Asia-Pacific
Economic Cooperation

Third Emergency Management CEO Forum 2009

APEC Task Force on Emergency Preparedness

September 2009

TFEP 01/2009A

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Asia-Pacific Economic Cooperation

AGENDA

THE THIRD APEC EMERGENCY MANAGEMENT CEOs' FORUM 2009

(Ha Noi, 15-17 September 2009)

Organized by: APEC Task Force on Emergency Preparedness (TFEP)

Hosted by: Viet Nam

Tuesday, 15th September 2009 - Day 1

08:00 – 09:00	CEOs' Forum Steering Committee meeting (Australia, Indonesia, Peru, Viet Nam, Japan, USA)	
09.00 – 09:30	**Registration**	
Opening Session		
09:30– 09.45	**Welcome remarks** *Ministry of Agriculture and Rural Development*	
	CEOs' Forum Introduction ***Mr. Antony Charles Pearce*** *(CEOs' Forum Steering Committee representative)*	
09.45 – 10.00	**Coffee break**	
Session I: Overview of disaster risks and management in Asia Pacific – Implications to development growth and Regional cooperation ***Chaired by Mr. Antony Charles Pearce*** *Director General – Attorney-General Department – Emergency Management Australia*		
10.00 – 10.30	Overview of disaster risks and management in Asia Pacific – Implications to development growth – Regional cooperation	**Mr. Chris Chiesa** *Chief Information Officer* *Pacific Disaster Center*
10.30 – 11.00	APEC cooperation on disaster and emergency preparedness – achievements and challenges *With focus on: Reviewing the implementation of "Strategy for Disaster Risk Reduction and Emergency Preparedness and Response in the*	**Mr. Vincent Liu** *Program Director of APEC Secretariat*

	Asia Pacific Region: 2009 to 2015"	
11.00 – 11.30	ASEAN's experience of disaster risks and management – Possible cooperation between APEC and ASEAN	**Mr. Tabrani** *DM Steering Council of BNPB* *Indonesia*
11.30 – 12.00	Public-private partnership in disaster preparedness and management in Asia Pacific	**Mr. Yunsong Yang** *Board member of Beijing Global Safety Technology Co. Ltd.* *President of XY Internation Group* **Representative of Viet Nam**
12.00 – 14.00	**Lunch**	
14.00 – 14.30	Identifying CEOs' role in strengthening regional cooperation with a view to mainstreaming disaster risk reduction into development	**Mr. Antony Charles Pearce** *DG of Attorney-General Department* *Emergency Management Australia*
14.30 – 15.00	**Discussion** ***Expected outcomes of discussion:*** 1. Reviewing the overall picture of disaster risk and management in the region. 2. Exploring the possibilities of strengthening APEC cooperation (both bilateral and multilateral) as well as public private partnership. 4. Identifying the CEOs' role in this process (Specific Action to be taken by CEOs)	
15.00 – 15.15	**Coffee break**	
Session II: Overview of disaster risk and management in the Asia Pacific – Practices and Lessons Learned **Chair Viet Nam**		
15.15 – 16.00	1. Australian Bushfire 2009 – *presented by Australia* 2. One year after Sichuan earthquake: China report on her efforts - *presented by China* 3. The situation and rapid recovery from Typhoon Morakot – *presented by Chinese Taipei* 4. Viet Nam's experiences on disaster preparedness and response – *presented by Viet Nam*	
16.00 – 16.45	**Climate Change Adaptation** 1. Extreme weather and climate related disasters in APEC region: role of climate information in emergency preparedness with focus on public health, food and energy security 2. What's going on in APEC	**Dr. Saji N Hameed** *APEC Climate change Center (APCC)*

16.45 - 17.15	**Influenza A/H1N1** 1. Brief update on the current situation of H1N1 in Asia Pacific region – How to strengthen the regional cooperation in the fight against H1N1 and other epidemic influenza	**Mr. Jean-Marc Olivé** *WHO representative in Viet Nam*
17.15 – 17.30	2. APEC Cooperation	**APEC Health Working Group**
17.15 – 17.30	**Discussion** ***Expected outcomes of discussion:*** 1. Sharing experiences among member economies 2. Exploring the possibilities of cooperation	
18.30 – 21.00	**Welcoming Dinner**	

Wednesday, 16th September 2009 - Day 2

Session III: Increasing awareness on risk identification and management ***Chaired by Mr. Tabrani*** *TFEP Co-chair*		
9.00 – 9.30	***Keynote speech:*** The importance of increasing awareness on risk identification and management (Presenting the survey on the awareness of different sectors on emergency preparedness)	**Mr. Huy Nguyen** *Regional Coordinator* *UN/ISDR Secretariat* *Asia and the Pacific*
9.30 – 10.30	**Panel:** **1.** Policies of disaster management and response and how to increase the public awareness – from government's perspectives	**The United States**
	2. Whole of Government approach to National Preparedness and the Private Sector"	**Mr. Alphonse F. La Porta** *Advisor to US Foreign Ministry in Kosovo*
	3. CEOs' point of views on the issue – what and how CEOs can do?	**Viet Nam Red Cross Association**
	4. Member economies share experiences and best practises	**Member economies**
10.30 – 11.00	**Discussion**	

	Expected outcomes of discussion: 1. Reviewing the actual state of recognizing the importance of raising awareness of all stakeholders on disaster and emergency risk and management, especially in the context of high incidence of natural disasters and economic downturn. 2. Putting forward cooperative measures and recommendations, identifying the role of CEOs.	
11.00 – 11.15	**Coffee break**	
10.45 – 11.30	**Integrating disaster risk awareness and management education into school curricula:**	
	1. Overview	**Mr. Arghya Sinha Roy** *Program Manager* *Dept. Disaster Management Systems* *Asian Disaster Preparedness Centre*
	2. Integrating disaster risk awareness and management education into school curricula – Experience of Australia	**Mr. Darren Taylor** *Australian Curriculum, Assessment and Reporting Authority*
	3. How can APEC response to the instructions by APEC Ministers of Education in 2008.	**Mr. Quinton Devlin** *TFEP Co-chair*
11.30 – 12.00	**Discussion** ***Expected outcomes of discussion:*** 1. Developing possible recommendations relating to integrating disaster risk awareness and management education into school.	
12.00 – 14.00	Lunch break	
Session IV: Strengthening the linkages and cooperation among emergency management agencies in Asia Pacific Region ***Chaired by Mr. Quinton Devlin*** *TFEP Co-chair*		
14.00 – 14.30	Reviewing CEOs' actions in 2008 and 2009 to promote the implementation of the Strategy and work plan in 2010	**CEO from Peru**
14.30 – 15.00	Report on the outcomes of the APEC Workshop on Damage Assessment Techniques	**Indonesia <TBC>**
15.00 – 15.15	Presentation of discussion paper on Emergency Management Volunteers	**Australia**

15.15 – 15.30	Coffee break	
15.30 – 16.00	Reinforcing the CEOs' Forum and next steps	**Steering Committee representative**
16.00 – 16.30	Japanese presentation on the 4th CEOs' Forum	**Japan**
16.30 – 16.45	**Discussion** ***Expected outcomes of discussion:*** 1. Exploring measures to put forth the efficient implementation of the Strategy, of which the role of public – private partnership is strengthened. 2. Consolidating the CEOs' Forum, bringing out guidelines of follow up actions. 3. Support outcomes of the APEC workshop on Damage Assessment Techniques and recommend to the APEC Task Force for Emergency Preparedness for its endorsement.	
16.45 – 17.30	**Wrap up Session** ***Chaired by:*** ***Mr. Tabrani, Mr. Quinton Devlin (TFEP Co-chairs) and*** ***Mr. Antony Pearce (CEOs' Forum Steering Committee representative)*** **Expected outcomes:** Draft of Summary Report and possible recommendations of the 3rd APEC CEOs' Forum	

Thursday 17th September 2009 - Day 3

7.00 – 9.30	**Leave Ha Noi for Quang Ninh Province**
9.30 – 11.00	Meeting with Quang Ninh Province authority to share experiences in confronting with emergency cases.
11.00 – 16.00	Tour to Ha Long Bay
16.00 18.30	Come back to Ha Noi

APEC Emergency Management CEOs' Forum
15-17 September 2009, Ha Noi

Key Decisions and Recommendations

1. CEOs underlined the importance of **public-private partnerships** in disaster preparedness, management and response, and agreed to share their economies' experiences and challenges ahead of the APEC Workshop on Public-Private Partnerships for Business Resilience in 2010 and to explore ways to foster corporate social responsibility, business resilience and operational continuity.

2. CEOs agreed that **disaster risk education and communication** was critical to business and community preparedness**,** particularly the integration of disaster education in school curricula and the use and effectiveness of hazard warnings to inspire action. CEOs considered draft principles on integrating disaster education in school curricula and recommended TFEP finalise APEC-wide guidelines.

3. CEOs recognised the important role that **volunteers** – both government and non government – play in disaster management and response, and agreed to share experiences and challenges. CEOs agreed to discuss this issue further at the next Forum and welcomed Australia's offer to investigate the possibility of a workshop.

4. CEOs underscored the importance of clarity on the potential impacts of **climate change** and extreme weather events so that the disaster management community can plan for the future.

5. CEOs welcomed in principle the TFEP's draft principles on **disaster damage and loss assessments**, highlighting the importance of capturing the full socio-economic impact to justify resource allocations for disaster risk reduction activities**.**

6. CEOs accepted Japan's invitation to **meet again in Kobe** in January 2010 with a view to sharing experiences and lessons learned on urban risk reduction and climate change adaptation. CEOs agreed to develop a business plan to set the strategic direction of the Forum. CEOs also noted the 4th Asian Ministerial Conference on Disaster Risk Reduction next year in the Republic of Korea.

7. CEOs urged APEC Senior Officials to renew the mandate of the APEC Task Force for Emergency Preparedness (TFEP) until 2013, and reinforced the importance of APEC member economies – supported by the TFEP – implementing the *Strategy on Disaster Risk Reduction and Disaster Management and Response in the APEC Region 2009-2015.* CEOs also recommended SOM consider upgrading the TFEP to a permanent APEC working group.

8. CEOs agreed to enhance cooperation with regional institutions.

Asia-Pacific
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Code e.g. 2009/TFEP01/SEM1/PL

Participant List

Submitted by: Viet Nam

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

Participant List

Economy: Australia

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5	Mr	Darren Taylor						Male
6	Ms	Jacqui Dixon	Director of Hong Kong Office	CSR Asia	+852 3579 8079	+852 3579 8080	jdixon@csr-asia.com	Female
7	Ms	Janice Evelyn Bennett	First Assistant Secretary	Primary and Ambulatory Care Division, Australian Government Department of Health and Ageing.			Hwg.chair@health.gov.au	Female

Economy: Brunei Darussalam

S/N	Title	Name	Position	Organization	Tel	Fax	Email	Gender

Economy: Canada

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Economy: Chile

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Economy: Hong Kong, China

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Economy: Indonesia

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Economy: Malaysia

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Economy: Mexico

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Economy: New Zealand

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Economy: Chinese Taipei

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Economy: United States

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Economy: Viet Nam

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				Rural Development.				
6				Department of International Cooperation, Ministry of Agriculure and Rural Development.				
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9				Colonel Do Van Son, Vice Chairman, Viet Nam's National Committee on Search and Rescue.				
10				Colonel Trinh Hoang Hoa, Head of Consultancy and Planning Section, Viet Nam's National Committee on Search and Rescue.				
11				Colonel Le Van, Deputy Head of Disaster Prevention Section, Viet Nam's National Committee on Search and Rescue.				
12				Colonel Vo Ha Trung, Viet Nam's National Committee on Search and Rescue.				
13				Colonel Dang Van Cat, Deputy Head of Fire and Explosion Prevention Section, Viet Nam's National Committee on Search and Rescue.				
14				Senior lieutenant, Assistant to Foreign Affairs, Deputy Head of Prevention Section, Viet Nam's National Committee on Search and Rescue.				

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Pacific Disaster Center: Advancing Disaster Risk Reduction in the Asia-Pacific Region

Submitted by: Mr. Chris Chiesa
Pacific Disaster Center

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

3rd APEC TFEP CEO Forum
Hanoi, Viet Nam
15 - 17 September 2009

Fostering Disaster-Resilient Communities

Pacific Disaster Center: Advancing Disaster Risk Reduction in the Asia-Pacific Region

Mr. Chris Chiesa
Chief Information Officer
Pacific Disaster Center

cchiesa@pdc.org

Building a Bridge

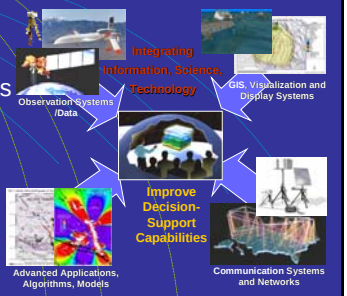
Science Community		Decision Makers
Peer Review	Audience	The Public
Low	Comfort with uncertainty	High
Complex	Vocabulary	Simple
Technical Groups	Associations	Very Public

Presentation Outline

- Brief Overview of Pacific Disaster Center
- Disaster Risks in the AP Region
  - Implications for Sustainable Growth
- Opportunities for Regional Cooperation
  - Risk and Vulnerability Assessment
  - Risk Communication / Early Warning
  - Information Sharing

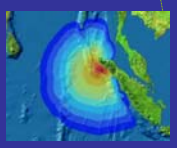
Our Center …

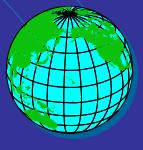
- Applied Science & Technology
- Information Products Supporting:
  - Policy & Decision Makers,
  - Disaster Managers
  - Humanitarian Assistance



PDC Mission …

Provide applied information research and analysis support for the development of more effective policies, institutions, programs and information products for the disaster management and humanitarian assistance communities of the Asia Pacific region and beyond.

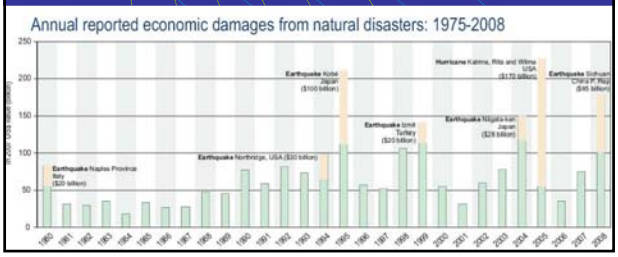




Global and Regional Hazards and Trends

Facts …

- Disasters Destabilize Economies, Social and Institutional Systems
  - In 2008 disasters killed 235,816 people, affected 214 million others, and cost more than $190 billion USD
    (CRED – Annual Disaster Statistical Review: The Numbers and Trends 2008)
  - Natural disasters cost developing countries 2%–15% of GDP annually [on average]
    (Kreiner, Arnold, and Carlin 2003)
  - Natural disasters cause high instability in national incomes
    (Asian Development Bank, Strategy for the New Millennium)

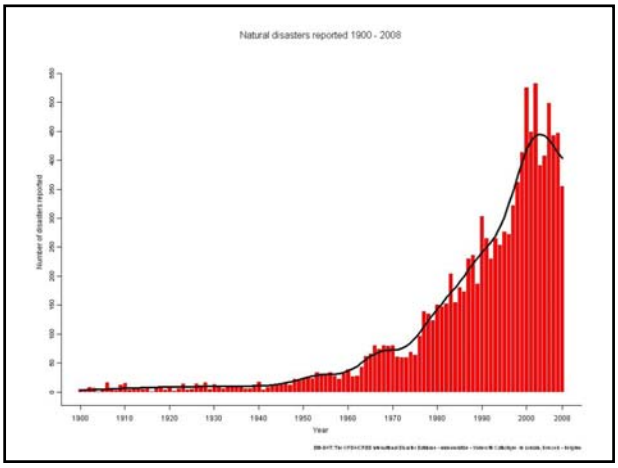


Asia Pacific Region

We Live in a Disaster-Prone Region

- 40% of disasters BUT 92% of victims (2000-2006)
  (CRED – Annual Disaster Statistical Review: Numbers and Trends 2008)
- In 2008, disasters in Asia affected 177M people and cost $118B USD
  (CRED – Annual Disaster Statistical Review: Numbers and Trends 2008)

		Africa	Americas	Asia	Europe	Oceania
Occurrence	2008	71	95	143	33	12
	2007	85	102	153	65	9
	2000 - 2006 Average	59.7	92.9	160.4	= 40% 64.7	16.7
Number of Victims	2008	16 200 000	19 900 000	177 800 000	260 000	100 000
	2007	9598158	8940362	190563162	1642878	171855
	2000 - 2006 Average	13056460.1	5172569.3	214771857.9	= 92% 1055514.9	43354.9
Damages 2007	2008	900 000	64 000 000	118 200 000	4 700 000	2 500 000
	2007	755341	17617126	34245932	20529206	1837652
	2000 - 2006 Average	1297221.4	45809019.2	29307371.2	= 33% 13053541.1	924357.4



2008 Overview

Table 4 – Top 10 most important disasters by economic damages

Events	Country	Damages (in

Table 3 – Top 10 most important disasters by number of victims

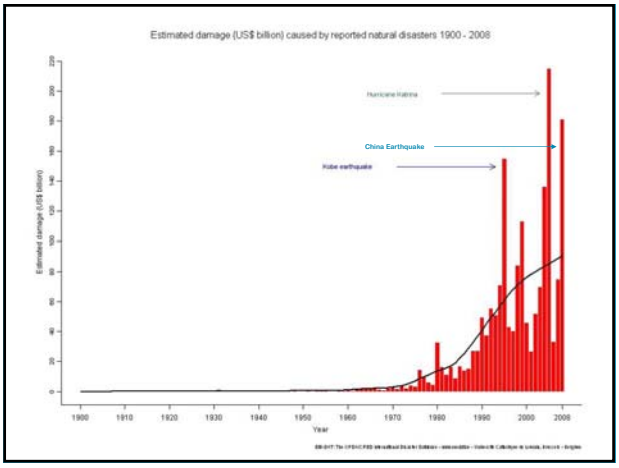
Events	Country	Victims (in

Table 2 – Top 10 most important disasters by number of persons killed

Events	Country	Persons killed
Cyclone Nargis, May	Myanmar	138 366
Earthquake, May	China P Rep	87 476
Snowstorm-Blizzard, January-February	Afghanistan	1 317
Flood, June-July	India	1 063
Typhoon Fengshen (Franck), June	Philippines and China P Rep*	658
Hurricane Hanna, September	Caribbean and Northern America**	537
Landslide, September	China P Rep	277
Flood, June	China P Rep	176
Flood, September	India	173
Earthquake, October	Pakistan	166
	Total	230 209

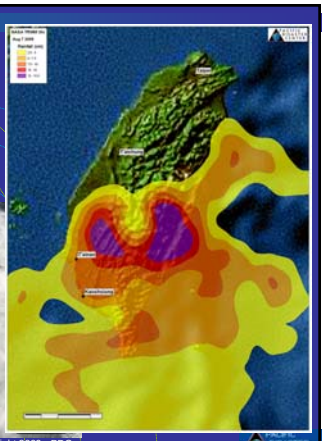
* Philippines (644), China P Rep (14)
** Haiti (529), USA (7), Dominic Rep (1)

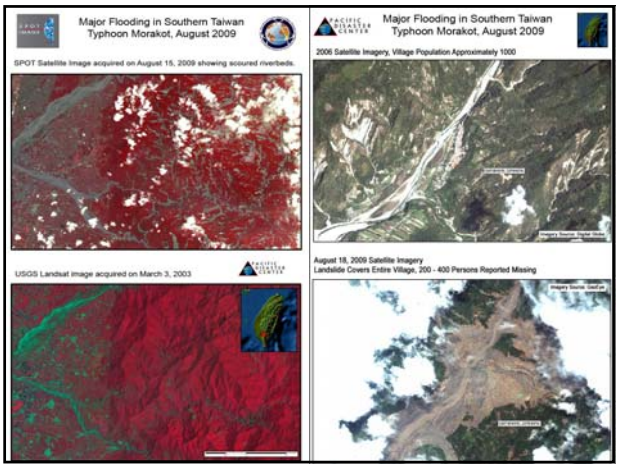
Source: "EM-DAT: The OFDA/CRED International Disaster Database www.emdat.be - Université Catholique de Louvain - Brussels - Belgium"

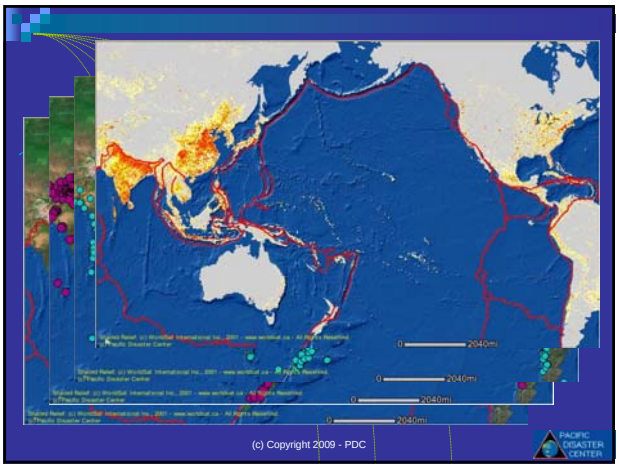


Typhoon Morakot
Chinese Taipei
August 2009

- 700+ dead/missing
- 7000+ homeless
- $1.5B+ USD damage







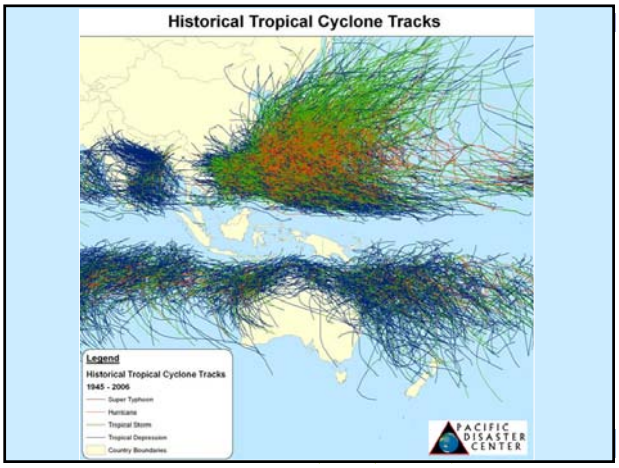
Regional Disaster Overview

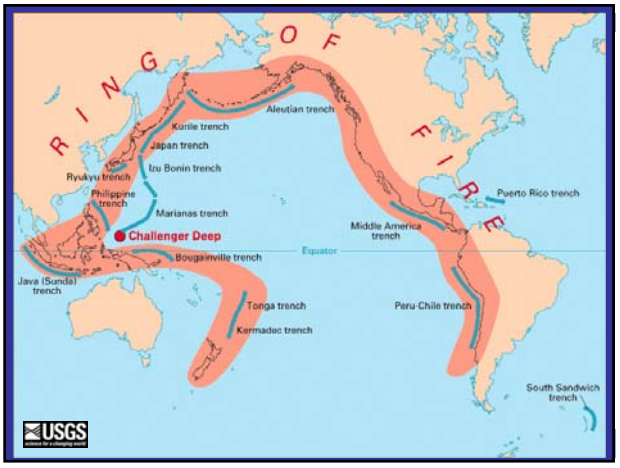
"Asia has been the world's most disaster prone region, having suffered about half of the world's major disasters over the past five decades"

(SRC: ADRC, http://www.adrc.or.jp/publications/ngo_workshop/1.pdf)

Why?

- Asia accounts for about 60% of the World's total population with estimated 4 billion people
  - However, only 30% of Earth's land area
- Developing economies
- Much of Asia lies within a high risk area termed the "Pacific Ring of Fire"
- Seasonal Monsoon





Disasters in Developing Economies

- Proportion of persons living in cities vs. rural in developing economies has doubled since 1960.
  - Half are disaster prone due to the same features that make them livable
- The poor in these economies are hardest hit
  - Poverty drives informal settlements in disaster prone areas
  - Disasters severely affect food production in the poor
  - Small fluctuations in income have a dramatic impact on the poor. Savings not adequate to deal with a catastrophe
  - No insurance

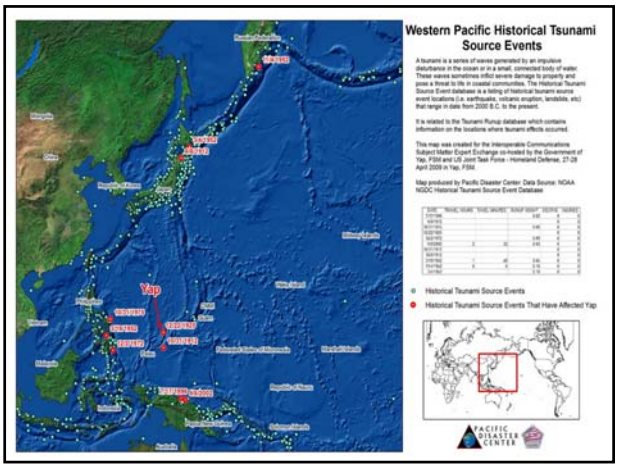
SRC: Freeeman, P., Keen, M., Mani M., "Being Prepared", Finance and Development, Sept 2003.

The future …

- Disasters are Global Concerns requiring wide-spread support
  - Whole of Government – Civil and Military (HA/DR)
  - International Support and Collaboration
- Cannot Stop Disasters; But Can Reduce Impacts
  - In 1991, Cyclone Val cost 230% of Samoa GDP; while Heta in 2004 cost only 9% of GDP

(World Bank, Not if but when – Executive Summary 2006)

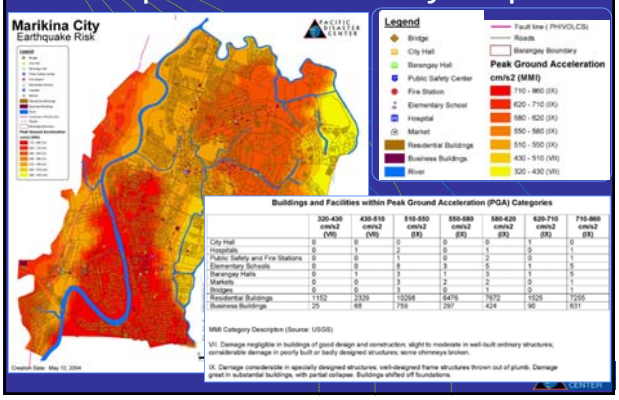
- Applications of Science & ICT Are Here Today
  - Risk Assessment Methodologies
  - Early Warning / Decision Support Systems
  - Preparedness / Exercises



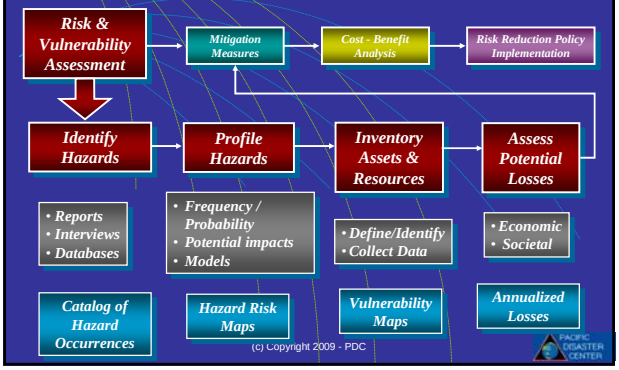
Risk Reduction / Emergency Preparedness

- Risk Assessment
- Risk Communication
  - Risk Awareness
  - Disaster Early Warning
- Information Sharing

Earthquake Vulnerability Map



RVA Implementation Strategy



Asia Pacific Natural Hazards Atlas

Web-based, Geospatial Information Application Supporting Regional Hazard and Vulnerability Assessments

Natural Hazards

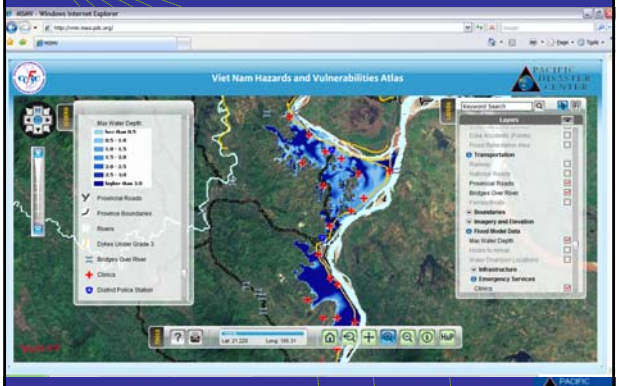
- Tropical Storms
- Wildfires
- Earthquakes
- Tsunamis
- Volcanoes
- Floods

Risk Exposure

- People
- Infrastructure

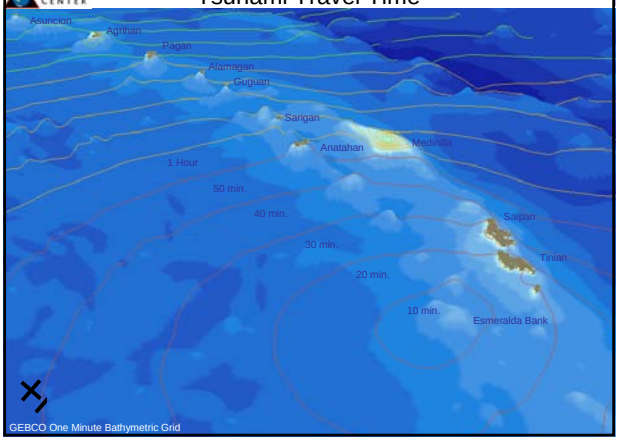
http://atlas.pdc.org

Viet Nam Hazards Atlas

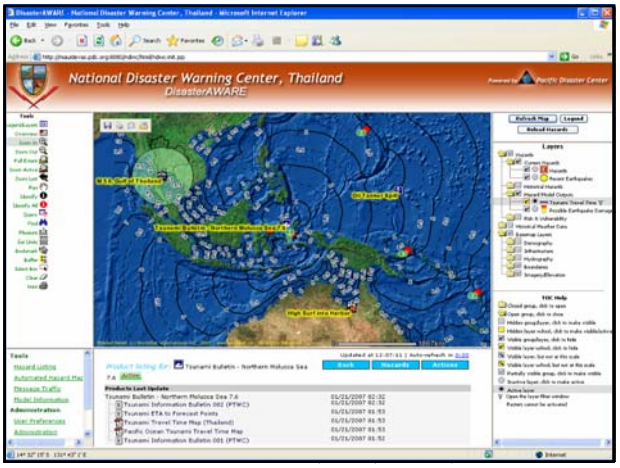


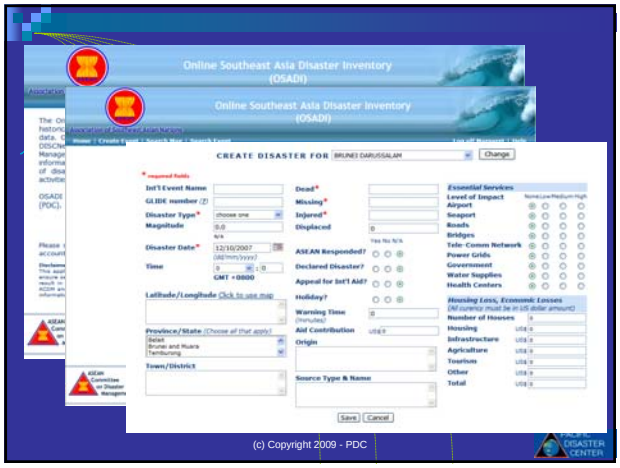
http://www.ccfsc.org.vn/atlas (c) Copyright 2009 - PDC

Tsunami Travel Time

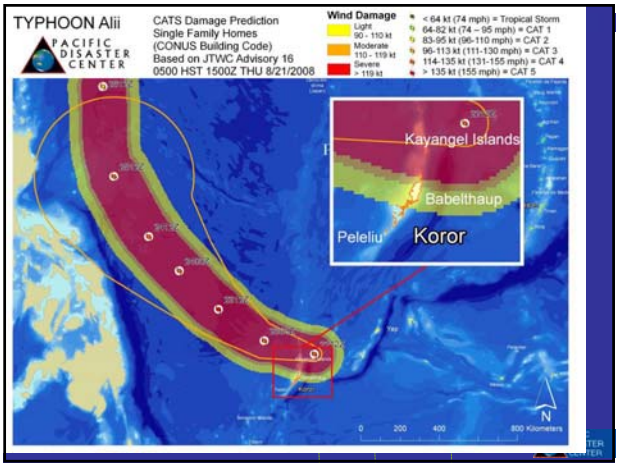


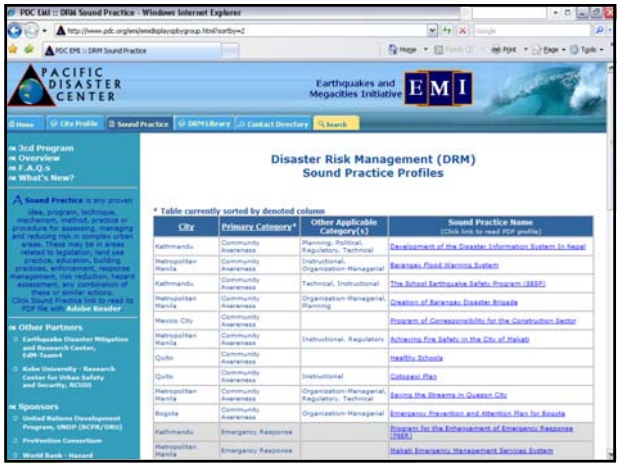
GEBCO One Minute Bathymetric Grid





(c) Copyright 2009 - PDC





In Summary …

- Reducing Impacts By:
  - Monitor Hazards
  - Understand Risks and Vulnerabilities
  - Disseminate Warnings
  - Share Information and Sound Practices
  - Timely Action through Informed Decisions

Multi Hazard Information and Warning

Contact Information

Mr. Chris Chiesa
Chief Information Officer
Pacific Disaster Center
1305 N. Holopono St., Suite 2
Kihei, HI 96753 USA
808.891.0525
cchiesa@pdc.org
http://www.pdc.org

Visit AP Hazards Atlas at:

http://atlas.pdc.org

Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/003

APEC cooperation on disaster and emergency preparedness - achievements and challenges

Submitted by: Mr. Vincent Liu
APEC Secretariat

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

APEC cooperation on disaster and emergency preparedness - achievements and challenges

Presented at the Third TFEP CEO Forum on September 15, 2009

Vincent Liu
Program Director
APEC Secretariat

Overview on APEC cooperation on disaster and emergency preparedness

-Role of TFEP CEO Forum

-CEO Forum and Strategy

-TFEP Projects

-Achievements and Challenges

We are living in a world where disasters occur at a higher and higher frequency

-- 2009 Morakot Typhoon hit Chinese Taipei and China, and earthquake hit West Java of Indinesia

--2008 earthquake in Sichuan, China

--2007 earthquake in Peru

-- 2005 Hurricane Katrina

-- 2004 Tsunami

2009 is a year of PERFERT DISASTER that compels us to work harder in emergency preparedness.

- Global Economic Crisis
- Global Pandemic AH1N1
- Global Warming – Climate Change

TFEP Mandate

- Improve coordination and enhance intra-APEC cooperation and integration of best emergency practice, natural disaster preparedness and response efforts
- Build capacity in the region to mitigate, prepare for and respond to emergencies and natural disasters

I. Role of TFEP CEO Forum

- TFEP CEO Forum was initiated and planned by Australia. The first CEO Forum was successfully in held in Cairns in 2007
- In the 2008 Forum in Peru, subject to a biennial renewal of the TFEP mandate, it is proposed that APEC Emergency Management CEOs agree to continue to hold an annual Forum for at least the next five years - until 2013.

I. Role of CEO Forum (2)

TFEP CEO Forum has become a vehicle to consolidate and advance the progress and agreed initiatives endorsed by the members

I. Role of CEO Forum (3)

It provides chance for TFEP to interact with other like-minded organizaions where we can learn from each other.

II. TFEP CEO Forum and the APEC Strategy(1)

In 2007, TFEP CEO Forum agreed to develop a 3-5 year strategic plan for the Task Force taking into account the human and political imperative for more effective emergency preparedness and risk reduction as well as more timely and effective disaster response;

II. TFEP CEO Forum and the APEC Strategy(2)

In 2008, thanks to Peru's dedication and efforts an APEC Strategy for Disaster Risk Reduction and Emergency Preparedness and Response in the AsiaPacific Region: 2009 to 2015 was endorsed

The entire text of the Strategy can be seen at http://member.aimp.apec.org/Documents/2008/TFEP/TFEP1/08_tfep1_012.pdf

TFEP Strategy 2009-15

Objectives :

1. Help political decision-makers better understand the economic and social costs of disasters;
2. Develop practical mechanisms to build business and community resilience;
3. Identify gaps in disaster risk reduction approaches and address through capacity building initiatives

(Source:TFEP Co-Chair Quinton Devlin)

TFEP Strategy 2009-15

Approach:
1. Disasters should be prepared for jointly
2. Recovery should be long-term
3. Risk should be managed prospectively
4. Supports Hyogo Framework for Action (HFA)
5. Complement, not duplicate

(Source:TFEP Co-Chair Quinton Devlin)

TFEP Strategy 2009-15

1. This Strategy is a guideline for both governments and a guideline for APEC

2. The strategy is based on APEC's own TFEP stocktake outcome and not to duplicate what has already been identified under the Hyogo Framework, but to develop actions that are more consistent with APEC's structure of action draw on Hyogo Framework For Action

TFEP Stocktake Outcome

(Drafted by Indonesia)

The most identified Disaster types in APEC region are:
→ Flood
→ Earthquakes
→ Typhoons/Hurricanes/Tornados
→ Urban Fire/Rural/Forest/Bush Fire
→ Agricultural/Animal Health Emergencies
→ Population Health Emergencies (such as Pandemics)

TFEP Stocktake Outcome

(Drafted by Indonesia)

With regard to TRAINING PROGRAMS
Priorities for Future Joint Regional Training Programs, the most needed training programs are:
1. Community Emergency Preparedness (CEPP)
2. Community Based Disaster Management
3. Vulnerability & Risk Assessment/Risk Map Analysis
4. Training of Trainers on Disaster Management
5. Emergency Relief Assistance

http://member.aimp.apec.org/Documents/2008/TFEP/TFEP1/08_tfep1_004.pdf

Hyogo Framework for Action (1)

There are five Priorities for Action:
1. Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation
2. Identify, assess and monitor disaster risks and enhance early warning.
3. Use knowledge, innovation and education to build a culture of safety and resilience at all levels;

Hyogo Framework for Action (2)

4. Reduce the underlying risk factors

5. Strengthen disaster preparedness for effective response at all levels.

These five priorities for action may shape APEC's agenda, and could include the following key issues, which are stated in the Hyogo Framework:

- Sustainable development, through disaster risk reduction and adequate environmental management;
- Resilience to adverse situations by strengthening capacities;
- Preparation plans for action in emergencies, contingency plans

(continued)

- Recovery after a disaster through cooperation and financial risk reduction programs by promoting the use of insurances;
- Scientific and technologic development for an adequate monitoring and early warning (information systems)
- Alliances, such as the coordination between the public and private sector
- Social responsibility translated into humanitarian support in crisis situations
- Development of indicators for measuring progress.

TFEP 2009 Workplan and Six Medium-Term Objectives

1. business and community resilience;
2. public-private partnerships;
3. disaster risk reduction;
4. cooperation and coordination among heads of APEC emergency management agencies;

TFEP 2009 Workplan and Six Medium-Term Objectives (2)

5. preparations for the recovery phase; and
6. integration of disaster risk awareness and management education into school curricula.

- Stocktake Outcome
- Hyogo Framework for Action
- Annual workplan and medium-term objectives

Three sets of documents constitute foundation for implementing the APEC Strategy and APEC Cooperation for Emergency Preparedness

III. APEC Projects (1)

→ Workshop on Large-Scale Disaster Recovery in APEC in September 2008 (Chinese Taipei and China)

Shared experiences and information on disaster recovery and ways to further enhance the disaster management capacity of APEC member economies. and offer APEC member economies the opportunity to build-up cross border collaboration

III. APEC Projects (2)

→ Workshop on Damage Assessment Techniques in August 2009 (Australia and Indonesia)

Held workshop in Yogyakarta on 3-6 August 2009 and developed APEC-wide principles on disaster damage and loss assessments.

III. APEC Projects (3)

→ Third TFEP Emergency Management CEOs' Forum in September 2009 (Vietnam)

This Forum is expected to review the implementation of APEC Strategy for Disaster Risk Reduction and Emergency Preparedness, further advance the advocacy of closer private-public partnerships, and address concerns to disaster caused by the extreme climate.

III. APEC Projects (4)

→ Workshop on a Framework for Long-term Capacity Building in APEC in November 2009 (Chinese Taipei)

Will map regional training programs and seek to bring some logic and coherence to these programs. A follow-up action plan based on the TFEP Stocktake Outcome.

III. APEC Projects (5)

→ Workshop on Public-Private Partnerships for Business Resilience in early 2010 (Australia and Thailand)

Will increase collaboration and demonstrate global best practice between public and private sectors in emergency preparedness and management efforts.

