



**NATIONAL ACADEMIES FORUM (NAF)  
REPORT ON THE WORKSHOP:**

**“AFTER THE TSUNAMI –  
HARNESSING AUSTRALIAN  
EXPERTISE FOR RECOVERY”**



Photograph courtesy of Dr Jes Sammut.



Photograph courtesy of Rotary International Indonesia.

**CANBERRA, 31 MARCH 2005**





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## FOREWORD

The National Academies Forum (NAF) is the peak body of Australia's four learned Academies. One of its most important roles is to harness the national expertise across the natural and social sciences, humanities and engineering for advice to government on important cross-cutting interdisciplinary issues such as disaster management and recovery.

The Australian Academies, individually and collectively through NAF, have focused a lot of attention on natural disaster reduction over the past 30 years, including the major NAF-sponsored Gold Coast Conference in 1996 as a mid-decade assessment of Australia's contribution to the IDNDR (International Decade for Natural Disaster Reduction).

One major outcome of the IDNDR, and especially of Australia's contribution to it, was the much greater emphasis that now exists worldwide on risk assessment, preparedness and disaster prevention, through capacity building, implementation of warning systems and the like.

Yet even in the wake of the huge achievements of the IDNDR, the tsunami of 26 December produced a loss of life that was more than an order of magnitude larger than anything from a similar event during the 20th century.

We are all well aware that enormous numbers of meetings and studies have been going on around the world since 26 December 2004, focusing both on the immediate recovery process and on learning the long-term lessons from the Indian Ocean tsunami. Much is happening bilaterally and multilaterally under the auspices of the ISDR (International Strategy for Disaster Reduction), GADR (the Global Alliance for Disaster Reduction), and the responsible UN agencies such as the IOC (Intergovernmental Oceanographic Commission) of UNESCO.

The NAF group, which organised this workshop, in collaboration with the Department of Education, Science and Training (DEST) and with the support of the ARC (Australian Research Council), CSIRO and others, saw our particular task as that of exploring and assessing how Australian expertise in the sciences, humanities, technologies and engineering – and especially those in the academic communities and other non-government sectors not readily accessed by government through other channels – can be most effectively brought to bear, both on the current process of recovery and for the long term.

We were able to bring together a great program of speakers to set the scene and breakout group chairs and rapporteurs to draw all the ideas together across the disciplines. On behalf of my colleague Academy Presidents, Dr Jim Peacock, Professor Sue Richardson and Professor Graeme Turner and the NAF organisers of this workshop, I thank all those who participated.

I commend the conclusions and recommendations of the workshop for consideration by all those concerned with harnessing Australian expertise for disaster recovery.

John W Zillman  
President of NAF

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Canberra, 31 March 2005

*The National Academies Forum is the coordination and consultation mechanism for the four Australian learned academies—the Academy of the Social Sciences in Australia, the Australian Academy of Science, the Australian Academy of Technological Sciences and Engineering and the Australian Academy of the Humanities. It was established in 1995 to succeed the former Consultative Committee of the Australian Committees .*

### Introduction

The magnitude 9.3 earthquake in the Indian Ocean off Sumatra on 26 December 2004 resulted in a massive tsunami. It caused catastrophic loss of more than 300,000 people and inflicted major damage to infrastructure, property and the environment of many coastal and island nations of the Indian Ocean—principally Indonesia, Sri Lanka, Thailand, India, Africa and the Maldives.

In response to this large-scale international disaster, the National Academies Forum (NAF), in collaboration with the Department of Education, Science and Training (DEST), organised a one-day workshop at the Shine Dome, Canberra on 31 March 2005. The aim was to consider how Australian science, technology, social science and humanities could impact on three key aspects of dealing with disaster—preparedness, recovery and rehabilitation.

### Organisation of the Workshop

The Workshop was attended by approximately 100 natural disaster experts and other participants from academia, government, industry and the community at large. It was chaired by the President of the National Academies Forum, Dr John W Zillman AO FTSE and opened by the Hon Bruce Billson MP, Parliamentary Secretary to the Minister for Foreign Affairs and Trade, with an opening address delivered by the Hon Tim Fischer AC FTSE, former Deputy Prime Minister and Chairman of the ATSE (Australian Academy of Technological Sciences and Engineering) Crawford Fund. Following the opening address, the workshop involved four sessions

1. Setting the scene – a series of expert presentations covering:
  - disasters – understanding the phenomenon;
  - disaster recovery – processes, implications and management;
  - cultural and economic aspects of disaster;
  - learning from the PNG tsunami;
  - the Indian Ocean tsunamis – science and seismics
  - progress in the Maldives and global coral reef recovery; and
  - the human face of disaster.

