are vulnerable, to what, and to which specific hazards on a more local level.
• It is important to increase the use of an interdisciplinary approach linking epidemiological studies with long-term urban development and the redesigning and redevelopment of communities.
• More detailed research is needed in the following areas:
  - the patterns of survival and morbidity across disasters and the underlying causes of differences among vulnerable groups;
  - the vulnerability of those communities who in addition to natural hazards such as tsunami may also be subject to more complex vulnerabilities such as armed conflict;
  - long-term recovery impacts;
  - the applicability of indicators in different fields;
  - the gaps in preparedness for single and multiple hazards on community and national level;
  - models, procedures, and strategies for integration of disaster risk management into social and economic development.

**Concluding discussion**

The workshop participants acknowledged the fact that the presented studies represent highly-specific case studies and questions remain as to how conclusions can be extrapolated that are relevant in more general hazard situations. Adding vulnerability assessments to the distribution of maps of damage patterns could be applied to more generalized scenarios but policy-makers need generic findings relating to daily risk within a multi-hazard context. The tsunami was an atypical situation so mortality figures generated may not be as useful for decision-making purposes. Consequently, damage research may provide more tangible lessons that are useful in future disaster risk reduction activities.

The workshop stressed that research needs to continue to provide sufficiently accurate disaggregated data and propose underlying causes for differences in gender-based mortality. Research also needs to look at both urban and rural communities in assessing vulnerabilities,
taking into account that while rural communities may be more vulnerable, the stronger social networks in rural communities may improve resilience. Issues regarding attachment to place, especially for IDP’s, need to be addressed. The participants also recognized that in some tsunami-affected countries (such as Thailand) mortality figures were skewed by the presence of foreign tourists. With an increasingly transient global population researchers and disaster reduction practitioners need to work on how to factor these populations into vulnerability assessments in a way that can be fed back to governments. While most of the discussions focused on the affects of the tsunami in Southeast Asia it was also noted that the lack of risk assessments to determine vulnerability of areas along the tsunami affected African coast needs to be addressed. In addition, participants stressed the importance of extending research studies to include other parts of the world.
Annex I - Methodological discussion.

Methodological issues were discussed during a closed scientific roundtable held on the morning of June 16th, 2006.

Different methodologies employed were discussed and the utility of each debated. Simple random sampling was a preferred method as it provides for a more representative sample. In Tamil Nadu simple random sampling was used as it is the most robust method and because accurate lists were provided of all households within the sampling universe. However where a sampling frame is not available it was suggested that either a simple or modified cluster approach is feasible if not more complex. In Tamil Nadu the questionnaire used was created with the intention of triangulating with risk factors identified during the focus group discussions. In hindsight the focus groups should have preceded questionnaire development.

The study in Galle attempted to classify different built environments and determine individual vulnerability in settlements by creating a classification system for density/quality. However in Galle diverse structures with few areas of homogenous construction types made it difficult to apply a methodology to classify structures. The study also used the governmental 100m buffer zone as a means of estimating vulnerability and to assess whether the 100m zone was a useful tool. However it was determined that elevation maps might be more appropriate rather then distance from the coast as they give a better idea of inundation.

Questions were raised as to how to assess transient populations such as IDPs for whom there may not be accurate records but who are likely to be affected and continue to prove difficult to provide relief.

Bias
Researchers acknowledged that all studies potentially suffer from survivor bias. In the case of the Tamil Nadu study however, survivor bias was not considered a major issue because government records suggested that none of the families in the sampling frame lost every member. Other researchers raised the concern that they considered this an unlikely situation. However the lack of alternative information sources means that it is not always possible to cross-check government records.
Questions were raised about the definition of family and the comparability of households. The Tamil Nadu study used data from the time of the tsunami which was suggested to be representative for the day of the tsunami but household composition may have changed post-tsunami. Survey questionnaire in Galle used census data to randomly select families based on the destruction they experienced. However in Tamil Nadu ration cards had to be used to generate lists of families. Interestingly household average size in Batticoloa was smaller then in Galle complicating comparability.