III. APEC Projects (6)

→ *Study Course on Improving Regional Cooperation in Emergency Training and Response in July 2010 (Russia)*

→ *Cooperation to Prevent Forest Fires in APEC region in October 2010 (Russia)*

→*First (of four) workshop forming part of the Social Economic Recovery and Development Programme after Large-scale Disaster in 2009/2010 (China)*

IV Achievements and Challenge

Achievements:

- 2007-2009 three times TFEP CEO Forum
- completed a stocktake of APEC best practice and capacity building needs (Indonesia)
- established a TFEP Steering Committee; established an Emergency Management CEOs' Steering Group;
- conducted a Workshop on Large-Scale Disaster Recovery in APEC in Chinese Taipei and in China on 22 to 28 September 2008 (Chinese Taipei and China) and agreed on the recommendations out of this Workshop

IV Achievements and Challenge

Achievements (continued):

- agreed on a Strategy for Disaster Risk Reduction and Emergency Preparedness and Response in the Asia Pacific Region 2009-2015, which was welcomed by Leaders and Ministers in Lima
- agreed on APEC Principles on Disaster Response and Cooperation, which were welcomed by Leaders and Ministers in Lima (China)
- Finalisation of an electronic library of disaster risk reduction school education material

IV Achievements and Challenges

Kuala Lumpur Declaration on Disaster Risk Reduction in Asia (December 2008)

- TFEP Co-Chair Quinton Devlin was invited to make presentation on TFEP achievements at the Third Asian Ministerial Conference on Disaster Risk Reduction
- APEC's accumulated and ongoing efforts was recognized as part of a regional development to further the course of Disaster Risk Reduction in Asia and the Pacific in the KL Declaration.

IV Achievements and Challenges

In 2009 TFEP will collaborate with APEC Climate Change Center and begin to consider including the impact of climate change for disaster management into workplan. This keeps pace with the development of global concern over the disasters caused by extreme climate.

IV Achievements and Challenges

APEC member economies are also leading other international or regional cooperation in emergency preparedness and disaster risk reduction.

-- Peru in ADEAN Community

-- Indonesia in ADMC (ASEAN)

-- Korea in UN/ISDR Northeast Asia and hosting economy of the 4th AMCDRR

IV Challenges

- Mandate is still on a two year review
- New reform measures of project quality control
- TFEP Virtual Forum needs active participation

Importance of the 2009 TFEP CEO Forum in Ha Noi, Viet Nam

Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/004

ASEAN's Experience of Disaster Risk and Management – Possible Cooperation between APEC and ASEAN

Submitted by: Indonesia

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

ASEAN's Experience of Disaster Risk and Management – Possible Cooperation between APEC and ASEAN

The 3rd Disaster Management CEOs' Forum,
Hanoi, 15-17 September 2009
TABRANI
Executive Director Interim AHA Centre
tabrani@bnpb.go.id

1

ASEAN Regional Instruments

- ASEAN
- ASEAN Committee on Disaster Management (ACDM)
- ASEAN Agreement on Disaster Management and Emergency Response (AADMER)
- ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre)
- ASEAN Regional Forum (ARF)
- APEC

2

ASEAN

Promoting Regional Cooperation in the spirit of equality and partnership thereby contributing to peace, progress and prosperity in the Region

(Bangkok Declaration, 8 August 1967)

3

ACDM

- 1971 AEGDM → ACDM - 2002
- 10 ASEAN NDMO
- Enhance Regional cooperation in DM

4

ASEAN Map

5

APEC

Asia-Pacific Economic Cooperation

- Established in 1989
- 7 ASEAN Countries + 14 Outside ASEAN Economies
- Economic/Trade and Investment Forum
- TFEP-APEC ⟶ 1997 VTFEP
  2005 TFEP

6

APEC Map

7

ARF

- Established in 1994
- 10 ASEAN Countries + 17 ASEAN Dialogue Partners
- Political and Security Forum

8

ASEAN Regional Forum Map

ASEAN in orange, Dialogue Partners in yellow.

9

Disaster in ASEAN Member States, January – June 2009

No	Country	Disaster occurrences	Casualties			Total affected	Total evacuated	Damaged Buildings & Facilities	Damaged Agriculture (in hectares)
			Dead	Injured/ Hospitalized	Missing				
1	Brunei Darussalam	2	2	-	-	2000	-	890	-
2	Cambodia	1	-	23	-	-	-	454	-
3	Indonesia	88	328	1071	236	642,971	212,475	33,290	89,675
4	Lao PDR	-	-	-	-	-	-	-	-
5	Malaysia	7	1	19	-	7,168	4,370	448	-
6	Myanmar	-	-	-	-	-	-	-	-
7	Philippines	16	228	118	31	1,897,659	987,298	88,274	88,904
8	Singapore	2	2	150	-	157	-	-	-
9	Thailand	12	1	218	-	6,152,240	N/A	105	786,317
10	Vietnam	3	14	7	2	1	N/A	432	46,64
	TOTAL	131	576	1606	269	8,695,028	1,199,773	123,893	969,560

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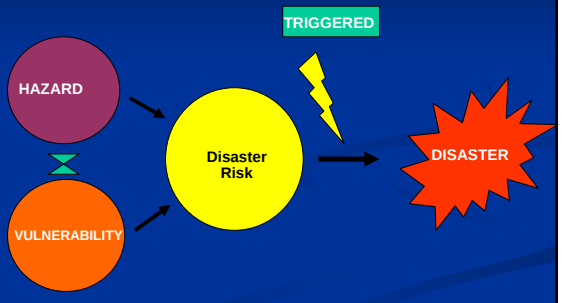
DISASTER OCCURENCE



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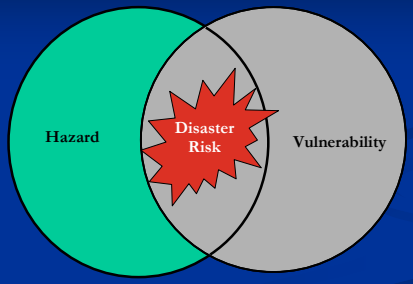
RISK = HAZARD * VULNERABILITY



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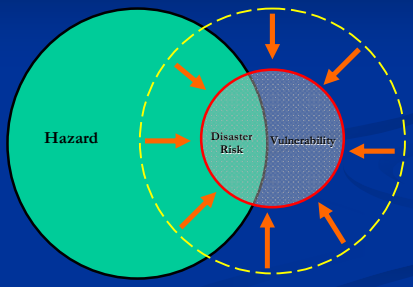
DRR



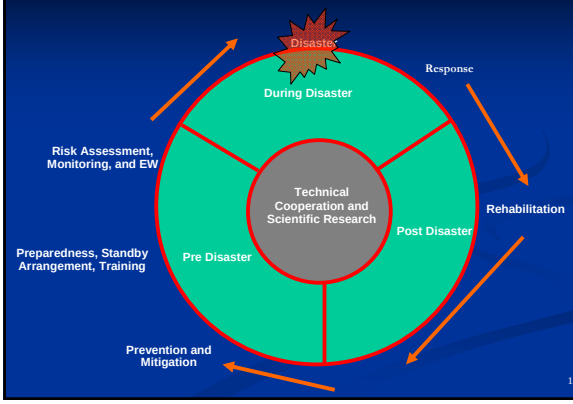
13

AADMER

- Signed on 26 July 2005
- XI Parts and 36 articles
- The Regional mechanism for cooperation and collaboration in DM and ER
- Establishment of AHA Centre
- Entry into force: After all AMS's have ratified
- Regional Legally Binding for HFA Implementation

14

AADMER



15

CLUSTER AREAS OF CONCERN FOR THE AHA CENTRE

Cluster Areas of Concerns	AADMER Articles	TOR Provisions
Disaster Risk Identification, Assessment, and Monitoring	Articles 5 and 7	(i) – (iii)
Disaster Preparedness and Emergency Response	Articles 8 - 16	(iv) – (xii)
Prevention and Mitigation, Technical Cooperation, Research and Rehabilitation	Articles 6, 17-19	(xiii) – (xvi)

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ASEAN Regional Programme on DM (ARPDM) 2004-2010

Component 1 : Establishment of ASEAN Regional Disaster Management Framework

Component 2 : Capacity Building

Component 3 : Sharing of Information and Resources

Component 4 : Promoting Collaboration and Strengthening Partnerships

Component 5 : Public Education, Awareness, and Advocacy

17

ASEAN Regional Disaster Emergency Simulation Exercise (ARDEX)

ARDEX-05 in Malaysia

Collapsed Structure Disaster Scenario

18

ARDEX-06 in Cambodia

Flood Disaster Scenario

19

ARDEX-07 in Singapore

Collapsed Structure Disaster Scenario

- In activation stage (receive the Initial Report from the affected country and facilitate request/offer of assistance)

20

ARDEX-08 in Thailand

Typhoon and Fire Disaster Scenario

- Establish and operate a joint reception (RDC) with UNDAC at the airport incl. briefing and de-briefing
- Form a joint assessment team with ERAT and RDRT
- Participate in Camp Management Workshop

21

AADMER Work Programme

2010 – 2015

Strategic components suggested in ASEC Kick-off Meeting

CORE STRATEGIC COMPONENTS

- **Risk Assessment, Monitoring and Early Warning**
- **Prevention and Mitigation**
- **Preparedness and Response**
- **Recovery and Rehabilitation**

CROSS-CUTTING ELEMENTS

- **Training and Knowledge Management**
- **Partnership and Resource Mobilisation**
- **Other Cross Cutting Issues** (CCA, vulnerable groups)

Notes: (i) The roles of AHA Centre and ASEAN Humanitarian Assistance Coordinator to be addressed in all the above components.,(ii) Ensure that the cross-cutting elements will be taken into account in the core strategic components

Working Groups (agreed in Geneva)

Working Group	Proposed Composition
WG on Preparedness and Response *(expanding the Sub Committee on SASOP)*	Malaysia (lead), Singapore, Thailand, Philippines
WG on Risk Assessment, Monitoring and EW *(expanding the Sub Committee on DISCNet)*	Philippines (lead), Singapore, Cambodia + Indonesia, Viet Nam
WG on Prevention and Mitigation *(expanding the Sub Committee on PEA)*	Lao PDR (lead), Thailand, Cambodia, Viet Nam, Philippines
WG on Needs Assessment, and Recovery and Rehabilitation	Indonesia (lead), Singapore, Philippines, Brunei Darussalam, Myanmar

National DRR Strategies/HFA Priorities Adopted in :

- **Cambodia**
- **Indonesia**
- **Lao PDR**
- **Philippines**
- **Singapore**
- **Viet Nam**
- **Myanmar (under development)**

National Progress on the Implementation of HFA 2007-2009

24

Possible Cooperation between APEC and ASEAN

Objectives :

- To enhance national capacities/capabilities/resilience

Challenge :

- Not all ASEAN States is a member of APEC Economies
- All programme must be approved by all 10 ASEAN Member states

Possible cooperation :

- Secretariat to Secretariat
- Center to Center
- Capacity Building, etc

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Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/003

Emergency Management in China, Research and Solutions

Submitted by: Mr. Yunsong Yang,
President of XY Internation Group

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

清华大学 Tsinghua University

公共安全研究中心 CENTER FOR PUBLIC SAFETY RESEARCH

Emergency Management in China, Our Research and Solutions

Center for Public Safety Research, Tsinghua University
Beijing Global Safety Technology Co. Ltd.

2010-1-29

Contents

The increasing risks to mankind

- Along with the social/economic development, risks on: high-rise buildings, oil/gas/water/electricity lifeline system, important infrastructures, key facilities etc.
- Natural disasters and their secondary disasters cause great potential risk to lives and properties
- New challenges brought forth by high-tech and information security
- Nuclear and radiological threat
- Increasing possibility of foreign biological threat and disease with international trades
- The complexity and difficulties in emergency response are rising with the economic development and people's expectation for safety

Our Major Research Projects

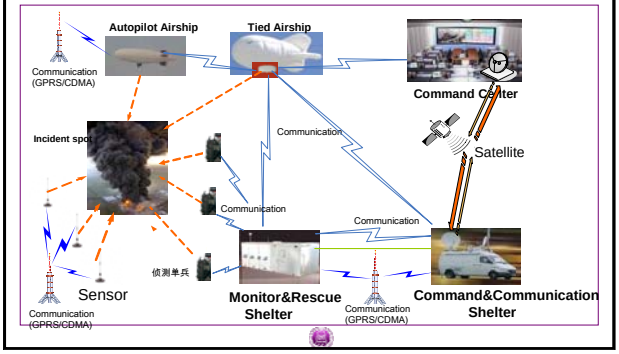
We has conducted numerous major projects from government:

- Framework Design of National Emergency Response Platform System (National, Province, City, and County)
- Software and Database System Development for National ERP
- Integrated Prediction and Pre-warning System for National Emergency Response Platform (ERP)
- Emergency Response System for Sichuan Earthquake-Relief Commanding Center
- Digital Emergency Response Plan Management System for Beijing City Emergency Response Commander Center
- Digital Fire Safety Emergency Response Plans for All 2008 Beijing Olympic Stadiums and Training Centers

Emergency Response Related Research

- **Fundamental mechanism and dynamics** on the causes of disasters and evaluation of crisis
- **Multi-scale modeling and visualization** on disaster evolution
- **Risk analysis** and **pre-warning** of disasters
- **Inspection and detection** systems using multiple sensors
- **Human behaviors** under disasters and during evacuation
- **Human protection** technology and equipment
- **GIS-based prediction and intelligent decision support system**
- Technologies for digitized **emergency response plans**
- Emergency platform design, hardware and software integration
- City's comprehensive disaster mitigation and prevention

Mobile Emergency Products



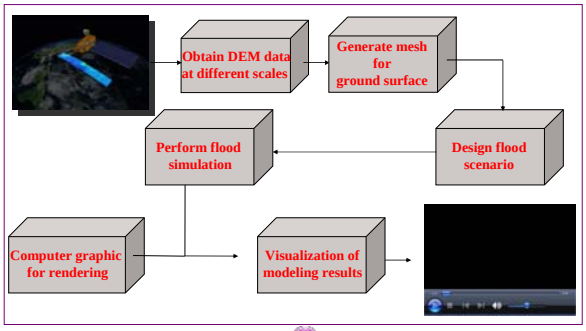
Hardware: Mobile systems for near-field command

What make us *UNIQUE*

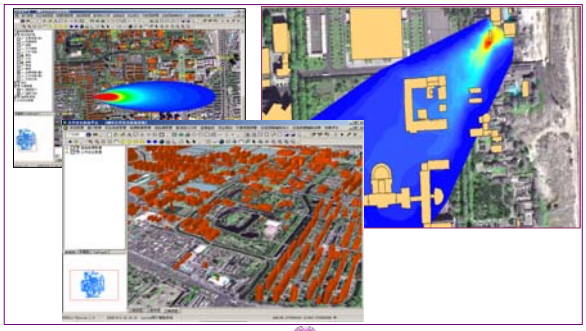
Hardware: design & integration
Software: design & development

- The concept of "model integration"
- The concept of "incident chain"
- The concept of "digital response plan"
- The concept of "data overlay"
- The concept of "data exchange"
- The best use of GIS
- Flexible interfaces with hardware/software

Flood Modeling and Simulation



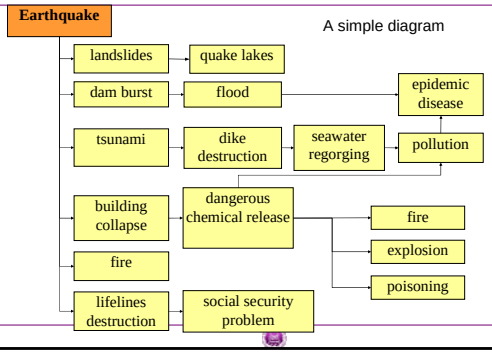
GIS-based Air Pollution



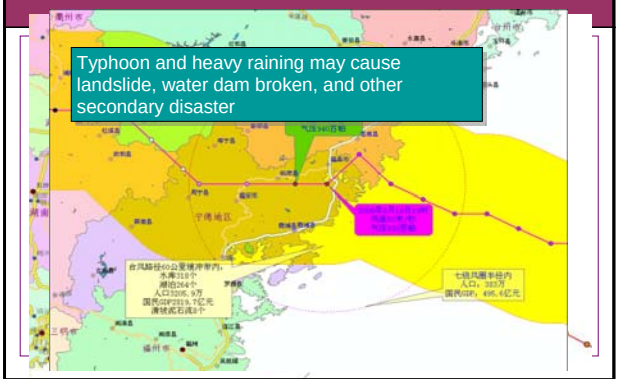
The concept of "incident chain"

- A disaster is not an isolated occurrence, but interaction, showing a complex derivatives and secondary relationship. One disaster may trigger more disasters at certain circumstances, constructing a chain-like form. (*Domino effect*)
  - Songhua River pollution (2005): chain of explosion, fire, water pollution, social panic and diplomatic affair.
  - Ice storm (2008): chain of ice storm, traffic jam, interruption of power transmission, halt of railway transportation and even shortage of necessaries.
  - Earthquake (2008): chain of earthquake, landslides, quake lakes, road broken, etc.

Typical incident chain of earthquake, stored in DB



Secondary Disaster Prediction



The concept of “digital response plan”

- Turn paper works into electronic tables via the deconstruction of response plans
  - Basic plans: objectives, commander, basic procedures, related agencies, basic functions, etc.
  - Specific plans: assumed situation and resource dispatch table, procedures, maps and diagrams, etc.
- Easy to use/refer to
- Use digital response plan to assist the compile of IAP

Beijing 2008 Olympic Games

- Truly exceptional Olympics - *Jacques Rogge*
- Beijing 2008 Olympics Response Plan by Tsinghua Univ. & Beijing Global Safety Tech. Co. Ltd.
  including 31 competition venues, and 45 training venues and related hotels etc
  - Hazard analysis in venues
  - Structure, facilities, disaster scenario awareness
  - Develop comprehensive and detailed digital response plan via High-tech solutions
  - Virtual training

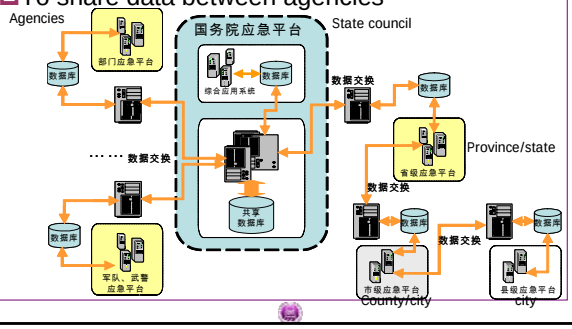
Risk Evaluation, Action Plan

The concept of “data overlay”

- It’s a method for comprehensive impact analysis, and for better situation awareness.
  - If typhoon is coming, data we may concern: population, hazmat, river bank, landslides, etc; other analysis based on “incident chain”
- Data overlay: to integrate multiple layers of data and analysis results on a map for comprehensive analysis.
- If we have more data, we can do more analysis by ourselves. If we don’t, we can get analysis results from different agencies via “data exchange”.

The concept of “data exchange”

- To share data between agencies



Our Contribution in Sichuan Earthquake

CPSR and Beijing Global Safety Tech. Co. Ltd. were working in the situation room making situation maps on May 17, 2008

CPSR and Beijing Global Safety Tech. Co. Ltd. were working in Sichuan Emergency Rescue Commander Center

Thank you!

Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/007B

Restoration and reconstruction Post-wenchuan Earthquake

Submitted by: China

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

Restoration and Reconstruction Post-Wenchuan Earthquake

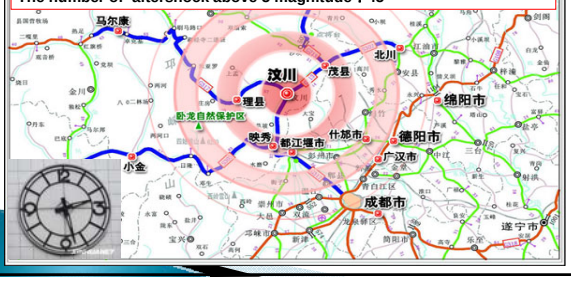
Zhang Yunxia *Deputy Director*
Disaster Information Department of
National Disaster Reduction Center of China

Overview

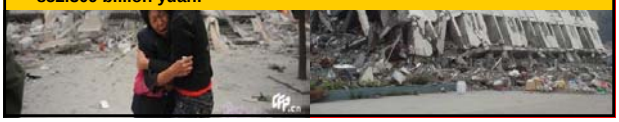
- Basic Information of the Wenchuan Earthquake
- Measures of Restoration and Reconstruction Work
- Progress of the present rehabilitation work

2008 Wenchuan Earthquake

Date: May 12, 2008 **Magnitude: 8.0**
Epicenter：Wenchuan County in Sichuan Province
Maximum seismic intensity: 11 grade
The number of aftershock above 5 magnitude：45



- **Areas affected**
  10 provinces, 417 counties, 4667 township, 48,810 villages were affected, a total area of about 500,000 square km.
- **Casualty**
  Killed People: 69,227
  Missing People: 17,923
  Injured Pepple: 374,600
- **Economic loss**
  852.309 billion yuan.



Wenchuan county before earthquake

Wenchuan county before earthquake

2008 Wenchuan Earthquake

This is the most destructive, the most widely spread earthquake, and the most difficult to provide relief since the founding of the PRC. ！ ！ ！

✓ May 19th to 21st are designated as an national mourning period for victims of the earthquake.

✓National flags were flown at half-mast .
✓All public entertainment was suspended.

Countermeasures of Restoration and Reconstruction Work

The terrain conditions of affected area

- Disaster areas in this earthquake were mostly mountain valley areas with inconvenient traffic.
- The traffic, electric power and communication were disrupted by a large-scale.

Countermeasures of Restoration and Reconstruction Work

Great challenge

- How to provide tens of thousands of people homeless for food, clothing, temporary shelter and clean water in the shortest period of time?
- How to restore the lives of affected people and production order in a short time?

Countermeasures of Restoration and Reconstruction Work

Target

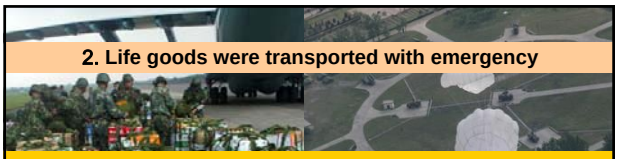
- Complete the main post-disaster reconstruction tasks and make the basic living conditions and economic and social development meet or exceed pre-disaster level in three years!!!

Countermeasures of Restoration and Reconstruction Work

1. Emergency relief funds were allocated in time

- The central government allocated 300 million yuan of emergency relief for the quake-stricken area at the first time.
- In 2008, the fund from the central government reached more than 100 billion yuan for disaster relief work.

2. Life goods were transported with emergency



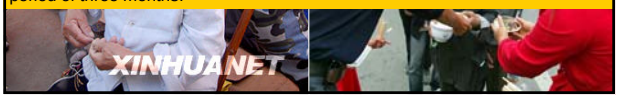
- Relief supplies from the central pool of disaster relief were transported to the disaster areas timely.
- An emergency government procurement was launched to buy the much-needed life items.
- The material was transported in ways like cars and air-dropping so as to guarantee the urgent need of life material of people in the disaster areas.

3. Various ways were adopted to solve the issue of temporary accommodation

- The central government purchased 900,000 tents, a great amount of fabric for building up 800,000 simple sheds , and one million sets of transition room in a short period of time to solve the problem of temporary accommodation for a large number of people homeless.

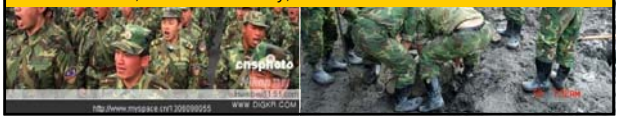
4. “three lonely” and “three nones” were properly settled down

- The earthquake resulted in 1449 childless elders, orphans and the disabled without child. The Chinese government gave them living subsidies of 600 yuan monthly per person.
- The earthquake caused more than 10 million people homeless, with no means of production and no source of income. The Chinese government granted them 1 kg of food and 10 yuan of subsidy per person every day for a period of three months.

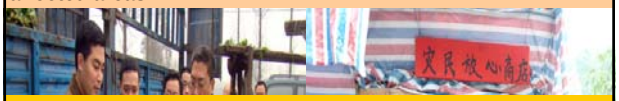


5. No effort was spared to restore the infrastructure

- On the next day of the Wenchuan earthquake, six main rail lines, except Baocheng line, resumed traffic.
- In five days after the earthquake, outreach communications in 109 townships were restored.
- According to incomplete statistics, more than 320 thousand professionals participated in infrastructure repair in roads, railways, electricity, communications, water conservancy, etc.



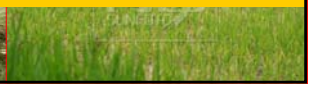
6. Adopt a variety of measures to ensure market supply of the affected areas



- The central government allocated 8708 tons of meat from the central reserve for the people in disaster areas.
- 20,000 tons of vegetables were transferred from the main vegetable production areas to Sichuan disaster areas to address the issue of vegetable supply.
- Over 500 mobile vans were transferred to the hit areas and 2700 tent stores and more than 400 board room convenience store were set up to resume part of the original commercial retail outlets.

7. Help people restore production


- Chinese government developed policies of economic support, tax relief, subsidized loans, financial support, employment assistance to promote resumption of production.
- The central finance established Wenchuan earthquake restoration and reconstruction funds. The total amount of funds reached 300 billion yuan.
- Farmers whose houses were destructed are granted 20,000 yuan of subsidy on average per household to rebuild their homes.

8. Assessment survey was carried out in time

- After the Wenchuan earthquake, the Chinese government organized a number of technical personnel to the disaster area to collect extensive basic information, make full use of high-tech means such as remote sensing and aerial survey to carry out disaster assessment.
- After several months of effort, the scope of disaster areas and the loss of the earthquake were defined.

9. Laws and regulations were promulgated to standardize the reconstruction work.

- On June 8, 2008, the State Council promulgated the "Ordinance on Wenchuan Earthquake Restoration and Reconstruction", which serves as the guideline and legal basis for post-disaster restoration and reconstruction work.
- After that, Chinese government developed post-disaster reconstruction plan as well as 10 special programs. All of them provide guidelines for the overall planning and recovery of the affected areas in the reconstruction.

10. Donations for earthquake relief were organized in all walks of life


- Chinese government organized donations for quake relief, opened donation hotline and set up account number for donation reception.
- All walks of life showed their warmth and love to the people in disaster areas. The amount of donation was unprecedented.
- More than 170 countries and 20 international organizations offered funds, materials and personnel assistance.


11. Volunteers played important role in disaster relief work


- About 3 million volunteers home and abroad went to the disaster areas to participate in the rescuing, medical aid, health and epidemic prevention, material distribution and other voluntary services.

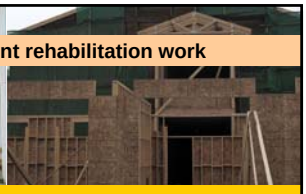

12. Psychological counseling and comfort was carried out


- Social organizations and professional bodies give psychological counseling and comfort to people in disaster areas and to help stabilize their minds and emotions so as to overcome the difficulties and rebuild confidence and courage to live a healthy life.

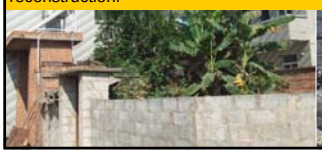
13. Working mechanism of oriented assistance is established

- The central government organized non- affected areas in eastern and central China to assist the heavily-hit counties in aspects of human force, material and financial resources, intelligence, etc.
- Twenty provinces support for the 20 heavily-hit counties for a period of 3 years.
- By the end of April 2009, the 20 provinces have set out 56 billion yuan of supporting funds.

Progress of the present rehabilitation work



- By the end of April 2009, 21 thousand restoration and reconstruction projects have been initiated, accounting for nearly 60% of planned tasks. More than 600 projects have been completed and over 360 billion yuan investment were realized, accounting for 36% of the entire investment plan for restoration and reconstruction.



Progress of the present rehabilitation work

- In the house reconstruction in rural areas, as of August 12, 2009, altogether 1,826 thousand households have started the reconstruction in the heavily-affected areas, accounting for 99.7% of the total. 1624 thousand houses have been completed, taking up 88.7% of the total. More than 3 million rural houses destroyed were repaired.

Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/007D

The Situation and Rapid Recovery from Typhoon Morakot

Submitted by: Chinese Taipei

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

National Science & Technology Center for Disaster Reduction

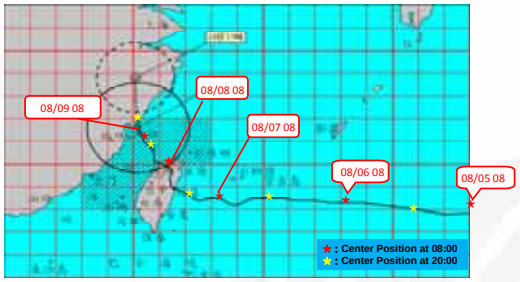
The Situation and Rapid Recovery from Typhoon Morakot

Chinese Taipei
Wei-Sen Li
2009/09/15

Sincere Appreciation

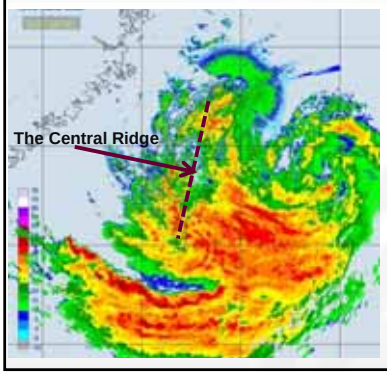
- **Right after the unprecedented disaster, Chinese Taipei received rapid responses from the APEC member economies including**
  - **Canada; People's Republic of China; Hong Kong, China; Indonesia; Japan; Republic of Korea; Malaysia; New Zealand; The Russian Federation; Singapore; United States of America; Viet Nam**
- **All the supports warm hearts of the affected and encourage people devoting in recovery**

Typhoon Morakot: #8 in 2009



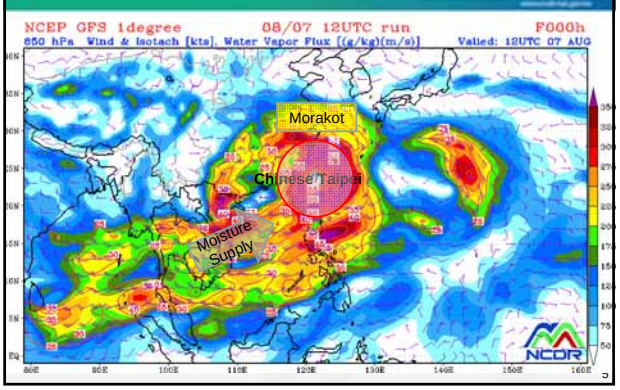
Aug 5-6: Moved fast toward Chinese Taipei
Aug. 7 : Slowed down and out skirt touched the island
Aug. 8 : Made landfall at 00:0; Center left the island at 14:00; at very low pace; Cast influence on the whole island
Aug. 9 : Gradually moved toward China

Unsymmetrical structure of Rain Clouds

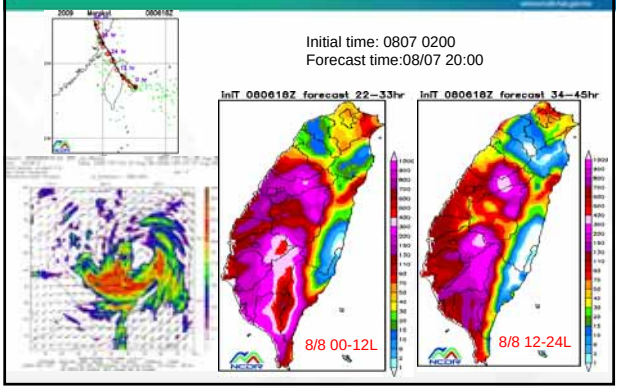


- **The unique rain cloud structure brought the record-breaking rainfalls concentrated in the southern part.**
- **The Central Ridge further intercepted the rain clouds and downpours triggered landslides and mudlsides.**

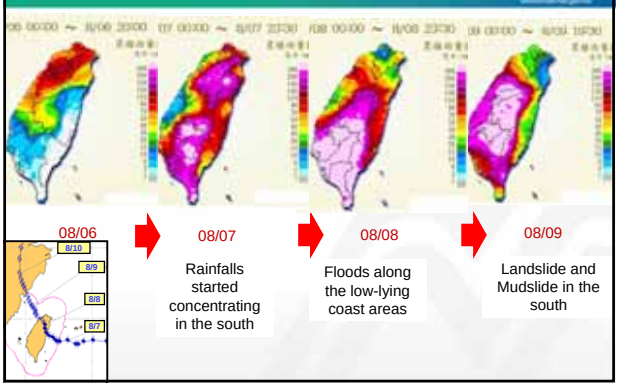
Southwest Monsoon interacted with Morakot by supplying extra moisture



Analytical Prediction



Time History of Rainfall Distribution



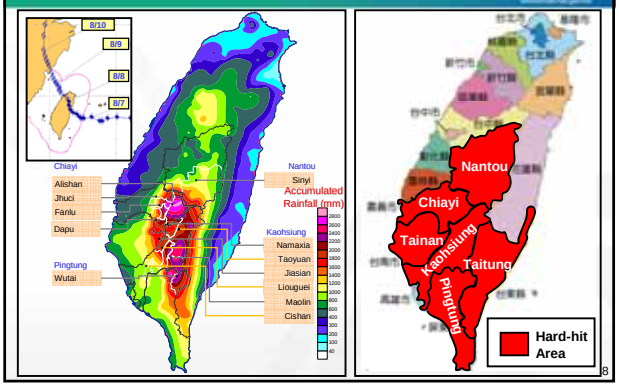
08/06

08/07 Rainfalls started concentrating in the south

08/08 Floods along the low-lying coast areas

08/09 Landslide and Mudslide in the south

Hard-hit Areas and Accumulated Rainfall



8

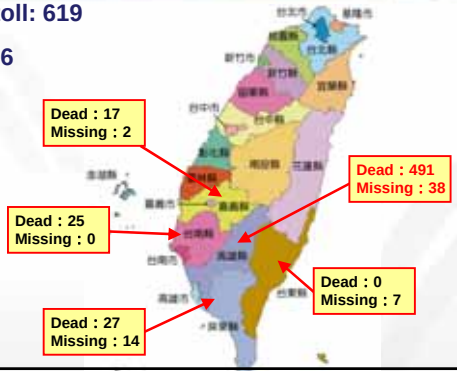
Record-breaking Rain-gauge Data

County	Township	Annual Rainfall (mm)	08/7 (mm)	08/08 (mm)	08/09 (mm)	08/10 (mm)	08/07-08/10 (mm)	08/07-08/10 vs Annual
Chiayi	Alishan	3,910	420	1,161	1,166	218	2,965	76%
Pingtung	Sandimen	3,884	745	1,402	394	332	2,872	74%
Chiayi	Jhuci	3,801	556	1,185	877	156	2,775	73%
Kaohsiung	Taoyuan	4,086	501	1,283	583	423	2,790	68%
Kaohsiung	Liouguei	3,138	236	1,178	696	351	2,461	78%
Chiayi	Fanlu	3,437	708	815	601	79	2,202	64%
Chiayi	Dapu	2,749	482	1,214	458	3	2,156	78%
Kaohsiung	Jiasian	2,861	400	1,072	345	203	2,020	71%
Nantou	Sinyi	3,254	170	717	909	134	1,929	59%
Kaohsiung	Maolin	3,152	252	743	230	179	1,404	45%
Pingtung	Wutai	2,898	206	580	208	165	1,160	40%
Kaohsiung	Cishan	2,365	91	620	128	85	924	39%

Casualties

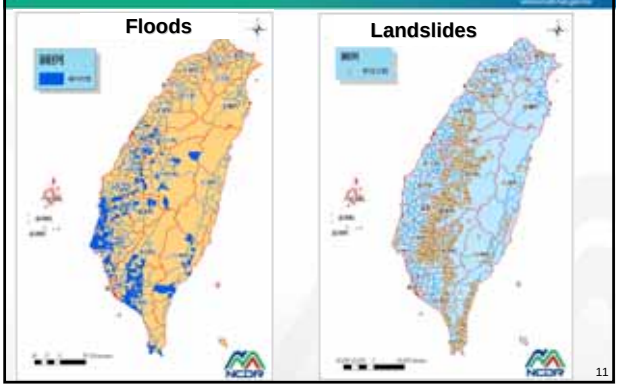
till 2009.09.08

- Death toll: 619
- Miss: 76



10

Locations of Damaged Areas

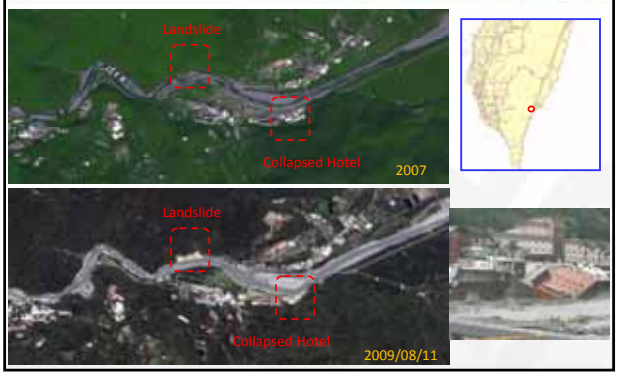


11

Damaged Levees by flood water

- InTaimali Township of Taitung County, east coast

Damaged Levees and Collapsed Hotel
In Chihpenof Taitung County



Floods in coast and low-lying areas of Pingtung County

Siaolin Village
the hardest-hit area

- In Jiasian Township of Kaohsiung County
- 400 died and 53 missing
- Landslide, barrier lake and mudslide

Aerial imageries of Siaolin Village

Imagery in 2007 | Imagery of Aug. 15, 2009

Direction for Future Improvements

- **Risk communication and perception**
  - Leading to different attitudes in face of warning
- **More frequent sever weather**
  - Adaptation strategy for risk reduction
- **Compound disaster and countermeasures**
  - Typhoon triggers flood, landslide, mudslide and interruption of lifeline systems
- **Scenario-based measures by stages**
  - Shelters, response plan and codes….
- **Operation continuity of business and public sectors**

Rescheduling Announcement

- **Due to the heavy loads of primary recovery from Typhoon Morakot**
  - **"Workshop on the Framework of Long-Term Capacity Building for Disaster Risk Reduction in APEC" is rescheduled to November 30 and December 1**

Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/006

Lessons from the Xangsane typhoon in Viet Nam

Submitted by: Viet Nam

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

Socialist Republic of Vietnam

National Committee for Search and rescue

(VINASARCOM)

Content

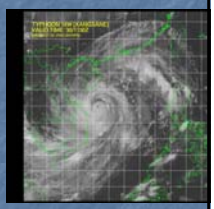
I. The Development of Xangsane typhoon in of Vietnam

II. How to response (Command, Preparedness and SAR)

III. Lessons from the typhoon response

The Development of Xangsane typhoon in Danang city in the south of Vietnam

- From 26th September 2006, A new tropical typhoon named Xangsane was predicted to intensify, moving into the East Sea after pounding the eastern Philippines archipelago
- in the afternoon 28th Sept. it reached the East Sea.
- 1st October 2009 this typhoon hit Danang city with the maximum wind speed near the typhoon's center was more than 133 km per hour ; directly affected Hue and Quang Ngai Province.
- Heavy rain in many areas: Thua Thien Hue with its rainfall of 150-300mm; Danang with its rainfall of 254mm.



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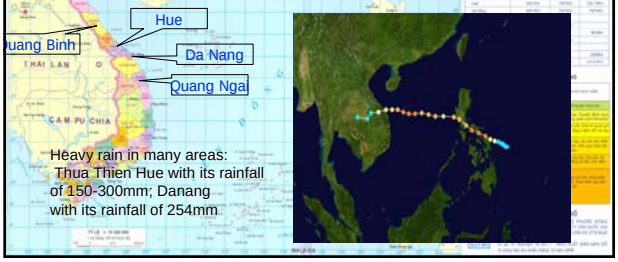
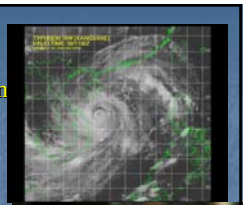


How to response

- Government's Deputy PM Nguyen Sinh Hung directly guide relevant ministries and branches how to response this typhoon.
- Vinasarcom and CCFSC (The Central Committee for Flood and Storm Control) coordinated with various ministries and branches as well as directed Steering Board of flood control of the affected provinces (Danang, Hue, Quang Ngai…).
- The people's Committees of the affected provinces holding a working session with its relevant agencies to response the storm.



Consequence of the typhoon

Damage:

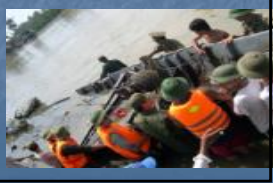
- 66 people died and missing, 527 people injured;
- 26.717 houses collapsed or with no roof.
- houses flooded: 52.069
- sunken and damaged boats: 579
- destroyed 9,191 hectares of rice and other crops.

Estimated damages: about : VND3.223,2 billions.

How to response

- Military force mobilized:

- 36.120 soldiers and civil defense;
523 vessels (boats…);
- 756 asorted motors (trucks, cars)
- 19 helicopters informing storm, transporting people and tens of tones of relief goods.
- Informing, providing guidance for 39.624 fishing boats operating on sea to proactively prevent from the storm
- Evacuate 28.782households/ 41.963 ones (the rapid evacuation of over 200.000 people within only 17hr (a record figure) before the typhoon struck.