2. Eight breakout groups dealing with:
  - warning and preparedness;
  - sustainable reconstruction;
  - health systems;
  - continuity of knowledge;
  - governance and policy;
  - longer term issues – economic, social, cultural and environmental;
  - technology and ICT for rehabilitation; and
  - understanding and harnessing community response.
3. Report back and general discussion
4. The way forward

The program of speakers and presentations is at Appendix 1.

The outcome from the Workshop can be summarised in terms of:

- the major conclusions from the eight individual breakout group discussions; and
- a synthesis of conclusions and recommendations from the group discussions which were brought together by the rapporteurs into a set of seven overarching recommendations;

as set out below.

## **Major Outcomes**

### **Warning and preparedness**

The three main components to ‘warning’ are: issuing a tsunami forecast, transmitting the tsunami warning/forecast to coastal communities and ensuring the public knows what action to take. There are a series of steps in moving from an earthquake to a tsunami impact forecast, and each requires significant scientific and modelling expertise (which Australia possesses). False warnings can be a problem, as they may lead to complacency. But it is vital that a tsunami early warning system (TEWS) transmits any alert to all relevant coastal communities.

Post-tsunami, the World Meteorological Organization (WMO) has joined forces with the Intergovernmental Oceanographic Commission of UNESCO (UNESCO-IOC), the UN International Strategy for Disaster Reduction (ISDR) and other key agencies to develop a tsunami early warning system in the Indian Ocean and other regions at risk. Since 1968 UNESCO-IOC has coordinated the development of the highly effective Tsunami Warning System in the Pacific (TWSP). WMO’s Global Telecommunication System (GTS) interconnects the world’s National Meteorological and Hydrological Services, enabling the timely and reliable exchange of warning messages and related information. The TWSP already makes use of this system, and WMO is working to make it fully operational for tsunami and seismic applications in vulnerable areas worldwide.

Australia already has a sophisticated communication infrastructure, used to issue warnings of severe weather and storms to all involved in emergency management.

***Our expertise in the appropriateness of different message dissemination techniques for different types of communities is a valuable resource for other Indian Ocean countries.***

Tsunami are infrequent events, nevertheless long-term public awareness programs are an essential component of a TEWS. Those most at risk live in high-density coastal settlements and isolated coastal communities, and inevitably have low levels of technology. Any education program must incorporate basic tsunami information, facts on how a community should prepare for such an event and how to act when a tsunami warning is received. Preparedness involves identifying the level of risk and implementing a risk mitigation strategy, which can comprise a wide range of activities and will be tailored to each community's specific situation.

***Australia's substantial skills in emergency management and risk assessment and mitigation could be of considerable value to other Indian Ocean countries.***

The value of just a little knowledge was demonstrated in the recent tsunami disaster. Associated Press reported on January 1, 2005 the story of 10-year-old Tilly Smith from Surrey in England, who was vacationing with her family on Maikhao beach in Phuket, Thailand, when the tide suddenly went out. She remembered a recent lesson on earthquakes and tsunamis from her geography teacher, and warned her mother of the danger. Her parents informed other beachgoers and staff at their hotel, which was quickly evacuated. The wave crashed a few minutes later, but no one on the beach was killed or seriously injured.

### **Sustainable reconstruction**

A sustainable future for those Indian Ocean communities affected by the tsunami relies on enhancing the resilience of the system. Prior to the event most had low resilience, mainly the result of poverty and environmental damage (some examples are bleaching of coral reefs, destructive fishing practices, clearing of mangroves and beach erosion).

Sustainable reconstruction involves people, places and production—for communities that must deal with considerable natural variability. Such reconstruction is the outcome of effectively linking the built, social, cultural and environmental infrastructures. Rebuilding must start with development of appropriate building codes and practices and determination of whether sites for communities should be moved (set back)—bearing in mind the critical dependence of communities upon the coast for their livelihood.