Data needs
In developing surveys it was found that there was a lack of reliable previous research to indicate which variables to include and thus often too many variables were included. Rapid assessment tools were found to be useful but often provide operational indicators not scientific. Measures such as death to injury ratios are important because they facilitate the estimation of the number of injured to dead and therefore have important implications for emergency preparedness and response. While operational indicators are important, scientific indicators have a place in emergency management. Questions were raised as to whether it would be possible to disaggregate mortality data to determine how either the earthquake or the tsunami influenced mortality.
Annex II

LIST OF PARTICIPANTS

BANGLADESH

Ms. Afroza PARVEEN, Senior Assistant Secretary, Ministry of Food and Disaster Management, Building 4, BGD Sectt, Dhaka
Tel: +880 2 7161031; Fax: + 880 2 7165405; Email: mof@bttb.net.bd

INDIA

Mr. Naveen VERMA, Joint Secretary (Disaster Management II), Ministry of Home Affairs, Room No 210 A North Block, New Delhi
Tel: +230 92478; Fax: +230 92478; Email: n.verma@nic.in

KENYA

Mr. Shem Ishahilidza AMADI, Director, National Operations Centre for Disaster Management, P.O. Box 30510, 00100-GPO, Nairobi
Tel: +254 20210077; Fax: +254 2210077; Email: coamadi@yahoo.com

MALDIVES

Mr. Mohamed NAZIM, National Disaster Management Centre, NDMC, Ministry of Defense, Male
Tel: 960 3322607; Fax: 960 3322901; Email: axcym@defence.gov.mv, naxcym@hotmail.com

THAILAND

H.E. Mr. Smith DHARMASAROJA, Vice Minister to the Office of Prime Minister, Chairman of the Committee for the Development of an Early Warning System, Chairman of the Committee for the National Disaster Warning Administration, Government of Thailand
Tel: (662) 2807163; Fax: (662) 2807164; Email: kk_kajon@hotmail.com

Mr. Wanchai SIGNTHONG, National Disaster Warning Centre, Rattanatibet Rd., Bangkrasor, Muang, Nonthaburi 11000, Thailand

Mr. Pisnupong ANURATPANICH, Meteorologist, National Disaster Warning Centre, Rattanatibet Rd., Bangkrasor, Muang, Nonthaburi 11000, Thailand

THAILAND (Cont’d)

Mr. Cherdsak VIRAPAT, Chief, International Coordinator, National Disaster Warning Centre, Rattanatibet Rd., Bangkrasor, Muang, Nonthaburi 11000, Thailand
PAKISTAN

Mr. Qamar-Uz-Zaman CHAUDHRY, Director General, Pakistan Meteorological Department
Email: dgmetpak@hotmail.com, tsupmd@yahoo.com

SRI LANKA

Mr. Gamini HETTIARACHCHI, Director General, Disaster Management Centre, Sri Lanka, Room No. 2-222, BMICH, Bauddhaloka Mawatha, Colombo 07, Sri Lanka
Tel: (94-11) 2670070; Email: dgdmcsl@gmail.com

TANZANIA

Mr. Bakari SHABAN, Director, Department of Disaster Management, Prime Minister's Office, P.O. Box 3021, Dar-es-Salaam
Tel: +255 22 2117266, 255 74 4384125; Email: disaster@pmo.go.tz
## UN BODIES

| United Nations Development Programme (UNDP) | Mr. Pablo TORREALBA  
Region Risk Reduction Specialist  
UNDP Regional Centre  
UN Service Building, 4th Fl., Rajdamnern Nok Ave., Bangkok 10200 GPO Box 618, Bangkok 10501 Thailand  
Tel: (662) 288 2674  
Fax: (662) 288 3032  
Email: pablo.torrealba@undp.org |
|---|---|
| United Nations Office for the Coordination of Humanitarian Affairs (OCHA) | Mr. Terje SKAVDAL  
Head. a.i.  
OCHA Regional Office for Asia and Pacific  
UN Conference Centre, 2nd Floor  
Rajdamnern Nok Ave., Bangkok 10200, Thailand  
Tel: (662) 288 2425  
Fax: (662) 288 2425  
Email: skavdal@un.org |
| United Nations Population Fund (UNFPA) | Mr. Wasim Zaman  
UNFPA  
Email: zaman@unfpa.org  
Mr. Edward JONGSTRA  
UNFPA  
Mr. Viennarat CHUNGWIWAT  
UNFPA  
Email: viennarat@unfpa.un.or.th |
INTERGOVERNMENTAL ORGANIZATIONS