Affected-storm localities have also given necessary measures for caused-storm impact recovery in the aftermath of the typhoon

- to support food and essential utensils for difficult households
- especially beneficiaries of the social welfare, recourses mobilizing to help grassroots people repair damaged houses,
- environment sanitation treatment, clean water and health care supply to people.

Relief activities in the aftermath of the typhoon

Prime Minister called for support the people in distress

Restore electricity system

Restoration and Recontruction in the aftermath the typhoon

Restore school

Residents return their home after storm

Prime Minister Nguyen Tan Dung urged ministries, State agencies and local authorities to draw lessons from weather forecast, rescue and relief activities in the aftermath of the Typhoon Xangsane.

1. to strenghthern the Early warning system (forecast, evaluation, prediction and rapid assessment

2. Effective direction by the Government and close coordination among relevant agencies at all level

3. Rapid evacuation of the people out of dangerous areas

4. **Strategic Guideline and 4 on-site principle**

STRATEGIC GUIDELINE:

- Take the initiative in prevention, timely response, quick and effective recovery. The main policy: "Prevention is better than cure".
- Mobilize all resources in the society to participate in search and rescue activities, in case of emergency, implementation of the principle "***4 on site".***
- Attach much importance and develop the collective strength from the entire people, political system, promote the internal force as the main policy.
- Take advantage of the support, co-ordination from the international community, especially from APEC.

CONTENT OF Principle of "4 on-site"

a) On-site forces

Immediately mobilize, utilize the force of civil defense, armed force in the locality or the available specialized force to the scene.

b) On-site facilities

Immediately mobilize, utilize all available means or means laid as planned. Even primitive tools must be prepared in advance which will also effectively work.

c) On-site Logistics

Immediately mobilize, utilize all material facilities for response. **Each person, household, hamlet, commune, district, province and in each area and strategic direction, food, medicine, potable water, tents, lifebuoy, lifeboat ...must be reserved and prepared...for preparedness and self-response in a certain time before the force in charge to come.**

d) On-site Command

In case of emergency, the Steering Committee of all levels must be established urgently.

Through summarization, learning from experience from emergency preparedness and response activities:
- 70% of people and means rescued owning to the on-site forces.
- Remaining 30% is owning to the specialized force in charge.

2. SOME KEY MEASURES:

a) Before the disaster:

- It is a must to develop an overall, strategic, long-term, short-term plan, mechanism, policy on natural disaster emergency preparedness and response;

- To prepare forces, means, training and development of the human resources; to conduct exercise on SAR co-ordination, command, management to enhance the preparedness and response capacity of all levels.

-To Actively apply and develop technical science and technology for enhancing the capability of natural -disaster forecast, warning, assessment to make the effective preparedness and response plan.

- Dissemination, education for enhancing the public awareness of the whole society on natural disaster prevention and emergency response.

- Regularly maintain the SAR forces and means for preparedness and response to all situations.

- To conduct SAR duty on watch 24/24 to keep track of the situation and deal with timely all disasters or risks.

b) During disaster:

- In case of natural disaster the most important measure is urgent evacuation, removal of people and means out of dangerous area (on sea, on land, time) evacuation is an important measure.

- To set up command post and to ensure communications.

- To mobilize forces and means in timely manner
- To search and rescue and provide first aid to the victims.

- Transport and provide relief goods.

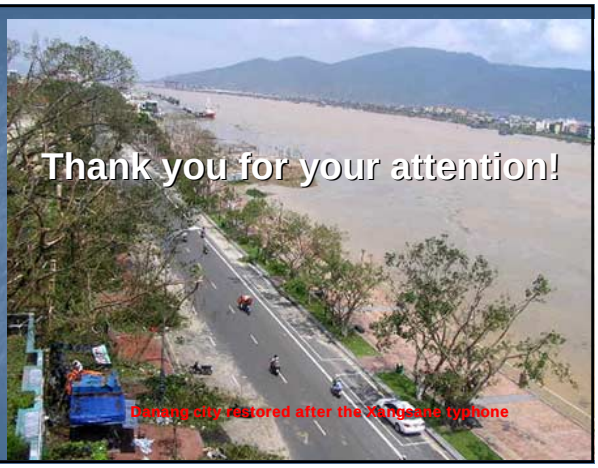
- Ensure security, safety and social order in the disaster affected area.

c) After natural disaster:

- To Quickly overcome consequences , environmental sanitation, epidemic prevention.

- To Restore infrastructure, especially traffic roads, electricity, water, schools, hospitals, public agencies.

- To quickly stabilize people's life, production and other normal activities of the residents.



Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/008A

Role of climate information in emergency preparedness

Submitted by: Dr. Saji N Hameed
APCC

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

Extreme weather and climate related disasters in APEC region

Role of climate information in emergency preparedness

Saji N Hameed,
APEC Climate Center,
Busan, Korea

http://www.apcc21.net

Thanks and quick feedback

- APCC thanks the organizers esp. TFEP for the invitation to take part in this important forum and its future activities
- APCC is quite interested in contributing to the development of disaster reduction strategies in the region and beyond
- In this regard it is willing to:
  1. Assist TFEP in preparing a statement on "Adaptation to climate variability and change" through its extensive network of climate scientists and forecasters in the region.
  2. Undertaking the development, in cooperation with TFEP and the CEOs, of a strategy for early warning on extreme climate events and its implementation

Outline

- A sampling of extreme weather/climate events
- Hydro meteorological disasters – some statistics
- Climate Vulnerabilities
- Issues of climate predictability
- Role of climate information in emergency preparedness – illustration using case study of RVF episode in Kenya, 2006

Weather and Climate

- Climate – patterns of weather
  - Climate or average state of weather over a given region – could be controlled by forces other than that which creates weather itself.
  - Just as the average life expectancy of people in any region is controlled by certain factors, such as diet or quality of life, and is therefore predictable to some extent, so is climate predictable due to the same reasons.

Extreme Weather/Climate events

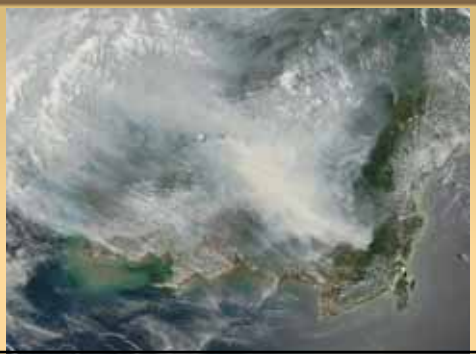
Hot Weather Turns Up the Heat on US Electric Power – NorthEast Blackout in USA and Canada, Aug 2003

Snow disaster leaves 1.6 mln people frostbitten in NW China province – Jan 2008

London suffered its first October snowfall in 74 years as a winter chill set in across England – October 2008

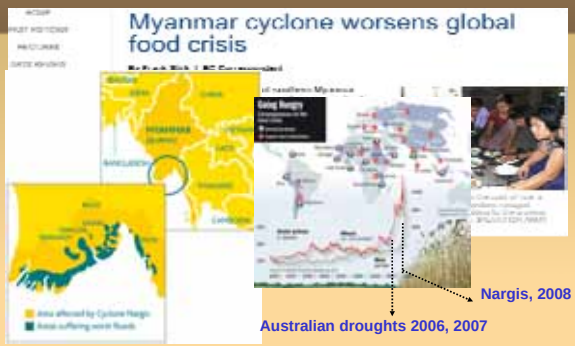
2006 ... an year of extreme climate

South East Asian Haze - 2006



Impacts of Indonesian wild fires

Disasters affect everyone



Is Climate to blame?

- Climate is ever changing, has changed in the past and will change again
- Some extreme events are predictable, but there are also many that are not predictable
  - Some are not predictable under the current state of knowledge
  - Some will never be predictable
- Extreme climate events affect everyone – the least developed are more affected.
  - Ripple effects of local climate disasters affect everyone in a globalized economy
- It is not climate that should bear the responsibility for disasters, rather our vulnerability is to be blamed

Hydro meteorological disasters

some statistics

All data from CRED (Centre for Research on the Epidemiology of Disasters, Brussels, Belgium http://www.cred.be

Disasters on the rise

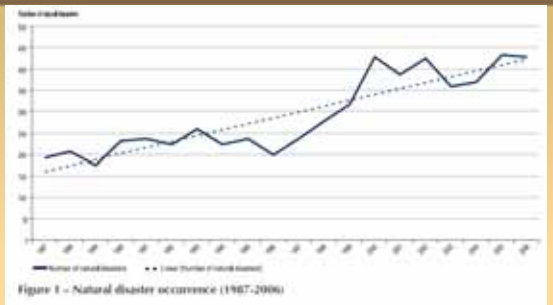


Figure 1 – Natural disaster occurrence (1967-2006)

A new era of climate disasters?

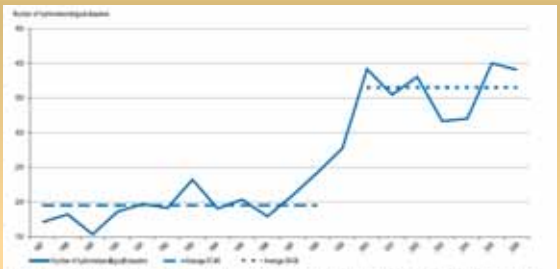


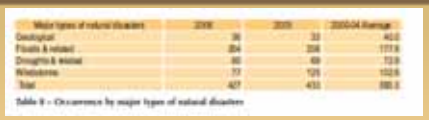
Figure 4 – Occurrence of hydrometeorological disasters: 1987-2006 with averages for periods 1987-1998 and 2000-2006

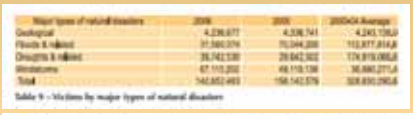
Hydro meteorological disasters account for a majority of natural disasters

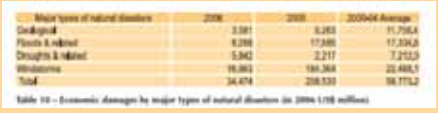
Impact of Hydro meteorological disasters

- Number of victims due to all natural disasters ranged between 100 Million to 300 Million on the average between 1987 and 2006
- 1987 drought in India affected 300 Million
- 1991 flood in China affected 210 Million
- 1994 flood (drought) in China affected 78 (80) million
- 2002 drought in India affected 300 million and 60 million in China, wind storm affected 100 million people in China and flood affected another 60 million

Impact of hydro meteorological disasters







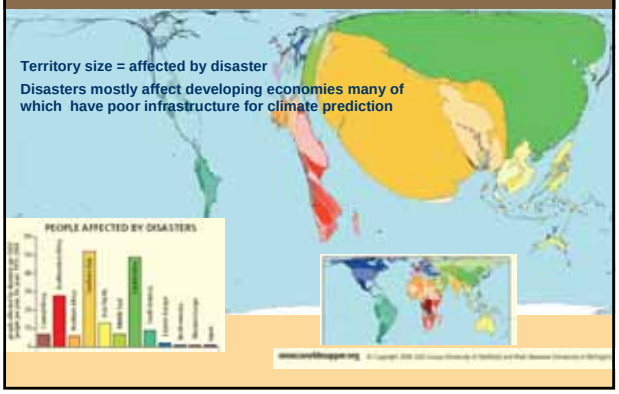
Impacts by Continent – APEC region is most affected

Continent	2006	2005	2000-04 Average
Africa	79	60	65.0
Americas	75	98	97.8
Asia	187	166	147.8
Europe	68	94	65.6
Oceania	18	15	16.8
Total	427	433	393

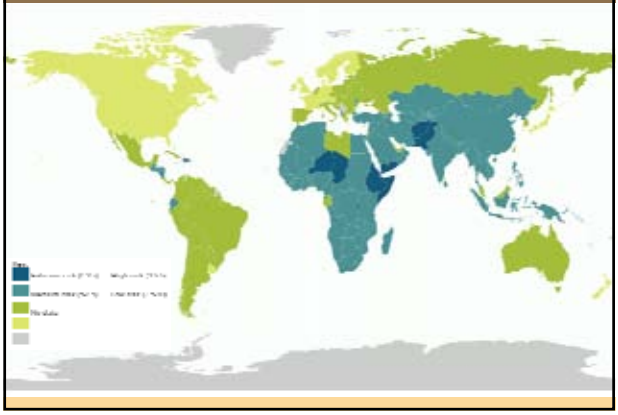
Continent	2006	2005	2000-04 Average
Africa	18.50%	13.86%	16.54%
Americas	17.56%	22.63%	24.89%
Asia	43.79%	38.34%	37.61%
Europe	15.93%	21.71%	16.69%
Oceania	4.22%	3.46%	4.27%
Total	100%	100%	100%

Table 11 – Natural disasters occurrence by continent

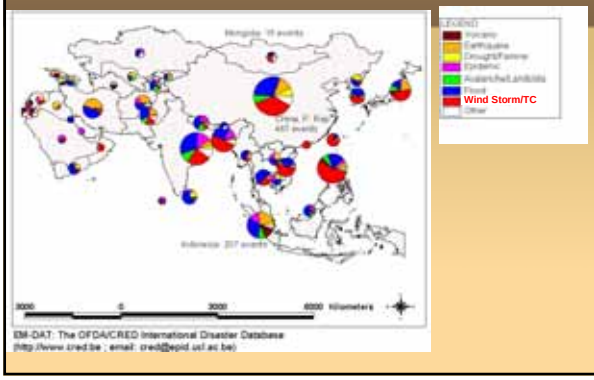
Cartography of Disasters



Climate Change Vulnerability Index



International Disaster (1975~2001)



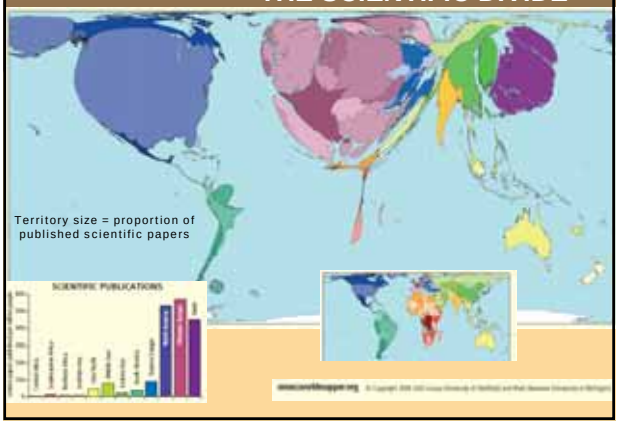
Obstacles

- Important **Structural** issues :
- lack of infrastructures,
- skilled resources,
- education research and innovation (« knowledge triangle ») foundations, policies and related investments,…

Advanced Climate Prediction Infrastructure in APEC region

- Produce dynamical global climate predictions (*in APEC region*)
- Does not produce dynamical global climate predictions

THE SCIENTIFIC DIVIDE



Making better use of climate information

- Improved climate prediction systems
- Application Research and implementation
- Better Disaster Preparedness
  - Early Warning Systems
  - Capacity Building
    - Training
    - Technology Transfer
    - Investments in Education and Research

Role of climate information in managing infectious diseases

Case study of RVF episode in Kenya, 2006

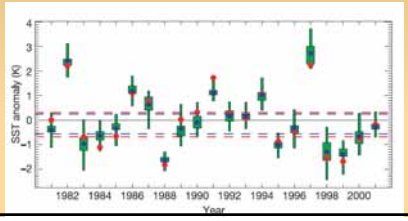
Climate Sensitive Diseases

- Cholera
- Malaria
- Meningococcal meningitis
- Dengue/dengue haemorrhagic fever (DHF)
- Yellow fever
- Japanese (JE) and St Louis encephalitis (SLE)
- Rift valley fever (RVF)
- Leishmaniasis
- African trypanosomiasis
- West Nile virus (WNV)
- Murray Valley encephalitis (MVE) and Ross River virus (RRV).
- Influenza

Improving response time

Status of Climate Prediction

Strengths: Predictions months/seasons in advance. In some cases, there is predictive skill 1 year in advance.



Status of Climate Prediction

Weakness: Lack detailed spatio-temporal evolution of climate event (quasi chaotic dynamics)

- Spatial detail can be improved through downscaling techniques
- Detailed evolution can be monitored in near real time from space

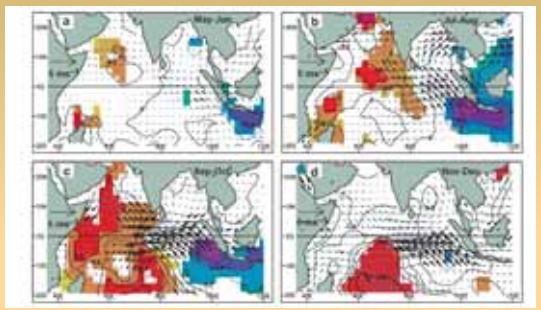
Monitoring from space

Real time monitoring of temperature, rainfall, soil moisture

Environmental remote sensing

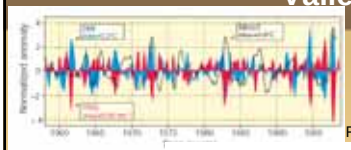
- Vegetation indices
  - NDVI – Normalized Difference Vegetation index
    - Monitor changing vegetation and relate to changes in precipitation (thereby disease vector populations)

Indian Ocean Dipole and Rift Valley Fever

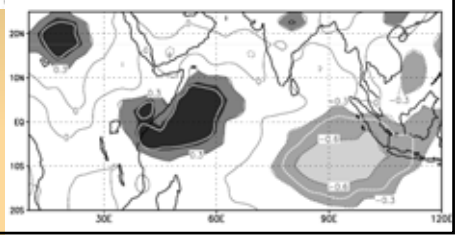


From Saji et al, Nature, 1999

Indian Ocean Dipole and Rift Valley Fever



From Saji et al, Nature, 1999



Rift Valley Fever

First identified – Rift valley, Kenya 1931 (a group of exotic sheep suffered severe losses)

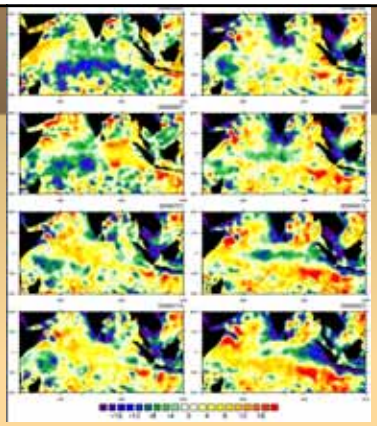
Transmitted by mosquitoes (Aedes) which breed in flooded low-lying habitats known as dambos.

Trade bans since 1997 IOD and El Nino episodes cost $300-500 million annually for GHA

NDVI of 0.43 and above correspond to short-term flooding of mosquito breeding dambo habitats.

Periods of RVF epizootic activity correlates with persistent and excessive rainfall, with an apparent lag that allows 1-2 months of early warning based on monitoring of rainfall trends.

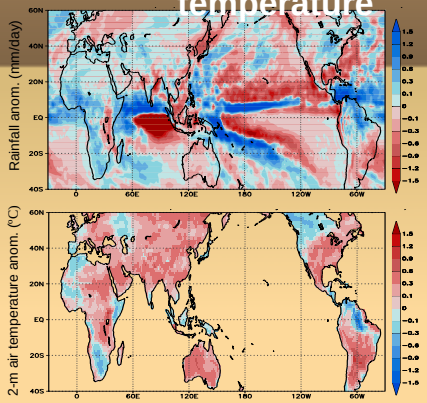
400 human fatalities in 1997

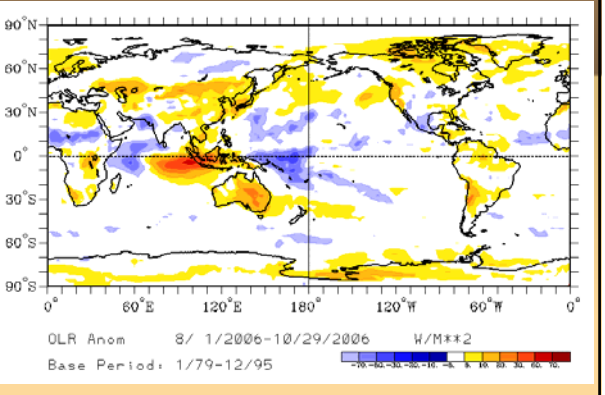


2006 IOD predicted 1 year in advance

Data source: AVISO near realtime sea level anomalies

Predicted rain and temperature





From NOAA/CDC

RVF Strategy : Anyamba et al

NASA climate expert Dr. Anyamba tracks climate factors that influence RVF outbreaks.

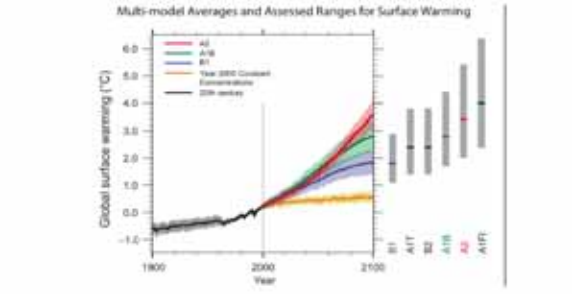
Assaf and team sprang into action by the end of October

- Notified affected countries through WHO and FAO
  - Health officials were prepared and flew to Kenya within days of the virus' confirmation in December.
- Kenyan government outlaws sacrificing of cows,camels,goat and sheep during Eid to minimize contact between humans and infected animals.
  - Believed to have cut the risk factor for virus transmission to humans

Because of early warning measures in 2006, death toll was limited to about 100 people (cf. > 400 in 1997)

IPCC New Scenarios

(**Representative Concentration Pathways** : full range of radiative forcing 3w/m2,4.5w/m2,6w/m2,8.3w/m2)



Greenland – Melt Areas

More Extreme Events in the Future

Global Sea Ice Level

21st century Global sea level rise will affect hundreds of millions of people on our planet. *World Bank, 2007*
- 500 million people for 1 m rise (USGS)

It is critical to get projections right for the planning of infrastructure:

30 cm of sea level rise can mean that extreme events you thought would happen once in 1000 years will instead happen once in 10 years!

Summary

- Improved climate prediction systems will enhance lead time.
- Application Research and implementation needed to put climate science into useful products for decision making.
- Better Disaster Preparedness
  - Early Warning Systems
  - Capacity Building
    - Training
    - Technology Transfer
    - Investments in Education and Research

Brief Status report about APCC

Background

- **2004 APEC Science and Technology Minister's Meeting**
  - **Recognition of importance of work of APEC Climate Network**
  - **APEC Climate Center has been providing operational 3-month lead dynamical seasonal predictions through the multi-model ensemble (MME) technique (www.apcc21.net)**
- **2007 Sydney Leaders' Declaration**
  - **Called for members of APEC to support effective adaptation strategies to climate change**
  - **High priority on strengthening emergency preparedness and promoting the economic benefits of risk reduction**

Better Information for Climate Adaptation

Climate prediction is very important for best practices in agriculture, water management, etc. It is crucial in advance preparation to address disasters such as forest fire, haze, yellow dust associated with pollution

Goals of APCC

Facilitating the share of high-cost climate data and information essential for emergency preparedness and disaster management

Capacity building in prediction and sustainable social and economic applications of climate information

Accelerating and extending socio-economic innovation

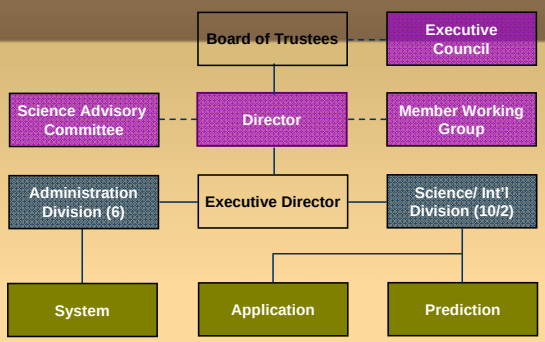
Focus areas

- Improving lead time needed to prepare for climate related disasters by advancing technology
- Reduce vulnerabilities to climate events through capacity building activities, including:
  - Technology Transfer (help implement advanced climate prediction technologies in needed economies)
  - Training (provide training to members so as to implement best practises)

How APCC works

- Multi economy and multi institutional networking
- Annual APEC Climate Symposiums provide forum for climate experts to interact with climate practitioners.
  - This feedback helps advance climate prediction science and to develop and implement best practices
  - Feedback from disaster managers are crucial to this process, and we would like to collaborate with TFEP and the CEO Forum to make this possible in the near future.

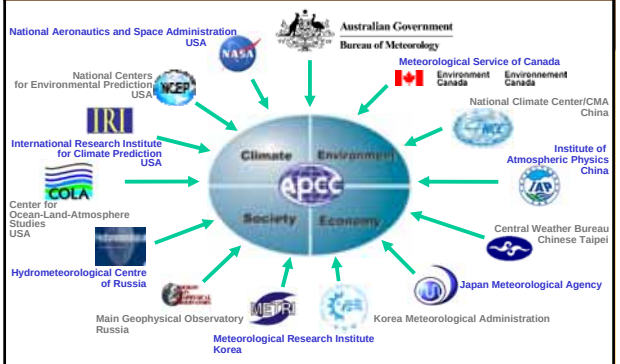
Organization (1)



APCC Services

- State of the art climate prediction information
- Climate prediction technology
- Training in Best practices

Multi-Institutional Cooperation



Technology and Data Sharing - Climate Information tool Kit (CLIK)

Available at http://clik.apcc21.net

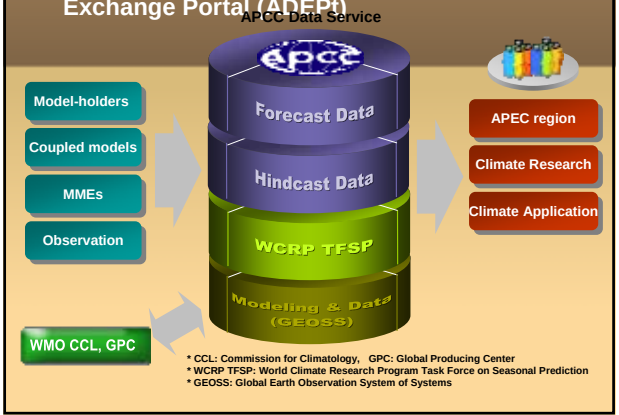
Customized Multi-Model Ensemble Prediction

Climate Information tool Kit (CLIK)

Climate Information tool Kit (CLIK)

9.09.14

Technology and Data Sharing – APEC Data Exchange Portal (ADEPt)



* CCL: Commission for Climatology, GPC: Global Producing Center
* WCRP TFSP: World Climate Research Program Task Force on Seasonal Prediction
* GEOSS: Global Earth Observation System of Systems

APEC Climate Symposia

- Annual events held since 2006
  - 2006 in Busan led to more frequent sharing and distribution of climate information
  - 2007 in Busan led to free and open sharing of digital climate information among stakeholders (first time in the world)
  - 2008 in Lima, Peru led to efforts to enhance extreme event prediction
  - 2009 in Singapore decided to develop an APEC wide position paper on “Adaptation to climate variability and Change in the region”

Thank You

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Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/008B

Climate Change and Disaster Risk Reduction in Korea

Submitted by: Korea

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

Climate Change and Disaster Risk Reduction in Korea

SEP. 15, 2009

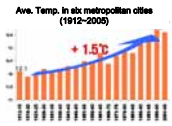
Byung - Hwa KANG

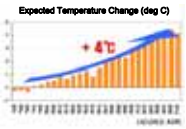
Director - General, The National Emergency Management Agency
Republic of Korea

Contents

1. Climate Change in Korea (4th IPCC Report)

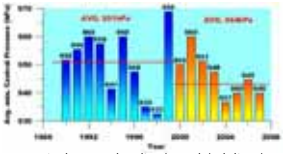
- Global temperature during the last Century: 0.74 ℃↑
  - At the end of this Century in the East Asia: 3 4℃↑
- Average temp. in Korea during the last Century: 1.5 ℃ ↑
  (two times to global average in six metropolitan cities)
  - At the end of this Century in Korea: 4℃↑, rainfall 20%↑
- Sub - tropical is moving North - ward
  - covering western & eastern coasts and central area of Korea





2. Changes in Disaster Risks in Korea

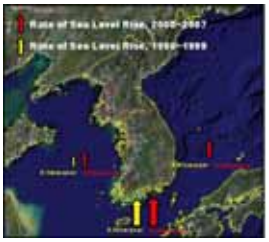
- Typhoon: lowered central pressure (951 → 944hPa)
  ⇒ increased strength (7 hPa↓)



- Rapidly increasing economic damages by climate - related disasters since 2000
  - 1960s (US$ 100 million), 1990s (US$ 600 million), after 2000 (US$ 2.7 billion)
    * Typhoon Rusa (Aug. 2002): US$ 5.1 billion, 63 thousand of sufferers
    * Typhoon Maemi (Sept. 2003): US$ 4.2 billion, 61 thousand of sufferers

2. Changes in Disaster Risks in Korea (cont'd)

- **Raised sea level compared to 1990s: 37% ↑**
  - 1990s: 0.14cm/yr (West Sea), 0.32cm/yr (South Sea), 0.07cm/yr (East Sea)
  - 2000s: 0.18cm/yr (West Sea), 0.34cm/yr (South Sea), 0.20cm/yr (East Sea)



3. Government's Response

- Taking threats by climate change as an opportunity for the new growth initiatives
  - Promoting and fostering "Green Industries" as new growth power through low - carbon green growth
- Operating Climate Change Task Force under the Office of the Prime Minister
  - Establishing comprehensive basic plans and countermeasures basic Act
- Disaster managers are participating in "Adaptation" area of the three major areas

Major Response Areas

① Science: cause analysis, monitoring, scenario, forecast, etc
② Impact and Adaptation: set up of measures thru impact assessment, etc
③ Mitigation: alternative energy development, reducing greenhouse effect, etc
* following IPCC and other international climate change study classification

- NEMA established the "Climate Change Response Division"

3. Government's Response (cont'd)

1 Linking Land Development Plan
2 Establishment of Nature - friendly Disaster Prevention
3 Resetting Design Codes for Prevention Facilities
4 Development of Disaster and Safety Technology using IT
5 Strengthening Climate Change Adaptation including Health
6 Promoting Voluntary Participation of Civil Society

3. Government's Response (cont'd)

1 Linking Land Development Plan

- Linear flood control by levee ⇨ Area flood control by basin
  - Concept change focusing on regional flood safety

- Linking disaster policy to land and urban development
  - Fundamental measures through relocation from flood - prone areas
  - Housing environment improvement through re - development

3. Government's Response (cont'd)

2 Establishment of Nature - friendly Disaster Prevention

- Flood hazard reduction caused by increased impervious areas
  - Restoration of nature - friendly water cycle system

Natural Water Cycle:
Rain - Evaporation - Infiltration - Runoff

Urban Water Cycle:
Rain - Direct Surface Runoff

Restored Water Cycle:
Rain - Evaporation - Infiltration - Runoff

3. Government's Response (cont'd)

2 Establishment of Nature - friendly Disaster Prevention

- Supply and expansion of rainfall runoff reduction system such as rainfall detention and infiltration facilities

Rainfall Infiltration New Town Schematics

3. Government's Response (cont'd)

3 Resetting the Design Codes for Prevention Facilities

- Changed extreme rainfall history due to climate change

From design code based on previous history
→ To improved design code for future extreme events

- Increased rainfall intensity
- Increased local heavy rains
- Strengthened typhoon power due to sea surface temperature change
- Increased flood level in downstream due to sea level rise

3. Government's Response (cont'd)

4 Development of Disaster and Safety Technology using IT

- NDMS (National Disaster Management System)

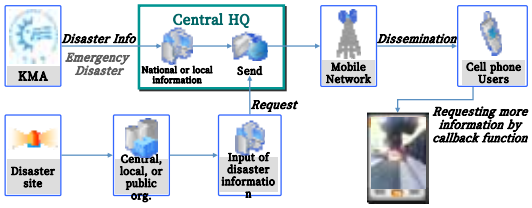
Comprehensive disaster information system for disaster prevention, preparedness, response, and recovery

3. Government's Response (cont'd)

4 Development of Disaster and Safety Technology using IT

- CBS: Cell Broadcast Service for Disaster Information

Sending disaster information to cell phone users in disaster area



4 Development of Disaster and Safety Technology using IT

WEB GIS based Typhoon Committee Disaster Information System(TCDIS)

- ✓ WGDPP of Typhoon Committee developed WEB GIS based TCDIS as its first project at 2006
  - To exchange the disaster information and experience among TC Members
  - To expand international cooperation and knowledge for disaster management system
  - To build information system to reduce the damages from typhoon disaster by sharing information and results of research

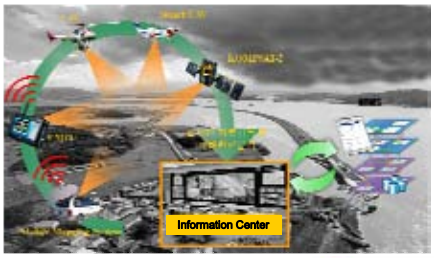

Main page of TCDIS web site


Typhoon information analysis for Viet Nam through TCDIS system log in

3. Government's Response (cont'd)

4 Development of Disaster and Safety Technology using IT

- Automated Disaster Damage Survey System



3. Government's Response (cont'd)

5. Strengthening Climate Change Adaptation including Health

- Against heat wave and tropical epidemics with relevant Ministries
- Heat wave early warning, emergency medical services, etc.

6 Promoting Voluntary Participation of Civil Society

- Supporting education and participation programs
  - Vitalization of local voluntary organizations
  - Disaster and safety education program development

4. Conclusions

Natural disasters due to climate change are inevitable

- Expecting increased natural disasters even with reduced Carbon Dioxide

↓

Establishment of Disaster - Resilient Society against Climate Change

- Reset the design code
- Strengthening of land constitution by changing way of thinking.
  - Nature - friendly disaster prevention
  - Adaptation of high technology

Final Comments & Suggestion

The system and management for regional share and cooperation

- Share the climate information
- Share the result of technical development on disaster response system
- Education & training
- Mutual aids

Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/009A

Update on Pandemic (H1N1) 2009 in the Asia Pacific Region and Opportunities to Strengthen Regional Cooperation

Submitted by: Dr. Jean-Marc Olivé,
WHO representative in Viet Nam

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

World Health Organization

THE THIRD EMERGENCY MANAGEMENT CEOS' FORUM
Ha Noi, Viet Nam – 15 September 2009

Update on Pandemic (H1N1) 2009 in the Asia Pacific Region and Opportunities to Strengthen Regional Cooperation

Dr Jean-Marc Olivé
WHO Representative

Concerns about Pandemic Influenza

- **Rapid global spread (morbidity and mortality); limited mutual aid**
- **Shortages and delays of vaccines and antiviral medications**
- **Increased burden on outpatient care facilities and hospitals**
- **Potential for disruption of national and community infrastructures**

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Influenza Pandemics in the 20th century


Credit: US National Museum of Health and Medicine

1918: "Spanish Flu"	1957: "Asian Flu"	1968: "Hong Kong Flu"
>40-50 million deaths	2 million deaths	1 million deaths
A(H1N1)	A(H2N2)	A(H3N2)

2009: Pandemic H1N1 cases? deaths?

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Epidemiology of Pandemic (H1N1) 2009 Virus Infection (I)

- So far overall severity falls within seasonal flu boundaries
  - Majority of cases show mild disease - resolves without treatment
  - Some asymptomatic cases reported
  - CFR: < 1% of confirmed cases
- 5-45 yrs of age most commonly affected
- Hospitalization and case/fatality in young adults higher than seasonal influenza
- Epidemiologic and serologic evidence for low susceptibility in older adults, although at increased risk for severe complications
- At risk groups: Pregnant women, people with chronic diseases and underlying health conditions, young children, people with immunosuppression

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Epidemiology of Pandemic (H1N1) 2009 Virus Infection (II)

- Efficient, rapid person-person transmission
- International travel has facilitated geographical spread
- Cases have been reported in all regions.
- More cases in urban centers before wider geographical spread within the countries.
- Most countries reporting an increasing trend.
- Continued circulation outside of usual influenza season

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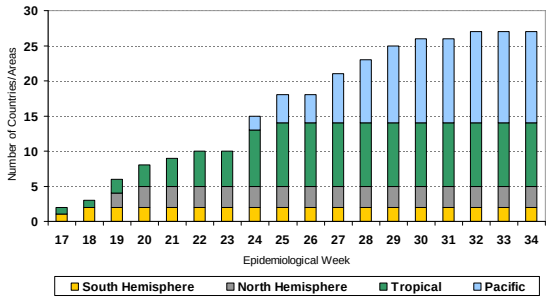
Number of Countries/Areas Reporting Confirmed Pandemic (H1N1) 2009 Cases to WPRO by Week



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Seasonal Influenza and Pandemic (H1N1) 2009 Situation in WPR

Northern Hemisphere	• Influenza like illnesses (ILI) activity in Japan has passed the seasonal epidemic threshold indicating a very early beginning of the influenza season. • Pandemic (H1N1) 2009 is geographically widespread • Number of cases are gradually increasing and deaths are now surfacing • Laboratory test results are predominantly Pandemic (H1N1) 2009
Southern Hemisphere	• Overall downward trend in influenza activity, with focal increases in the later affected regions • Peak levels of infection occurred at different times in different parts of the countries. • Laboratory test results are predominantly Pandemic (H1N1) 2009 • Spread is higher compared to seasonal influenza
Tropics	• Continued increase in rates of respiratory disease, becoming more higher compared to previous years • Pandemic (H1N1) 2009 activity is continuing and sustained • Increasing fatal cases was observed in some countries in the past several weeks
Pacific	• 20 out of 22 countries/areas have reported cases of Pandemic (H1N1) 2009 • Fiji and Samoa have reported almost 100 cases as of 23 Aug 2009

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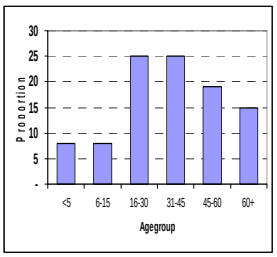
Pandemic (H1N1) 2009 Fatal Cases Western Pacific Region

Pandemic (H1N1) Fatal Cases by Age Group, Western Pacific Region (N=57)



Total Deaths 294

Clinical picture (N=57)

88% - with underlying medical condition

3 deaths among pregnant women, all without underlying medical conditions

Clinical Course

11 days - median interval from onset of symptoms to death (range: 0-38) (N=29)

5 days - median interval from onset of symptoms to hospitalization (range: 0-16) (N=21)

6 days – median interval from hospitalization to death (range: 0-34) (N=30)

Final diagnosis (N=44)

62% - severe pneumonia

14% - congestive heart failure

12% - ARDS

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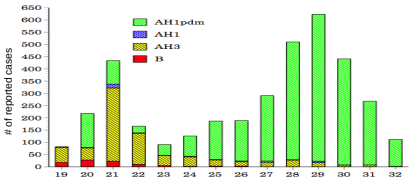
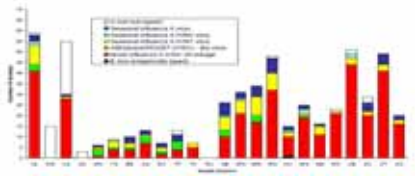
Influenza Virus Typing

Japan Week 19-32 2009



New Zealand August 2009



General Findings (I)

- Countries are following a similar path
  - Sporadic imported cases → local transmission → widespread community transmission
  - Appearance of severe cases/deaths
- Different responses are required for different stages
  - There is a need to transition from Containment to Mitigation
  - The decision to shift is difficult; should be based on a local risk assessment
- Many pandemic preparedness plans are not yet fully endorsed or made operational
  - Preparedness for a human pandemic is often very weak, insufficiently detailed and insufficiently broad or multi-sectoral
  - Preparations in sectors beyond health need to be strengthened

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General Findings (II)

- Epidemiological patterns remain unpredictable
  - Outbreaks in non-influenza season
  - Sudden increases and decreases (triggers?)
  - Majority of cases are self-limiting, but some severe cases (high risk groups)
- The pandemic is occurring at the same time as seasonal flu and other viral disease outbreaks in some countries
  - Concurrent outbreaks confuse the clinical picture and can increase demand for health services
- Coordinated and strengthened regional information sharing is needed

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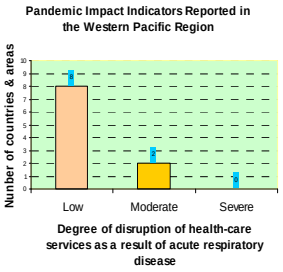
Monitoring of Pandemic Impact

- **Pandemic impact still remains uncertain and is currently under monitoring**
- **Pandemic impact on a population has many dimensions: health, social, and economic consequences**
- **No severe impact on health-care services as a result of acute respiratory disease has been reported**
- **Pressures on local hospitals and potential economic loss has been reported in some countries**



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Key Related Decisions

- Appropriate management practices
- Role of non-pharmaceutical interventions
- Target groups for intervention with antivirals and vaccines
  - Ensuring continuity of essential services, especially health care
  - Risk groups in need of protection
  - Target groups that might have greatest impact on transmission
- Increasing supply and access to pandemic vaccines
- Effective means of communication

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Pandemic Framework for Action

Pandemic *preparedness* should continue, even when in pandemic *response.*

Framework of Action can be used to guide country preparedness for community transmission

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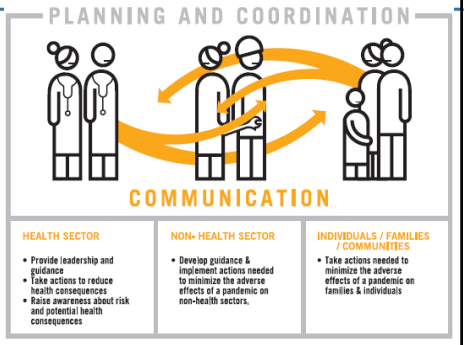
Whole-of-Society Approach

- A multisectoral collaborative approach
- Involving all sectors, communities and individuals
- Support at high levels of governments and organizations



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Steps for Promoting "Whole of Society" Preparedness

- All levels of Government demonstrating advocacy and commitment
- Setting up a coordinating body at sufficiently high level and involving the national disaster management agency
- Issuing required legislature
- Assigning roles & responsibilities for the Ministries (Sectors) for sectoral planning
- Ministries providing guidance and monitoring progress in their domain
- Involving the private sector
- Developing, testing and aligning plans
- Involving mass organizations / civil society

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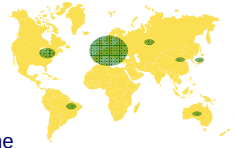
Pandemic Influenza Vaccine Challenges

- Lag time between declaration of the pandemic and availability of vaccines (4-6 months)
- Gap between vaccine potential demand and anticipated supply
- Regional disparity between vaccine production regions and the global need for vaccines
- Lower than optimal immunogenicity of non-adjuvanted inactivated split vaccines (for H5N1)



65-70% of global vaccine production located in Europe
Source: EVM Press Release 30 April 2004

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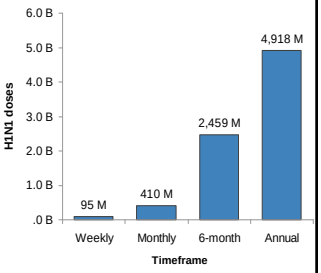
All Potential Influenza A(H1N1) Vaccine Manufacturers

Pandemic Vaccine Baseline Capacity Estimated at 94.5M Doses per Week

Assumptions / Methodology

- Survey sent to 36 potential influenza vaccine manufacturers
  - 100% response rate
  - All 21 current influenza vaccine producers responded
  - 26 manufacturers that intend to produce pandemic vaccines
  - Includes LAIV and one recombinant vaccine capacity
- Survey assumes
  - 1:1 H1N1 to seasonal yields
  - Most dose sparing formulation for **each** manufacturer
  - Use of full production capacity

Estimated H1N1 Vaccine Capacity
At 1:1 yields, most dose-sparing formulation, full capacity



Source: WHO survey

Countries are Drawing Against the Capacity in Different Ways

Segments	Access Strategy	Population	% of H1N1 Capacity[1]
High-income (e.g., U.S., Canada, Europe, Japan, Australia)	▪ **Mostly open system:** Countries negotiate contracts for vaccine with major, industrialized country manufacturers – Facilities serve home countries and export to other markets	**893 M**	**90%**
Low / Middle Income with local supply (e.g., China, Russia)	▪ **Mostly closed system:** Will procure vaccine mainly from within country – Limited or no plans by manufacturers to export	**3,114 M**	**10%**
Low / Middle Income without local supply	▪ **No current access to H1N1 vaccine**	**2,662 M**	**N/A**

1 Refers to portion of capacity located within these countries.
Source: UNPD population dataset , WHO survey

Pandemic (H1N1) 2009 Vaccine Availability

- Earliest expected vaccine availability: Sept 2009
- Discussions to expand access are on-going
  - Sanofi Pasteur donation to WHO: 100 million doses
  - GSK donation to WHO: 50 million doses
  - Both donations are targeted to provide access to low and middle income countries without access to vaccine

What Are Our Immediate Challenges?