Similarly, activities of agriculture, aquaculture and forestry (both community and commercial) should be sited in optimal locations to foster sustainability. Education and capacity-building are also keys to future developments, as is an integrated coastal zone management (ICZM) approach. Geographic information systems (GIS) provide a powerful means to attain these goals. However, available data are still limited for the broader region (including parts of Australia).

A partnership approach involving universities, government and non-government institutions should be fostered through added strength of existing linkages and networks. In the quest for sustainable reconstruction, local communities must be involved in decision-making at all stages.

***Australia, with its particular strengths in tropical coastal and marine science, ICZM, multiple-use natural resource management (NRM), and building codes and practices, is well-positioned to make a longer-term commitment to capacity building in the region.***

### **Health systems**

The tsunami has had a major impact on the health systems of affected countries. For example, in the Aceh province of Indonesia around 50 per cent of the provincial health centres were seriously

damaged or destroyed and over 50 per cent of health care professionals were killed or displaced. Australia's response tested our own health system resources and emergency management protocols, but highlighted the willingness of the Australian health community to assist.

Through a partnership with the Government of Indonesia, Australia now has the opportunity to extend this assistance into the rehabilitation phase. However, there is little knowledge about the capacity and capability of Australia's health workforce to operate in the region. This is compounded by our diminishing knowledge base in Asian languages, culture and politics. And we have lost the knowledge of how to manage tropical diseases and 'old' diseases (such as measles and tetanus), especially in the compromised setting of a country in the aftermath of a major natural disaster.

The enormity is clearly recognised of rebuilding in countries devastated by the loss of so many health professionals and so much of the health infrastructure, especially when this is compounded by the scale of the physical and psychological trauma experienced by the local population. Any rebuilding effort should go beyond just restoring the national health infrastructure and human resources and ensure that people of the affected countries are empowered to materially improve, in a sustainable manner, the health and welfare of their communities.

We must be mindful of the situation that confronted the population around the Sissano Lagoon near Aitape in Papua New Guinea. They lived on and around a sand bar that protected the lagoon, and enjoyed good health with a low incidence of communicable diseases. But in July 1998 their tropical paradise was inundated by a tsunami triggered by an undersea earthquake and landslide. This was a one-in-200 year-event that killed 2200 people and left over 10,000 people homeless. In response to contamination of the lagoon and the threat of future tsunamis, the people were resettled in-land. Settlements were built, including houses, schools and churches. Since then people have started contracting mosquito-borne and skin diseases that they had avoided when living in their previous location. There is also family tension because the men have to travel some distance to fish in the ocean, and social unrest because of land-ownership issues.

***The following are designated as priority areas for health systems: 1) mapping resources, i.e. knowing what we have to call upon in our region; 2) consideration of long-term health impacts and improving resilience to disease threats; 3) developing Centres of Excellence featuring national exchange of professionals; 4) improving knowledge and understanding of the region.***

### **Continuity of knowledge**

Culture and custom are as important for community survival as physical assistance and technical expertise. Devastating natural disasters can destroy all knowledge upon which communities depend for their identity, survival and reproduction along with physical infrastructure and human lives. As well as formal and codified knowledge (such as that produced and disseminated by education systems) there is also the informal, lived knowledge of traditional communities.

In Aceh, for example, the tsunami destroyed many written land titles, and international agencies are now assisting to restore and rebuild the formal land documentation system. But in rural areas, including coastal communities, land ownership is often governed by custom and tradition, and many individuals and families have no written titles. In these cases, recovering records of land ownership will depend on intricate knowledge of local language, culture and community structures. Rebuilding communities, or altering land-use patterns, without respecting such local knowledge will only exacerbate community trauma.

***Australians need expert knowledge of the countries and communities of our region to assist the rebuilding of societies devastated by natural disasters.***

Cultural knowledge and sensitivity are an essential component of aid delivery. In Aceh an Australian civilian medical team was on the ground and performing operations within five days of the tsunami. Yet at first, no interpreters or persons with local cultural knowledge were included in these teams. Until the arrival of several volunteer interpreters, patients expressed frustration at their inability to communicate directly with medical staff about their injuries and other concerns. The medical team, in turn, had difficulty explaining treatment regimes and ascertaining the nature of injuries. Without the assistance of volunteer interpreters, there was the likelihood of misdiagnosis. Interpreters also assisted medical teams to achieve effective triage for determining evacuation versus on-site treatment options.