Asian Development Bank (ADB)  
Mr. Neil Richard BRITTON  
Senior Disaster Risk Management Specialist  
ADB  
No.6 ADB Avenue, Mandaluyong City 1550  
Metro Manila, Philippines  
Tel: (632) 6325202  
Fax: (632) 6362093  
Email: nbritton@adb.org

OTHER ENTITIES

ADPC  
Arghya Sinha Roy  
Project Coordinator  
Disaster Management Systems (DMS)  
PO Box 4 Klong Luang, Pathumthani 12120 Thailand  
Tel: +662 5165900 ext 301  
Fax: +662 5245360  
Email: ajrego@adpc.net

ADRC  
Mr. Akihiro TERANISHI  
Senior Researcher  
Hitomiraikan 5F  
1-5-2 Wakinohamakaigan-dori  
Chuo-ku, Kobe, 651-0073 Japan  
Tel: +81 78 2625540  
Fax: +81 78 2625546  
Email: teranishi@adrc.or.jp

Beijing Normal University, China  
Ms. Li Ning

Eastern University  
Mr. Thangamuthu JAYASINGAM,  
Eastern University, No. 30, Charles Velupillai Road  
Kannady, Batticaloa, Sri Lanka  
Tel: (00945) 2240490; Fax: (00945) 2240758 ; Email: jay_one@sltnet.lk
HumanitarianInfo Center for Sri Lanka (HIC)          Mr. Srimal P. RANKOTHGE
HIC, Ground Fl. District Secretariats Building
Galle, Sri Lanka Tel: +94-77-7258331(mobile), +94-91-2248171 (office)

International Federation for Mr. Ian Odonnell
Red Cross and Red Crescent (IFRC) IFRC

John Hopkins University                Mr. Courtland ROBINSON
John Hopkins School of Public Health Email: croblinso@jhsph.edu

Nagasaki University                   Mr. Nobuyuki NISHIKIORI
Research Center for Tropical Infectious
Diseases Nagasaki University, Japan Email: nobu@net.nagasaki-u.ac.jp

OXFAM                                 Mr. Ines SMYTH
Gender Advisor, Policy Department. OXFAM

Tsunami Evaluation Committee          Mr. John COSGRAVE
Email: j.cosgrave@odi.org.uk

Badan Meteorological dan Geofisika    Mr. Fauzi
Indonesia Engineering Seismology and
Tsunami Division Badan Meteorologi dan Geofisika
Jakarta 10720, Indonesia Email: fauzi@bmg.go.id

University of Delhi                   Mr. PC JOSHI
University of Delhi, India Email: pcjoshi@anthro.du.ac.in

University of Ruhuna                  Mr. Nishara Fernando
Department of Sociology Colombo-03
Sri Lanka Tel: (00941) 0785 658 515 mobile
Fax: (00941) 730197
Email: nishara2000@yahoo.com

Mr. Sarath AMARASINGHE
Dept. of Sociology
Tel: +94 41 2792202, +94 71 302 7775
Email: sarath@mail.ruh.ac.lk

Unit for Social Environmental Research  Mr. Lebel LOUIS
Voluntary Health Association  Ms. JP Sauluia Arnold
Tamil Nadu, India  Email: tnvha@md2.vsnl.net.in

UN/ISDR Secretariat

Mr. Reid BASHER  Senior Coordinator, UN/ISDR, Palais des Nations, CH 1211 Geneva 10, Switzerland
Tel: (41 22) 91 72788
Fax: (41 22) 917 0563
Email: reid.basher@un.org

Mr. Yuichi ONO  Programme Officer/Acting Coordinator, UN/ISDR Platform for the Promotion of Early Warning, 30, Bonn, 53113 Germany
Tel: (49) 2282498812
Fax: idem 2498888
Email: onoy@un.org

Ms. Stefanie DANNENMANN  Programme Officer, UN/ISDR Platform for the Promotion of Early Warning
30 Bonn, 53113 Germany
Tel: (49) 2282498813
Fax: idem 2498888
Email: dannenmann@un.org

Ms. Luna ABU-SWAIREH  Programme Officer, UN/ISDR Platform for the Promotion of Early Warning
30 Bonn, 53113 Germany
Tel: (49) 2282498814
Fax: idem 2498888
Email: abu-swaireh@un.org