- Monitoring seasonal, pandemic, and avian influenza and reducing opportunities for reassortment
- Reaching high risk persons
- Promoting behaviour change
- Recognizing possibility that pandemic may become more severe
  - Country-specific situation
  - Change in the virus
- Continuing planning and preparedness efforts
  - Allocating limited resources, esp re: health care surge
  - Non-health sector preparedness

Urgent Actions for the Next Twelve Months: Country Level Analyses and Response

- Capacity for planning and direction
- Disease surveillance
- Health care response
- Public health interventions
- Communication strategies
- Whole of society preparedness and response
- Preparedness support by UN agencies, funds, programs and partners
- Formation of a member-state based contact group

Urgent Actions for the Next Twelve Months: Global and Regional Level Response

- Advocating for further multi-sectoral pandemic planning, preparedness, and response
  - Health care surge capacity
  - Continuity of operations in non-health sectors
- Monitoring disease progression
  - Epidemiological characterization, impact on the community, transmission characteristics, and clinical characterization
  - Geographic spread (localized / regional / widespread), trend and intensity of level of respiratory disease activity, and impact on health care infrastructure
- Generating and transferring knowledge
  - Selection, implementation, and effectiveness of interventions
  - Educational materials and training
- Accelerating access to laboratory diagnostic supplies, vaccines, and antivirals

Summary

- **The pandemic situation is evolving**
  - **Concerns of unpredictable mutation of the pandemic virus**
  - **Concerns of co-circulating seasonal, pandemic, and avian viruses**
- **An efficient response is needed**
  - **Well-coordinated global, multisectoral, and collaborative**
  - **Timely sharing of information**
- **Key resources are limited**
  - **The supply of safe, effective vaccines need to be improved**
- **More information is needed to fully understand the virus, the disease and effectiveness of various measures**
  - **Information sharing needs to be timely and accurate**

World Health Organization

Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/009B

Influenza H1N1 2009 and APEC Cooperation

Submitted by: APEC HWG

INFLUENZA H1N1 2009 and APEC COOPERATION

THIRD APEC EMERGENCY MANAGEMENT CEO'S FORUM

Ha Noi, 15-17 September 2009

Jan Bennett
Chair, APEC Health Working Group

Health Working Group, August 2009 major focus on pandemic (H1N1) 2009.

- Recognised that the pandemic impact is different in different countries.
- Acknowledged the efforts of Mexico to alert the world to the emergence of H1N1.
- Noted the issues around modern day movement of people and the impact of travel.
- Noted that there was some concern about the issue of anti-viral resistance and the potential for future reassortment of the virus.

Health Working Group, August 2009 major focus on pandemic (H1N1) 2009.

- Recognised the importance of communication and information sharing.
- Recognised the importance of pharmaceutical responses.
- Noted that economies need to be able to identify where in the pandemic it is and target it response accordingly.
- Emphasised the importance of maintaining essential services and not having unnecessary barriers to trade.

Health Working Group, August 2009 major focus on pandemic (H1N1) 2009.

- Recognised the importance of work being undertaken by other organisations such as WHO and ASEAN.
- Highlighted the important projects and work that the HWG has progressed.
- Emphasised the importance of continuing APEC action to strengthen capacity in the region to prepare for, respond to and mitigate human influenza pandemics.

Health Working Group Projects

- APEC Guidelines for Functioning Economies in Times of Pandemic.
- APEC Action Plan on the Prevention and Response to Avian and Influenza Pandemics.
- Establishment of the APEC Emerging Diseases Network.
- A training course conducted by China will build technical capacity for animal and human influenza surveillance.

Lessons Learned – APEC Economies

- Information is the cornerstone for effective management of the crisis.
- Increased focus on hygiene, prevention and healthcare strategies and social distancing measures were effective.
- Pandemic plans need to be flexible and adapted in order to respond to changing situations.

Lessons from Australia

- Border measures implemented were effective in gaining valuable time to prepare and activate response strategies in anticipation of the arrival of the infection on our shores.
- Having a stockpile of antivirals and personal protective equipment is imperative to be able to respond quickly.
- Naming the Australian phases (e.g. ALERT, DELAY, CONTAIN etc.) rather than using a numbered system worked well when communicating to the public.

Lessons from Australia

- The need to scale pandemic planning so that an appropriate and proportionate response.
- Recognising the moderate severity of this infection, Australia needed to develop a new phase to our plan.
- Australia has identified that there is a need to strengthen diagnostic laboratory capacity.
- The need for effective communication between all levels government, health professionals and the public.
- Closing schools as a public health measure has an enormous impact on the wider community, both in terms of social and economic costs. More research needed.

Lessons from Australia

- Australia recognises that morbidity and mortality data can provide valuable insights into the severity of the virus.
- harnessing expert health advice is vital in responding to pandemic conditions.
- public health workforce capacity.
- public and professional acceptance needs to be gained early in the planning phase.
- many aspects of existing legislative and regulatory frameworks which may have an impact on strategies.

Conclusion

- Need to prepare for a second wave of infection or for a possible change in the viral strain that increases transmissibility or virulence.
- Important for the Health Working Group to continue its dialogue on H1N1 issues .
- Collaboration will be a key component of strengthening regional capacity to prepare for, respond to and mitigate the effects of human influenza pandemics.

United Nations International Strategy for Disaster Reduction

The Hyogo Framework for Action -

Biennial Progress Review Process 2007/9

www.unisdr.org

UNISDR Secretariat Asia and Pacific,
THE THIRD APEC EMERGENCY MANAGEMENT CEOs' FORUM 2009

HFA Biennial Progress Review 2007/9

Why monitor HFA implementation?

- HFA identifies monitoring and reporting responsibilities with **National Governments having the lead responsibility**
- Reporting and analysis of progress is essential to **improved DRR planning** and work-programming
- Reporting and progress analysis will lead to a **more focused HFA implementation**
- Consolidate **political and economic commitment for DRR**

ASEAN Region HFA Reporting

- **National Reporting**: Coordinated by National HFA Focal Points through national consultations.
  - **Complete** (6): Cambodia, Indonesia, Lao PDR, Philippines, Singapore, Viet Nam
  - **Ongoing** (1): Thailand
- **Regional Reporting**: Sub-regional progress reports coordinated by regional inter-governmental institutions.
  - Regional synthesis report on progress in HFA implementation (UNISDR)
  - **ASEAN Report**
- **Thematic Reporting**:
  - Report on Urban Disaster Reduction in Asia (Regional Task Force on Urban DRR)
  - Report on Space Technology Applications in Asia (UNESCAP and ADRC)

Hyogo Framework of Action (HFA) Priorities

- **HFA Priority Area 1 - Governance** - ***Ensure that disaster risk reduction is a national and local priority with strong institutional basis for implementation***
- **HFA Priority Area 2** - ***Risk identification - Identify, assess and monitor disaster risks and enhance early warning***
- **HFA Priority Area 3 – *Knowledge - Use knowledge , innovation and education to build a culture of safety and resilience at all levels***
- **HFA Priority Area 4** - ***Reducing the underlying risk factors***
- **HFA Priority Area 5** - ***Strengthen disaster preparedness for effective response***

HFA Priority Area 2

Risk identification

Identify, assess and monitor disaster risks and enhance early warning

HFA 2: 1 - National and local risk assessments based on hazard data and vulnerability information are available and include risk assessments for key sectors.

	1	2	3	4	5
Cambodia	X	X	X		
Indonesia	X	X	X		
Lao PDR	X	X			
Philippines	X	X	X		
Singapore	X	X	X	X	X
Viet Nam	X	X	X		

Singapore has completed the tsunami risk assessment on Singapore and has put in place a tsunami response plan from various agencies to deal with any tsunami threat.

HFA 2: 2 - Systems are in place to monitor, archive and disseminate data on key hazards and vulnerabilities

	1	2	3	4	5
Cambodia	X	X			
Indonesia	X	X	X		
Lao PDR	X	X	X		
Philippines	X	X			
Singapore	X	X	X	X	X
Viet Nam	X	X	X	X	

Indonesia At the national level, monitoring, archiving and dissemination of data on hazards, such as floods, volcanic eruption, landslides, earthquake monitoring, etc., have been made available. However, **when such data and information reach the local intended area, the utilization and dissemination of that information is still not optima**l due to lack of systematic information dissemination, as well as limitations of existing capacity.

HFA 2: 3 - Early warning systems are in place for all major hazards, with outreach to communities.

	1	2	3	4	5
Cambodia	X	X			
Indonesia	X	X	X	X	
Lao PDR	X	X	X		
Philippines	X	X	X		
Singapore	X	X	X	X	X
Viet Nam	X	X	X	X	

Indonesia Nationally-based early warning system for several major hazards has been made available and considered as quite functioning. Its dissemination has reached up to the community level prone to such hazards. Evaluation on early warning system at community level for several major hazards has also been undertaken professionally, with the support from experts from research institutes / universities / academicians so that this early warning system can be adapted into the local situation and condition, and include or consider the existing local wisdom. **However, in some areas, due to lack of human resources and capacity, response to early warning system is often still limited.**

HFA 2: 4 - National and local risk assessments take account of regional / trans boundary risks, with a view to regional cooperation on risk reduction.

	1	2	3	4	5
Cambodia	X				
Indonesia	X	X	X		
Lao PDR	X	X	X		
Philippines	X	X			
Singapore	X	X	X	X	X
Viet Nam	X	X			

Viet Nam At national level, the bi/multilateral corporations with other countries in Mekong region like Thailand, Laos, and Cambodia through MRC have achieved some preliminary results such as the **strategy for flood mitigation and management of the lower Mekong basin** with a view to regional cooperation on risk reduction developed and implemented.

HFA Priority Area 4

Reducing the underlying risk factors

HFA 4: 1 - Disaster risk reduction is an integral objective of environment related policies and plans, including for land use natural resource management and adaptation to climate change.

	1	2	3	4	5
Cambodia	X	X	X		
Indonesia	X	X	X		
Lao PDR	X	X	X		
Philippines	X	X	X		
Singapore	X	X			
Viet Nam	X	X			

Viet Nam The 5 year socio-economic development plan (2006-2010) has mentioned matters related to natural disaster mitigation. The cooperation with international organizations, nations and non-government organizations in disaster mitigation such as UNDP, UNESCAP, WB, ADB, etc., has been increased, particularly the **cooperation in DRR and Climate Change projects and programs with the emphasis on the integration of DRR into the policies / programs on environment, such as the land use policies, natural resource management policies and climate change adaptation policies**.

HFA 4: 2 - Social development policies and plans are being implemented to reduce the vulnerability of populations most at risk.

	1	2	3	4	5
Cambodia	X	X	X		
Indonesia	X	X			
Lao PDR	X				
Philippines	X	X			
Singapore	X	X	X	X	X
Viet Nam	X	X	X	X	

Lao PDR Recognizing the increasing importance of disaster risk reduction, the United Nations Development Assistance Framework (2007-2011) seeks to support the Government of Lao PDR's Sixth Five Year National Socio Economic Development Plan (2006-2010). **Under this UNDAF, disaster risk management is listed as a key area for cooperation and one of the critical components of poverty reduction framework.**

HFA 4: 3 - Economic and productive sectoral policies and plans have been implemented to reduce the vulnerability of economic activities

	1	2	3	4	5
Cambodia	X	X			
Indonesia	X				
Lao PDR	X				
Philippines	X				
Singapore	X	X	X	X	X
Viet Nam	X	X	X	X	

Philippines Very little has been done to protect economic activities and productive sectors. Although some private enterprises may have business continuity plans, how well these are linked with a local government's contingency plan leaves many doubts. **This is because DCCs rarely, if any, involved the private sector. Makati City is among the few exceptions.** Crop insurance for *palay* and high value crops and livestock insurance through the Philippine Crop Insurance Corp. (PCIC) are available but many farmers do not subscribe for reasons usually ascribed to as financial.

HFA 4: 4 - Planning and management of human settlements incorporate disaster risk reduction elements, including enforcement of building codes.

	1	2	3	4	5
Cambodia	X	X	X		
Indonesia	X				
Lao PDR	X				
Philippines	X	X			
Singapore	X	X	X	X	
Viet Nam	X	X	X	X	

Viet Nam The document called "Plan for 2006 and main objectives and tasks for the next 5 year" of the Construction Sector, there is no sight of integration of natural disaster mitigation. The plan as a whole is merely for developing the sector in terms of technical aspect and growth. **Main tasks and solutions of the Construction Sector that are related directly to natural disaster prevention, response and mitigation are designing and implementing construction planning, especially in the sites that are frequently suffered from natural disaster.**

HFA 4: 5 - Disaster risk reduction measures are integrated into post disaster recovery and rehabilitation processes

	1	2	3	4	5
Cambodia	X	X			
Indonesia	X	X	X		
Lao PDR	X	X			
Philippines	X	X			
Singapore	X				
Viet Nam	X	X	X	X	

Indonesia There have been efforts to integrate DRR into recovery and rehabilitation processes post disaster. For example, the reconstruction of collapsed building or infrastructure as a result of disaster, are then rebuild as disaster resistant building. **The Department of Health has also developed policy related to reconstruction of damaged hospital due to disasters by utilizing DRR norms.**

HFA 4: 6 - Procedures are in place to assess the disaster risk impacts of major development projects, especially infrastructure.

	1	2	3	4	5
Cambodia	X	X			
Indonesia	X	X	X		
Lao PDR	X	X			
Philippines	X	X			
Singapore	X	X			
Viet Nam	X	X			

Cambodia There are developments of procedures, guidelines and methods to assess the flood risk impacts on major development projects, especially infrastructures. For instance, under Component (2) " Flood Proofing and Structural Measures" and Component (5) "Land Use Management" of Flood Management and Mitigation Programme of MRC, **some procedures, guidelines and methods are being developed**

HFA Priority Area 5

Strengthen disaster preparedness for effective response

HFA 5: 1 - Strong policy, technical and institutional capacities and mechanisms for disaster risk management, with a disaster risk reduction perspective are in place.

	1	2	3	4	5
Cambodia	X	X	X		
Indonesia	X	X	X		
Lao PDR	X	X			
Philippines	X	X	X		
Singapore	X	X	X	X	X
Viet Nam	X	X	X		

Viet Nam Ministries and local governments have reviewed, and improved the system of the flood and storm control as well as search and rescue in order to meet the requirements of the DRR in the face of increasing negative impacts of natural disasters. **For example, ministry of home affairs in close collaboration with MARD, relevant ministries, and provincial/city governments developed a proposal for reviewing, adjusting, and establishing the supporting agencies for DRR implementation at all levels.**

HFA 5: 2 - Disaster preparedness plans and contingency plans are in place at all administrative levels, and regular training drills and rehearsals are held to test and develop disaster response programmes.

	1	2	3	4	5
Cambodia	X	X	X		
Indonesia	X	X			
Lao PDR	X				
Philippines	X	X	X		
Singapore	X	X	X	X	X
Viet Nam	X	X	X	X	X

Singapore The SCDF has developed a comprehensive set of emergency preparedness plan which includes the **Community Emergency Preparedness Programme, conducted community exercises, developed the civil emergency handbook to members of public**

HFA 5: 3 - Financial reserves and contingency mechanisms are in place to support effective response and recovery when required.

	1	2	3	4	5
Cambodia	X	X			
Indonesia	X	X	X	X	
Lao PDR	X				
Philippines	X	X			
Singapore	X	X	X	X	
Viet Nam	X	X	X	X	

Indonesia The government has made available emergency/buffer stocks as emergency preparedness measures at national, provincial and district/municipality level. These buffer stocks consist of humanitarian needs, such as tents, rice, public kitchen, food, clothing, and health basic needs. **Meanwhile, contingency or "on call" budget has also been made available in the amount of IDR 40 -50 billion and can be added if or when required.** BNPB is currently in the process of establishing its Technical Operational Unit (Unit Pelaksana Teknis/UPT) in certain parts of the economy. These UPTs will function as training centers as well as hubs for emergency/buffer stocks.

HFA 5: 4 - Procedures are in place to exchange relevant information during hazard events and disasters, and to undertake post-event reviews

	1	2	3	4	5
Cambodia	X	X			
Indonesia	X	X	X		
Lao PDR	X				
Philippines	X	X	X		
Singapore	X	X	X	X	X
Viet Nam	X	X	X	X	

Cambodia There are some achievements in terms of planning to exchange the relevant information during hazard events, including a draft National Policy for Emergency Management formulated by NCDM; Disaster Emergency Response formulated by the Cambodian Red Cross, Disaster Preparedness Plan formulated by Provincial Committee for Disaster Management in Svay Rieng province, Flood Emergency Management Strengthening (FEMS) programme of MRC/ADPC in provinces of Prey Veng, Kandal and Kratie; etc.

Summary of issues

- In 2005 very few countries in the region (including Australia) had conducted national multi-hazard risk assessments. **Since the adoption of the HFA Hong Kong China, the Islamic Republic of Iran, New Zealand and the Republic of Korea report significant achievements in this area**.
- National-level information on hazards is easier to come by than information on vulnerability though hazard assessments are often sector-specific and hard to integrate since different sectors employ different methodologies and data formats. **Bangladesh, Cambodia, Indonesia, the Philippines and Sri Lanka report a general lack of consistent approaches and objectives of risk assessments from the national to the local level**.
- Methodological issues include the need to define "community reliance" or "safety" within a broader risk assessment framework to monitor and document the effectiveness of investing in risk reduction at the local level. In areas of higher climate risk, global climate change may considerably intensify established patterns of risk and stretch coping capacities to the limit; however policy-makers and planners have limited access to credible assessments and scenarios.

Summary of issues

- On the positive side some countries including **Australia, Indonesia, New Zealand, the Republic of Korea, Sri Lanka and Vanuatu have a framework for risk assessments and the standardization of risk assessment procedures and methodologies** (national/ and or local levels).
- There is recognized need to identify the impact of climate change on risk patterns and scenarios particularly at the local level. **Bangladesh reports considerable progress in assessing the risk from climate change on agriculture but this seems an isolated case.**
- Majority of current risk assessment activity seems to be happening at the sub-national and local level though initiatives tend to be scattered, externally funded and often detached from an integrated risk information and monitoring system.
- In the aftermath of major disasters remote sensing applications have gained further importance to support emergency response and recovery efforts in Asia Pacific. **However the use of satellite-imagery requires solid and specialized disaster information management capacity on the ground as the following case from China illustrates.**

Summary of issues

- Another good example in the region of Asia and Pacific is the **installation of a seismic monitoring network in Tajikistan**. A network of seven digital stations replaced the old and hardly functioning net of 49 analogue stations most of which were destroyed in the civil war of 1992-1997.
- The Indian Ocean Tsunami disaster has prompted the establishment of early warning systems (EWS), particularly in the countries directly affected but **also confirmed or increased interest in others to review and update their systems (Australia, Bangladesh, Cambodia, Marshall Islands, New Zealand, Korea, Vanuatu).**
- At the national level **Sri Lanka and Indonesia have made significant progress in system development but challenges to disseminate information to end-users** in less accessible locations have not yet been fully resolved. Another challenge is the ability of communities to respond adequately to warning messages.
- In many countries targeted investments in preparedness of high risk communities remain sporadic, dependent upon external aid and insufficiently harmonized with each other. **Cambodia for instance reports that some local authorities have not been adequately involved in the development of a flood early warning system in the Lower Basin of the Mekong**. In these districts the termination of external support led to the discontinuation of EW activities.

Opportunities for Follow-up

From Laws and Strategies to Action and Investment

- National DRR Strategies adopted/exist in the following countries:
  - Cambodia
  - Philippines
  - Thailand
  - Viet Nam
  - Indonesia
- National DRR Strategies under development
  - Myanmar
- Gaps and opportunities are known
- National implementation plan being developed
  - Viet Nam

Disaster risk reduction is everyone's business.

Invest today for a safer tomorrow

Thank you for your attention

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Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/0010

Khuôn khổ hành động Hyogo - Tiến trình rà soát tiến độ hai năm một lần 2007/9

Submitted by: UNISDR

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

Cơ sở:

Tháng 11 năm 2008, các Bộ trưởng và Lãnh đạo APEC đã yêu cầu các cán bộ APEC hỗ trợ việc đưa giáo dục về vấn đề thiên tai vào chương trình giảng dạy ở học đường.

Năm 2008, các Bộ trưởng Giáo dục APEC còn nhận thấy tầm quan trọng của việc tiến hành các nghiên cứu thực tiễn và khoa học về các nguy cơ thiên tai và tình trạng khẩn cấp thông qua việc đưa giáo dục về vấn đề thiên tai vào chương trình giảng dạy ở học đường.

Hội nghị Bộ trưởng Châu Á lần 2 và lần 3 về Giảm thiểu nguy cơ thiên tai tổ chức vào tháng 11/2007 và tháng 12/2008, cũng đã kêu gọi các chính phủ làm cho trường học an toàn và đưa vấn đề giảm thiểu nguy cơ thiên tai vào chương trình giảng dạy và đây nên được xem là ưu tiên của từng quốc gia.

Hoạt động tiến hành hiện nay

Một bản báo cáo tư vấn do Úc tài trợ về "Giáo dục về nguy cơ thiên tai tại nhà trường" đã được Công ty CSR Châu Á soạn thảo. Báo cáo này sẽ được trình bày và thảo luận tại Diễn đàn lần 3 các Lãnh đạo Quản lý thiên tai ÂPEC tổ chức tại Hà Nội Năm 2009.

Báo cáo này được chuẩn bị dưới dạng một văn bản của tài liệu họp có thể được sửa đổi, hoàn thiện trong suốt quá trình thảo luận tại Diễn đàn và trình bày tại cuộc họp sắp tới của nhóm công tác Đối phó với tình trạng khẩn cấp. Do vậy, việc tham khảo ý của của các nền kinh tế thành viên APEC và thảo luận tại Diễn đàn sẽ đóng góp cho việc hoàn thiện Báo cáo.

Dự thảo nguyên tắc trong APEC

Báo cáo bao gồm một chương về các nguyên tắc sơ bộ như là khởi điểm cho việc thảo luận sâu hơn trong APEC nhằm đạt được mục đích chung là đưa vấn đề giáo dục về thiên tai vào trường học.The paper also includes a chapter with a preliminary list of principles as a starting point for further discussion within the APEC community on a common approach towards integrating disaster risk awareness at schools.

Khuyến nghị

Diễn đàn đóng góp vào việc hoàn thiện báo cáo và dự thảo các Nguyên tắc trong APEC về việc đưa giáo dục nguy cơ thiên tai vào trường học.

Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/010

The Hyogo Framework for Action – Biennial Progress Review Process 2007/9

Submitted by: Mr Huy Nguyen
UNISDR

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/011

Proposal for Successful 4th AMCDRR 2010 in Seoul, Korea

Submitted by: Korea

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

Proposal for Successful 4th AMCDRR

Incheon, Republic of Korea, 2010

For the Meeting of the 3rd Emergency Management CEO's Forum
Ha Noi, Sep. 16, 2009

Byung-Hwa KANG
Director General
The National Emergency Management Agency,
Republic of Korea

Contents

I. Background

- **Asian Ministerial Conference on Disaster Risk Reduction (AMCDRR) has been organized every two years since 2005**

• Previous AMCDRR
- The First (Beijing, China) : September 2005
- The Second (New Delhi, India) : November 2007
- The Third (Kuala Lumpur, Malaysia) : December 2008

• Next AMCDRR
- Incheon, Republic of Korea : October 2010

II. Conference Theme

"Disaster Risk Reduction through Climate Change Adaptation"

Five Topics for HLRT and Technical Sessions

- Establishment of Nature-friendly Disaster Prevention and Mitigation Practices and the Improvement of Current Design Criteria for Prevention of Disasters due to Climate Change
- Development of Risk Analysis System and the Establishment of Early Warning & Evacuation Systems using information and Communication Technologies (ICT)
- Strengthening Recovery Systems for the Prevention and Mitigation of Recurring Disasters
- Reducing Urban Risks due to Natural and Technological Hazards
- Enhancement of Regional Sharing and Cooperation Systems on Disaster Risk Reduction including International Joint Researches

Conference Schedule

Tentative Program

Date		Program
Oct. 25	All Day	Pre-Committee
Oct. 26	Morning	Opening, Plenary, AMCDRR Review, HFA Review
	Afternoon	Thematic Segment (HLRT & Technical Sessions)
	Evening	Welcome Dinner
Oct. 27	All Day	Thematic Segment (HLRT & Technical Sessions) * Declaration Drafting and Photo Session
Oct. 28	Morning	Plenary (Five-Topic Presentations by Rapporteurs), Closing, Press Conference
	Afternoon	Cultural Visit
Oct. 25~28		Public Forum (Exhibition, Seminars, Side Events)

III. Proposal for a Successful Conference

1. **Inviting More Members and Ministerial-level Participants**
2. **Executing Responsible and Feasible Agenda after Analyzing Disaster Characteristics of Participating Countries**
3. **Organizing a Substantial Conference with the Assistance of "Supporting Groups" for Each Theme**
4. **Promotion of Continuity of Conference Outcomes**
5. **Creating a New Type of UN Conference in Korea**

1. Inviting More Members & Participants

BACKGROUND

It is required to have more participants, especially ministerial-level contributors, to organize a substantial conference and execute conference outcomes.

- 1st Conference in China, 2005 → 42 Countries, 33 Ministers
- 2nd Conference in India, 2007 → 47 Countries, 26 Ministers
- 3rd Conference in Malaysia, 2008 → 44 Countries, 29 Ministers

STRATEGY

- Systematic Management for Participants
  - Constructing D/B & Designating Persons in Charge
- Extension of Invitees beyond 62 ESCAP Member Countries
  - Inviting Non-ESCAP Member countries in Asia
- Connecting Donor Countries such as Sweden and Norway with LDCs in Asia

2. Analyzing Disaster Characteristics

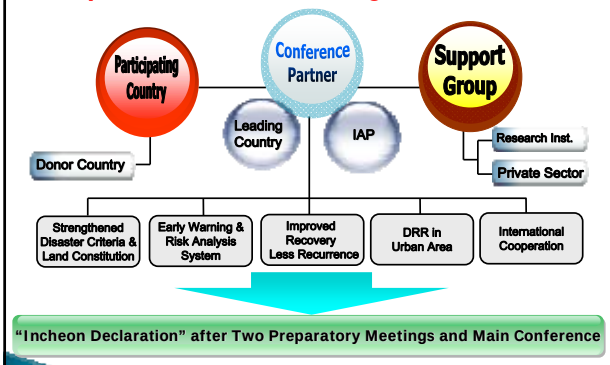
BACKGROUND

To have a feasible and responsible conference, it is required to analyze disaster characteristics of participating countries in advance.

STRATEGY

- Systematic Disaster Data Analysis for Each Country constructing a Database
  - Disaster Data Sharing among IAP and Other IOs
  - Performing an R&D Project for "Disasters and CC in Asian Countries"
- Allocation of Participants into 5 thematic discussion groups based on the Disaster Characteristics
- Hosting Preparatory Meetings in Feb. and June 2010
  - Seeking for Tangible Solutions for Participating Countries
  - Seeking for Thematic Pre-Conclusions even before the Main Conference
- Encouraging and Assuring Practical Discussions and Outcomes in the Conference
  - During the Main Conference, Review and compile the Results from the Two-Preparatory Meetings

Concept of the Conference Organization



3. Organizing Thematic Supporting Group

BACKGROUND

To operate the conference efficiently with more expertise and resources, it is desired to organize 5 thematic supporting groups inviting private sectors and experts.

STRATEGY

- Organization and Operation of the Supporting Groups
  - Organization: Expert Groups (Research Institutions and Private Sectors)
  - Operation : Provide Expertise and Perform R&D, attending Preparatory Meetings and Main Conference
- Organize Two Preparatory Meetings to Draft Practical Discussion Agenda for Each Theme, inviting Conference Partners, Supporting Groups, and Donor Countries

4. Promotion of Outcomes' Continuity

BACKGROUND

Need to secure a feedback function after the Conference following up the the good outcomes of the conference

STRATEGY

- Proposing a Platform for Mutual Production and Application of the Information and Technologies of Climate Change Adaptation
  - Constructing Web-based Platform operated by UNISDR NE Regional Office
  - Focusing on DRR Policies and technologies for CCA in the Asian Region

Main Functions of the Platform

1. Share the climate information
2. Share the result of technical development in disaster management system
3. Mutual Aid

5. Creating a New Type of UN Conference in Korea

BACKGROUND - Culture and Events with Fun -

Need to have a fun even during the most serious discussions on disaster topics
Need to provide an international market place for disaster related-industries

STRATEGY

- From the "Boring" to the "Exciting"
- Providing various Cultural Programs during the Conference
  - Organizing Additional Cultural Programs beside Opening and Closing Ceremonies
  - Korea will provide time and space and other countries are invited to bring their cultures to the AMCDRR
- Introduction and Sharing of DRR Technologies through **"CCA & DRR EXPO"**
- Maximize Booth Registration for International & Domestic DRR Industries
- Organizing Thematic and Cultural Events in the EXPO

Ⅳ. Next Steps

	Date / Event	Content
1	August ~ December 2009	Selecting Conference Partners with five themes
2	November 2009	Circulation of First Invitation Letter
3	December 2009	Attending UNFCCC
4	February 2010 "First Pre-Committee"	Further Discussion on Each Economy Presentation, possible to connect with 1st 2010 IAP meeting
5	June 2010 "Second Pre-Committee"	Further Discussion on Declaration, possible to connect with 2nd 2010 IAP meeting

Thank You!

If you have any question,
please kindly contact to
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Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/007D

The Situation and Rapid Recovery from Typhoon Morakot

Submitted by: Chinese Taipei

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/012

Whole of Government approach to National Preparedness and the Private Sector

Submitted by: US

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

Enhancing "All Hazards" Readiness & Resilience

A Whole of Government Approach Built on The Hyogo Framework

"This Presentation consists of L-3 Communications Corporation general capabilities information that does not contain controlled technical data as defined within the International Traffic in Arms (ITAR) Part 120.10 or Export Administration Regulations (EAR) Part 734.7-11."

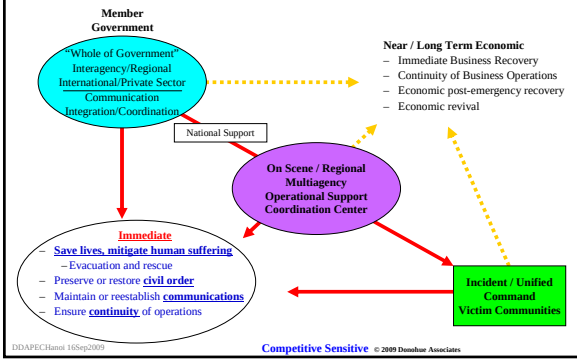
Observations

Since the Dec 2004 tsunami and the August 2005 hurricane Katrina most nations have **heightened preparedness attention** in broadly definable patterns.

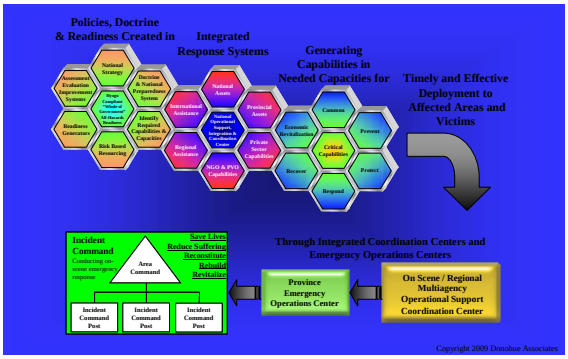
- **Prepare,** including taking into account unique and scarce **regional capabilities that can be shared**
- **Prevent,** including information and intelligence sharing, **early warning** systems, prepositioning procedures and infrastructure protection
- **Respond,** including delivering overwhelming capabilities to **prevent loss of life, mitigation of human suffering** and meeting immediate human and systemic needs
- **Recover**, including seamless transition to social, **governmental and economic / private sector** recovery, reconstitution, and regeneration

- The **"Whole of Government" approach** is **based on real world observations** and is designed to **ensure needed capabilities in the required capacities can be provided and employed in the most effective manner in time of catastrophic events, both for immediate response and long term recovery**

Common Operating Challenge



National Resilience

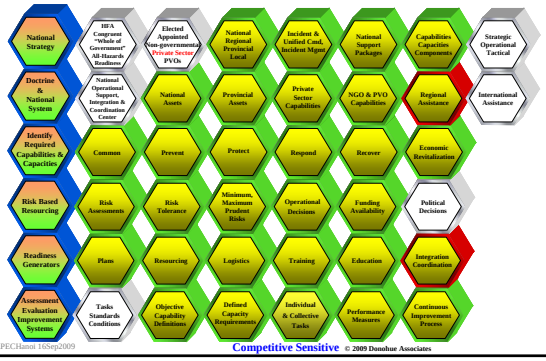


"Whole of Government" Readiness

"Whole of Government" Approach	Readiness Generators	Preparedness and Response Framework	
Strategy	Plans	National	• National Readiness
Doctrine	Resources	Provincial	• Disaster Preparedness
Capabilities	Logistics	Local	• *Resilience*
Capacities	Training	Interagency	• *Risk reduction*
Exercises / Operations	Education	Intergovernmental	• *Enhanced risk identification*
Assessment		Private Sector	• *Enhanced early warning*
		Community	• *Enhanced information and awareness*
		NGOs / PVOs	• Foundation for post-emergency economic recovery and revival
		Regional Orgs	
		International Orgs	

Enhancing resilience, reducing risk, saving lives, mitigating human suffering, and creating a foundation for post-emergency economic recovery and revival through strategic planning, training and integrated critical path preparedness

Economic Resilience



The "HFA" and Whole of Government Model

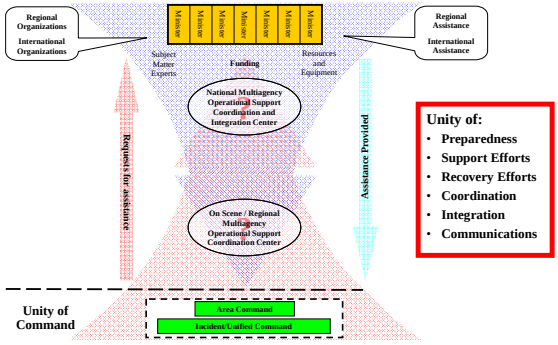
"Whole of Government" Readiness	Hyogo Framework
Strategy: Member goals and priorities are incorporated into the strategy making them **national policy** and establishes them as **critical objectives** to be accomplished. It becomes the foundation upon which doctrine is developed.	**Strategic goals** • The integration of disaster risk reduction into sustainable development policies and planning. • The development and strengthening of institutions, mechanisms and capacities to build resilience to hazards. • The systematic incorporation of risk reduction approaches into the implementation of emergency preparedness, response and recovery programmes.
Doctrine: The Member develops a **body of principles essential to accomplishing the Member's strategic objectives**. They are defined in a manner upon which coordinated, integrated and interoperable multi-discipline and discipline-unique doctrine is developed and deployed to all government levels, the private sector and NGOs.	
Capabilities: The Member's doctrinal requirements are used to indentify specific **capabilities necessary to effective prevention, preparedness and response**.	**Priorities for Action** • **Governance:** *ensure that disaster risk reduction is a national and local priority with strong institutional basis for implementation* • **Risk identification:** *identify, assess and monitor disaster risks and enhance early warning* • **Knowledge:** *use knowledge , innovation and education to build a culture of safety and resilience at all levels* • Reducing the underlying risk factors • Strengthen disaster preparedness for effective response
Capacities: Member employs **risk management** process to decide depth of capabilities.	
Exercises / Operations: Member **exercises capabilities against doctrine** to identify gaps and shortfalls for remediation and determine readiness.	
Assessment: The Member's continuous improvement process analyzes exercise and operational performance and develops and **shares best practices and lessons learned**.	