Post-tsunami, a model for appropriately rebuilding higher education is emerging: Approximately 100 lecturers at Banda Aceh's main state university, Universitas Syiah Kuala, died in the tsunami—a devastating loss for an institution at the heart of Aceh's educational and cultural life. A group of Australian universities is working to revive a former Research Training Centre at the University. To compensate for the higher education sector's loss of staff, the universities intend to provide 'hands on' training for promising graduate students and junior university staff. An Australian academic would cooperate with an Indonesian director, increasing the skills of local academics and experts *in situ*, in a way that is culturally appropriate and driven by their needs.

At present, discussions focus on the social sciences, but extending the plan to cover areas in natural sciences, technology, medicine and education would strengthen the local education system's capacity to contribute directly to reconstruction, and would broaden the range of Australia's institutional links into the region.

### **Risk—governance and policy**

Australia's current governance structure and policy-making framework have supported strong response and relief efforts, stemming from a tradition of military assistance after natural disasters. Under our Constitution, the States and Territories are responsible for emergency management, only calling on Federal assistance when a situation becomes unmanageable, in terms of containing the hazard and associated costs. Our timely military and civilian assistance has rescued many people over many years and provided immediate relief in the wake of natural hazards that have devastated communities.

However, the recent Council of Australian Governments' *Review into Natural Disasters* (2004) recognised the need for disaster risk management measures other than just relief and response. Policy development needs to support mitigation and long-term recovery in order to ensure safe and sustainable communities. This recommendation is aligned with developments in emergency risk management, which often refers to risk management practices as 'PPRR' — Prevention (now termed Mitigation), Preparation, Response and Recovery.

Australia has the capacity to develop risk assessments, to assist policy makers, both in Australia and our broader region and to reduce the vulnerability of communities to natural disasters.

***Australia is well placed to employ best practice risk management measures, and should consider risk assessments as an effective and sustainable form of international aid.***

### **Longer-term issues: Economic, social, cultural, environmental**

In the aftermath of the tsunami, Australia's research and development sector contributed its significant expertise to disaster relief efforts in many ways — specifically through disaster

management, provision of scientific and technical know-how, and its understanding of socio-cultural, economic and political issues of the affected areas. However a number of important gaps limit our capacity to contribute to development and reconstruction efforts in the longer-term.

These relate to a lack of:

- personnel trained in Asian languages or with knowledge of socio-cultural and political contexts
- a coordinated regional disaster management framework
- base-line data
- coordination and collaboration across disciplines, institutions and industry sectors
- methods to effectively disseminate research findings
- sustainable regional partnerships.

***Australia has a unique opportunity to reflect on and evaluate our national capacity to respond to future disasters and contribute to sustainable development in our region.***

In evaluating our contributions and gaps, we need to recognise that decisions made now will have long-term effects on Australia's R&D capacity as well as reconstruction and other activities in the region.

### **Technology and ICT (Information & Communication Technologies) for rehabilitation**

In the aftermath of a disaster, commercial telecommunications providers (e.g. Telstra and Eriksson) have mobile telephone capability that could be readily deployed to disaster areas to provide connectivity for relief providers. The technology also exists to establish secure or priority mobile phone networks in emergency situations.

The introduction and application of 'appropriate' technology in the rehabilitation phase could bring great benefit ('appropriate' referring to the need to recognise the nature and capability of the society that will use and maintain the technology). Experience has already demonstrated that insertion of high technology equipment into regions that lack the capacity to support and maintain it usually means that it rapidly falls into disuse when the providers leave. Rehabilitation must do more than restore the status quo that existed prior to the disaster; this is an opportunity for the society to advance technologically.

In this arena Australia's distinctive technical advantage (compared with, say, Europe/US) is knowledge of, and demonstrated capability in, servicing and supporting small remote communities.

***Australia should therefore help its regional partners to focus on the following facets of ICT: simple, cheap remote communications (eg. low-cost wireless systems); low-cost solar energy systems; delivery of distance health and education support.***

Despite significant technological expertise in Australia, there are important gaps. There is an urgent need for a national forum involving all relief and rehabilitation agencies to facilitate a 'whole-of-systems' approach. In particular, an integrated, national GIS capability would facilitate all phases of response—this would need to be sourced with appropriate data, which could be developed from the various nations involved.