Mr. Patrick KRATT
Associate Expert (JPO), UN/ISDR Platform for the Promotion of Early Warning
30 Bonn, 53113 Germany
Tel: (49) 2282498817
Fax: idem 2498888
Email: kratt@un.org

Ms. Carolin SCHAERPF
Associate Programme Officer, UN/ISDR Platform for the Promotion of Early Warning, 30, Bonn, 53113 Germany
Tel: (49) 2282498818
Fax: idem 2498888
Email: schaerpf@un.org

Mr. Joseph CHUNG
Senior Regional Advisor, UN/ISDR Regional Programme for Asia and Pacific, United Nations Conference Centre, Rajadamnern Nok Ave., Bangkok 10200, Thailand
Tel: (662) 288 2750
Fax: (662) 288 1050
Email: chung2@un.org

Ms. Christel ROSE
Regional Programme Officer, UN/ISDR Regional Programme for Asia and Pacific, United Nations Conference Centre, Rajadamnern Nok Ave., Bangkok 10200, Thailand
Tel: (662) 288 2766
Fax: (662) 288 1050
Email: rosec@un.org

UNU-EHS Secretariat

Mr. Joern BIRKMANN
UNU-EHS, Goerresstr. 15
D-53113 Bonn, Germany
Tel: +49 228 422855-03
Fax: +49 228 422855-99
Email: Birkmann@ehs.unu.edu
Mr. Juan Carlos VILLAGRAN
UNU-EHS, Goerresstr. 15
D-53113 Bonn, Germany
Tel:+49 228 422855-13, +49 228 422855-99
Email: villagran@ehs.unu.edu

Ms. Ilona ROBERTS
CRED Secretariat

Ms. Debarati GUHA-SAPIR
Email: Sapir@esp.ucl.ac.be

Ms. Lian PARRY
Email: Lian.Parry@esp.ucl.ac.be

Mr. Olivier DEGOMME
Email: Olivier.Degomme@esp.ucl.ac.be

Ms. Elizabeth TSCHOEGGL
Email: Elizabeth.Tschoegl@esp.ucl.ac.be
Annex III

**Workshop agenda**

**Friday 16 of June**

**Venue:** United Nations Conference Centre (UNCC), in Meeting Room 4, level 1.

- 08.30-09.30  Registration
- 09.30-12.30  *Scientific roundtable (Closed session)*
- 14.00-14.10  **Opening of workshop.** Dr. Reid Basher, UN/ISDR
- 14.10-14.30  **Presentation of Study 1:** Measuring Vulnerability in Sri Lanka at the Local Level, Dr. Joern Birkmann, United Nations University (UNU-EHS).
- 14.30-14.50  **Presentation of Study 2:** Risk Factors for Mortality and Injury: Post-Tsunami Epidemiological Findings from Tamil Nadu. Prof. Debarati Guha-Sapir, Centre for Research on the Epidemiology of Disasters (CRED).
- 14.50-15.30  Panel discussion on Study 1 & 2
- 15.30-15.45  Coffee Break
- 15.45-16.05  **Presentation of Study 3:** Tsunami Mortality and Displacement in Aceh Province, Indonesia. Prof. Courtland Robinson, John Hopkins University.
- 16.05-16.25  **Presentation of Study 4:** Strengthening Early Warning Systems (*TBC*). Dr. Juan Carlos Villagrán de León, United Nations University (UNU-EHS).
- 16.25-17.00  Panel discussion on Study 3 & 4
- 17.00-17.30  Open discussion.
- 17.30  Closing of session.

**Saturday 17 of June**

**Venue:** Prince Palace Hotel, 488/800 Bo Bae Tower, Damrongrak Road.

- 09.00-09.15  Overall summary of research findings
- 09.15-10.30  **Development of policy recommendations**
  Break-out group discussions
- 10.30-10.45  Coffee Break
10.45-11.30  Presentation of break-out group’s policy recommendations
11.30-12.30  Open discussion and consent on policy recommendations
12.30-14.00  Lunch
14.00-15.30  Identifying future national needs and priorities for building resilience to tsunami.
15.30-15.45  Coffee break
15.45-16.45  Exploring existing national, regional and international frameworks for strengthened cooperation between the research community and the policy making community.
16.45-17.00  Closing of workshop