Member Defined Critical Resilience Elements

National Level	Regional / Province Level	Incident Management Tasks	Incident Prevention and Response Tasks
Manage national preparedness activities	Conduct regional, provincial and local preparedness activities	Coordinate transportation operations	Provide transportation
Conduct national prevention operations	Conduct regional and local prevention operations	Operate/manage telecommunications and information technology	Operate telecommunications and information technology
Provide for command and management of significant incidents	Command and manage incidents	Manage/direct public works and engineering	Conduct public works and engineering
Provide national incident support	Provide regional and province incident support	Coordinate firefighting operations	Conduct firefighting
Manage national resources	Manage regional and provincial resources	Coordinate incident management operations	Conduct incident management
Provide national communications and information management support	Provide regional and provincial communications and information management support	Coordinate mass care, housing and human services	Provide mass care, housing and human services
Support national technologies		Coordinate resource support	Provide resource support
		Coordinate public health and medical services	Provide public health and medical services
		Coordinate urban search and rescue	Conduct urban search and rescue
		Coordinate oil and hazardous materials response	Conduct oil and hazardous materials response
		Coordinate agriculture and natural resource response and recovery	Support agriculture and natural resource recovery
		Coordinate energy recovery	Support energy recovery
		Coordinate public safety and security	Provide public safety and security
		Coordinate community recovery, mitigation and economic stabilization	Support community recovery, mitigation and economic stabilization
		Coordinate emergency public information and external communications	Provide emergency public information and external communications

Hyogo Framework components

Member Defined Preparedness and Response Framework



Unity of:
- Preparedness
- Support Efforts
- Recovery Efforts
- Coordination
- Integration
- Communications

Critical Private Sector Roles / Impacts During Emergencies

Function	National	Region / Province	Local
Transportation			EOC / UC / IC / Public / Private
Communications			EOC / UC / IC / Public / Private
Public Works and Engineering			EOC / UC / Public Works / Private
Firefighting			EOC / UC / Fire
Emergency Management			EOC / UC
Mass Care, Emergency Assistance, Housing, and Human Services			EOC / UC / NGO / Private / NGO
Logistics Management & Resource Support			EOC / UC / Private
Public Health and Medical Services			EOC / UC / EMS / Private / NGO
Search and Rescue			EOC / UC
Oil & Hazardous Materials Response			EOC / UC / Private
Agriculture and Natural Resources			Agriculture Authority
Energy			EOC / UC / Public / Private
Public Safety and Security			EOC / UC / IC Law
Long-Term Community Recovery			EOC / Government / Private / NGO
External Affairs / Public Information			EOC / UC / IC

National & Regional Support to Victim Jurisdictions

Critical components of economic recovery and revival Critical components of response often involving private sector resources

APEC Strategy and Whole of Government Model

"Whole of Government" Readiness	APEC Strategy for DRR & EP&R
Strategy: Member goals and priorities are incorporated into the strategy making them **national policy** and establishes them as **critical objectives** to be accomplished. It becomes the foundation upon which doctrine is developed.	• Sustainable development, through disaster risk reduction and adequate environmental management. • Prepare plans for action in emergencies, contingency plans. • Recovery after a disaster through cooperation and financial risk reduction programs by promoting the use of insurances. • Alliances, such as the coordination between the public and private sector.
Doctrine: The Member develops a **body of principles essential to accomplishing the Member's strategic objectives**. They are defined in a manner upon which coordinated, integrated and interoperable multi-discipline and discipline-unique doctrine is developed and deployed to all government levels, the private sector and NGOs.	
Capabilities: The Member's doctrinal requirements are used to indentify specific **capabilities necessary to effective prevention, preparedness and response**.	• Resilience to adverse situations by strengthening capacities. • Scientific and technologic development for an adequate monitoring and early warning (information systems) • Social responsibility translated into humanitarian support in crisis situations. • Development of indicators for measuring progress.
Capacities: Member employs **risk management** process to decide depth of capabilities.	
Exercises / Operations: Member **exercises capabilities against doctrine** to identify gaps and shortfalls for remediation and determine readiness.	
Assessment: The Member's continuous improvement process analyzes exercise and operational performance and develops and **shares best practices and lessons learned**.	

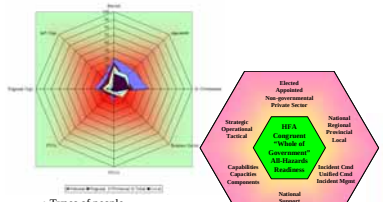
ASEAN DM/ER and Whole of Government Model

"Whole of Government" Readiness	ASEAN Agreement DM/ER
Strategy: Member goals and priorities are incorporated into the strategy making them **national policy** and establishes them as **critical objectives** to be accomplished. It becomes the foundation upon which doctrine is developed.	**National Emergency Response.** Ensure according to their national legislation that the necessary measures are taken to mobilise equipment, facilities, materials, human and financial resources required to respond to disasters. Each Party may forthwith inform other Parties and the AHA Centre of such measures. **Preparedness.** Jointly or individually, develop strategies and contingency/response plans to reduce losses from disasters. • Prepare Standard Operating Procedures for regional co-operation and national action required under this Agreement... • Jointly or individually enhance their national capacities, as appropriate, inter alia, to: facilitate mobilization of national resources to support such regional standby arrangements for disaster relief and emergency response; co-ordinate with the ASEAN Food Security Reserve Board to facilitate release of rice from the ASEAN Emergency Rice Reserve; and conduct training and exercises to attain and maintain the relevance and applicability of such Standard Operating Procedures. • Regularly inform the AHA Centre of its available resources for the regional standby arrangements for disaster relief and emergency response. **ASEAN Standby Arrangements for Disaster Relief and Emergency Response.** On a voluntary basis, each Party shall earmark assets and capacities, which may be available for the regional standby arrangements for disaster relief and emergency response, such as: emergency response/search and rescue directory; military and civilian assets; emergency stockpiles of disaster relief items; and disaster management expertise and technologies. • Such earmarked assets and capacities shall be communicated to each Party as well as the AHA Centre and updated as necessary by the Party concerned. • The AHA Centre shall consolidate, update and disseminate the data on such earmarked assets and capacities, and communicate with the Parties for their utilization. • To facilitate the utilization of assets provided, each Party shall designate a network of pre-designated areas as entry points for supplies and expertise from Assisting Entities.
Doctrine: The Member develops a **body of principles essential to accomplishing the Member's strategic objectives**. They are defined in a manner upon which coordinated, integrated and interoperable multi-discipline and discipline-unique doctrine is developed and deployed to all government levels, the private sector and NGOs.	**Risk Identification and Monitoring.** Take appropriate measures to identify disaster risks in its respective territories covering, among others, the following aspects: natural and human-induced hazards; risk assessment; monitoring of vulnerabilities; and disaster management capacities.
Capabilities: The Member's doctrinal requirements are used to indentify specific **capabilities necessary to effective prevention, preparedness and response**.	**Prevention and Mitigation.** Undertake measures to reduce losses from disasters which include: developing and implementing legislative and other regulatory measures, as well as policies, plans, programs and strategies; strengthening local and national disaster management capability and co-ordination; promoting public awareness and education and strengthening community participation; and promoting and utilizing indigenous knowledge and practices. • Co-operate in developing and implementing regional disaster prevention and mitigation programs to complement national-level efforts.
Capacities: Member employs **risk management** process to decide depth of capabilities.	**Disaster Early Warning.** As appropriate, establish, maintain and periodically review national disaster early warning arrangements including: regular disaster risk assessment; early warning information systems; communication network for timely delivery of information; and public awareness and preparedness to act upon the early warning information.
Exercises / Operations: Member **exercises capabilities against doctrine** to identify gaps and shortfalls for remediation and determine readiness.	
Assessment: The Member's continuous improvement process analyzes exercise and operational performance and develops and **shares best practices and lessons learned**.	

ACDM ARPDM and Whole of Government Model

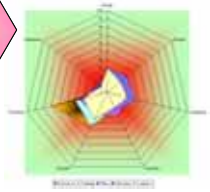
"Whole of Government" Readiness	ACDM / ASEAN Regional Program on Disaster Management	
Strategy: Member goals and priorities are incorporated into the strategy making them **national policy** and establishes them as **critical objectives** to be accomplished. It becomes the foundation upon which doctrine is developed.	**Establishment of ASEAN Regional Disaster Management Framework.** Promote cooperation and collaboration among Member Countries in all areas of disaster management including joint projects, collaborative research and networking.	1. Establishment of the ASEAN Response Action Plan (RAP) 2. Enhancing Quick Response Capacities of Member Countries 3. ASEAN Joint Simulation Exercises for Disaster Relief 4. Technical Cooperation Projects
Doctrine: The Member develops a **body of principles essential to accomplishing the Member's strategic objectives**. They are defined in a manner upon which coordinated, integrated and interoperable multi-discipline and discipline-unique doctrine is developed and deployed to all government levels, the private sector and NGOs.	**Promoting Collaboration and Strengthening Partnerships.** Promote partnerships among various stakeholders (GOs, NGOs, and community based international organizations)	1. Supporting Community-Based Management Programs 2. Partnerships with Relevant Organizations and NGOs 3. Mobilizing Financial Support and Resources
Capabilities: The Member's doctrinal requirements are used to indentify specific **capabilities necessary to effective prevention, preparedness and response**.	**Capacity Building** . Strengthen capacity building in areas of priority concern of Member Countries, and promote human resources development in disaster management in accordance with the needs of Member Countries	1. ASEAN Disaster Management Training Institutes Network 2. Specialized Disaster Management Training 3. Specialized Training in Risk, Damage and Needs Assessment
Capacities: Member employs **risk management** process to decide depth of capabilities.		
Exercises / Operations: Member **exercises capabilities against doctrine** to identify gaps and shortfalls for remediation and determine readiness.	**Public Education, Awareness and Advocacy.** Promote advocacy, public education and awareness program related to disaster management	1. ASEAN Day for Disaster Management 2. Integration of Disaster Management in School Curricula 3. Enhancing Disaster Management Public Education and Awareness Programs 4. Mainstreaming Disaster Management into Development Plans of ASEAN Member Countries
Assessment: The Member's continuous improvement process analyzes exercise and operational performance and develops and **shares best practices and lessons learned**.	**Sharing of Information and Resources** . Promote sharing of information, expertise, best practices, and resources.	1. ASEAN Disaster Information Sharing and Communication Network (ASEAN DISCNet 2. Research and Development and Dissemination of Good Practices 3. Improved Use of Climate and Weather Forecasting

Readiness & Resilience Overview



- Readiness framework
- Management systems
- Unity of effort
- Readiness generators
- Standards / gaps / shortfalls
- Resilience / readiness
- Extra-jurisdictional support

- Types of people
- Organizations involved
- Respective operational responsibilities
- Respective level of Government, non-governmental organization or private sector enterprise at which they operate

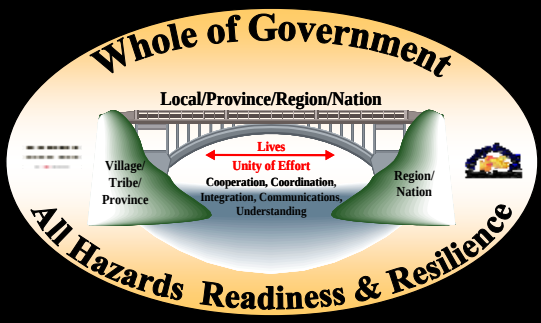


MPRI Consulting

Assist Members, Nations and regional organizations in:

- Strategy development / enhancement at the national level
- Doctrine development / enhancement at all jurisdiction levels
- Capabilities development / enhancement across the interagency / intergovernmental, emergency management, emergency response, private sector, NGO / PVO spectrum
- Enhancing - plans, training, resources, logistics and education; identifying gaps, shortfalls and inhibitors to readiness
- Developing and conducting training / exercises at all levels
- Developing / enhancing systemic assessment and improvement tools and practices

Questions ?



Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/013

Meansures on enhancing awareness and capacity in managing and confronting disasters

Submitted by: Viet Nam

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/014

Integrating Disaster Risk Reduction in Education Sector: 15 years experience of ADPC in Asia

Submitted by: ADPC

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

Integrating Disaster Risk Reduction in Education Sector

15 years experience of ADPC in Asia

Presentation at the
APEC, The Third Emergency Management CEO's Forum
Hanoi, Vietnam, September 2009

gtz

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Asian Disaster Preparedness Center

Why integrate DRR?

1. Children are amongst the most vulnerable group;
2. There is a multiplier effect of educating the public through the children;
3. Schools are often used as evacuation centers during a disaster event;
4. Educational institutions are a major public infrastructure, which can create long-lasting impact on future generations

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How to integrate DRR?

1. Integrating DRR in School Curriculum
2. Safer school construction

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What does integrating DRR into school curricula mean?

- Aspects on DRR is taught as part of the formal and non formal school curricula
- Teaching aid available to support delivery of the formal curricula
- System in place for training teachers to deliver the DRR curricula
- Annual education sector budget includes cost for training teachers, developing teaching aid, printing text books etc.
- DRR component is recognized as an important aspect of the national education sector plan

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Approaches for integrating DRR in school curricula

Lessons learned from The Philippines, Cambodia, Lao PDR, Sri Lanka, Nepal, Indonesia, Vietnam

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Integrating DRR concepts in formal School Curricula

- DRR can be integrated as new modules/chapters in existing subjects or as a new subject
- Curriculum framework plan to be developed – matrix of different subjects in each grade, content of each subject, identifying opportunities to integrate DRR in relevant subjects in specific grades
- The National Pedagogical department to take the lead in close partnership with National Disaster Management Offices
- Partnership with development partners involved in education sector agenda of the country in taking up integration for specific grades
- Integration would have budgetary implications- Essential to have political will, buy in from high level officials from Ministry of Education- involve Department of Planning
- Plan in advance of the curriculum revision cycle

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Integrating DRR concepts in non-formal School Curricula

- Non-formal curricula provides an opportunity to raise awareness among students on the issues related to surrounding environment including risk faced by the community
- Provides an opportunity to be local specific, Content would depend on Location of School, Socio economic condition of the area, characteristics of the community, common local disasters
- Higher chances of reaching out to the communities
- National Curricula usually have a certain percentage dedicated to non-formal curricula- school authorities could decide the content of this
- Work closely with local school authorities, NGOs, Red Cross Branches to integrate DRR in the extra curricula activities

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Training Teachers

- Teaching exemplars need to be developed
- Integrate in the regular teachers training courses, working closely with the National and sub-national teachers training institutes
- Have budgetary implication- need endorsement from higher levels in Ministry of Education

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DRR teaching aid

- Supplementary teaching aid for better delivery of DRR module
- Local specific
- Work closely with partners, NGOs to use/adapt existing IEC materials on DRR

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Involve the children from the very beginning

- Involve the children in carrying risk assessment of the communities
- Adopt child oriented participatory risk assessment as a tool in incorporating children's perspectives, contributions, and capacities before, during and after a disaster

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Engage the community and other Stakeholders

- Education sector portfolio involves both Government and the private sector, hence develop partnership between various stakeholders
- Ways of engagement could range from parent and students clubs to formation of formal partnerships including local authorities, private sector, school authorities, communities

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Scale up-Strengthen collaboration with various stakeholders involved in the Education Sector

- Link pilot initiatives to larger education sector programs
- Dialogue with the National Education Sector Working Groups (UN Agencies, bilateral and multi lateral agencies) involved in education sector agenda of the country
- Undertake national programs on awareness raising on DRR in schools
- Reaching all at risk children and the communities

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Way Forward

- Build on the past and ongoing local, national and regional initiatives in the region;
- Do not use DRM curricula only to raising awareness on better prepared, but equally important pass the concepts of the underlying factors which contribute to the risk of natural disasters and actions necessary to reduce those risk;
- Address challenges of increasing scale of implementation as well as the process of institutionalization, by connecting the pilot initiatives to ongoing large scale programs of the Education Sector for sustainability;

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Way Forward

- Work closely with the Ministry of Education and its various outreach services like teachers training institutes, sub-national departments of education, local authorities and in close collaboration with the teachers, parents and above all the children;
- Build partnership to implement the regional road maps laid down by the Bangkok Action Agenda, October 2007and to TAKE FORWARD the global campaign on School Education and Disaster Risk Reduction and

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Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/015

Development of Curricula: *Disaster risk education*

Submitted by: Australia

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

Development of Curricula:

Disaster risk education

APEC – The Third Emergency Management CEOs Forum
September 2009

Outline:

- The 'school' in disaster risk education
- What is curriculum?
- Curriculum approaches to disaster risk education
- Curriculum development process

What is curriculum?

- Knowledge
- Understanding
- Skills

What society feels young people need to learn?

Drug education

Road safety education

Environmental education

Global education

Citizenship education

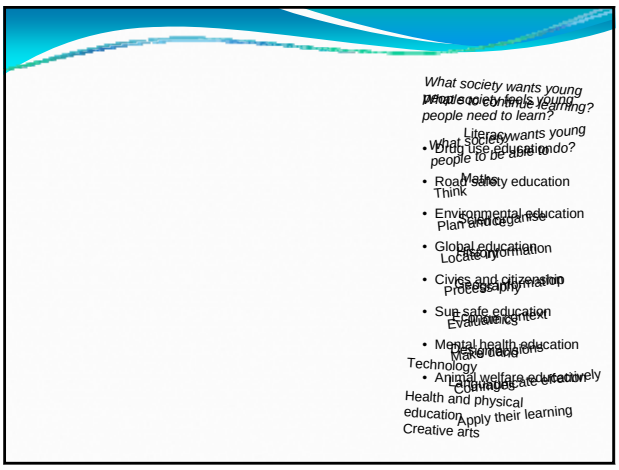
Sun safe education

Mental health education

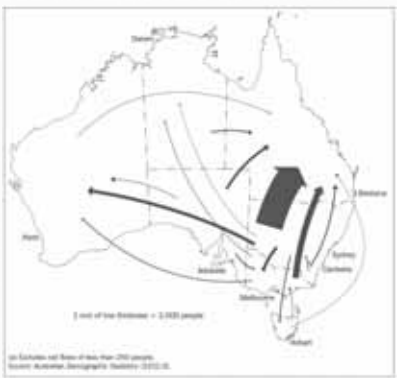
Animal welfare education

What society feels young people need to learn?	*What society wants young people to be able to do?*
Drug education	Think
Road safety education	Plan and organise
Environmental education	Locate information
Global education	Process information
Citizenship education	Evaluate context
Sun safe education	Make decisions
Mental health education	Communicate effectively
Animal welfare education	Apply their learning

What society feels young people need to learn?	*What society wants young people to be able to do?*	*What society wants young people to continue learning?*
Drug education	Think	Literacy
Road safety education	Plan and organise	Maths
Environmental education	Locate information	Science
Global education	Process information	History
Citizenship education	Evaluate context	Geography
Sun safe education	Make decisions	Economics
Mental health education	Communicate effectively	Design and Technology
Animal welfare education	Apply their learning	Languages
		Health and physical education
		Creative arts



Curriculum approaches to disaster risk education



General capabilities

- Literacy
- Numeracy
- Information and communications technology (ICT)
- Thinking skills
- Creativity
- Self-management
- Teamwork
- Intercultural understanding
- Ethical behaviour
- Social competence

General capabilities and disaster risk reduction

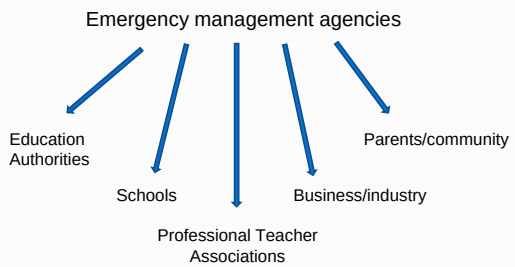
- Creativity
- Teamwork
- Intercultural understanding
- Ethical behaviour

Curriculum development process

Four main stages:

- Curriculum Shaping
- Curriculum Writing
- Implementation
- Evaluation and Review

Partnerships in disaster risk education



Emergency Management Australia

Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/016

Building Resilient Communities: The New Zealand experience

Submitted by: New Zealand

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

Building Resilient Communities

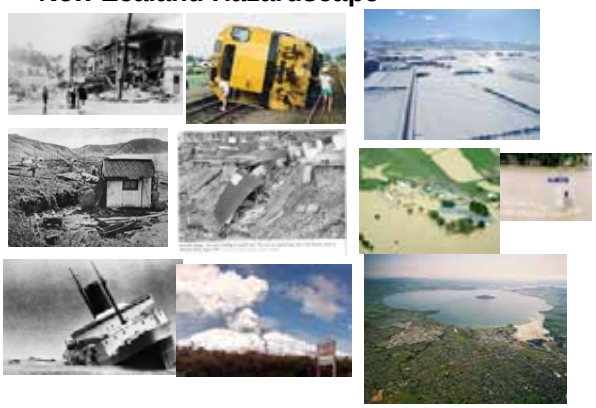
The New Zealand Experience

John Hamilton

Ministry of Civil Defence & Emergency Management

GET READY GET THRU

New Zealand Hazardscape



New Zealand's Strategic Goal for Emergency Management

GET READY GET THRU

Resilience: The NZ Approach

Reduction, Readiness, Response, Recovery

- Acknowledges that some hazard risks, such as earthquake, can't be totally eliminated.
- The equivalent of US Prevention, Preparedness, Response and Recovery (PPRR).

GET READY GET THRU

National Public Education Programme

Goal: "To increase community awareness, understanding and participation in civil defence emergency management"

- Linked to legislation, national strategy and plans
- Provides national "umbrella" programme
- Facilitates community activities and responsibilities that generates individuals and communities that are:
  - aware of hazards, and their likely impact; and,
  - make a commitment to take action and become better prepared

GET READY GET THRU

Key Components

- Mass media advertising programme "Get Ready Get Thru"
- Supporting website
- Schools' programme "*What's The Plan Stan?"*
- Survey and research programme to monitor preparedness and evaluate programmes

GET READY GET THRU

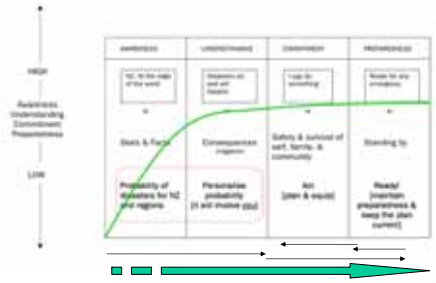
Barriers to Preparedness

- Low probabilities
- The uncertainty of 'when?'
- Unrealistic levels of optimism
- Other priorities to deal with in everyday life
- Misconceptions about role and capacity of civil defence
- Denial of risk
- Non-acceptance of negative messages

Motivation to take action

- Responsibility for people: especially family and loved ones, pets, stock
- Separation from family and loved ones
- "It's up to me"
- Tell me what to do and keep it simple!
- Make it easy!

Awareness to Action



Get Ready Get Thru

The Get Ready Campaign

Clear focused messages:

- In a disaster help can't get to everyone quickly
- You could be on your own for 3 days or more
- But you can take some simple steps to look after yourselves and your loved ones

Call to take action:

- Have a Plan and emergency survival items like food, water, torches, special dietary needs and medications
- Get Ready now so you can Get Through the disaster

The Get Ready Campaign

- TV, radio and print advertising
- Reinforced by printed collateral distributed through councils
- Website www.getthru.govt.nz – in nine languages
- Yellow Pages advertising in all phone books
- Annual Disaster Awareness Week
- Media/PR Opportunities
- Support of CDEM Groups – Online Toolkit
- Annual Colmar Brunton research

Get Thru website

Get Thru website – nine languages

What's The Plan Stan?

- A programme that involves kids, teachers, schools, families and communities
- Ensuring kids know what to do to be prepared and keep safe
- Meets a demand from teachers for a CDEM teaching resource
- Material specifically written for 7-12 year olds
- A curriculum based resource for schools comprising:
  - A website/CD-Rom for teachers and students, with stories, interactive games and research material
  - A handbook guide for teachers, including unit plans, activities and scenario cards

GET READY GET THRU

15

Monitoring the programme

- Annual Colmar Brunton research to monitor levels of awareness and preparedness

Being prepared defined as:

- having a plan and emergency survival items, which are regularly checked and updated
- being able to look after yourselves for up to 3 days or more.

GET READY GET THRU

18

How prepared are we?

2009

10%	**Fully Prepared**
41%	**Commitment** Have water and survival items
80%	**Understanding** Have a good understanding of the effects if disaster struck
81%	**Awareness** Have an understanding of the types of disasters that could occur
19%	**Unaware** No knowledge what disasters could occur

How prepared are we – at home?

- ❑ One in every four are now prepared at home
- ❑ One in five were prepared at home at the 2006 benchmark measure

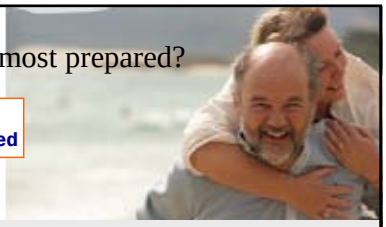
PREPARED AT HOME= 23%

How prepared are we when away from home ?

- ❑ One in every ten are now fully prepared
- ❑ One in fourteen were fully prepared at the 2006 benchmark measure.

FULLY PREPARED = 10%

Who are the most prepared?



10% **Fully Prepared**

Fully prepared NZers are more likely to…

- ➔ Be in the older portion of the population (15% of those aged 50 or over are fully prepared)
- ➔ Be NZ European or Maori (5% of those who identify with other ethnicities are fully prepared)
- ➔ Be born in NZ, or have lived here more than 10 years (just 3% of those who have lived here less than 10 years are fully prepared)

Who is unaware?

19% **Unaware** No knowledge what disasters could occur

Those who are unaware are more likely to…

- ➔ Be younger, under 40 years of age (26% are unaware)
- ➔ Live in larger households (23% of those in homes with three or more people are unaware, compared to 18% in homes with two people, and just 12% who live alone)
- ➔ Have lived in NZ for less than 10 years (28% are unaware)
- ➔ Speak English as a second language (27% are unaware)

Note: There is a close relationship between length of time living in New Zealand and the likelihood that a person speaks English as a second language – 43% of those who have lived in New Zealand less than 10 years speak English as a second language, compared to 22% who have lived here more than 10 years (but were not born here) and just 1% who were born in New Zealand.

The Good

- ❑ Campaign is well understood and well received
- ❑ Strong branding is achieving cut-through despite modest advertising budget.
- ❑ Preparedness is seen as very important
- ❑ 75 % of those who have seen the ads have thought about taking action and some have taken action

Challenges

- Maintaining intensity of campaign with available funding
- Keeping the message in front of the public
- Some groups in the community are harder to reach and so are more at risk: eg Aucklanders / under 40 yrs / minority ethnic groups
- Local programmes should target specific groups

Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/0017

Discussion Paper and Draft APEC Principles: 'Disaster Risk Education at Schools'

Submitted by: Australia

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

Background

APEC Leaders and Ministers instructed in November 2008 that APEC officials support the inclusion of education on disaster issues in school curricula where appropriate.

APEC Education Ministers also acknowledged in 2008 that much importance should be attached to providing the necessary scientific and practical knowledge about disaster risks and related competencies through the integration of disaster risk reduction education into school curricula.

Separately, the Second and Third Asian Ministerial Conference on Disaster Risk Reduction, held in November 2007 and December 2008, also called upon governments to make school safety and the integration of DRR into school curricula a national priority.

Current Progress

To assist in APEC consideration, Australia has arranged for the attached consultant report "Disaster Risk Education at Schools", by CSR Asia Pty Ltd, to be prepared as a discussion paper and presented at the Third APEC Emergency Management CEOs' Forum 2009 in Ha Noi.

The discussion paper has been prepared in the form of a working document that can be finalised, if required, after the Forum on an out-of session basis, for presentation to the APEC Task Force for Emergency Preparedness. Therefore, consultation with representatives from the APEC Member Economies and discussions during the workshop will feed into the finalisation of this paper.

Draft APEC Principles

The paper also includes a chapter with a preliminary list of principles as a starting point for further discussion within the APEC community on a common approach towards integrating disaster risk awareness at schools.

Recommendation

That the Forum contribute to the finalisation of a report and Draft APEC Principles on Disaster Risk Education at Schools.

Disaster Risk Education at Schools

Draft version of principles for APEC economies

Jacqui Dixon
jdixon@csr-asia.com

Background

- November 2008:
  - APEC Leaders and Ministers instructed that APEC officials support the inclusion of education on disaster issues in school curricula where appropriate
  - APEC Education Ministers also acknowledged that much importance should be attached to providing the necessary scientific and practical knowledge about disaster risks and related competencies through the integration of disaster risk reduction education into school curricula
- Purpose of the discussion paper and this session:
  - Assist in the development of common definitions and language among APEC Member Economies for disaster risk awareness and management education in schools curricula
  - Prepare a draft list of APEC-wide best practice examples and school education principles

Draft Principles

1. Disaster risk education at schools should be embedded as a key pillar of broader public disaster risk education to enhance community resilience to disasters, gain support for school-led activities, and motivate citizens to participate in local and regional risk mitigation and planning.
2. Disaster risk education should be integrated into school curricula because children are among the most vulnerable during a disaster and they are very effective communicators and disseminators of disaster risk reduction and preparedness messages at the family and community level.

Draft Principles

Education materials

3. Schools should teach about all stages of the disaster risk reduction cycle, therefore education materials should introduce students to disaster prevention, mitigation, preparedness as well as response.
4. Education materials should introduce students to land use planning, building codes, insurance and environmental stewardship as means of managing and reducing disaster risk.
5. Education materials should supplement a range of academic subjects, must be rooted in existing learning materials, must suit the local context, and should be culturally sensitive taking into account indigenous and traditional knowledge.

Draft Principles

Pedagogy (teaching strategies)

6. Disaster risk education should be cemented through learning extensions at home and the encouragement of child-parent and teacher-parent communication and activities such as community risk mapping, community-based fairs and exhibits, and publicized drills.
7. Disaster education in schools must highlight the importance of child-led disaster risk reduction and response cadres in and out of school at the community level and of reaching out to children with disabilities, their teachers and parents.

Draft Principles

Integration

8. Disaster risk education should be integrated into formal education at pre-primary, primary and secondary levels, as well as non-formal education and into teacher education and training.
9. The development and integration of disaster risk education into national curricula should be led by the Ministry of Education, involve national and local governments from various sectors and be based on a multi-stakeholder approach engaging the private sector, communities as well as UN, donor and development agencies. Disaster risk education at schools is a continuous process that requires a constant collaborative effort from all stakeholders.
10. Integrating disaster education at schools must take into account the national education policy and the curriculum revision cycle so disaster risk awareness is introduced to the curriculum development board before or during the actual revision phase. Time is needed to develop and pilot the curriculum, train the teachers, and make budgetary arrangements. A disaster, while tragic, can be a useful trigger for changing education, research policies and practices.

Draft Principles

11. Local community and civil society stakeholders must be involved in the development of disaster risk education materials for schools to help identify local risks and response measures. Often, the schools themselves form part of the response plan. Equally, disaster risk education policies should be taken into account in local development planning and future growth strategies.
12. To ensure the effectiveness of disaster risk education, regular monitoring and evaluation should be carried out. This could involve measuring the ability of students to cope with and learn from a disaster, and whether an emergency management plan has been prepared and maintained by a student's family.

Draft Principles

Making schools safer

13. Resilience of school buildings must be ensured through adherence to building codes, land use planning, and emergency plans. School buildings should be retrofitted to meet safety standards, train local builders and raise public awareness.

THANK YOU

Jacqui Dixon
jdixon@csr-asia.com

DRAFT

Version 04 September 2009

DISASTER RISK EDUCATION AT SCHOOLS

Best Practices and Principles for APEC Member Economies

DRAFT DISCUSSION PAPER FOR
THE THIRD APEC TFEP EMERGENCY MANAGEMENT CEOS' FORUM
HA NOI, VIET NAM, 15-17 SEPTEMBER 2009

For comments please contact Helen Roeth
at hroeth@csr-asia.com or +852 3579 8079

Prepared by

CSR Asia

Hong Kong, August 2009

Table of content

1. Executive summary

To follow

2. Introduction

Asia-Pacific is one of the most disaster-prone prone regions. In 2008 natural catastrophes and man-made disasters caused 240,500 fatalities most of which happened in Asia (228,400).[1] Children are often among the most vulnerable. The Wenchuan Earthquake in Sichuan, China, killed about 7,000 students who were trapped in damaged school buildings. During the 2005 Kashmir earthquake around 8,000 school buildings collapsed and 18,000 children died.[2] In 2005 hurricane Katrina led to the closure of 700 schools; in Louisiana 40 schools were destroyed and 875 were damaged and in Mississippi 16 schools were destroyed and 287 were damaged. The congress had to appropriate US$ 645 million to cover education costs for the 372,000 displaced school children for the 2006-2006 school year.[3] This highlights the need for effective disaster response practices and mechanisms but in particular for improved pre-disaster risk reduction to decrease disaster vulnerability and mitigate impacts. Under the Hyogo Framework for Action education has been identified as key to mitigating the impact of natural disasters.

In August this year CSR Asia was commissioned by the Attorneys General Department (AGD) of the Government of Australia, on behalf of the APEC Task Force for Emergency Preparedness (APEC TFEP)

- to assist in the development of common definitions and language among APEC Member Economies for disaster risk awareness and management education in schools curricula and
- to prepare a draft list of APEC-wide best practice examples and school education principles for the Third Emergency Management CEO's Forum in Ha Noi, 15-17 September 2009.

On this account, the paper briefly outlines approaches for disaster risk education at schools in APEC Member Economies and elaborates on key strategies and lessons learned. A draft list of principles for integrating disaster risk awareness and education into school curricula is presented as a starting point for further discussion within the APEC community on a common approach.

This paper is a working document that will be finalised after the Third APEC TFEP Emergency Management CEOS' Forum. Consultation with representatives from the APEC Member Economies and discussions during the workshop will feed into the finalisation of this paper.

[1] SwissRe, 2009

[2] UNCRD, 2009

[3] RiskRed et al., n.d.

3. Definition and scope of disaster risk education schools

The Hyogo Framework for Action (HFA) was formulated as a comprehensive, action-oriented response to international concern about the growing impacts of disasters on individuals, communities and national development. It was adopted by 168 Governments at the World Conference on Disaster Reduction, held in Kobe, Japan, in January 2005. The HFA sets a clear expected outcome: "The substantial reduction of disaster losses, in lives and in the social, economic and environmental assets of communities and countries". In order to attain this outcome the HFA emphasizes the importance of disaster risk reduction (DRR) as a central issue for development policies and calls upon signatories to make DRR a priority. It stresses the "use of knowledge, innovation and education to build a culture of safety and resilience at all levels" as one of the five priorities of action with a focus on including disaster education in formal and non-formal education and protection of public facilities.[4]

Against this background, APEC Leaders and Ministers instructed in November 2008 that APEC officials support the inclusion of education on disaster issues in school curricula where appropriate. APEC Education Ministers also acknowledged in 2008 that much importance should be attached to providing the necessary scientific and practical knowledge about disaster risks and related competencies through the integration of disaster risk reduction education into school curricula. Separately, the Second and Third Asian Ministerial Conference on Disaster Risk Reduction, held in November 2007 and December 2008, also called upon governments to make school safety and the integration of DRR into school curricula a national priority.

It is widely acknowledged that school disaster education programmes have the potential to build community resilience to natural hazards as:

- If properly planned, built, maintained and managed, schools provide a safe haven to the children who spend most of their waking hours at school and safe facilities for public shelter in the aftermath of a disaster
- Strong leadership of teachers has been proven to be very effective in dealing with emergency situations in disaster-prone countries[5]
- Incorporating risk awareness and risk reduction strategies into school curricula contributes to institutionalising the reach of these messages to the broader public as what is learnt in childhood becomes incorporated into collective knowledge and is carried into future decision-making. In most countries children are very influential and effective communicators and knowledge disseminators at the family level.[6] It has to be considered, however, that with students learning from a broad range of sources, unless there is a prescribed activity (e.g. homework task to develop a family home emergency plan) students may not take home hazard-related learning and messages.[7]

[4] UN/ISDR, 2007a

[5] UNCRD, 2008

[6] OECD, 2009

[7] Dufty, 2009

According to the OECD (2008) *risk awareness education* encompasses understanding natural and biological mechanisms that may create hazards and the human vulnerability to these hazards.

According to the UN/ISDR *education for DRR* is

> *"an interactive process of mutual learning among people and institutions. It encompasses far more than formal education at schools and universities, and affects all aspects of life through the concerted efforts to overcome universal barriers of ignorance, apathy, individual interests and lack of political will present in communities. It also involves the recognition and use of traditional wisdom and local knowledge for protection from natural hazards. Education is conveyed through experience, established learning arrangements, information technology, staff training, electronic and print media and other means that facilitate the sharing of information and knowledge to citizens, professionals, organizations and policymakers, among a range of other community stakeholders.* (UN/ISDR, 2005)

Against this background disaster risk education programmes and activities need to cover:

- Preparedness conversion: Learning how to commence and maintain preparations for natural disasters.
- Mitigation behaviours: Learning what to do before, during and after a natural disaster.
- Adaptive capability: Learning how to change and maintain systems, networks and build community competencies (e.g. skills, leadership) to minimise the impacts of natural disasters.
- Post-disaster learnings: Learning how to improve preparedness conversion, mitigation behaviours, and adaptive capability after a natural disaster.[8]

In the Philippines four strategies were suggested for integrating risk reduction into the education sector. The strategies, shown in Figure 1 below, very much reflect the ongoing discussion on this issue globally and include:

- Community-school based disaster risk reduction and management: The Center for Disaster Preparedness (2008) stresses that in the Philippines schools are a fundamental institution that are very much embedded in communities. Thus, it is important to develop schools to become centers for disaster risk reduction for both the school and its community. Similarly, Dufty (2009) stresses the importance of viewing school natural hazards education as one possible component of a local community education package and of integrating it into a broader context of a learning process or activity that builds community[9] resilience to natural hazards. Such a community education package would target a range of vulnerable groups and organisations such as the elderly, people of non-native speaking background, those living in especially high risk areas, and businesses. According to Dufty (2009) successful school programmes have integrated student learning with community risk preparedness programmes through learning extensions at

[8] Dufty, 2009

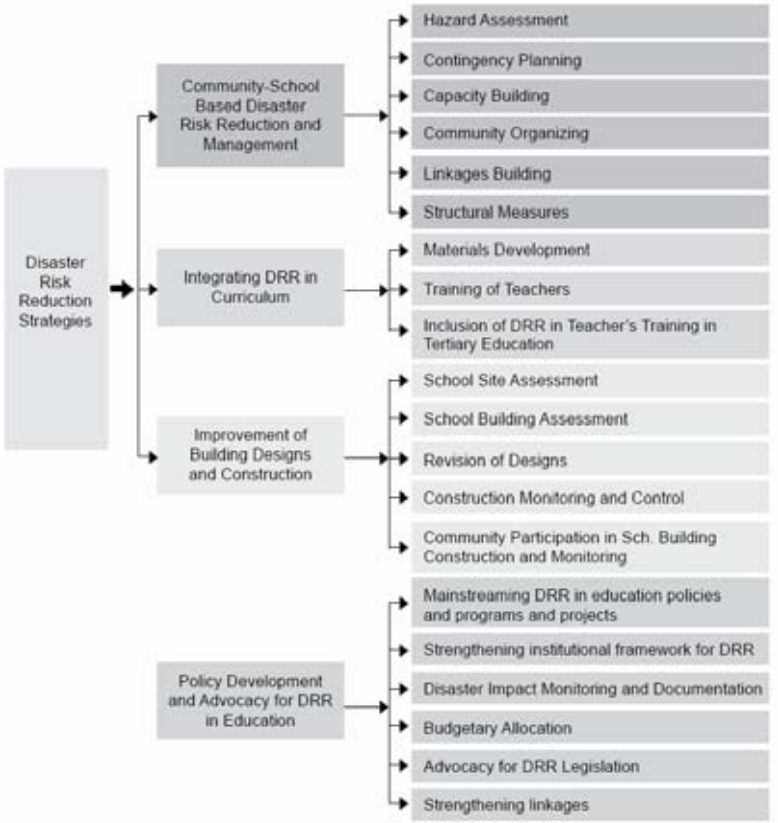
[9] The term community encompasses all spheres of government, business, industry and the general public.

home and the encouragement of child-parent and teacher-parent communication.