It is vital that lessons learnt from the current tsunami response experience are captured in a consistent format for wide distribution. A review of the programs operating under the National

Research Priority *Safeguarding Australia* is recommended, to identify all aspects relevant to natural disaster recovery, and the establishment of a high-level ASEAN Forum involving regional governments and NGOs is strongly supported.

### **Understanding and harnessing community response**

The magnitude of the response after the Boxing Day tsunami showed how various communities can harness their capacity for assistance and renewal (e.g. scholarly, diasporic (expatriates), donor, medical, aid, other). Australia can contribute to the understanding of this process (and learn some lessons itself) as it evaluates how assistance can be best utilised in ongoing donor/reconstruction efforts.

Many Australians have long been engaged in projects in the region and can offer some knowledge of the communities affected by the tsunami disaster. Many have acquired relevant language and local area cultural knowledge—assets in addressing two of the main barriers to engagement. There are also networks of important overseas alumni of Australian universities, who maintain links with Australian academia.

Despite these positives, there are still large gaps in our knowledge and capacity, and these require further investment to resolve. It is also important to consider the local ‘perceptions’ of Australians throughout the region (and be prepared that these may not always be positive). And there is a disturbing downward trend in Asian language and cultural studies across the Australian university sector that needs to be reversed.

More needs to be done in scaling down the development focus from the national to the provincial level. Also emergency relief personnel need to know how to access expertise outside their specific discipline (for example in the tsunami relief program, high-level language expertise was available but relief agencies were unsure how to access it).

Evaluation of the response to the Boxing Day tsunami will assist planning and preparedness for future disasters, and there are now unique and unprecedented opportunities for longer-term integrated projects at the community level. We can avoid the semblance of a ‘white-knight’ mentality in disaster response efforts through longer-term investments, commitments and relationships.

### **Conclusions and Recommendations**

The workshop concluded that, by comparison with most other countries, Australia is well-placed to offer assistance in many of the above areas of expertise, due to our local knowledge of servicing and supporting tropical and remote community conditions, and our historical associations with the broader region. The serious situation of the tsunami provided a unique (if unwelcome) opportunity for a reassessment to improve disaster and rehabilitation management and the more strategic and sustainable approach of Integrated Coastal Zone Management (ICZM) across the region. It may also provide the opportunity to plan for the mitigation of potential impacts of global climate change.

The eight focus breakout groups reached consensus on some universal aspects that would consistently underpin an effective and positive response. Their conclusions, formulated in terms of seven specific *recommendations*, are:

1. **United strategic regional disaster management:** For an effective, strategic and unified approach to regional disaster management, Australia needs to establish and formalise multidisciplinary, multisectoral teams supported by a national framework, networks and a ‘common’ language — and underpinned by whole-of-government support.
2. **National regional database:** Develop a national regional database (supported by a whole-of-government input) to support expedient access to knowledge of capacity — both Australian and regional (this would have a multitude of other national benefits, including a national shorelines geospatial framework).
3. **Regional continuity of knowledge:** Australia should make communication and education a key priority for all aspects of disaster preparedness, recovery and rehabilitation — particularly to support remote communities and effect evidence-based policy development; this may require the supply of sustainable technology.
4. **High-level Indian Ocean governance:** Establish a high-level Indian Ocean regional forum (similar to that already operating in the Asia Pacific) with an Australian role that considers disaster warning and preparedness as part of its charter.
5. **Culture of collaboration:** Create a ‘culture of collaboration’ through developing partnership centres of excellence and stronger links between Australian and regional research agencies — including in-country training of professionals.
6. **Strengthen Australia’s regional knowledge/skills base:** Australia must consider regional cultural imperatives in all assistance and partnering activities. Therefore, we urgently need to strengthen our regional knowledge and skills bases — particularly in languages, history, cultural and religious studies, and political science — through appropriate education, training and career structures with government support.
7. **Risk management as aid:** Australia should consider *risk management* an essential component of a broader approach to *aid and development* to support sustainable regional futures (i.e. risk management is not just a response mechanism).

These recommendations, together with suggestions of ways to support them through the humanities, the natural and social sciences and engineering are elaborated in Appendix 2.

## PROGRAM AND PRESENTATIONS

### *After the Tsunami – Harnessing Australian Expertise for Recovery*

**Thursday 31 March 2005**

#### **Workshop Opening**

*Chair Dr John Zillman, President National Academies Forum*

**9.00 Welcome**

*The Honourable Bruce Billson MP  
Parliamentary Secretary, Foreign Affairs and Trade*

**9.05 Opening Address**

*The Honourable Tim Fischer, Chairman ATSE Crawford Fund; Patron ACIAR;  
Patron Engineers Australia*

#### **Session One: Setting the Scene**

*Chair Dr John Zillman, President, Australian Academy of Technological Sciences and Engineering.*

**9.20 Disasters – Understanding the Phenomenon**

*David Templeman, Director General, Emergency Management Australia*

**9.35 Disaster Recovery – Processes, Implications and Management**

*Ms Amanda Roberts and Mr Tony Prescott, AusAid*

**9.50 Cultural and Economic Aspects of Disaster**

*Professor Jim Fox, Director Research School of Pacific and Asian Studies, ANU*

**10.05 Learning from the PNG Tsunami**

*Professor Hugh Davies, National University PNG*

**10.20 The Indian Ocean Tsunamis – Science and Seismics**

*Dr Phil Cummins, Geoscience Australia.*

**10.35 MORNING TEA**

**10.55 Progress in the Maldives and Global Coral Reef Recovery**

*Dr Tony Haymet, Chief CSIRO Marine Research and  
Dr Charlie Veron, Australian Institute of Marine Science*

**11.20 The Human Face of Disaster**

*Professor Beverley Raphael, Dept. Health NSW and  
Dr Jim Robertson, Australian Federal Police*

## **Session Two: Focus Breakout Groups**

*Chair Prof Leon Mann, Academy of the Social Sciences in Australia*

### **11.45 Group One: Warning and Preparedness**

Chair – *Professor Brian Kennett, Australian National University*

Rapporteur – *Dr Mark Leonard, Geosciences Australia*

### **Group Two: Sustainable Reconstruction**

Chair – *Dr Allen Kearns, CSIRO Sustainable Ecosystems*

Rapporteur – *Dr Colin Woodroffe, University of Wollongong*

### **Group Three: Health Systems**

Chair – *Dr Moira McKinnon, Dept. Health and Ageing*

Rapporteur – *Dr Bronwyn Morrish, Dept. Health and Ageing*

### **Group Four: Continuity of Knowledge**

Chair – *Dr Barbara Leigh, University of Technology Sydney*

Rapporteur – *Dr Ed Aspinall, Department of Asian Studies, University of Sydney*

### **Group Five: Risk – Governance and Policy**

Chair – *Dr John Schneider, Geosciences Australia*

Rapporteur – *Ms Anita Dwyer, Geosciences Australia*

### **Group Six: Longer-Term Issues: Economic, Social, Cultural, Environmental.**

Chair – *Prof. Stephanie Fahey, Director Research Institute for Asia and the Pacific, Sydney University.*

Rapporteur – *Dr Lenore Lyons, University of Wollongong*

### **Group Seven: Technology and ICT for Recovery and Rehabilitation**

Chair – *Mr Niel Bryans, DSTO, Department of Defence*

Rapporteur – *Mr Steve Pendry, DSTO*

### **Group Eight: Understanding and Harnessing Community Response**

Chair – *Prof. Graeme Turner, President, Australian Academy of the Humanities*

Rapporteur – *Mr Nicholas Farrelly, Australian National University*

### **1.00 LUNCH**

Rapporteurs prepare reports.

## **Session Three: Reporting Back and General Discussion**

*Chair Prof Leon Mann, Academy of the Social Sciences in Australia*

### **1.50 Reports from Groups 1, 2, 3, 4, 5, 6, 7 and 8.**

Each spokesperson for a group has 8 minutes plus 2 minutes questions.