- Integration of DRR in the curriculum: To create a culture of safety, DRR has to be integrated within all levels of formal education, from the pre-primary to the advanced university levels, and particular attention has to be paid to curricula and school integration, teacher training, and the assessment of learning.[10] Disaster risk education needs also to be integrated into non-formal education, which can take many forms such as community campaigns and emergency drills. Non-formal education activities can be the rapid entry point for DRR education. Within recent years indigenous and traditional knowledge and the realisation of its potential to improve DRR policies has been emphasized, especially through the linkage with disaster education and early warning systems.[11]
- Improvement of the building design and construction: Safer construction of school buildings need to be mainstreamed and preparations to be made in order to allow school buildings to provide public shelter after a disaster.[12] According to UNESCO (2009) a safe education facility is "that which is either located in a danger-free zone or has been built to be resilient to an extreme natural event". Educational facilities, new and old ones, can be made resilient through land use planning, structural reinforcement and emergency plans.[13]
- Policy development and advocacy for DRR in education: Existing institutional set-ups need to be strengthened and DRR needs to be integrated in all policies and programs of a country's national Ministry or Department of Education. Linkages to other sectoral ministries and departments need to be established in order to ensure access to resources, capacity building, advocacy and support in times of emergencies but also to coordinate the different DRR activities ad increase efficiency.[14] The aftermath of a disaster can be a turning point for changing policies and practices and for raising public awareness while simultaneously taking action to improve community safety.[15]

[10] UNESCO, 2009b
[11] UNESCO, 2009b
[12] Center for Disaster Preparedness, 2008
[13] UNESCO, 2009b
[14] Center for Disaster Preparedness, 2008
[15] UN/ISDR, 2005

Figure 1: Strategies for Disaster Risk Reduction in Education (Source: Center for Disaster Preparedness, 2008)



3.1. Infusing disaster risk awareness into school curricula

According to Dufty (2009) a critical success factor for the uptake of natural hazard education activities in schools is

> *"the ability to embed these activities in existing school programs that are already linked to learning outcomes in curricula and syllabuses. This helps to ensure that the school will accept the natural hazards program as a valid activity as part of its existing teaching program and not as a 'one off'. Moreover, as a natural hazard can occur at any time, this approach will also mean that 'natural hazards' will be taught each year."* (Dufty, 2009)

He explains that curriculum-based programmes are developed by initially identifying opportunities for the inclusion of natural hazards education in appropriate state and territory curricula through a process known as 'curriculum mapping'. An OECD draft policy handbook on DRR education stresses the importance of elaborating the scope and sequence and competencies expected at each age level and of undertaking a full curriculum audit in all subjects to identify the appropriate insertion points. For expert advice, Dufty (2009) suggests involving the curriculum support section from the respective state or territory department of education and teachers in this process.[16]

After this, programmes need to be designed with activities that link with learning outcomes and subject matter in the appropriate parts of the curricula and thus school programmes.[17] This stage may also involve textbook revisions, development of supplemental teacher training material, introduction of the subject matter through teacher-training colleges and in-service training plans.[18]

Formal curricula approaches can involve infusion into existing courses at all grade levels, insertion of modules into existing courses, and supplemental stand-alone courses. Informal and co-curricular approaches can include special assemblies, drills, projects, competitions, festivals, exhibitions and performances.[19]

The OECD Handbook stresses the importance of developing leadership in teacher training through targeting both the education faculty as well as programmes for in-service training of existing teachers. Particular attention, therefore, needs to be paid to both curriculum and teacher support materials and their formal inclusion into national curricular guidelines.[20]

The content of risk reduction and its adequate placement in school curricula is important. Historically, disaster awareness content has been placed in science and geography courses. But also school subjects in social studies, language and literature, environment, reading, health, communications, and even art provide important opportunities for cultivating hazard and risk awareness. In this regard

[16] Dufty, 2009
[17] Dufty, 2009
[18] OECD, 2009
[19] OECD, 2009
[20] OECD, 2009

building knowledge about local weather conditions, nearby geological risks, or careful use of natural resources is equally pertinent as practical guidelines for risk-wise actions, problem-solving skills for risk reduction, and education on financial tools for risk sharing and protection.[21]

The Asia Disaster Preparedness Center (ADPC) Regional Consultative Committee on Disaster Management (RCC), whose aim is to provide an informal consultative mechanism for development of action strategies for disaster reduction in the Asia-Pacific region and for the promotion of cooperative programmes on a regional and sub-regional basis, outlines the following key approaches for mainstreaming DRR into school curriculum:

- Plan in advance of the National Curriculum Development Cycle: In every economy the curriculum revision process is repeated every 3-5 years. For each grade the long revision process usually starts a year before the actual revision takes place and any new curriculum can only be taught from the beginning of a new revision cycle. It is essential to be aware of the national education policy and the curriculum revision cycle in order to take the necessary steps to introduce disaster risk awareness to the curriculum development board before or during the actual revision phase. Adequate timing is crucial in order to provide concerned agencies enough time to develop and pilot the curriculum, train the teachers, and make budgetary arrangements.
- Establish partnerships between Ministry of Education and the National Disaster Management Office (NDMO): Partnership between the Ministry of Education and the NDMO (the national agency mandated with the task of DRR) is important to ensure technical support to the Ministry as well as help in sourcing funds to initiate the process of integrating DRR into the national curriculum. The NDMO is a crucial partner in advocating for DRR integration and in generating political will.
- Adopt a consultative process: It is important to build consensus and adopt a consultative process by involving key national agencies such as Ministries of Planning and Finance since the whole process of curriculum change is linked to the development plan and the budget of the nation. Other important partners to involve include specific national hazard related technical agencies and research institutes as well as various international agencies specifically involved in education sector development such as UNICEF and UNESCO and donors like GTZ, ECHO, and JICA.
- Link with processes of the education sector programmes funded by the multilateral and bilateral agencies, and the education sector Working Group led by Ministry of Education: It is important to stay informed of education sector programmes and projects funded and implemented by various agencies and organisations in order to tap the potential of these programmes and to magnify the benefits. Among these are pipeline or ongoing programmes by multilateral, bilateral or national agencies focussing on curriculum development, construction of schools, or the publication of textbooks at different geo-political levels (e.g. provinces or districts).[22]

[21] OECD, 2009 and UNISDR, 2004
[22] RCC, 2007

3.2. Disaster education material

An OECD Stocktaking Review on natural catastrophe risk awareness and education, published in 2008, found that much of the education material on risk awareness produced during recent decades continues to place significant emphasis on hazard identification, risk awareness, drills and emergency response. The material is often not adequately integrated with risk reduction education. Many programmes miss opportunities to introduce students to land use planning, building codes, financial pooling of risk and risk-wise environmental stewardship as means of managing and reducing disaster risk. Much of the education material for schools has been primarily developed by civic, private and public agencies with limited collaboration with regional or national education boards or ministries.

The OECD Stocktaking Review further found that material that conforms to national education standards is easier for teachers to integrate into their teaching schedules. This approach, however, typically relies on enterprising teachers and requires the integration of these materials into already full teaching programmes. The review points out that teachers "may not feel confident enough in the subject to teach it to their students, especially when student performance in other core subject material is heavily scrutinized". Therefore, support from teachers' unions, education ministries, and official mandates is important in order to fully integrate risk awareness and reduction education into school curricula.

Another finding of the review stressed the need for many countries, where innovative and in-depth education materials have been developed, to move from pilot projects to a thorough integration of these materials into national or regional curriculum standards. There is an urgent need to advance both curriculum and teacher support materials and to formally incorporate these materials into national curricular guidelines.[23]

Examples of disaster education materials being used in APEC member economies are provided in ANNEX 1.

3.3. Ensuring the effectiveness of natural hazard education programmes

According to Dufty (2009) the effectiveness of school natural hazard programmes can be measured at several levels including:

- The program compared with learnings from education psychology and leading practice: Children's understanding of concepts such as causality and prevention are strongly influenced by age-related changes in cognitive ability. The acquisition of knowledge about risk and mitigation takes place in a social context, with some elements of social context exerting more influence than others.'
- Student's understanding of the natural hazards risk
- Student's understanding of appropriate preparedness behaviours
- The preparation and maintenance of an emergency management plan by the student's family

[23] OECD, 2008

- If a natural disaster occurs, the ability of the student to cope with and learn from the event.

Dufty (2009) points out that a major weakness in disaster education programmes is the lack of evaluation to gauge the effectiveness using measures such as those listed above. The ongoing monitoring and evaluation of awareness and education efforts are, however, essential to assure accountability and transparency, increase public confidence in the outcomes and to further build up research knowledge to guide planning. Therefore, it is important to incorporate ways to evaluate the effectiveness of immediate outcomes (e.g. awareness, personal preparedness, transfer of learning to families) into all school natural hazards programmes.[24]

[24] OECD, 2009 and Dufty, 2009

4. International efforts and developments

Since the adoption of the HFA a large number of activities and initiatives have been implemented at international and regional level to advance disaster risk awareness and management education at schools. Some of these activities and initiatives are further explained in the following sections.

4.1. School Earthquake Safety Initiative 2005-2009

The UN Center for Regional Development (UNCRD) emphasizes the multifaceted role of schools in building resilience of communities and in propagating a culture of safety to communities. Its School Earthquake Safety Initiative (SESI), under the theme of "Reducing Vulnerability of School Children to Earthquakes", aims to ensure that earthquake safe schools in seismic regions and that local communities build capacity to cope with earthquake disasters.

The project is being implemented in Fiji, India, Indonesia, and Uzbekistan and comprises the following four components:

- Seismic retrofitting of school buildings: Seismic vulnerability analysis of selected schools and retrofitting of two to three schools typical to the region in each economy.
- Capacity building of communities: On-the-job training during retrofitting works for government officials and experts in the community such as masons.
- Disaster education and awareness raising: Development and wide distribution of educational materials for students, manuals for teachers, and guidelines for experts.
- Knowledge and experience dissemination: Regional and international workshops.

Best practices and lessons learned:

- The project seeks to transfer ownership of concepts and activities to governments and local stakeholders. School are therefore retrofitted in a participatory way engaging local communities, governments and resource institutions.
- School retrofitting provides an ideal opportunity to disseminate technology and train local masons about safe construction practices. [25]
- Activities like retrofitting of schools and safe school construction can significantly contribute to raising the community's awareness of the importance of safe buildings in reducing disaster impacts. The final product 'safe school' is therefore equally important as the process of achieving this product.[26]

[25] UNCRD, 2008

[26] UNCRD, 2008

4.2. Decade of Education for Sustainable Development 2005 – 2014

The international implementation scheme of the Decade of Education for Sustainable Development (2005 – 2014) considers disaster preparedness and mitigation as crucial issues in achieving sustainable development. Under the scheme, in April 2005 UNESCO Bangkok's programme for Education for Sustainable Development (ESD) initiated a project entitled "Education for Natural Disaster Preparedness (ENDP) in Asia-Pacific in the context of Education for Sustainable Development" (ENDP-ESD). The goal of the project is to develop the preparedness of local stakeholder groups towards disaster prevention, recognition and preparedness in selected Asia-Pacific countries. ESD is employed as a framework to facilitate holistic and critical thinking as well as problem-solving in local communities threatened or affected by disasters.

During the UNESCO World Conference on ESD, held from 31 March – 2 April 2009 in Bonn, Germany, a workshop on 'ESD and disaster risk reduction: building disaster-resilient societies' was conducted. In a concept note to the workshop the German Committee for Disaster Reduction (DKKV) and the UN/ISDR Thematic Platform on Knowledge and Education proposed the following recommendations to encourage education for sustainable development by DRR:

1. Motivate political commitment and strengthen legal frameworks: High-level advocacy to Ministers of Education on Education for DRR is urgently required, so that it is recognized as one of the key priorities on the national education agenda and that it thus benefits from increased resource mobilization.
2. Promote capacity building at all levels: In the field of DRR capacity building can include issues such as training, transfer of technology, application of traditional knowledge and know-how, as well as strengthening of institutional capacities at the community, national and regional level.
3. Clarify responsibilities and promote networking and exchange between stakeholders: Acknowledging the multi-disciplinary approach of education for DRR, institutional networks with clear responsibilities have to be set up to support networking and know-how transfer.
4. Develop effective education strategies to achieve quality education and learning: It is imperative to ensure that DRR education is rooted in existing learning theories and firmly embedded in education programmes at all levels.
5. Develop and apply minimum standards for safe and disaster-resistant schools and educational infrastructure: The safety of educational infrastructure needs to become a national priority. Older school buildings should benefit from effective retrofitting programmes.[27]

In 2007 UNESCO and the ADPC published country reports on natural disaster preparedness and education as part of the "Educational Materials for Education for Natural Disaster Preparedness in Asia-Pacific in the Context of Education for Sustainable Development" project. Existing activities and materials in the following countries were analysed: Maldives, Thailand, Indonesia, India, and Bangladesh. The analysis highlighted the importance of the following issues:

[27] DKKV and UN/ISDR, 2009

- Collaboration and consultation: Collaboration and consultation are essential to correctly identify needs and gaps, learn about a community's preferred learning styles and develop ongoing support for their projects.
- Affected communities are keen to help: Natural disaster affected communities want to be involved in projects that will lessen the impact of future natural disasters. They must be viewed as a valuable resource rather than passive recipients of donor aid.
- Language barriers: It is important to use local languages effectively in order to deliver natural disaster preparedness messages. However in doing so, the universality of the project may be lost. A lack of natural disaster preparedness terminology in local languages inhibits effective communication.
- Culture and religion: Culture and religion require sensitivity in order to develop innovative approaches that can build upon local culture and religion and promote communication and understanding where certain cultural beliefs and practices may present obstacles to natural disaster preparedness.
- Government/programmatic support: It is important to develop sustainable, ongoing commitment to local stakeholder initiatives. This can be at the national or local government levels and can include policy, financial or coordination efforts.[28]

4.3. Islamabad Declaration and Action Plan 2008

The International Conference on School Safety was held from 14-16 May 2008 in Islamabad, Pakistan. The aim of the conference was to share lessons learned about issues related to school safety across the globe and to come up with recommendations for action at national and regional levels. Delegates to the conference adopted the Islamabad Declaration and Islamabad Action Plan.

The declaration outlines the role of governments, civil society and communities in promoting school safety while the action plan suggests strategic actions with regards to policy and institutional mechanisms, technical aspects, capacity development, integrating Disaster Risk Management (DRM) information in formal and informal education, community preparedness for disaster prevention and response, and public-private partnerships for safe schools.

Participants of the International Conference on School Safety in Islamabad declared that:

- The safety of our children is the goal of society and as such it is incumbent upon national governments to fulfil that obligation through comprehensive policies, programmes and financing mechanisms.
- School safety is an opportunity to establish innovative and effective partnerships between national government and state, local entities and community to ensure that school safety policy is implemented through priority actions.
- State governments can develop mechanisms, provide technical, financial and capacity support as needed to design and implement School Safety Action Plans. These plans can guide investments that address school vulnerabilities,

[28] UNESCO, 2007

structural and non-structural; and reflect priorities of local governments and communities.
- Resilient schools policy and practice needs to be linked to and incorporated in local development planning and future growth strategies. Schools are community assets and as such are tools for local governments to translate and implement locally appropriate action plans that apply to broader community applications of disaster management, planning, finance and safe construction.
- Schools are multi-functional assets for communities. Schools are places of learning, community activities and can be safe havens in times of disaster. Communities play a critical role as safe haven managers and first responders to disaster situations. Communities are thus necessary partners of the school planning and development process including site selection, improved local technologies and the application of community skills in the school development process.
- Civil society and private sector organizations are critical partners in school safety action plan implementation through their provision of technical and project management expertise and financial support to national and local governments, and community groups.[29]

4.4. Bangkok Action Agenda 2007

The goal of the Asia Pacific Regional Workshop on School Education and Disaster Risk Reduction, held in Bangkok from 8-10 October 2007, was to make a contribution toward reducing the vulnerability of school children to disasters and helping to decrease the loss of lives. It also aimed to improve resilience of school communities struck by disasters, or in hazard prone areas.

The workshop adopted the Bangkok Action Agenda as the regional blueprint to guide DRR implementation in the Asia Pacific region along four key priority areas of focus:

- Integration of DRR into school education: The Action Agenda stresses the importance of integrating and mainstreaming DRR into school curricula and into teacher education and training. It further highlights the need for broad stakeholder participation in the development of learning approaches and materials for both formal and non-formal DRR education and for children with various disabilities.
- Strengthening DRR education for community resilience: The Action Agenda calls to strengthen participatory mechanisms to involve communities in formal and non-formal disaster risk education, to take into account indigenous knowledge and to use socio-economic impact assessment to influence decision makers towards increased investments into disaster risk reduction education.
- Making schools safer: The Action Agenda suggests updating minimum standards for the construction and operation of school buildings to incorporate disaster mitigation, to facilitate the development of tools and guidelines for safe construction considering sub-regional characteristics, and to use national budget and infrastructure protection resources to make schools safe, with no funding cuts from the education sector.

[29] Islamabad Declaration on School Safety, 2008

- Empowering children in DRR: The Action Agenda highlights the importance of developing child-led disaster risk reduction and response cadres in and out of school at the community level and of developing special outreach efforts to reach children with disabilities, their teachers and parents.[30]

4.5. World Disaster Reduction Campaign 2006-2007

As part of the implementation of the Hyogo Framework for Action and the UN Decade of Education for Sustainable Development, UN/ISDR in cooperation with UNESCO coordinated The World Disaster Reduction Campaign 2006-2007 with the central theme of "Disaster Risk Reduction Begins at School". The aim was to encourage the integration of disaster risk education in school curricula and the safe construction and retrofitting of school buildings to withstand natural hazards.

The importance of raising awareness within school communities, building a culture of prevention and making school buildings safer was stressed. Acknowledging that awareness can trigger interest, interest can lead to attention, and attention can prompt action, diverse ways to raise awareness among school students, teachers and their communities were promoted such as training of teachers, bringing DRR into the classroom, organizing disaster quiz competitions, school contests on DRR knowledge, campaigning for disaster safety, and turning school students into catalysts and initiators.[31]

The campaign further promoted DRR as ‘every one's business’ and a culture of disaster safety within society. Suggested ways to building a culture of safety in and through schools ranged from developing disaster education material, to mainstreaming DRR into school curricula or national education systems, and using alternative or innovative ways to educate children, youth, teachers and parents. A number of initiatives engaged children in on-the-ground activities such as assessing vulnerabilities, mapping hazards and risks, carrying out preparedness and making response plans, taking part in mock exercises and emergency drills, and helping communities prepare against and respond to disasters.[32]

The campaign also outlined the role of different key stakeholders in advancing DRR education at schools including among others governments, UN and other international organisations, donors and the private sector.

Governments are requested

- to commit to teacher training and curriculum development to support large-scale teaching of DRR and
- to review the safety of their schools and develop a comprehensive policy toward school safety by taking all locally relevant hazards into account and using location of schools, maintenance of buildings, design and construction methods as risk reduction tools.

[30] Bangkok Action Agenda 2007

[31] UN/ISDR, 2007b

[32] UN/ISDR, 2007b

UN and other international organisations are called upon

- to work with professionals, educators, communities, children and youth to develop a short list of “quick win” actions that can rapidly increase the safety of schools and raise risk awareness among all those concerned with schools,
- and to dynamize coalitions and partnerships, facilitate the creation of knowledge networks including South-South exchange, build capacity and guide others to existing resources for training.

Donors are asked

- to link DRR education issues to all MDGs not just the education MDG, and
- to select “fast track” countries that have considerable numbers of schools in dangerous locations or otherwise at risk and show the potential for rapid scaling up of school protection.

Private sector:

- Professional organizations, involved with schools and building, are requested to work with governments to establish and enforce strict building codes of conduct so that high standards are met in school construction and a new culture of respect for building codes of conduct within professional bodies is established.[33]

[33] UN/ISDR, n.d.

5. Status of disaster education in APEC member economies

A stocktaking review by the OECD of selected country efforts[34] to raise public awareness and education of the impact of natural hazards and to enhance awareness and education regarding risk mitigation measures found that:

- Most countries have taken the approach of supplementing curriculum with regional and national co-curricular education developed by civil protection agencies or civic organizations, often in conjunction with wider public education campaigns. China, India, Mexico, New Zealand, and Turkey have co-curricular risk education in regional or national curriculum. Japan also has co-curricular risk education in some schools, though it has been removed from the national curriculum. In Mexico, environmental awareness, the interaction of humans and the environment, and disaster risk reduction and preparedness are taught in secondary school geography classes. As part of these studies, students participate in risk mitigation activities in their communities.
- Some countries are currently considering adding risk awareness and risk reduction education into their educational mandates. In the United Kingdom, integration of hazard awareness and risk reduction is being discussed as part of a new citizenship curriculum. Segments of this citizenship curriculum may draw upon innovative risk awareness and reduction education in geography lessons developed by a secondary school teacher. These lessons ask students to learn about hazards in their neighbourhood, country of origin or holiday destination, create educational videos and help their families better prepare for natural hazard events. In other countries such as Canada, Italy, and the United States, teaching material for risk awareness and risk reduction education in the schools is implemented on a voluntary basis. [35]

The review further found that a key factor in the success of disaster education school programmes was the integration of student learning with community risk preparedness programmes through learning extensions at home and the encouragement of child-parent and teacher-parent communication. The integration had been achieved through community based projects such as community risk mapping, community-based fairs and exhibits, and publicized drills. Public risk awareness and risk reduction education are crucial in developing a consciousness about the need for school and community-based disaster management planning and in motivating citizens to participate in local and regional risk mitigation and planning.[36]

As part of the ENDP-ESD, UNESCO Bangkok coordinated with six countries in the Asia-Pacific in order to integrate education for natural disaster preparedness in school curricula, i.e. China, Japan, Philippines, Sri Lanka, Thailand and Vanuatu. It

[34] The stocktaking was published in 2008 and covered the public, education, private and civic sectors of 13 selected OECD and emerging economy countries, i.e. Canada, Iceland, Italy, Japan, Mexico, New Zealand, Portugal, Spain, Turkey, United States, United Kingdom, and the two largest emerging economies outside the OECD, namely China and India.

[35] OECD, 2008

[36] OECD, 2008 and Dufty, 2009

was found that each of the six countries had different priorities and were at different stages of ENDP integration.

- China has always attached great importance to disaster prevention and mitigation work and thus has sufficient educational materials on this topic. However, a majority of schools in the country have not yet set up prevention and mitigation programmes and still lack quality disaster prevention and mitigation materials.
- Japan has the most successful education for natural disaster preparedness programmes in its schools.
- The Philippines is at the stage of recognizing and implementing policy to address the issues hindering ENDP.
- The significance of ENDP has only really come to light in Thailand after the 2004 tsunami. Therefore, Thailand is at a very early stage of ENDP implementation, starting in schools in the six coastal provinces affected by the tsunami.

Case studies of disaster risk education approaches in the different APEC member economies are provided in ANNEX 2.

6. Principles

The brief outline of various approaches to integrating disaster risk awareness into school curricula has shown the multitude of pilot projects and programmes being implemented by different government, UN and development agencies. Various conferences were held at global, regional and national level in order to advance disaster risk education at schools but the shift from pilot activities to a consequent mainstreaming of disaster risk awareness at schools has yet to happen.

A preliminary list of principles is outlined below as a starting point for further discussion within the APEC community on a common approach towards integrating disaster risk awareness at schools.

Proposed Principles

1. Disaster risk education at schools should be embedded as a key pillar of broader public disaster risk education to enhance community resilience to disasters, gain support for school-led activities, and motivate citizens to participate in local and regional risk mitigation and planning.

2. Disaster risk education should be integrated into school curricula because children are among the most vulnerable during a disaster and they are very effective communicators and disseminators of disaster risk reduction and preparedness messages at the family and community level..

Education materials

3. Schools should teach about all stages of the disaster risk reduction cycle, therefore education materials should introduce students to disaster prevention, mitigation, preparedness as well as response.

4. Education materials should introduce students to land use planning, building codes, insurance and environmental stewardship as means of managing and reducing disaster risk.

5. Education materials should supplement a range of academic subjects, must be rooted in existing learning materials, must suit the local context, and should be culturally sensitive taking into account indigenous and traditional knowledge.

Pedagogy (teaching strategies)

6. Disaster risk education should be cemented through learning extensions at home and the encouragement of child-parent and teacher-parent communication and activities such as community risk mapping, community-based fairs and exhibits, and publicized drills.

7. Disaster education in schools must highlight the importance of child-led disaster risk reduction and response cadres in and out of school at the community level and of reaching out to children with disabilities, their teachers and parents.

Integration

8. Disaster risk education should be integrated into formal education at pre-primary, primary and secondary levels, as well as non-formal education and into teacher education and training.

9. The development and integration of disaster risk education into national curricula should be led by the Ministry of Education, involve national and local governments from various sectors and be based on a multi-stakeholder approach engaging the private sector, communities as well as UN, donor and development agencies. Disaster risk education at schools is a continuous process that requires a constant collaborative effort from all stakeholders.

10. Integrating disaster education at schools must take into account the national education policy and the curriculum revision cycle so disaster risk awareness is introduced to the curriculum development board before or during the actual revision phase. Time is needed to develop and pilot the curriculum, train the teachers, and make budgetary arrangements. A disaster, while tragic, can be a useful trigger for changing education, research policies and practices.

11. Local community and civil society stakeholders must be involved in the development of disaster risk education materials for schools to help identify local risks and response measures. Often, the schools themselves form part of the response plan. Equally, disaster risk education policies should be taken into account in local development planning and future growth strategies.

12. To ensure the effectiveness of disaster risk education, regular monitoring and evaluation should be carried out. This could involve measuring the ability of students to cope with and learn from a disaster, and whether an emergency management plan has been prepared and maintained by a student's family.

Making schools safer

13. Resilience of school buildings must be ensured through adherence to building codes, land use planning, and emergency plans. School buildings should be retrofitted to meet safety standards, train local builders and raise public awareness.

Proposed recommendations for individual APEC member economies (as appropriate)

1. Motivate political commitment and strengthen legal support frameworks for the integration of disaster risk education at schools to move from pilot projects to the mainstreaming of disaster risk education at schools
2. Promote inter-sectoral and inter-institutional support for the integration of disaster risk reduction into school curricula
3. Link disaster risk education initiatives to national development planning
4. Develop and enforce minimum standards for disaster-resistant schools

ANNEX 1: EXAMPLES OF DISASTER RISK AWARENESS MATERIALS IN APEC MEMBER ECONOMIES

Regional disaster education material

ACCU is a Japan-based non-profit organization which implements regional cooperative programmes in Asia-Pacific in the field of culture, education and personnel exchange in close collaboration with UNESCO and its member states. In 1997 ACCU launched a multi-media teaching-learning materials series called "PLANET" short for "Package Learning mAterials oN EnvironmenT" with the aim to provide environmental education materials for learners in non-formal and formal education in order to generate motivation for improving current environmental conditions and raising environmental awareness. To date the following titles have been produced: Water Pollution (PLANET 1), Forest Conservation (PLANET 2), and Waste Management (PLANET 3). A fourth title of the series is under production, i.e. Natural Disaster Preparedness (PLANET 4). The overall PLANET scheme is based on the following three stages:

- Production of a regional English prototype version: Prototype learning materials are produced in cooperation between ACCU and regional experts. These English versions of education materials are sought to serve as references for local material developers.
- Production of local versions: Regional prototype materials are to be modified to depict country-specific contexts. This goes beyond simply translating materials into local languages and involves an adaptation of the materials' format, presentation, illustration and contents to take into account local needs, culture and environment. This requires the collection and integration of baseline data and workshops with local experts.
- Dissemination and utilization of local versions: Delivery and utilization strategies need to be based on needs and impact assessments and be plotted well before delivering materials due to their limited number.

ACCU stresses the importance of integrating local knowledge and resources into the adaptation of local learning materials and of aligning these with international and national agendas such as the MDGs.

The main target audience of the PLANET series includes neo-literates, school children, and learners in environmental education programmes in Asia and the Pacific. The PLANET materials have been used in primary and secondary schools, in educating community leaders as well as by state broadcast channels.

Lessons learned and major challenges:

- One of the biggest challenges was attaining universality for the regional prototype materials as there is a great variety in the disaster experiences of countries in the region. As a consequence the regional prototype prioritised the following five major disasters: typhoons, tsunamis, earthquakes, forest fires, and landslides.
- Another challenge lied in the varied response activities required to meet different disasters and in different cultural contexts. Different responses are required for different disasters and the cultures that underlie societies and people's lifestyles influence these responses. ACCU is considering producing a set of separate fact sheets so that people can obtain additional information on the disasters of particular relevance to their region.[37]

[37] UNESCO, 2005

Emergency management for schools in Australia

The Attorney-General's Department Emergency Management for Schools program aims to provide nationally consistent educational resources to schools and teachers available through the dedicated website www.ema.gov.au/schools.

Disaster lesson plans, resources and interactive teaching tools are provided for teachers and educators to help young Australians understand what to do if a disaster or emergency arises. Materials are provided for three main types of school disaster education programmes: interactive programmes presented by emergency management authorities, teaching/learning units and lessons, and extracurricular activities. A few Australian emergency management authorities use all three types of programmes in an integrated manner, thus maximising opportunities for effective impacts.

A few innovative approaches are briefly explained in the following:

"Dingo Creek - The Disaster" is an engaging, easy-to-use multimedia learning tool, with associated classroom activities and resources. It provides interactive and engaging content for students and teachers and is based on real life issues and problems that affect a community during a disaster. Aimed at school students from years 5 - 9, the game introduces the broader concepts of disaster risk management and minimisation.

A companion learning object "Dingo Creek - The Recovery" takes students into a post-disaster situation and guides them in rebuilding the community, in physical, environmental, economic and socio - psychological aspects. Students are asked to assess the effects of the disaster in all these areas and design recovery strategies.

The Dingo Creek series was developed by the Attorney General's Department for primary and secondary age (middle years 10-15 year old) students. The cross-curricula, cross year level learning object is built using Adobe Flash and is structured to use in the classroom, supported by associated offline activities.

Best practices:

- Unlike most other disaster education activities online, 'Dingo Creek' explores the all-hazards approach. It explains issues around emergency risk assessment, analysis and treatment and thus develops an understanding of how the emergency services across Australia work to protect communities and minimise risk.
- The resources have been designed to be used flexibly so that the key messages of student empowerment, responsible and careful decision-making and positive actions within the local community can be applied in any area of school's curriculum across the middle years of schooling.[38]

The "Living with Disaster" digital stories series was developed after the extreme bushfires of February 2009. The series presents the personal experiences and reflections of young people from different communities that have experienced disasters and talks about the impact of those events on themselves, their families, schools and communities. Participants use their own photographs, music, videos and

[38] Materials explicitly link to the following school subjects: geography, personal development, health and physical education, science, technology, studies of society and environment, English/literacy, and personal learning

memorabilia to create short multimedia presentations through workshops facilitated by the Australian Centre for the moving Image (ACMI). Stories are presented as part of a teaching resource and are used as a base for discussion and classroom activities.

Best practices:

- By seeing, hearing and feeling the experiences of their peers students can more directly relate to the story and its message and better develop an understanding of the different impacts of disaster events.

"People Get Ready", a culturally inclusive emergency management resource for schools, it aims to enhance the understanding of students (years 8 -10) from culturally and linguistically diverse (CALD) backgrounds with regards to disaster prevention, preparedness, response and recovery. A web-based toolkit supported by 9 lesson plans incorporates the wide range of different cultures and life experiences into teaching and learning. It can be applied across a number of cultural backgrounds and be adapted for specific cultural, language and religious contexts. The toolkit encompasses:

- "Teaching in a culturally inclusive way": This section provides practical hints and tips for teachers.
- "About CALD students": This section highlights some of the experiences of students from culturally diverse backgrounds and how this might impact on the teaching of natural disasters and/or emergency management.
- "The importance of family": This section highlights the dynamics and some of the experiences of families from culturally diverse backgrounds.
- Comprehensive lesson plans on "Me and My Community", "Take the Communication Mission", "Experiences of Emergencies and Families Preparing Together".
- Curriculum links to state or territory curriculum framework for each lesson plan.

Best practices:

- Culturally sensitive disaster education materials do not only contribute to a better understanding of disaster issues by students but also improves the adoption of messages and behaviours taught as students can easier relate those to their own living environment and experiences.

Disaster risk education material in China

In China, nearly 500,000 textbooks on natural disasters and mitigation have been produced for elective high school geography courses, covering characteristics and impacts of natural hazards in China, hazard monitoring, mitigation, preparedness and disaster relief.

In 2004, the National Text-book Authorization Committee for Primary and Middle Schools of China approved a text-book for senior middle schools on natural hazards which was distributed widely across the country: by 2006, there was a copy on every senior middle school student's desk. The book offers a thorough introduction to natural hazards in the world, with a more detailed focus on China, and pays particular attention to preparedness and DRR. In addition it provides a list of Chinese web sites that students and teachers can consult, including a site maintained by the Chinese Science Museum.

The website of the virtual Earthquake Museum, for examples, features interactive games on earthquake response (Escape from an Earthquake in 10 seconds) and information on a range of topics including basic hazard awareness, Chinese seismographic history and earthquake risk management. The website is addressing both children and adults.[39]

[39] OECD, 2009

ANNEX 2: ECONOMY CASE STUDIES ON DISASTER RISK AWARENESS

Japan: Guidance on School Retrofitting and Seismic Resistance

Mandatory risk education was removed from the national curriculum in 1951 due to concerns over declining achievement in other subjects. However, most schools have hazard drills and teach DRR in this context. A 2005 study showed that 80 percent of the high schools in five prefectures of Japan had participated in disaster education and a small percentage of schools in Japan have been recognized as pioneer schools in DRR education. Extensive materials for disaster awareness and risk reduction have been produced by municipalities, prefectures, engineering and scientific institutions and the General Insurance Association of Japan.[40]

A survey carried out by the Fire Protection Agency and the Cabinet Office of the Japanese Government in 2001 and 2002, however, showed that public facilities including school buildings were not satisfactorily earthquake resistant: seismic diagnosis was carried out on only 30 percent of buildings built under the pre-1981 Earthquake-Proof Standards and only about 45 percent of government primary and junior high school buildings had been retrofitted. In response to this "Guidelines for the Promotion of Earthquake-Resistant School Buildings" were published in July 2003 which describe the basic concept of earthquake-resistant school buildings and outline methods for devising earthquake-resistant promotion plans as well as for determining the urgency of earthquake resistance projects.[41] The basic principles outlined in the guidelines are as follows:

- Prioritize earthquake resistance measures for school buildings with high risk of collapse or severe damage
- Prompt the implementation of seismic resistance capacity evaluation and the development of a plan for promoting earthquake resistance
- Disclose the results of the seismic resistance capacity evaluation and of the plans for promoting earthquake resistance
- Check and take measures for the earthquake resistance of non-structural elements

Good practice examples:

- The guidelines took into consideration the crucial importance of competing priorities among public needs and therefore emphasized prioritization and urgency based on vulnerability assessment.

Lessons learned and major challenges:

- To implement projects related to earthquake resistant school buildings effectively, more attention needs to be paid to various issues such as selecting adequate construction methods for seismic reinforcement and methods for earthquake resistance improvements to non-structural elements, and adopting emergency reinforcement.
- Retrofitting vulnerable school buildings is costly and represents only one of many public needs. Therefore it is difficult to assign higher budgets to school buildings even in seismic areas where the occurrence of earthquakes is very likely.[42]

[40] OECD, 2008

[41] UN/ISDR, 2007b

[42] UN/ISDR, 2007b

New Zealand: Mandatory National Curriculum

New Zealand has a mandatory curriculum for risk awareness and reduction which is one of the most extensive ones in the Asia-Pacific region. Civil defence and emergency service personnel, supported by teachers, are responsible for developing and delivering community safety programmes in primary and intermediate schools, while national level committees are responsible for their production. The 2006 “What’s the Plan Stan?”, which targets primary and intermediate school children, teaches risk awareness and risk reduction by highlighting the four Rs of emergency management: reduction, readiness, response and recovery. The initiative seeks to support teachers to develop the students' knowledge, skills and attitudes to respond to and prepare for an emergency. In addition to curriculum resources, the initiative also provides simulation and practice activities, disaster activities and fact sheets, and a list of references and templates to be used by the teacher. The program increases its impact by encouraging students to talk with their parents about natural hazard risks and preparedness.[43]

A study of children’s natural hazard risk perceptions, levels of preparedness and participation in education programmes in Christchurch was published in 2004 for which 102 participating students from Cobham Intermediate School from the age of 10 to 12 years were surveyed. The study showed that

- The children’s awareness of hazards impacting Christchurch was fairly accurate; however, the awareness of the risk from storms with heavy snow falls and tsunami was very poor.
- Overall the surveyed children had a good knowledge of safety behaviour with some vital safety behaviours better known by the children than other safety behaviour.
- A significant majority of the children have participated in a hazard education school programme conducted by Civil Defence personnel.
- Preparedness plans and practices were reported to be poorly adopted by the children’s household: torches, first aid kits and smoke detectors were the principal preparedness measures adopted by the children’s families while only less than one fifth of children have an emergency kit prepared. Only emergency practices at school had a majority of children participating.[44]

Lessons learned:

- Continuing hazards education is necessary in order to increase understanding of the hazard types and impacts communities could face and to improve household preparation.
- An emergency management focused programme that emphasises children’s interactions with their parents can increase home preparedness, e.g. providing children with homework to fill out a home preparedness checklist might be one avenue to translate increased knowledge into useful actions.

[43] OECD, 2008 and RCC, 2008

[44] Finnis et al., 2004

The Philippines: MDRD-Education

In 2005 the Regional Consultative Committee on Disaster Management (RCC) adopted the Hanoi RCC 5 statement on "Mainstreaming Disaster Risk Reduction into Development in Asian Countries", which prioritizes mainstreaming of DRR in the national development planning process as well as in six sectors, (i.e. agriculture, urban planning and infrastructure, education, health, housing and financial services). Within the education sector, the statement identified the following sub-themes to initiate mainstreaming of DRR:

- Integrating DRR modules into school curriculum
- Promoting hazard resilient construction of new schools
- Introducing features into schools for their use as emergency shelters

With the aim to mainstream DRR in the education sector ADPC, UNDP and ECHO initiated the project "Support to Implementation of Hyogo Framework for Action (HFA) through Mainstreaming of Disaster Risk Reduction into Development Planning, Policy and Implementation in Asia: Advocacy and Pilot Implementation Project in Education Sector in 3 South East Asian RCC member countries (Cambodia, Lao PDR and the Philippines)" project (hereinafter referred to as MDRD-Education project).

In its Phase I (2007-2008) the MDRD-Education project formed a Technical Working Group with representatives from the Department of Education, National Disaster Coordinating Council, National Economic Development Authority and Department of Finance. This Technical Working Group spearheaded the implementation of the project and undertook the following activities:

1. Initiating the mainstreaming of DRR into secondary school curriculum
2. Studying the impacts of disasters on the education sector to develop an evidence-based rationale for mainstreaming DRR into the education sector
3. Conducting an advocacy workshop on mainstreaming DRR into the education sector
4. Stakeholder consultation as follow up to the advocacy workshop

As a result of the first project phase the mainstreaming of DRR in the three project countries was advanced, networking among DRR practitioners strengthened and government commitment in making communities safer and upholding government responsibility to ensure public safety enhanced.

In the particular case of the Philippines the project achieved the following

- A country specific DRR curriculum was developed which includes a chapter on volcanic eruptions, a hazard very specific to the Philippines.
- The curriculum has been integrated into the science and social sciences subjects of Grade 7.
- The Ministry of Education has endorsed the DRR module and the Philippine government has integrated DRR in the education sector into the Strategic National Action Plan (SNAP)[45].

[45] The "Strategic National Action Plan 2009-2015: Strengthening Disaster Risk Reduction in the Philippines"

- The country authorities have expressed their commitment to elaborate or review the existing building codes and construction guidelines for school buildings.

Starting from October 2007, the DRR module was taught at three private and three public schools in three provinces, i.e. St. Bernard, Tabaco, and Basilan. Before this, 74 teachers and 24 officials were trained on the DRR module, lessons plan, and teaching techniques. A group of curriculum specialists[46] monitored the teaching of the DRR module in classrooms in December 2007 and January 2008 and based on their comments some lesson plans were revised.

In order to evaluate the teaching and the effectiveness of the module the ADPC initiated a School Safety Day which included activities such as hazard hunt, poster painting competition, and a quiz in the schools. The School Safety Day was held from January to February 2008 and also engaged students from other classes. 15 outstanding students from two pilot schools had a poster painting competition and were evaluated during the National Advocacy Workshop.

A survey of the impact of disasters on the education sector in the Philippines was conducted and showed that in order to improve the resilience of school constructions improvements were required in the following areas: fire prevention and safety, road safety, proper use of chemicals and gases in the science laboratories, location and environment of the school, and accessibility of school buildings.

A National Advocacy Workshops was conducted at the end of the first project phase on 31 March 2008 in Manila with the aim to showcase results of the MDRD Education project, to gather recommendations from the workshop participants on next steps, and to arrive at an endorsement by the Government of the Philippines of future programmatic activities for the integration of DRR in the education sector. Participants of the workshop included representatives from the government, NGOs, and from international donor and UN bodies.

Building upon the lessons learned from Phase I the ongoing Phase II of the PIP (September 2008-December 2009) aims to:

- forward the integration of DRR into school curricula in every country by:
  - Expanding the Technical Working Group and engaging with the Education Sector Working Group,
  - Institutionalising DRR modules in the national curricula and in the teachers training system (this includes the development of teaching aids for the delivery of the modules developed in phase I),
  - Reviewing existing national curricula in order to develop a Curriculum Plan for integrating DRR from primary to secondary level,
- Integrating hazard resilient features in school construction by reviewing, enhancing and developing school construction guidelines and promoting the application of these guidelines in ongoing school construction projects/programs supported by multilateral and bilateral agencies in the project countries.

[46] Specialists from the Ministry of Education, the National Disaster Coordinating Council focal point, project working group members and school principals/school directors from the three project countries.

Best practice examples:

- Development and testing of economy-specific DRR modules and research on the impact of disasters in the education sector
- Development of the curriculum module based on multi-department consultation under leadership of the Department of Education (e.g. Office of the Civil Defence, Department of Environment and Natural Resources, Department of Energy, Philippines National Red Cross and Philippines National Police)
- National advocacy workshops to demonstrate and discuss the findings of disaster impact studies and school pilot activities with key stakeholders

Lessons learned and challenges:

- Efforts to integrate DRR in the curriculum must not only be piloted but mainstreamed at the national level.
- The integration of DRR in education should be both in the formal, as well as non-formal education, including adult education for different vulnerable groups such as people with physical, mental and emotional disabilities, the elderly, and those in occupational risks.
- The education has to include modules in caring for the caregivers such as teachers and disaster workers who could be both a victim and a service provider. Training in psycho-social intervention is also needed.
- DRR has to be incorporated as a subject in the tertiary education of teachers in colleges and universities to develop teachers' capability in handling DRR in teaching.
- The existing institutional set up of the DepEd for DRR has to be strengthened by developing the capacity and mobilizing the people who are supposed to play their roles and responsibilities. There has to be warm bodies of second liners who shall continue the work in DRR within DepEd to ensure that the experiences and the capabilities are institutionalized, and not dependent on a few individuals to whom the responsibilities are bestowed upon.
- Disaster damages, losses and impact have to be monitored and documented at the school level and transmitted to the higher level in the DepEd echelon to gather education sector-specific and relevant information.
- Significant resources need to be allocated for a successful mainstreaming of DRR in the education sector. In order to gain access to resources and capacity building linkages between different sector and different stakeholders need to be strengthened. As the focal agency for education, the Department of Education has to show greater leadership in maximising the potentials of collaborative work.
- Mainstreaming of DRR in the education sector needs to be supported by appropriate legislation at the national and local government units. The Department of Education plays a key role in advocating for DRR legislation.
- NGOs and the local communities have to be involved in the school construction, monitoring, repair and rehabilitation to ensure that there is ready and available local resources that can respond to immediate concerns.[47]

[47] Center for Disaster Preparedness, 2008

UNICEF Philippines: Building Safe Learning Environment for Children (BSLE)

The BSLE project is a pilot project of UNICEF Philippines which was initiated after the devastating 2006 typhoons. The purpose was to pilot UNICEF's engagement in large-scale construction work as part of its humanitarian intervention. The project is being coordinated and managed by UNICEF, in partnership with the Department of Education, Department of Social Welfare and Development and concerned local government units. The project aims i) to improve the teaching-learning environment of pre-school and school-age children, day care workers and teachers and ii) to enhance their capacity for emergency preparedness and disaster risk management.

It comprises two project components: the Safe Schools sub-project and the Emergency Support for Day Care Centers sub-project. The main feature of BSLE Project is the structural component or construction and rehabilitation work for damaged day care centers and schools combined with non- structural components. The first covers the service delivery aspect of the project while the latter encompasses policy as advocacy, social mobilization of school-community stakeholders, participation and capacity building of school children and teachers, technical assistance and monitoring and evaluation.

The project covers four city school divisions and six provincial school divisions and two regional office- Southern Tagalog and Bicol Regions. To date, the project has contributed to the following:

1. Policy Advocacy and Social Mobilization:
   - Provided technical assistance to the Department of Education in developing its DRR Resource Manual which will serve as a guide for teachers and school heads on DRR concepts and strategies.
2. Service Delivery:
   - Enhanced building and construction resilience at 18 school sites and provided basic school supplies in 29 recipient primary schools and to 780 teachers in the targeted elementary and secondary schools
   - Enhanced the library collection and learning materials of 59 primary schools,
3. Project coordination, monitoring and evaluation:
   - Broadened multi-stakeholders participation (governments at different levels, NGOs, donors, private sector) and facilitated the sharing of lessons learned
   - Enhanced the quality of classroom repair and construction by maintaining close partnership with the Department of Education and engaging the services of an independent engineering firm to strengthen quality assurance monitoring
   - Strengthened the lead cluster role of the Department of Education and coordination among the education cluster members.

Best practices:

- School principals or school heads take charge of the implementation and management of the repair work and/or construction with the assistance of a project engineer. This approach has not only ensured successful and timely project completion but also empowered school communities to manage and eventually own and sustain projects.[48]

[48] Center for Disaster Preparedness, 2008

United States: American Red Cross' Masters of Disaster® series

The American Red Cross' Masters of Disaster® series is an educational tool which teaches children how to prevent, prepare for and respond to disasters and other emergencies. The Masters of Disaster curriculum materials meet national educational standards tailored for lower elementary (K–2), upper elementary (3–5), middle school (6–8) classes, and high school (9–12). This also allows for easy adaptation for preschool or students with special needs.

Customized formats for both families and educators are available which help for example teachers to meet their required curriculum objectives while teaching disaster risk awareness and management. The Masters of Disaster curriculum intends to support teachers to integrate important disaster safety instruction into their regular core subjects such as language, arts, math, science, and social studies.[49] By 2008, approximately half of the 756 local Red Cross chapters had implemented this program in schools within their community, reaching 5.2 million children in six years. As risk awareness and reduction education is not mandatory the use of this material varies widely.[50]

Good practice examples:

- The curriculum supplements core academic subjects rather than providing additional material.
- The Masters of Disaster Curriculum Kit contains ready-to-go lesson plans, activities, and demonstrations on disaster-related topics that teachers can incorporate within core subject areas.
- Designed for flexibility, materials/activities are non-sequential and teachers can integrate specific hazard-related modules into the core academic subjects.
- Step-by-step lesson plans and easy-to-follow directions enable the activities to fit a variety of time frames and learning environments.
- Cross-curricular activities tie key concepts within the lesson plan to a broad range of curriculum topics and can be used as reinforcement, enrichment or stand-alone assignments.

[49] http://www.redcross.org/portal/site/en/menuitem.d8aaecf214c576bf971e4cfe43181aa0/?vgnextoid=14c70c45f663b110VgnVCM10000089f0870aRCRD&vgnextfmt=default

[50] OECD, 2008

Vietnam: Disaster Preparedness Education at primary schools

The Vietnam Red Cross Society (VNRC) has put an emphasis on disaster preparedness activities since late 1990s. In 2001, it implemented a programme called "Introducing Disaster Preparedness in Primary Schools". The Programme's activities have been replicated since then and are under way in all 21 of the most disaster-prone provinces in Vietnam, aiming to reduce disaster risk among school-going children who are among the most vulnerable to disasters. The 12-month programme had the following specific objectives:

- Developing disaster needs assessment material and training national and provincial trainers and district and commune personnel in some 30 communes in a 12-month period
- Developing commune-level disaster preparedness material and training Community Development Boards in some 30 communes in a 12-month period
- Developing disaster preparedness material for Grade 4 and 5 school children and training trainers, school teachers and children in some 210 communes in a 12-month period

Targeted beneficiaries were teachers and children as well as VNRC staff and government personnel. Recipient schools in disaster-prone areas organized inter-provincial competitions including drama, quizzes and painting competitions built around a disaster preparedness booklet and disaster preparedness teaching.

The programme developed a new package of disaster preparedness training material for Red Cross personnel, community leaders, teachers and children. The training package was made available with the help of the Vietnam Red Cross Society and relevant stakeholders. It is currently used by international NGOs in Vietnam. The programme further helped envision the integration of disaster preparedness education into school curricula in Vietnam. The country's current strategy for flood and storm control – that is valid until 2020 – requests the Ministry of Education to include disaster preparedness education in school curricula by 2010.

The Vietnam Red Cross Society intends to continue providing disaster preparedness training until 2010 to teachers and children in eight coastal provinces in northern Vietnam (from Quang Ninh to Ha Tinh Province), with financial support from the Japanese Red Cross.

An external evaluation of the project showed that, one or two years after the lessons, school children might not remember all the definitions, technical terms and types of natural hazards but a majority still remember how to react when a disaster strikes (30-40 percent when interviewed individually and about 80 percent when talking to their peers).

Good practice examples:

- A participatory training method was promoted and used with audio and visual facilities
- Economy-wide replication of the programme with long-term support from the Vietnamese government and from donors

Success factors:

- Active participation of relevant stakeholders, including teachers and children, in writing and finalizing the training and learning material

- Replacing the lecturing method with the facilitating method which enabled the children to participate in discussions
- Building strong cooperation and consultation among diverse stakeholders

Major challenges and lessons learned:

- The Programme faced a major challenge in trying to integrate a disaster preparedness component into the official training curriculum without overburdening school children. This challenge has not yet been overcome.[51]

[51] UN/ISDR, 2007b

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Asia-Pacific
Economic Cooperation

2009/TEEP01-2009A/P01
Agenda item: 2009/TFEP/SEM1/018

TFEP 2009

Reviewing CEOs' actions in 2008 and 2009 to promote the implementation of the Strategy and work plan proposal for 2010

Strategy for Disaster Risk Reduction and Emergency Preparedness and Response in the Asia Pacific Region: 2009 to 2015

Purpose: Information and consideration
Submitted by: Peru

Third APEC Emergency Management CEOs' Forum
Ha Noi, Viet Nam
15-17 September, 2009

APEC Task Force on Emergency Preparedness

Third APEC Emergency Management CEOs' Forum
Ha Noi, 15-17 September, 2009

Reviewing CEOs' actions in 2008 and 2009 to promote the implementation of the Strategy towards 2015 and work plan proposal for 2010

1. Background

In August 2008, APEC CEOs´ Forum endorsed the "**Strategy for Disaster Risk Reduction and Emergency Preparedness and Response in the Asia Pacific Region: 2009 to 2015"**. This strategy seeks to facilitate cooperation between APEC economies, international organisations and the private sector to attain the goals of the Task Force of Emergency Preparedness (TFEP), chaired at present by Australia and Indonesia.

As a consequence, in November 2008, APEC Leaders and Ministers:

- agreed that greater focus is needed on disaster risk reduction, emergency preparedness and building domestic disaster management capabilities;

- endorsed the priority APEC had given to promoting risk management, building business and community resilience, and public-private sector partnerships, and supported efforts to prepare economies for the recovery phase;

- endorsed the concept of holding Emergency Management CEOs seminars annually to 2013, and welcomed Viet Nam's offer to host the third seminar in 2009;

- instructed officials to undertake long-term capacity building projects aimed at accelerating recovery in disaster-affected areas in APEC economies; and

- supported integrating disaster education into school curricula.

The *APEC Strategy*, which was endorsed by the TFEP and welcomed by Leaders and Ministers in November 2008, identified that the core objectives of APEC economies and the Task Force during the period 2009 to 2015 should be that:

- political decision-makers in APEC economies better understand the economic and social costs of disasters and, equally, the human and economic costs of failing to take action;

- gaps in regional disaster risk reduction approaches are identified and shared to support the delivery of targeted capacity-building initiatives; and

- a suite of practical mechanisms is developed that will aid APEC economies to build business and community resilience.

In June 2009 in Geneva, Switzerland, the II Meeting of the Global Platform for Disaster Risk Reduction, sponsored by UN-ISDR, presented the achievements and challenges for the implementation of the Hyogo Framework of Action and the creation and strengthening of regional and national platforms.

In July 2009, Peru was entrusted the *pro tempore* Presidency of the Andean Community (CAN) and INDECI received the Secretariat of the Andean Committee for Disaster Prevention and Assistance (CAPRADE) in a meeting held in Cusco City. During this meeting the Representatives of regional organizations CAPRADE, CEPREDENAC, CEDERA, and TFEP-APEC signed the Declaration of Cusco in which they express willingness to tighten cooperation ties between regional and sub-regional organizations in order to share knowledge, experiences and best practices for disaster risk reduction.

2. Emergencies and disasters during 2008 – 2009

The tendency of increased number and negative consequences of emergencies and disasters continued affecting the region and all over the world. Some of the most relevant are the following:

- On May 12, 2008 earthquake in China's Sichuan province that left nearly 90,000 dead or missing,
- The AH1N1 influenza pandemic, causing so far near 3000 deaths and which produced economic impact, particularly to Mexico.
- The August 8, 2009 Typhoon Morakot that flooded Chinese Taipei and the coast of People´s Republic of China,

These and other emergencies and disasters in the region keep reminding us the importance of TFEP's work and the implementation of the Strategy to improve our potential action to reduce risks and to give a coordinated, effective and timely response if necessary.

3. Objectives of the "Strategy for Disaster Risk Reduction and Emergency Preparedness and Response in the Asia Pacific Region: 2009 to 2015"

The main objective or the Strategy is to strengthen disaster risk reduction, preparedness, response and recuperation against disasters in order to increase the resiliency of businesses, communities and national and local actors as a contribution to achieve the objectives of TFEP, APEC and sustainable development of the region.

It has the purpose to promote the systematization of mutual cooperation and joint action of APEC economies in order to prevent and attend the effects of disasters of natural origin and to be a supporting element for orientation, mutual understanding, and synergy building among the different actors in the region, contributing to the achievement of TFEP and APEC objectives, and strengthening relationships among economies in the region.

This Strategy seeks to integrate current TFEP and broader APEC activities, and to guide future APEC efforts to achieve three core objectives or end-states by 2015 that will ensure:

1. Political decision-makers in APEC economies understand the economic and social costs of disasters and, equally, the human and economic costs of failing to take action to enhance disaster preparedness and facilitate efforts towards prospective risk management, which searches to prevent and control future risk factors in development initiatives.

2. The gaps in regional disaster risk reduction approaches are identified and shared to give the TFEP and APEC Member Economies – as well as multilateral and bilateral development partners, international financial organizations and other international and regional bodies – the foundation to offer and deliver targeted initiatives that enhance regional preparedness.

3. A suite of practical mechanisms, instruments and communication products for implementation in member economies that inter alia enhances business and community resilience and embeds more comprehensive disaster planning priorities into national and local government policy and legal aspects and tools to build capacity and remove gaps in local preparedness.

4. Strategic lines

To achieve the objectives of the Strategy, the Task Force and APEC economies are encouraged to explore three strategic lines or approaches when considering the scope of disaster preparedness activities:

a. Disasters should be prepared for jointly;

b. Recovery from disasters should be achieved using a long-term development approach; and

c. Risk should be managed prospectively.

The broad spectrum of sectors in which APEC operates, the depth of the networks of public sector officials attuned to APEC issues, and the associations APEC continues to develop with the private sector and international organizations, provides a strong base from which to consider these strategic lines.

5. Strategy Implementation (Strategic Plan for 2015)

According to the TFEP 2009 Work Plan. in line with present TFEP mandate and the United Nations Hyogo Framework for Action (2005-2015), the Task Force seeks to help achieve the following in APEC economies by 2015:

- Reduced risk of disasters, including through increased risk awareness and assessment, improved knowledge development systems, strengthened public commitment and institutional frameworks, implementation of disaster risk reduction measures; and the establishment of effective early warning systems[1];

- Increased business and community resilience, including an increased ability to absorb the shocks of hazard impact, improved capacity to bounce back during and after a disaster, and increased opportunities for change and adaptation following a disaster[2]; and

- Better coordination and cooperation in terms of emergency and disaster preparedness and response efforts, including with other international organisations.

6. Actions in 2008-2009

After August's Second CEOs´ Forum, a workshop on Large-Scale Disaster Recovery in APEC was held in Chinese Taipei, September 22-25 and China, September 26-28, which addressed ¨the pressing demands of disaster risk reduction, and to identify the best practices, share experiences and facilitate public –private partnership.

1 UN Hyogo Framework for Action (2005)
2 Asian Disaster Preparedness Centre (2006).

Steering Committee
To drive the Task Force's objectives for 2009 and the medium-term (subject to the extension of its mandate beyond 2009), a Steering Committee was formed in November 2008 to assist TFEP and its co-Chairs advance the Task Force's mandate and work plans, and to assess Task Force projects. Australia, Canada, China, Indonesia, Peru, Singapore, Chinese Taipei and Vietnam volunteered to be members of the Steering Committee.

The TFEP has focused in 2009 by virtual means on strengthening six focal areas: business and community resilience; public-private partnerships; disaster risk reduction; cooperation and coordination among heads of APEC emergency management agencies; preparations for the recovery phase; and the integration of disaster risk awareness and management education into school curricula. The following activities were scheduled for 2009:

a. Focus on the impact of climate change for disaster management professionals at the APEC Climate Symposium, Singapore, 14-16 July [APEC Climate Centre]

b. Workshop on Damage Assessment Techniques, Yogyakarta, 3-6 August [Australia & Indonesia], developed best practice guidelines for the conduct of post-disaster damage assessments. The improved knowledge about damage assessment and related economic systems will facilitate and accelerate communication and responses among aid recipient and donor economies in the immediate post-disaster period.

c. Third APEC Emergency Management CEOs' Forum, Hanoi, 15-17 September [Vietnam]

d. Workshop on the Framework of Long-Term Capacity Building for Disaster Risk Reduction in APEC, Taipei, late October [Chinese Taipei]

e. Social Economic Recovery and Development Programme after Large-scale Disaster, Sichuan, December [China]. Subject to funding.

f. Electronic library of disaster risk reduction school education material [TFEP & Human Resources Development Working Group (HRDWG)]

g. *Public-Private Partnership for Disaster Preparedness Workshop*: Australia is seeking a partner economy to co-host a CEO-level workshop, designed to strengthen business resilience, and ways in which public-private partnerships (PPPs) can be utilised to build preparedness, response and recovery processes.

h. *Website updates:* The Task Force will update the public website of the TFEP and the secure APEC Information Management Portal (AIMP) site to help strengthen coordination of APEC's work on emergency and natural disaster preparedness and information sharing between APEC members.

End of mandate Review
Also in accordance with the Task Force's Terms of Reference, towards the end of its mandate (end of 2009) the TFEP will review its achievements and outputs and invite Senior Officials to consider its future at CSOM.

7. Proposed Mechanism for the Implementation of the Strategy

To meet the objectives proposed in the Strategy it is necessary to establish a mechanism to guide its implementation process, with active participation of all member economies in the region, for which we propose the following scheme:

I. Planning
II. Monitoring System Strategic Plan
III. Organization
IV. Financing

I. PLANNING

It is necessary to develop strategic and operational instruments that enable the implementation of the three thematic areas identified in the strategy for the period from 2009 to 2015, formulating a Vision and Strategic Results of what is expected to be achieved at the end of the period.

I.a Strategic Plan 2009 – 2015
I.b Annual Operational Plans
I.c Work Plan 2010

I.a Strategic Plan 2009 – 2015

a.1. Agree the Vision and Strategic Results aligned with the three lines of the Strategy, to be approved at the Third CEO Seminar.
a.2. Based on the projects and activities conducted in 2009 and receiving other proposed activities for the next years, formulate a draft of the Strategic Plan 2009-2015
a.3. Socialization of virtual working paper.
a.4. Consolidation, inputs and suggestions.
a.5. Strategic Plan Approval.

Deadline: 60 days (October-November 2009).

Vision
Srengthened Economies on disaster risk reduction, preparedness, response and recuperation from disasters, along with a high resiliency of businesses and communities, which contributes to achieve APEC´s and TFEP´s objjectives and sustainable development of the region.

Priorities

In March 2008, APEC Senior Officials instructed the Task Force to:

- improve coordination and enhance intra-APEC cooperation and integration of best practice emergency and natural disaster preparedness and response efforts in APEC; and
- build capacity in the region to mitigate, prepare for and respond appropriately to emergencies and natural disasters.

In August 2008, the TFEP agreed that is priorities were strengthening:

- business and community resilience;

- public-private partnerships;
- disaster relief coordination and cooperation, including donor management; and
- integration of disaster risk awareness and management education into school curricula.

I.b Annual Operational Plans, 2009 – 2015

After taking a decision on the list of projects it is necessary to prioritize projects and activities for every year.

b.1 Projects and activities endorsed until now.
b.2 Proposals from the Economies
b.3 Prioritization

Deadline: 30 days. (December 2009)

I.c Work Plan 2010

Then Operational Plan for 2010 is as follows.

c.1. Identify in a consultative manner the projects and activities to be performed for the three Strategic Results.
c.2. Draft Operational Plan for 2010 to be circulated and to consolidate inputs and suggestions.
c.3. Approval of Annual Operational Plan

Deadline: 30 days. (December 2009)

II. MONITORING SYSTEM FOR THE STRATEGIC PLAN

II.a Follow up mechanism.

It is necessary to develop a follow up mechanism with appropriate performance indicators that allow us to measure progress in achieving strategic plan objectives for decision making by the TFEP.

a) Development of indicators proposed by Strategic Result in a consultative manner.
b) Draft and circulation of proposal.
c) Consolidation of contributions
d) Approval of the document.

Deadline: 30 days (December 2009).

III. ORGANIZATION

The coordination of the strategy implementation will be in charge of the Steering Committee. It is proposed that all projects sent to TFEP for review should state how it fits to the strategic lines of the “Strategy for Disaster Risk Reduction and Emergency Preparedness and Response in the Asia Pacific Region: 2009 to 2015.”

IV. FINANCING

a. APEC Resources
b. Contributions from the Economies
c. Contributions from International Cooperation Organizations

SCHEDULE - MECHANISM FOR THE IMPLEMENTATION

1º Planning 75 Days: Oct –Dic 15th 2009
2º Monitoring System Strategic Plan, 30 Days: Nov 2009
3º Organization
4º Financing

8. Proposed priorities in 2010

Areas of interest identified are: disaster relief coordination and cooperation, including donor management; understanding about the economic impact of disasters in the Asia Pacific region; and disaster risk information systems and tsunami early warning systems.

As considered in the 2009 Work Plan TFEP should continue to explore:

- *Follow-up activities to the workshop on large-scale disaster recovery:* This workshop, conducted in September 2008, made a number of recommendations for future TFEP activities.

- *Expanding APEC's library of disaster reduction, preparedness, management and recovery principles.*

- *Implementing one or more of the initiatives annexed to the APEC Strategy for Disaster Risk Reduction and Emergency Preparedness and Response in the Asia Pacific Region.*

- *Promoting the integration of disaster risk reduction education into school curricula.*

- *Assisting governments to absorb the shock of a hazard impact (disaster risk reduction).*

- *TFEP advisory group* to improve coordination with international/outside organisations.

- *Collaborating further with other APEC fora*, including possibly on logistics recovery following a large-scale disaster, the economic benefits of risk reduction for SMEs, climate change and disasters, gender integration in disaster management, and the structural and non-structural measures associated with disaster risk reduction.

- *Promoting business continuity plans (BCPs) as a component of disaster recovery strategy in the private sector.*

- *Food security concerns in its activities on disaster preparedness, risk reduction and recovery.*

- *Encouraging disaster reduction institutes in the APEC region to jointly provide comprehensive, integrated and long-term training courses*.

9. Expected outcomes/deliverables for 2010

As considered also in the 2009 Work Plan, the expected TFEP deliverables for 2010 should be in the line of:

- Further practical mechanisms to aid APEC economies to build and increase business and community resilience.
- Better coordination and cooperation in terms of emergency and disaster preparedness and response efforts, and also
- Systematisation of APEC´s and other regions´ experiences and better information sharing on disaster risk reduction

The Co-Chairs´ Progress Report (July 2009) consider the following activities in 2010:

1. Fourth APEC Emergency Management CEOs' Summit, Kobe, 17 January [Japan]
2. Workshop on Public-Private Partnerships for Business Resilience, Thailand, early 2010 [Australia & Thailand]
3. International Disaster Management Course, Singapore, early 2010 [Singapore] **
4. Study Course on Improving Regional Cooperation in Emergency Training and Response, Moscow, July 2010 [Russia] **
5. Cooperation to Prevent Forest Fires in APEC region, Russia, October 2010 [Russia] **
6. Second (of four) workshops forming part of the Social Economic Recovery and Development Programme after Large-scale Disaster, China, 2010 [China] **

** subject to funding

Implementation of the Strategy – Strategic Plan 2009 – 2015

(Working Paper: Member Economies are encouraged to suggest further activities and projects for each strategic line).

Title of the Action	**Implementation of the Strategy – Strategic Plan 2009 - 2015**			
Main Objective	Strengthen disaster risk reduction, preparedness, response and recuperation against disasters in order to increase the resiliency of businesses, communities and national and local actors as a contribution to achieve the objectives of TFEP, APEC and sustainable development of the region.			
Purpose	Promote the systematization of mutual cooperation and joint action of APEC economies in order to prevent and attend the effects of disasters of natural origin and to be a supporting element for orientation, mutual understanding, and synergy building among the different actors in the region, contributing to the achievement of TFEP and APEC objectives, and strengthening relationships among economies in the region.			
	Strategic Results	**Activities and Projects**	**Expected Products** [3]	**Performance Indicators**
Strategic Line 1 Develop joint disaster preparedness actions	APEC member economies have a coordinated mechanism for disaster and emergency response with improved tools and capacities.	• Sharing of information and technical capacities, particularly related to technology, training, and related human and material resource development • Development of promotional and advocacy activities, such as seminars and exhibitions, to enhance awareness and to learn from other experiences in the region • Enhance mutual assistance in preparing and readying emergency responses • Exchanges of good practices, lessons learned and gaps in disaster preparedness, as achieved through	• Database and shared access to information relating to disaster risk • Systematisation of outcomes of previous CEO meetings (Baseline) • Pilot program to foster Government and private sector disaster management collaboration implemented • Mutual assistance guidelines and harmonized existent tools for humanitarian aid[4]	•

[3] Considering the list of possible APEC initiatives included in Annex B of the Strategy.
As considered also in the 2009 Work Plan, the expected TFEP deliverables for 2010 should be in the line of:

- Further practical mechanisms to aid APEC economies to build and increase business and community resilience.
- Better coordination and cooperation in terms of emergency and disaster preparedness and response efforts, and also
- Systematisation of APEC´s and other regions´ experiences and better information sharing on disaster risk reduction

		the TFEP's 2008 stocktake of best practice and capacity-building needs. • Support for the development of information systems or geospatial data infrastructure for regional hazard monitoring, early warning and disaster response in real time, particularly, the implementation and reinforcement of end-to-end tsunami early warning systems that reach vulnerable communities. • Strengthening the resilience of local communities and businesses, given that local communities are often the most affected and the first line of response.	• Contingency plan including intervention protocol • Disaster Risk Information Systems in the Asia-Pacific linked together (Example: CAPRADE's SIAPAD) • Tsunami Early Warning System Final Mile Gap Assessment for the APEC Region • Disaster Preparedness Guide for Small and Medium Enterprises in the APEC Region	
Strategic Line 2 Support to recovery processes in disaster affected economies through long-term development approach	Recovery processes in the disaster affected economies in APEC region are managed more effectively promoting local and business resilience to guarantee sustainability.	• Prepare small and medium businesses, other economic actors and local communities to be ready for and respond well to disasters, minimizing livelihood and production losses [5] • Promote public-private partnerships to enable a collaborative approach to disaster risk reduction • Encourage the private and non-government sector, including individuals, local NGOs, businesses and international organizations, to provide support for the protection and strengthening of critical public facilities and physical infrastructure. • Relief/recovery processes facilitated by regional and national harmonization of international disaster relief guidelines.	• Effective business continuity and critical incident tools and guides for small and medium enterprises for reducing vulnerability and promote resilience • Recovery management models are shared and analyzed to gather replicable measures and methodology • Disaster relief guidelines	

[4] Humanitarian aid guidelines and website showing available humanitarian aid stock in each member economy and cooperation possibilities and humanitarian aid principles transferred to the private sector.

[5] To this end, document and information sharing on preparing for and responding to disasters would assist; synergies with other actors working at the communal level should be sought; tools for developing self-reliance and minimizing dependence on external assistance should be promoted; and, the production of toolkits tailored to the local needs and culture will help ensure long-term sustainability

Strategic Line 3 Prospective Risk Management	Social and economic development planning of APEC member economies use disaster risk analysis to enforce effective measures for risk reduction	• Evaluation of economic and social costs of disasters and projections for future disasters in the APEC Region • Development of public policies that are informed by the successful experiences of other member economies in the fields of land use planning and territorial organization, environmental management, public and private investments and other related topics • Development of financial mechanisms (including to transfer risk) and incentives, including for small and medium-sized enterprises • Promotion of diversified income options for populations in high-risk areas to reduce their vulnerability to hazards • Joint research on risk, vulnerability and specific instruments for risk reduction and control • Inclusion of existing information related to El Niño Phenomenon (ENSO) into the public and private development planning process, as well as economic and technical cooperation initiatives in APEC • Introduce climate variability issues into economic projections. • Addition of “risk assessment considerations” into the planning process for both private and public investments portfolios • Promotional and advocacy activities, such as seminars and exhibitions, to enhance risk awareness and to learn from other experiences in the region	• Establishment of risk indicators, including social and economic effects • Risk Transfer mechanisms analyzed and implemented • Encouraging Business to take Account of Non-Economic Risks Relating to Disasters • Disaster Risk Management Package for Local Communities • Experiences of Local territorial planning using risk analysis methods are shared and implemented. • Disaster Risk Information Systems in the Asia-Pacific linked together (Example: SIAPAD) • Development of an APEC Regional Platform for disaster risk reduction.	

Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/019

Report from APEC Workshop on Damage Assessment Techniques

Submitted by: Indonesia & Australia

Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/021

Report from APEC Workshop on Damage Assessment Techniques

Submitted by: Australia & Indonesia

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

Background

Following the devastating earthquake in China's Sichuan Province in 2008, Australian Prime Minister Kevin Rudd and Indonesian President Susilo Bambang Yudhoyono committed to intensify joint efforts to strengthen the region's disaster preparedness and management capabilities.

As part of this commitment an APEC workshop on damage assessment techniques was proposed, to harmonise efforts across 21 of the Asia-Pacific region's key economies. The aims of the workshop included development of:

- common understanding regarding post-disaster damages assessment techniques and policies,
- greater competencies and skills for the conduct of post-disaster economic analysis, and
- best practice guidelines for the conduct of post-disaster damage assessments.

The *APEC Workshop on Damage Assessment Techniques* was held in Yogyakarta, Indonesia on 3-6 August 2009, co-hosted by Indonesia and Australia.

The workshop is part of the vigorous effort being made by the APEC Task Force on Emergency Preparedness (TFEP) in building the capacity of the region to mitigate, prepare for, and respond to emergencies and disasters.

The workshop formulated a set of principles on disaster damage and loss assessment and agreed to recommend these principles to the TFEP, via consideration at the *APEC TFEP Emergency Management CEOs' Forum 2009* (Ha Noi, Vietnam), for its adoption.

Current Progress

To assist in APEC consideration, the Workshop submits the attached paper: *Report from APEC Workshop on Damage Assessment Techniques Yogyakarta, 3-6 August, 2009 including Draft APEC Principles - 'Currently Available Guidelines and Best Practice for Post –Disaster Damage and Loss Assessment'.* [Note - This paper has the workshop text. In a later 'published' version it will have photos from the workshop and the like}

Draft APEC Principles

The paper includes a chapter with proposed principles for a common approach towards post-disaster damage and loss assessment within the APEC community.

Recommendation

That the Forum contributes to the finalisation of Draft APEC Principles on Post-Disaster Damage and Loss Assessment.

DRAFT

Version 20 August 2009

Currently available guidelines and best practices for post-disaster damage and loss assessment

Report from APEC Workshop on Damage Assessment Techniques,

Yogyakarta, 3-6 August, 2009

jointly hosted by Australia & Indonesia

Prepared by

CSR Asia

Hong Kong, August 2009

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EXECUTIVE SUMMARY

The Asia-Pacific region is home to 70 percent of the world's disasters, and the intensity and frequency of disasters in the region is expected to continue to increase. Yet, little is known about the full economic and social impact of disasters because of the lack of holistic damage and loss assessment methodologies and measurement challenges.

A strategic process for post-disaster damage and loss assessment is, however, important to provide objective information to decision makers at all levels upon which to base the analysis and development of recovery and reconstruction plans as well as mitigation proposals and the development of new policies or development plans. Results of a damage and loss assessment provide the fundamental basis in considering whether proposed investments can be economically justified.

Recent post-disaster assessments increasingly seek to identify rehabilitation and reconstruction needs in addition to measuring the direct damages and indirect losses of a disaster. Considering cross-sectoral and macro-economic impacts, such as the impact on gross domestic product and the environment or the differential impact of disasters on women, is becoming common practice in post-disaster assessments.

Participants of the APEC Task Force on Emergency Preparedness (TFEP) Workshop on Damage Assessment Techniques, held in Yogyakarta from 3 to 6 August 2009, recommend APEC Emergency Management CEOs and then the Task Force endorse common principles for damage and loss assessment.

These principles are provided in this document. They outline the general objective and scope of damage and loss assessments and advocate taking into account the human dimension of disasters and engaging local community stakeholders. The principles further highlight the need to look beyond short-term emergency needs and to set the scene for mainstreaming disaster risk reduction and broader long-term sustainable development, including climate change adaptation.

APEC member economies are further recommended to agree on easily understood assessment terminology, standards, and procedures and to recognise the importance of continuous learning and sharing of experiences and lessons learnt.

DRAFT APEC PRINCIPLES ON DISASTER DAMAGE AND LOSS ASSESSMENT

The various approaches to post-disaster damage and loss assessment being used in the APEC region indicates the variability of methodologies being applied and the ongoing discussion on how to appropriately measure disaster effects on a certain economy. It is evident that disaster damages and losses can only be estimated and that it is not possible to arrive at an exact incontestable figure. Even if the same methodology would be applied loss estimates typically vary greatly between similar events or even for the same event. This is due to the differences in philosophy brought to the loss assessment, the inherent complexity of such assessments and due to the variations in funds, expertise and time available for assessments.[1] The emphasis for the economic assessment of disaster effects should therefore be on achieving a transparent and consistent approach that allows for a reasonable degree of accuracy.

Developing a consistent (national or regional) approach to post-disaster economic damage assessment does not mean achieving a detailed uniform approach, but one that produces comparable results and is based on agreed principles. In the following, a preliminary list of principles is outlined that is to be understood as a first basis for further discussion within the APEC community. In addition, best practices steps are outlined, which were derived from an evaluation of currently available post-disaster assessment guidelines.

The following two sections record

- the APEC principles on disaster damage and loss assessment as they were agreed upon by participants of the TFEP Workshop on Damage Assessment Techniques as well as
- recommendations for individual APEC member economies on the management and implementation of such assessments.

[1] EMA, 2002

(Draft) ***APEC Principles on Disaster Damage and Loss Assessment***

(Developed by participants of the TFEP Workshop on Damage Assessment Techniques)

The Asia-Pacific region is home to 70 percent of the world's disasters, and the intensity and frequency of disasters in the region is expected to continue to increase. Yet, little is known about the full economic and social impact of disasters because of the lack of holistic damage and loss assessment methodologies and measurement challenges.

Participants of the APEC Task Force on Emergency Preparedness (TFEP) Workshop on Damage Assessment Techniques in Yogyakarta from 3 to 6 August 2009 recommend APEC Emergency Management CEOs and then the Task Force endorse the following principles, and that the TFEP urge APEC member economies to consider the recommendations below.

For the purposes of this document, damage and loss assessment includes the quantification of direct, indirect, economic, social and psychological damage incurred by a disaster.

Proposed Principles

1. *Disaster damage and loss assessments must be credible, meaningful and holistic to secure the commitment and resources of governments and civil society in the disaster recovery phase, and importantly, to build community and business resilience and reduce the risk of potential disasters in the affected area and throughout the wider economy.*

2. *APEC economies should work towards harmonising damage and loss assessment techniques in the region to allow the compilation of credible region-wide data to help build regional support and consensus for disaster risk reduction policies and initiatives, and to ensure region-wide resilience.*

3. *Economic damage assessments should be consistent and transparent, and based on primarily economic principles and robust evidence.*

4. *The damage, loss and needs assessment processes should be integrated, and prioritized, address all hazards, and accommodate the need for, and different objectives of, a rapid assessment, early recovery assessment and an in-depth assessment for longer-term rehabilitation, reconstruction and recovery.*

5. *To be comprehensive, in addition to direct damage and indirect losses, the damage and loss assessment methodology should allow for an estimation of macro-economic impacts (eg. national income, government debt, trade deficit, development prospects) and, to the greatest extent possible, intangible impacts (eg. social, psychological, environmental, loss of life).*

6. *The human dimensions of disaster should be a key consideration in damage and loss assessment, including the impact on vulnerable groups.*

7. *When assessing needs, the longer-term recovery phase should be viewed as an opportunity to boost and accelerate development and economic growth, and to mainstream disaster risk reduction initiatives – to build communities with greater prosperity, resilience and preparedness than before the disaster.*

8. *Assessors and planners should look beyond short-term emergency needs and consider broader long-term needs for sustainable development, including climate change adaptation needs.*

9. *Disaster damage and loss assessment should be coordinated by one government agency, involve multi stakeholders, and include national and local government agencies.*

10. *Local community stakeholders must be involved and surveyed in every stage of the process to ensure a realistic picture of damage, loss and reconstruction and rehabilitation needs, as well as to identify the capacity of the affected community.*

11. *To be meaningful, damage and loss assessments must have relevance and applicability to the jurisdiction of the decision-makers – whether national, sub-national or local – and whether public, private or civil sector.*

Proposed recommendations for individual APEC member economies
(as appropriate)

1. *Agree on easily understood assessment terminology, standards, procedures and arrangements to allow comparable results; and train and exercise regularly a sufficient pool of assessors to use the standardized system.*

2. *Put arrangements in place ahead of the disaster so baseline and post-disaster data (including gender-segregated data and imaging), as well as data collection procedures and standards, can be accessed and employed quickly by the assessors.*

3. *Review damage and loss assessment methodologies with a view to allowing an estimation for, and consideration of:*
    a. *cross-sectoral effects, including the impacts on the environment, land-use , infrastructure, employment, and livelihoods*
    b. *social and psychological impacts, including on culture and values*
    c. *disproportionate effects on vulnerable groups, including women, children, the elderly, ill and disabled*
    d. *resources available to survivors such as savings, insurance and volunteers.*

4. *Re-evaluate assessments regularly to ascertain needs and priorities, as well as to assess the effectiveness and appropriateness of responses, and to identify lessons learned.*

5. *Recognising the importance of continuous learning, share data, experiences and lessons learnt in damage assessments to build consensus and support for disaster risk reduction, and to strengthen assessment methodologies, knowledge and information management.*

SUMMARY OF PROCEEDINGS FROM THE APEC WORKSHOP ON DAMAGE ASSESSMENT TECHNIQUES

The APEC Workshop on Damage Assessment Techniques was held in Yogyakarta, Indonesia on 3-6 August 2009, co-hosted by Indonesia and Australia. Representatives from Australia, China, Indonesia, the Philippines, Chinese Taipei, Thailand, the United States and Viet Nam participated in the workshop. Representatives from the World Bank and United Nations Development Program also participated.

The workshop is part of the vigorous effort being made by the APEC Task Force on Emergency Preparedness (TFEP) in building the capacity of the region to mitigate, prepare for, and respond to emergencies and disasters. The main objective of the workshop was to develop a common understanding regarding post-disaster damage assessment techniques and policies, increase greater competencies and skills for the conduct of post-disaster economic analysis, as well as to develop a preliminary draft of best practice guidelines for the conduct of post-disaster economic damage and loss assessment.

The workshop formulated a set of principles on disaster damage and loss assessment and agreed to recommend these principles to the TFEP for its adoption.

DAY 1

Opening Session

In her welcoming speech, Mrs. Artauli R.M.P. Tobing, Head of the Policy Analysis and Development Agency, Department of Foreign Affairs of Indonesia, highlighted the importance of responding proactively and effectively to the challenges posed by disasters through expanding regional cooperation in disaster preparedness.

Mr. Bakri Beck, Deputy for Rehabilitation and Reconstruction of Indonesia's National Agency for Disaster Management explained Indonesia's efforts in incorporating disaster management into the country's legislation. Disaster management in Indonesia comprises a wide range of policies that include disaster risk reduction, disaster prevention, emergency response and rehabilitation and reconstruction. He emphasized the importance of using the Damage and Loss Assessment (DaLA) method to ensure that development of affected areas can meet the needs of the people. He expressed his hope that through exchange of experiences and best practices the workshop will be able to develop common principles and a definition for quantifying post disaster economic damage assessment for the APEC region.

In his introductory speech, Mr. Martin Studdert, First Assistant Secretary, Attorney-General's Department of Australia, explained the role of the Attorney-General's Department in emergency management and its approach to disaster management. He also explained the aim of the workshop to improve regional capability on conducting damage and loss assessment following disasters. The outcomes of the workshop will help the TFEP to develop APEC's principles on damage assessment.

General Perspectives of Disaster Assessment

Under the theme of 'General perspectives of disaster assessment', participants heard presentations and discussed issues around existing disaster assessments, techniques used

in the economic assessment of disasters, applied disaster assessment procedures, and gender perspectives in disaster assessment.

Existing Disaster Assessment

Mr. Bakri Beck shared his views about the lessons learned from the recovery efforts of the Aceh-Nias tsunami and Yogyakarta earthquake. He concluded that a disaster recovery policy must be formulated on a case by case basis, taking into account the culture, social system, and geographic condition of the affected region.

Mr. Neil Head, Director, Information and Public Awareness, Attorney-General's Department of Australia elaborated on the report of the last TFEP CEOs' Seminar held in Peru on 12-14 August 2008, where TFEP members agreed on the *APEC Strategy for Disaster Risk Reduction and Emergency Preparedness and Response in the Asia Pacific Region: 2009 to 2015*. He outlined the draft discussion paper prepared for the workshop and initiated a discussion among the participants on a common approach for post disaster economic damage and loss assessment.

Techniques Used in Economic Assessment of Disasters

Mr. Iwan Gunawan, Senior Disaster Risk Management Adviser, World Bank Office Jakarta, presented best practices from the field. He informed the forum that since 1970, 7,000 disasters have occurred worldwide, killing 2.5 million people and causing US$ 42 trillion in material loss. Economic assessment is therefore not only important and crucial for the rehabilitation and reconstruction phases after a disaster but also crucial for developing risk reduction strategies in anticipation of future disasters. However, due to the lack of standardized definitions and methods for measuring damages and losses, there is limited knowledge about how economic assessment can be implemented. This point was emphasized as he explained the various assessment approaches applied by the different organizations and governments. He provided some recommendations for the development of common APEC principles for such assessments.

Overview of Disaster Assessment Procedures

Ms. Retno Winahyu, Project Consultant for the UNDP, explained the concept of Post Disaster Needs Assessment (PDNA). PDNA is an integrated assessment framework to provide data and information for different stakeholders. PDNA consists of two components: valuation of physical damages and economic losses for the Damage and Loss Assessment (DaLA), and identification of societal recovery needs for the Human Recovery Needs Assessment (HRNA). She explained on the sectors that must be taken into account when implementing PDNA, such as food and agriculture, environment, water and sanitation, shelter, education, health and nutrition, as well as cross cutting issues (livelihood, HIV/AIDS, gender, disaster risk reduction, and governance). She recommended a number of tools to implement PDNA, i.e. social impact assessment methods, sustainable livelihood framework, and promotion of baseline preparation at the village/community level.

Gender Perspectives in Disaster Assessment

Mrs. Yulfita Rahardjo, Gender Expert from the Indonesian Institute of Science (*LIPI*), gave a presentation on the *Study on Women in Times of Disaster* conducted by the APEC Gender Focal Point Network. The study found that women are a particularly vulnerable group and that gender perspectives in times of disaster and emergency have been acknowledged and to some extent mainstreamed into national development policy. However, these perspectives have yet to be fully integrated into disaster management policy. Gender perspective in disaster assessment recognizes the importance of differentiating the roles and

situations of women and men and the need to empower both women and men to respond to crises.