**1.50** 1: Rapporteur – *Dr Mark Leonard*

**2.00** 2: Rapporteur – *Dr Colin Woodroffe*

**2.10** 3: Rapporteur – *Dr Bronwyn Morrish*

**2.20** 4: Rapporteur – *Dr Ed Aspinall*

**2.30** 5: Rapporteur – *Ms Anita Dwyer*

**2.40** 6: Rapporteur – *Dr Lenore Lyons*

**2.50** 7: Rapporteur – *Mr Steve Pendry*

**3.00** 8: Rapporteur – *Mr Nicholas Farrelly*

**3.10**            **General Discussion 1**

**3.40**            **AFTERNOON TEA**

**Session Four: Panel Discussion – The Way Forward**  
*Chair Professor Kurt Lambeck, Australian Academy of Science*

**4.00**            **Panel Report**  
Comprises eight Breakout Group Chairs  
Each Chair reports for 2 minutes on top outcomes

**4.20**            **General Discussion 2**

**5.00**            **Summing Up**  
*Professor Kurt Lambeck*

**5.05**            **Close**  
*Dr John Zillman, President National Academies Forum*

**5.10**            **DRINKS (till 6.30 pm)**

**Friday 1 April 2005**

**Follow-up Session**

**9.00**            **Discussion, report and outcomes preparation**  
Reporting Team only (Rapporteurs, NAF)

**12.00**          **Conclusion**

## SEVEN RECOMMENDATIONS FOR A UNIVERSAL WAY FORWARD

Australia can provide a leadership role in assisting with capacity building and education within the broader region and ensure that reconstruction activities contribute to a sustainable future for the local regions affected by disaster. These recommendations have the potential to minimise the risks and possible toll from natural disasters and accelerate the recovery phase.

Seven recommendations for a universal way forward	Supported by social science, humanities, science, engineering and technology
<p><b>United strategic regional disaster management:</b></p> <p>For an effective, strategic and unified approach to Regional disaster management Australia needs to establish and formalise multidisciplinary, multisectoral teams that are supported by a national framework, networks and a ‘common’ language – and underpinned by Whole-of-Government support.</p>	<ul style="list-style-type: none"> <li>• Facilitate through mechanisms such as funding strategies and network development, a transdisciplinary approach to include the humanities, social sciences, science and technology underpinning disaster preparedness, response, recovery and rehabilitation</li> <li>• Develop supporting curriculum material and exchange programs</li> <li>• Develop and implement documentation procedures and follow-up with analysis and de-briefs of outcomes</li> <li>• Investigate ‘Systems’ domain for ‘common language’ adaptations</li> <li>• Incorporate and develop methodology/technology for understanding various community responses (local and Australian)</li> <li>• Develop ‘Codes of Conduct’ as appropriate</li> <li>• Incorporate into National Research Priorities</li> <li>• Build on existing SES/Defence networks to create a ‘flying squad’ for fast (24 hr), effective disaster response; or a ‘Disaster Defence Force’ designed to rescue and rehabilitate</li> </ul>
<p><b>National regional database:</b></p> <p>Supported by a Whole-of-Government input, develop a National Regional Database to support expedient access to knowledge of capacity, both Australian and Regional (this would have a multitude of other national benefits) – including a National Shorelines geospatial framework.</p>	<ul style="list-style-type: none"> <li>• Establish a distributed database system with nodes in neighbouring Regional countries, and an internet based ‘one-stop’ portal</li> <li>• Undertake a national and international exercise to populate the database with sources of knowledge, expertise, and information and data (eg. on capacity, local culture, demographics, immunisations, etc.) – including a ‘Health Profile’ of our neighbours</li> <li>• Develop methodologies to ensure standardisation of cross-country data, including ‘codes’ where appropriate (eg. sensitive information)</li> <li>• Ensure interoperability of civilian infrastructure and equipment (eg. medical, plumbing, etc) via database of specifications by country</li> <li>• Develop technology for data/information/language support for on-ground teams in recovery/rehabilitation phase of diaster (eg. technological language translators, micro database/GIS access)</li> <li>• Develop GIS based framework and supporting data (eg. bathymetry, vegetation, geomorphology, reef elevations) for a ‘National Shoreline’ initiative for Regional countries – this can also be used to support Risk Assessments</li> </ul>

<p><b>Regional continuity of knowledge:</b></p> <p>To facilitate ‘Continuity of Knowledge’ Australia should make Communication and Education a key priority for all aspects of disaster preparedness, recovery and rehabilitation – particularly to support remote communities and effect evidence-based policy development; this may require the supply of sustainable technology.</p>	<ul style="list-style-type: none"> <li>• Develop appropriate education programmes (eg. signs of tsunami) and communication strategies, supported by material and networks</li> <li>• Develop appropriate in-country media and capacity</li> <li>• Identify and implement sustainable ICT equipment (eg. radio powered by low-maintenance solar) to remote regions, supported by education material on use and maintenance</li> <li>• Incorporate expertise and capacity from across disciplines to implement and develop methodologies/tools to facilitate/support attitudinal/behavioural change</li> <li>• Develop methodologies and technologies to rebuild local knowledge and capacity after a disaster</li> </ul>
<p><b>High-level Indian Ocean governance:</b></p> <p>Establish a high-level Indian Ocean Regional Forum with Australian role (ie. similar to that which exists for Asia Pacific) that considers Disaster Warning and Preparedness as part of charter.</p>	<ul style="list-style-type: none"> <li>• Enable a ‘systems’ approach to disaster governance and related programme implementation</li> <li>• Broker and leverage partnerships and funding arrangements</li> <li>• Identify priorities and capacity/technology needs</li> <li>• Evaluate Australia’s role in the region</li> <li>• Develop or contribute to Strategic Plans for oceanic/earthquake monitoring equipment in Indian Ocean, eg. tide gauges, buoys, etc. – including sustainable maintenance aspects (note, Australia is the only country running an earthquake warning system in the Region) and consider link to global monitoring capability associated with the 1996 Comprehensive Nuclear Test Ban Treaty (yet to enter into force)</li> <li>• Facilitate Integrated Coastal Zone Management in Region</li> <li>• Support instigation / maintenance of long-term ecological research (LTER)</li> </ul>
<p><b>Culture of collaboration:</b></p> <p>Create a ‘Culture of Collaboration’ through developing partnership Centres of Excellence and stronger links between Australian and Regional research agencies - including in-country training of professionals.</p>	<ul style="list-style-type: none"> <li>• Develop strategies and support for in-country training of professionals (including social and technological, eg. language skills, remote video links)</li> <li>• Promote institutional exchange programmes – student and professional</li> <li>• Develop diagnostic capability and tools for non-experts</li> </ul>

<p><b>Strengthen Australia’s regional knowledge/skills base:</b></p> <p>Australia must consider Regional cultural imperatives in all assistance and partnering activities, therefore we urgently need to strengthen our Regional Knowledge and Skills Bases- particularly in languages, history, cultural and religious studies, and political science – through appropriate education, training and career structures supported by Government resourcing.</p>	<ul style="list-style-type: none"> <li>• Critical gaps exist in Asian languages, including Indonesian (Javanese and Bahasa), and in regional historical, cultural and political knowledge and expertise – these can be addressed through the planning and policy settings of the Australian tertiary education system but also require essential support from Australian in-country experience and research</li> <li>• Develop ability to access and share health data, and cultural and language information while Australians on-ground in recovery and rehabilitation phase of disaster</li> <li>• Develop appropriate Technology to support computer modelling and rapid exchange of information to underpin capabilities in all areas (eg. GIS, database search engines)</li> <li>• Undertake assessment of skills needs for Regional Disaster management as part of the National Skills Audit</li> </ul>
<p><b>Risk management as aid:</b></p> <p>Australia should consider Risk Management an essential component of a broader approach to Aid and Development to support sustainable Regional futures (i.e. RM is not just a response mechanism).</p>	<ul style="list-style-type: none"> <li>• Develop a strategic framework for Disaster Risk Assessments across the broader Region as part of AID governance</li> <li>• Undertake Risk Assessments prior to potential disaster and develop associated Action Plans (including Quality of Life issues)</li> <li>• Develop computer modelling and GIS capability to support Risk Assessments</li> <li>• Compile data and information necessary to support Risk Assessments – will require partner country involvement</li> <li>• Develop partner protocols/input mechanisms for Risk Assessment practices</li> </ul>



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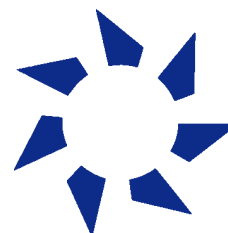
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