Summary and Introduction of Draft APEC Principles

Mr. Neil Head and Mr. Iwan Gunawan led the discussion on possible headings for the draft APEC principles. The workshop discussed and identified four main headings, i.e. pre-disaster planning, methodologies, special considerations, and future developments.

DAY 2

National Perspectives of Disaster Assessment

The workshop participants visited several locations that were damaged by the 2006 Yogyakarta earthquake and heard case study presentations from Indonesia, Australia, China, Thailand, and Chinese Taipei.

Site Inspection of the 2006 Yogyakarta Earthquake

The participants of the workshop visited Pasar Niten, a traditional market destroyed in the 2006 Yogyakarta earthquake, and the newly-built and relocated market. The participants also visited Kesangon Village, the center of ceramic crafts, which was damaged by the earthquake.

Following the site visit, Mr. Gendhut Sudharto on behalf of the Bantul Regency presented information about the local government's strategy to rebuild the region. Two key factors were the self-reliance of the people of Bantul in the recovery of their region, and the full trust they placed on their local government in planning and executing the development policy. He emphasized that every region needs different policies to recover from disasters, depending on the socio-cultural conditions.

Introduction and Discussion of Case Studies

Mr. Gary Gaffney from Victorian Bushfire Reconstruction and Recovery Authority Australia (VBRRA) shared experiences in handling the aftermath of the Victoria Bushfire. He emphasized that the response to the devastation required a multi-dimensional approach, which included immediate bushfire fighting, emergency relief, as well as rehabilitation and reconstruction. At the same time, each approach had numerous elements. To implement rehabilitation and reconstruction, the VBRRA had adopted a disaster recovery framework, comprising four key planning components that focused on people, environment, economy, and reconstruction, with the community at the centre – ensuring a structured and interactive approach to reconstruction.

In order to implement this plan successfully, the VBRRA activities were governed by principles that take into account the safety and welfare of the people, resource allocation to areas of greatest need, community involvement, integrity of services and resources, and tailored solutions. As a concrete action, Victoria established Natural Disaster Relief and Recovery Arrangements with funds totalling A$ 51 Million, which included packages for tourism and small and medium enterprise (SME) development.

Ms. Yuan Yi of the National Disaster Reduction Center, Ministry of Civil Affairs, China, gave a presentation on the Wenchuan Earthquake that struck in 2008 and its subsequent assessment. Considered as the most destructive earthquake in the history of modern China, the Wenchuan earthquake hit 10 provinces, took 69,227 lives, and destroyed 7.967 million houses and buildings. The total economic loss was US$ 125.3 billion.

She explained the National Disaster Reduction Center's initiative to cooperate with related ministries, commissions, and scientific research institutions in conducting rapid assessment. She highlighted the need for the economic loss assessment to include direct and indirect losses and suggested the use of the replacement cost method for the calculation of economic losses complemented by both the market comparison method and the income method. She further suggested a series of assessments of different scope conducted before, during, and after a large-scale disaster.

Mr. Kriengkrai Khovadana, Expert from Thailand's National Disaster Warning Center (NDWC), explained the establishment of the NDWC as well as its role and responsibility in managing the early warning system. NDWC works together with other agencies of the Thai government and international organizations. Its beneficiaries include the central government, local governments, rescue units, affected communities, and the general public. He also explained about the massive tsunami drill conducted by the NDWC in 2008 in Thailand's six provinces, aimed at disseminating information to the people as well as familiarizing them with the siren, evacuation routes and shelters. In addition, Thailand has established an emergency call centre, which facilitates the collection of crucial disaster information provided from various sources, including the general public.

Mr. Wei Sen Li of the National Science and Technology Center for Disaster Reduction of Chinese Taipei talked about the basic damage assessment process, based on Chinese Taipei's experience of several major disasters of various magnitudes. He emphasized the need to assess the affected area from a bird's eye view as well as from a more detailed view, and the importance of assessment standards, community involvement, and technology application. He shared best practices of Chinese Taipei's damage assessment, which builds upon well-defined operational mechanisms and procedures, data and information collection before, during and after a disaster, a comprehensive evaluation, traceability of the final report, and regular trainings.

Discussions of the draft APEC principles

Mr. Stephen Frost from CSR Asia led the discussion on possible draft APEC principles on post-disaster damage and loss assessment. Participants to the workshop discussed and provided inputs to the draft principles

DAY 3

Expert Comment on Disaster Assessment

Mr. Koeswiyanto from the National Development Planning Agency Indonesia (BAPPENAS) explained the recovery system approach, which includes post disaster assessment, policy planning process, action plan for rehabilitation and reconstruction, and monitoring and evaluation.

He compared lessons learned from the recovery program of the Aceh-Nias tsunami and the Yogyakarta earthquake, and concluded that the difference was in coordination. The Aceh-Nias recovery program was coordinated by BRR with locally guided policies, while the Yogyakarta earthquake recovery program was coordinated by BAPPENAS with nationally guided policies. He also explained that the future post disaster assessment methodology will be aligned with a rehabilitation and reconstruction guidelines which also take into account disaster risk reduction concerns.

Discussion on APEC Principles on Disaster Damage and Loss Assessment

The TFEP Co-Chairs led the discussion on APEC Principles on Disaster Damage and Loss Assessment. The participants agreed on a draft of ten Principles on Damage Assessment.

The principles highlight the importance of a credible, comprehensive, and relevant damage and loss assessment that involves local community stakeholders. The draft principles will be circulated to all TFEP members for endorsement and reported to AMM and AELM in November 2009.

APPENDIX – DISCUSSION PAPER PREPARED FOR THE APEC WORKSHOP ON DAMAGE ASSESSMENT TECHNIQUES

Table of content

1. Introduction

Following the devastating earthquake in China's Sichuan Province last year, Australian Prime Minister Kevin Rudd and Indonesian President Susilo Bambang Yudhoyono committed to intensify joint efforts to strengthen the region's disaster preparedness and management capabilities. As part of this commitment an APEC workshop on damage assessment techniques to harmonise efforts across 21 of the Asia-Pacific region's key economies is being held in Yogyakarta from 3 to 6 August 2009. The aim of this workshop is to develop

- common understanding regarding post-disaster damages assessment techniques and policies,
- greater competencies and skills for the conduct of post-disaster economic analysis, and
- best practice guidelines for the conduct of post-disaster damage assessments.

The workshop is being organised by the APEC Task Force of Emergency Preparedness, chaired by Australia and Indonesia, as part of the Task Force's vigorous effort in building capacity in the region to mitigate, prepare for, and respond to, emergencies and disasters.

The purpose of this paper is to initiate a discussion among representatives of the APEC economies participating at the workshop on a common approach for post-disaster economic damage assessment. On this account, the paper briefly outlines the most commonly used methodologies and tools for such assessments and discusses a few basic ideas and concepts of damage and loss assessments. In addition a preliminary set of principles for economic damage and loss assessment is provided, which serves to guide thoughts and considerations around a common standardised approach to economic damage assessment in the APEC region.

2. Definition and scope of post-disaster damage and loss assessment

Disaster loss assessment is the estimation of losses that have occurred or that could occur as a result of some specified event defined in space and time. It is a critical element of disaster management, as the techniques and estimates of loss assessment support the risk management process by evaluating risk management strategies and determining relief and recovery needs.[2]

A damage assessment presents, usually quantitatively and often also in monetary terms, the physical, and much less often the social and psychological, damage incurred by a disaster.[3]

To get a better understanding of the impact of disasters, post-disaster assessments usually aim to analyse both the damages and losses that communities experience. The aim is to define the magnitude of the damage and loss attributed to a disaster event, and the physical, and thus financial, resources needed for recovery and their appropriate allocation. Assessments that go further and help understanding the causal factors that underlie losses allows synthesis of losses for given risks and assists in evaluation of alternative mitigation strategies.

A comprehensive outline of a loss assessment process can be found, for example, in the Disaster Loss Assessment Guidelines published by Emergency Management Australia (see Figure 3 in Annex 1)[4]

2.1. Scope of post-disaster assessments

To ensure that reconstruction after a disaster takes into account disaster mitigation and vulnerability concerns, immediately after the emergency stage, an assessment must be made of the direct and indirect effects of the event and their consequences on the social well-being and economic performance of the affected country or area. This assessment need not entail the utmost quantitative precision, but it must be comprehensive in that it covers the complete range of effects and their cross-implications for economic and social sectors, physical infrastructure and environmental assets.

Common damage assessment and loss assessment (DaLa) approaches usually focus on determining

- Direct damages: Assets affected by a disaster, including immovable assets and stock (such as final goods, goods in process, raw materials, materials and spare parts). The main items in this category include the total or partial destruction of physical infrastructure, buildings, installations, machinery, equipment, means of transportation and storage, furniture, damage to farmland, irrigation works, reservoirs and the like. A distinction should be made between public and private sector damage in order to determine where the weight of the reconstruction effort might fall.
- Indirect losses: The flows of goods and services – expressed in current values – that will not be produced or rendered over a time span that begins after the disaster and may extend throughout the rehabilitation and reconstruction periods. Indirect damages result from the direct damage to production capacity and social and economic infrastructure. Examples include losses of future harvests due to flooding or prolonged droughts; losses in industrial production due to damage to factories or a resulting shortfall in access to raw materials; and greater transportation costs as the need for alternative routes or means of communication imply longer.[5]

Damage data are crucial in defining reconstruction needs while loss data are an indicator of economic recovery needs.

A broadly acknowledged and applied DaLa methodology is provided by the UN Economic Commission for Latin America and the Caribbean (ECLAC) and commonly used by the World Bank. In addition to direct damage and indirect loss this methodology also considers macroeconomic effects.

- Macroeconomic effects: Describe the effects of the disaster on the functioning of the economy and the resulting macroeconomic imbalances arising from the event. Macroeconomic effect estimates are a complementary way to assess direct damages and indirect losses from a different perspective. The most important macroeconomic effects of a disaster are those that have a bearing on growth in gross domestic product and in sectoral production; the current account balance (due to changes in the trade balance, tourism and services, as well as outflows to pay for imports and foreign services, etc.); indebtedness and monetary reserves; and public finances and gross investment.

Direct damages usually occur at the moment of the disaster or within the first few hours and can be easily evaluated during a quick assessment. Depending on the magnitude of the disaster, the indirect losses and macroeconomic effects can extend over a period of up to five years and will only become apparent at different times after the disaster and are, therefore, more difficult to identify during a rapid assessment. Adding the direct damage and indirect losses will provide an estimate of the total losses caused by the disaster. Since macroeconomic effects reflect the repercussions of direct damages and indirect losses, they must not be added.

It has to be considered that disasters may also have a positive result. A damage and loss assessment, therefore, needs to be aimed at determining the net effect, giving due consideration to both negative and positive results.[6]

Indirect losses and intangible damage/benefits

Most of the indirect losses are not evident when the assessment is carried out, and although they can be identified when the damage is estimated, it is not always possible to measure them in monetary terms. In this respect, indirect effects in cases of slowly evolving disasters (such as droughts or extended flooding) will occur for as long as the causing phenomenon lasts. The estimate of these effects must be extended throughout the period required to achieve the partial or total recovery of the affected production capacity.

Some major indirect effects may be difficult to identify and impossible to quantify, which may lead to so-called "intangible" damage or benefits, which are those not easily expressed in monetary terms such as loss of lives, health impacts, memorabilia, ecological damages, destruction of community life or cultural artefacts.

A comprehensive evaluation of the disaster effects must include an assessment or at least a global discussion of such intangible damage or benefits, since they considerably affect living conditions and standards.

Source: UN ECLAC, 2003 and Handmer, 2003

[2] Handmer et al., 2005
[3] Kelly, 2008
[4] EMA, 2002

[5] UN ECLAC, 2003
[6] Ibid.

2.2. Valuation criteria

Objective and accurate criteria are needed to assess the impact of disaster damage and losses in order to arrive at a true assessment which can provide the basis for defining rehabilitation and reconstruction programmes. Valuation criteria may vary over a range or variety of situations as more than one alternative for the monetary estimate or valuation of disaster damage and losses and the impact to the economy of the affected country or region need to be applied. This is due to the fact that damage valuation criteria depend on how the results of the evaluation are to be used and because of the diversity of the goods affected by a disaster which requires the use of many sources and information that are not always comparable.

The decision for what valuation option is applied depends on the needs of the analysis, the characteristics of the asset being valued, the availability of information at the time the valuation is made and, most importantly, the time the sectoral specialist has available to carry it out. The most common damage valuation criteria include:

- The depreciated value of lost assets or "book value": The value of the lost or damaged asset is estimated in its pre-disaster condition, taking its age into account in order to arrive at the value of its remaining useful life. This valuation method would be suitable for fixed production assets and others that, while not necessarily used in production processes, are subject to depreciation and obsolescence. In countries that have high inflation rates, the book value is not representative of an asset or good's actual market value and an attempt could be made to estimate its original value and adjust it for inflation. As this process, however, is complicated there would be no alternative but to use the replacement cost (with or without depreciation).
- The replacement costs: Replacement costs need not only account for certain technological advances (because of the age of a lost asset, it is unlikely that an identical product would still be on the market), but also for features making a replaced good more resistant to the impact of future incidents.

Alternatively an intermediate position could be chosen that would involve valuing asset damage on the basis of its replacement cost with the same characteristics as its original design and without deducting the asset's depreciation over its useful life. This valuation would be useful in determining the financing needs of the state or the private sector to replace their destroyed or damaged assets.

Regardless of the valuation option that is adopted, damage to assets should initially be quantified in physical units as this will facilitate defining the most appropriate valuation criteria. Examples of physical units include for example number of pieces of machinery and production equipment, square meters of construction destroyed, kilometres of highways by class, hectares of crops affected, tons of agricultural products lost.[7]

[7] UN ECLAC, 2003

Valuation of indirect damages

Indirect damage stemming from the interruption of the production or service flows over a given period must be valued at producer or market prices, as appropriate.

- In the case of production sectors, losses must be assessed at producer prices because they represent the value of what was not produced as a result of the disaster.
- In the case of interrupted service production (e.g. number of medical consultations or transportation costs increased due to detours) the most suitable approach is to value services not generated as a result of the destruction of infrastructure, based on the prices or fares paid by the final consumer or end user.

Costs and prices must be considered in "real" terms, which means that financing costs would not be brought into the damage assessment. Such costs refer to commissions, interests, discounts, insurance and reinsurance, subsidies, and all free forms of post-disaster financing, paid or free of cost, domestic or foreign. Transfers within the economy are also excluded from the disaster's costs (or benefits) because they are transactions that do not use resources or produce goods and services.

When calculating indirect effects it is advisable to try to estimate them both with and without the disaster; in other words, to make a comparison between what outputs would have been obtained if there had been no disaster and what was actually produced with the effects of the disaster. However, it may not be feasible to apply this approach to most sectors when the goal is a rapid assessment of damage.

Source: UN ECLAC, 2003

2.3. Economic analysis

Sound economic analysis builds the decision basis for mitigation proposals and expenditures. In the U.K., for example, for decades, central government funds have been made available for flood works only if the proposals satisfy cost-benefit criteria following government guidelines.

The principles of economics are different from those governing financial accounting in private-sector enterprises. The objective of an economic analysis is to assess the impact of an event on the economy of the area under concern which is usually a large political jurisdiction with responsibility for economic management. Selection of other smaller areas, such as a region or town, involves a large degree of judgment and acceptance that much of the economic activity flowing into and out of the area will not be captured.

In summary economic assessment is about:

- Losses and gains for all members of a defined economy, rather than individual commercial entities or households
- Changes to economic activity in the defined economy of a specified region, rather than to components within it
- Counting all impacts on this defined economy, both positive and negative
- Depreciated rather than replacement values, with the interest being on the market value of the asset or activity damaged by the disaster
- Avoiding double counting, by counting losses once and not counting losses made up later or by other businesses in the same economy[8]

Thus it appears that economic assessment is not about distributional affects or commercial profit and loss of an individual business, property or household. The following example clarifies the difference between a financial and an economic analysis: A food production facility has suffered income losses as it was not able to transport its goods to its customers due to blocked roads from flooding. However, another competitor was able to substitute the

[8] Handmer et al., 2005

goods from its own stock and therefore had an increased income as an indirect effect of the flood. Therefore, this incidence would not affect the economic impact of the flood.[9]

2.4. Gender perspective in post-disaster assessment

There is a growing awareness in the international community that full development can only be achieved when women and the resources they represent are fully integrated in the development process and women are empowered to improve the economic, social and political conditions of developing countries within a framework of sustainable development.

The UN *ECLAC Handbook for Estimating the Socio-economic and Environmental Effects of Disasters,* therefore, points out that it is important to treat the differential impact of disasters on women as

> *"a broad theme that cuts across the entire spectrum of social, economic and environmental sectors. Similarly, this theme should not be considered the exclusive province of women, nor should analysis of such issues be relegated exclusively to a team member chosen to conduct gender analysis. Instead, it should be seen as a social subject of multisectoral scope on which all specialists in each discipline must cooperate."* (UN ECLAC, 2003)

Against this background estimating a disaster's overall impact on women includes

- quantification of all the direct damages sustained by women taking into account all the property they possess and
- estimating the indirect losses that only affect women including loss of productive employment outside the home, loss of household production and income, the increase in reproductive work, and other damage of a financial nature stemming from outstanding debts or loans.[10]

Integrating a gender perspective into post disaster assessments, thus, involves considering not only the direct macro-level impact of a disaster but also the indirect impact at micro level, for example by not only accounting for the total number of destroyed houses but also the loss of household goods directly linked to women's income generation (e.g. weaving tools, cooking equipment, income-generating property such as poultry or compound garden). It involves collecting sex disaggregated data and identifying the particular needs of women, such as particular needs that need to be addressed by women relief workers. The inadequate recognition of this micro aspect hinders the development and implementation of effective gender-responsive disaster management programs and activities.[11]

[9] WMO and GWP, 2007
[10] UN ECLAC, 2003
[11] Raharjo, 2009

3. Overview of different approaches to damage and loss assessment

This chapter provides a brief overview on available guidelines and tools for post-disaster (economic) assessment. The different guidelines and tools are not described in full length but rather their underlying principles and concepts for economic damage assessment are pointed out.

Table 1 attempts to provide an overview on the different approaches to post-disaster assessment. It has to be noted that this is an evolving area where a number of new approaches are currently under development such as the post-disaster needs assessment or early recovery needs assessment approach.

Table 2 provides an overview of the post-disaster assessment guidelines and tools discussed in this paper and list their main distinctive features.

Table 1: Different post-disaster assessment approaches

Assessment approach	Description
Damage assessment	Analyses the total or partial destruction of physical assets, both physical units and replacement cost.
Loss assessment	Analyses the changes in economic flows that occur after a disaster and over time, valued at current prices.
Needs assessment	Estimates (usually based on the damage assessment) the financial, technical, and human resources needed to implement the agreed-upon programs of recovery, reconstruction, and risk management. Also evaluates and "nets out" resources available to respond to the disaster.
Rights-based assessment	Evaluates whether people's basic rights are being met. Has its origins in the UN Universal Declaration of Human Rights
Joint Damage, Loss and Needs Assessment (JDLA)	Combines a damage assessment and needs assessment with sector-based needs assessment. Helps identify short- to long-term recovery and reconstruction needs. Predecessor of the PDNA
Early Recovery Needs Assessment (ERNA)	Under development by UN: Allows capturing needs at lower geo-political levels, e.g. district or village level.
Post-Disaster Needs Assessment (PDNA)	Under development by UN, EC, World Bank: Combines the DaLa and ERNA approach
Socio-economic impact assessment	Allows capturing the socioeconomic impact for intangible elements such as health, the environment, and memorabilia in addition to the economic impact.
Rapid assessment	Undertaken after a major event, and conducted in one week or less. Provides immediate information on needs, possible intervention types, and resource requirements.
In-depth assessment or sector assessment	More specialised and separate assessment for certain sectors which is usually carried out at a later stage. In-depth assessment in order to guide reconstruction planning.

Table 2: Overview of different post-disaster assessment guidelines

Guideline/tool	Scope and purpose	Methodology
UN ECLAC Handbook	Provides guidance in the assessment of the social, economic and environmental effects of disasters Focuses on the value of lost assets and the definition of reconstruction requirements	• Considers cross-sectoral subject areas such as environmental damage and the differential effects on women and the overall macroeconomic effect • Distinguishes 3 types of break-downs for damages and losses: total direct damage and indirect losses; total damage to assets and production and increased costs or decreased income in the provision of services; total damage to public and private sectors
World Bank Handbook on Post-Disaster Housing and Community Reconstruction	Assists public officials and World Bank staff engaged in large-scale post-disaster housing reconstruction programs Provides principles and procedures for organising and carrying out Post-Disaster Needs Assessments (PDNAs)	• Under development[12]
WMO and GWP Flood Loss Assessment Tool	Provides guidance in conducting flood loss assessment	• Outlines hierarchy of different types and stages of flood loss assessments • Categorises different types of flood loss
EMA Disaster Loss Assessment Guidelines	Provides guidance in estimating direct and indirect losses	• Application of an averaging, synthetic or survey approach in measuring losses • Measuring potential losses as opposed to actual losses • Measuring the net loss to the economy • Calculation of annual average damages (AAD) for cost-benefit analysis of mitigation options
Hazus-MH MR 3 Earthquake Model	Provides tool to make earthquake loss estimates at a regional scale Focuses on economic losses that can be directly derived from building and infrastructure damage	• Addresses regional earthquake impacts • Displays inputs and outputs on GIS-based maps • Modular framework for flexible application • Provides default values and data sets for the estimation of damage and loss estimates • Direct economic loss estimates are derived from damage state information for buildings and lifelines
Socio-economic impact assessment (SEIA) model for emergencies	Provides a framework for measuring the socio-economic impact of emergency incidents and for identifying the resilience and recovery ability of a regional economy	• A 'with and without the emergency' comparison • Outlines methodologies to measure the cost and value of environmental loss and impact

[12] Draft Handbook available at http://tcgi.centraldesktop.com/postdisasterhousinghandbookpubliccommentspace/FrontPage

3.1. UN ECLAC Handbook for Estimating The Socio-Economic And Environmental Effects Of Disasters

The *Handbook for Estimating the Socio-Economic And Environmental Effects Of Disasters*[13] developed by the UN Economic Commission for Latin America and the Caribbean (ECLAC) was initially used in Latin America and the Caribbean region, but since the late 1990s it has been applied in post-disaster assessments worldwide. The framework outlined in the UN ECLAC Handbook represents a damage assessment and loss assessment (DaLa).

The purpose of framework is to determine an amount of damage that can reflect the socio-economic impact of a disaster on the economic performance of an affected country or region with the aim to inform on the domestic capacity for dealing with reconstruction tasks and the need for international cooperation.

However, to reduce the costs of conducting parallel needs assessments, the DaLa is complemented by sector-specific assessments, which provide more detailed insight into the socio-economic impact of a disaster. For this purpose, cross-sectoral subject areas such as the environment and employment and income are considered. The framework further considers the differential effects on women, whose action is essential both during reconstruction and in mitigating the future impact of disasters. Methodological considerations with regards to the cross-sectoral and macroeconomic effects are briefly outlined in Annex 2.

The *Handbook* classifies disaster damages and effects into direct damages, indirect losses and macroeconomic effects (as defined in section 2.1) and is aimed at determining the net effect, giving due consideration to both negative and positive disaster effects. While damage is measured in physical units and valued at replacement costs, losses are valued at current prices.

In order to estimate the overall monetary impact of a disaster national accounts are used as a means of valuation. This allows determining the value of destruction of physical assets and of changes in the flows of all sectors of economic activity down to the level covered by the national accounts of the affected country.[14]

The methodology allows for the quantification of the damage caused by any kind of disaster, whether man-made or natural, whether slowly evolving or sudden.

Once the social, economic and environmental impacts of a disaster have been assessed, the handbook suggests a recapitulation of damages in order to arrive at an analysis overview, which marks the culmination of the assessment and lays the basis for the subsequent macroeconomic analysis. The overview should include the total amount of damage and losses, together with breakdowns that identify the most affected sectors, geographic areas and population groups. In addition to quantifying the total impact in monetary terms, this overview must make it possible to identify the sectors and geographical areas requiring priority attention in order to provide valuable input for defining reconstruction strategies, plans and projects.

The following three types of breakdowns should be made:

- Total direct damage and indirect losses
- Total damage to assets and production and increased costs or decreased income in the provision of services
- Total damage to public and private sectors: The breakdown of the total damage into public and private sectors will enable the determination of some characteristics of

[13] UN ECLAC, 2003
[14] Jovel, R. personal communication on 30 July 2009

reconstruction programmes, by defining the relative efforts required from the state and from private individuals or enterprises. Even though the cost of reconstructing public infrastructure must be met by the government – which allows a determination of the amount of future public financing requirements – the latter may also have to establish financial schemes or credit lines for the private sector affected by the disaster, especially in the case of the lowest-income population or of strategic sectors of the national economy.

Best practice process steps and success factors:

Experience from past damage and loss assessments based on the UN ECLAC methodology has shown that:

- Not all disasters are at scale justifying a 'full-blown' assessment
- Maintaining consistency between different levels of assessment detail is crucial
- Ensuring traceability of the original data source is important as is keeping central repository of all assessment reports and their original data sources for long-term and macro analysis
- Pre-disaster arrangements and preparations are a condition precedent to ensure an efficient assessment process and include at a minimum arrangements for baseline data availability and clarified roles and responsibilities[15]

3.2. Post-Disaster Needs Assessment (PDNA)

According to Kelly (2008) there are two significant disadvantages of the damage assessment and loss assessment (DaLa) approach:

- Damage assessments tend to be challenged in capturing social or psychological impacts. Thus real damage experienced by the disaster survivors may be underreported and recovery assistance may be less than needed to address the full impact of a disaster.
- Damage assessments do not usually take into account resources available to the disaster survivors. In some circumstances, survivors may have considerable resources with which to engage in recovery (e.g. savings and insurance). This could lead to more assistance being provided than is really needed.

Based on these limitations Kelly (2008) argues for amalgamating the damage, needs and rights-based approaches into a single assessment process that meets the principle-based requirements of the rights-based approach, but has the practicality of the damage or needs-based approaches.

In contrast to a DaLa, a post-disaster needs assessment (PDNA) estimates (usually based on the damage assessment) the financial, technical, and human resources needed to implement the agreed-upon programs of recovery, reconstruction, and risk management. It also evaluates resources available to respond to the disaster and considers them in calculating the disaster net effect. It provides

> *"an integrated assessment framework and process to support the identification and selection of response options covering recovery interventions from early- to long-term recovery in a Recovery Framework[16]"*

Specialised assessments are often carried out to refine the results of an initial PDNA in a particular region or sector, or to develop data needed for project planning, such as site-related risk assessments and house-by-house damage assessments or a full housing sector assessment.[17]

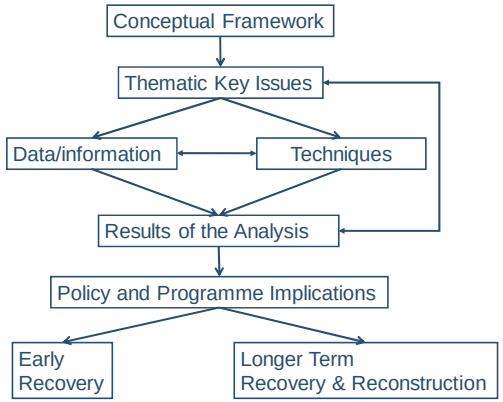
The PDNA comprises two components:

1. The valuation of physical damages and economic losses through a DaLa
2. The identification of societal recovery needs through a Human Recovery Needs Assessment (HRNA)

The elements of a PDNA are described in Figure 1 which highlights the unique feature of the PDNA which is the consideration of both early recovery needs and long-term development concerns:

- An early recovery view generally focuses at local level (constituencies, villages, and households) and basic needs and the ability to resume and sustain vital functions of the society. An early recovery assessment usually takes place at the time of relief efforts and can take up to 18 to 24 months. The data source is primary and secondary and to a large extent qualitative. The aim is to provide information crucial for stimulating life sustaining projects.
- The assessment of long-term needs generally takes place at a macro geographical level (regional and/or national) and can take up to two to three years or even longer. As opposed to early recovery assessment the focus is on damages, losses, and recovery requirements related to public goods, industry, markets, and investments. This requires the collection of primary and secondary quantitative data in addition to qualitative data which are crucial in developing programmes that ought to strengthen the regional or national economy.[18]

Figure 1: Elements of a PDNA (Source: Winahyu, 2009)



The PDNA provides a series of sector reports that conform to an agreed template and support the development of the Recovery Framework. It further provides prioritised response options drawn directly from the assessment which are proposed by and represent the advocacy stance of the sector teams. In case a sufficient baseline is available, the PDNA

[15] Gunawan, I. and Adriani, M. (2009)
[16] The Recovery Framework provides a strategic plan for guiding and reflecting all the decisions that need to be made to coordinate the recovery of a geographical area after a disaster.
[17] World Bank, 2009
[18] Winahyu, R. 2009

can also indicate the overall opportunities for "building back better" through shifting development patterns.[19]

Efforts to create unitary assessment procedures are underway, such as the *Handbook on Post-Disaster Housing and Community Reconstruction*, which is currently being prepared by the World Bank support of the Global Facility for Disaster Reduction and Recovery (GFDRR). The handbook which is expected to be publicly available in the fourth quarter of 2009, aims to provide a decision tool for use in the field by the World Bank staff, counterpart organizations, and other international practitioners who develop and carry out large-scale post-disaster local housing and community reconstruction projects. The handbook will outline the principles and procedures for organising and carrying out Post-Disaster Needs Assessments (PDNAs).

The development of the handbook and the PDNA concept has been motivated by inter-agency communication at national and global level, formalised in the 'Joint Declaration on Post-Crisis Assessments and Recovery Planning', signed in October 2008 by the United Nations, European Commission and the World Bank[20].

The PDNA guide to be outlined in the Handbook is supposed two bring together the two strands of DaLa and Early Recovery Needs Assessment (ERNA) in order to provide a full geographical breakdown in assessment results down to the district or village level.[21]

Best practice process steps and success factors:

- Close interaction between the national government and the respective country-representatives of the United Nations, the World Bank, the European Commission and other international partners at a headquarters level to ensure well coordinated resources support.
- Pre-disaster planning of the PDNA and early collaboration between the relevant partners
- One assessment team, one assessment process and one assessment output.
- Clear management structure including high level management team, PDNA coordination team, sectoral teams, technical support cell, and report secretariat. [22]

3.3. WMO and GWP Flood Loss Assessment Tool

The World Meteorological Organisation (WMO) and the Global Water Partnership (GWP) have published, as part of their Associated Programme on Flood Management (APFM) and the 'Flood Management Tool Series', guidelines to conduct flood loss assessments. As indicated by its name, this tool focuses on flood losses only and can therefore not readily be applied to the damage and loss assessment procedure for other disasters.

The tool outlines a hierarchy of different types and stages of flood loss assessments (see Figure 2 below) which builds upon the following three types of assessment:

A. Rapid assessment:

   The purpose of a rapid assessment is to inform emergency relief coordination during the flood. Emphasis of actions is therefore on having a basis for avoiding (further) losses of life, minimising misery and suffering of the affected population and avoiding knock-on effects (secondary disasters). As such, the focus of assessment during this phase is placed on emergency response rather than loss assessment.

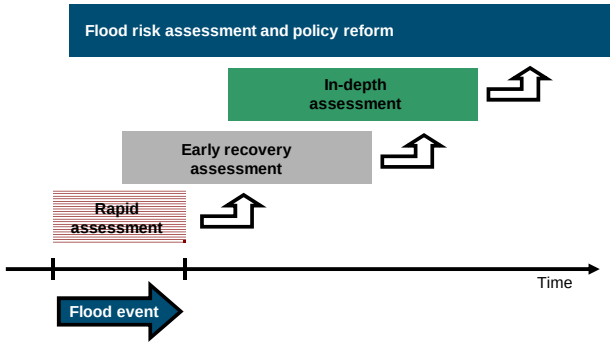
B. Early recovery assessment:

   This includes an initial assessment of damages in the first few weeks (1-3 weeks) after the flood (peak) in order to inform and guide the recovery process and in providing early indications for reconstruction, for example in an insurance context, for allocation of recovery funds from national budget or for guidance to external aid agencies. The focus of assessment at this stage is necessarily on tangible and direct losses, as most the of the intangibles need longer times to be assessed and the indirect losses may not yet be fully apparent or might not have fully materialised yet. A standard and internationally accepted methodology, applicable to all kinds of disasters, is provided by the UN ECLAC (see previous section). WMO and GWP advise to base early recovery assessments on actual costs and damages, i.e. how much it would costs to replace the assets and income lost according to their original specification and location (replacement costs).

C. In-depth assessment of flood losses:

   This assessment will usually be carried out 3 to 6 months after the flood in order to guide reconstruction planning as well as future flood management policy adjustments. WMO and GWP suggest that the best time to conduct an in-depth assessment is after 6 months, as most losses, including indirect and intangible losses can be assessed with sufficient reliability. As in-depth assessments may receive a number of data collected in the earlier phases, planning and delimitations that have been undertaken for the earlier appliances of loss assessments are crucial. The assessment at this stage can usually be based on reconstruction costs[23], according to a (preliminary) reconstruction plan that may provide for reconstruction in different locations according to different specifications.

Figure 2: Types of flood loss assessment in various phases (WMO and GWP, 2007)



One of the basic decisions to take in any flood loss assessment relates to which loss categories to include and how to assess each one of them. An overview of different flood loss categories as provided by the Flood Loss Assessment Tool is provided in Figure 4 in Annex 3. Loss categories are categorised into tangible direct losses, intangible indirect

[19] Winahyu, R. personal communication on August 3, 2009
[20] United Nations, European Commission and the World Bank, 2008
[21] Roberto Jovel, personal communication on July 30, 2009
[22] Winahyu, R. personal communication on August 3, 2009

[23] The cost of reconstruction includes the replacement of lost assets but excludes the value of production losses and the amount of increased spending and decreased revenues in the provision of services, and must also include the financial cost of reactivating production when necessary. (UN ECLAC, 2003)

losses and intangible human and other losses. These three categories of losses are further divided into primary, secondary and tertiary losses. The WMO and GWP tool does not suggest which categories to include in a loss assessment. This decision will not only be influenced by the type of assessment carried out, but also by the time and resources available for its completion.

Another important distinction made by this tool is between actual and potential flood losses. The determination of actual flood losses takes into account preparatory actions taken to reduce the impact of a flood while the determination of potential flood losses is based on the experience of past floods or synthetic stage-damage relationships. Again, the tool does not make a general suggestion on which type of losses to estimate.

3.4. EMA Disaster Loss Assessment Guidelines

The Queensland Department of Emergency Services, other Queensland agencies, Emergency Management Australia (EMA) and the Bureau of Meteorology collaborated with the Centre for Risk and Community Safety at RMIT University to produce a set of guidelines on loss assessment that is applicable at sub-national and local level (in the following referred to as the EMA Manual 27 Guidelines).

The EMA Manual 27 Guidelines seek to be easy in implementation without requiring in-depth specialist training or extensive experience in loss assessment. They cover direct and indirect losses and under both loss categories tangible as well as intangible losses.

They provide a step-by-step procedure (see Figure 3 in Annex 1) from identifying the purpose of the assessment through to presenting the results, which can be thought of in terms of five broad tasks:

1. Define the purpose, identify the stakeholders and resources available, and define the area and time frame
2. Select the type of assessment, i.e., averaging, synthetic or survey approach
3. Establish the information base about the hazard, people, assets and activities, and types of loss
4. Measure the loss
5. Analyse and present the results to be consistent with the purpose of the assessment and as appropriate consider actual and potential losses, average annual losses, and net economic loss

While this procedure has been set-up for inundation hazards, with minor modifications it can be applied to other hazards (see Table 3 in Annex 4).

The guidelines set out tree general approaches to measuring losses which are as follows:

a.) The averaging approach: This approach is based largely on pre-existing average data on losses for example an average loss per flooded property. It is the least expensive and quickest method, enables comparability, and only requires limited expertise. While it may be the most appropriate approach in the future as data sets are developed and tested, currently it has certain limitations: it may under or over value indirect and intangible losses. In addition it treats very serious and dangerous flood hazards the same as shallow flooding which results in little damage.

b.) The synthetic approach: This approach is a detailed assessment based on pre-existing databases covering a range of average building types and contents. It is probably the most flexible and currently the most widely used of the three approaches. It can make use of a variety of existing computer packages with their own stage-damage curves for calculating residential and small business direct losses. However, EMA (2002) argues that the extensive use and availability of calculation packages disguises considerable debate over the accuracy of the stage - damage curves and resulting figures.

c.) The survey or historical approach: This approach is based on detailed surveys of a recent event to establish the actual loss. It is different from the synthetic approach as it generalises from loss data obtained from the area in question whereas the synthetic approach applies loss data generated synthetically or from other areas. A characteristic of the survey approach is that it incorporates all the unique attributes of the event in question including the details of the response and people's preparedness. This makes the approach less suited for comparisons and difficult to use without a recent disaster to generate losses. It is also very sensitive to the resources and expertise used to collect the data.

Table 4 in Annex 5 outlines for each approach how the different loss categories are being measured and clearly shows that only surveys enable collection of detailed data for some categories of loss. In most assessments some combination of the three approaches will be necessary. Data collected by 'synthetic' or 'averaging' approaches are usually used to estimate losses of a hypothetical hazard event.

The EMA Manual 27 Guidelines recommend that, wherever possible, potential losses should be used rather than actual losses. This is due to the fact that actual losses, which take into account all kinds of measures that people take to minimise the damage wherever possible (e.g. heeding warnings or moving cattle and valuable items to high ground), may discriminate against well prepared or poorer communities. Also it is difficult to determine the correct ratio between actual and potential or predicted loss.

Since they are based on economic principles, the guidelines require measuring the net loss to the economy of the area of analysis. The guidelines highlight that assessment of benefits is particularly important within a regional context because post-disaster aid and insurance payouts are more likely to partly offset the tangible losses suffered, as the area of analysis becomes smaller.

Care is, however, needed in the application of net economic loss and it may not be appropriate as an indicator of what should be spent on mitigation. The EMA Manual 27 Guidelines do not include intangible losses and benefits as part of the calculation of "net economic loss" because the current state of knowledge about intangibles does not support the level of quantification necessary for this calculation. Therefore the guidelines suggest that any assessment should calculate the total and net economic losses and then set out why one approach is selected for use. This transparency would highlight local economic circumstances and assist with comparability.

While the EMA Manual 27 Guidelines do not provide any guidance in the estimation of (reconstruction) needs, they outline steps to calculate annual average damages to conduct cost–benefit analysis to assess mitigation options. Since the future pattern of disaster events cannot be known any investment in disaster mitigation has to be economically justified in terms of benefits expected on average every year which can be achieved by calculating annual average damages.[24]

[24] For further details on calculating annual average damages see EMA, 2002

3.5. US Federal Emergency Management Agency's HAZUS-MH MR 3 Earthquake Model

The Hazards U.S. Multi-Hazard (HAZUS-MH)[25] is a risk assessment methodology for analysing losses from floods, hurricanes and earthquakes. It applies geographic information systems (GIS) technology to produce estimates of hazard-related damage before, or after, a disaster occurs. Developed by the Federal Emergency Management Agency (FEMA) HAZUS-MH provides three models: a flood model, a hurricane model, and an earthquake model. In addition to these three hazard-specific models HAZUS-MH can perform multi-hazard analysis by providing access to the average annualised loss and probabilistic results from the hurricane wind, flood, and earthquake models and combining them to provide integrated multi-hazard reports and graphs.

Loss estimates analysed in HAZUS-MH include:

- Physical damage to residential and commercial buildings, schools, critical facilities, and infrastructure
- Economic loss including lost jobs, business interruptions, repair and reconstruction costs
- Social impacts including estimates of shelter requirements, displaced households, and population exposed to scenario floods, earthquakes and hurricanes

Extensive national databases are embedded within HAZUS-MH, containing information such as demographic aspects of the population in a study region, square footage for different occupancies of buildings, and numbers and locations of bridges which allow the use of default data in the calculation of loss estimates.[26]

In the following features of the earthquake model are explained in further detail, since the assessment approaches applied by the flood and hurricane model are based on these and follow similar principles. The HAZUS-MH MR 3 Earthquake Model is based on an earthquake loss estimation methodology which addresses regional impacts of earthquakes such as service outages for lifelines, estimates of fire ignitions and fire spread, potential for a serious hazardous materials release incident, and indirect economic effects. One of the model's strength is the ability to readily display inputs and outputs on GIS-based maps that can be overlaid.

Based on the needs and particular resources (e.g., ability to provide required data) of the user, three different types of analyses can be conducted, i.e. default data analysis, user-supplied data analysis and advanced data and models analysis.

The methodology is built upon a modular framework which allows the user to select the estimation of certain losses. Loss estimates analysed in HAZUS-MH MR3 Earthquake Model include:

- Direct physical damage to general building stock, essential and high potential loss facilities, lifelines-transportation systems and lifelines-utility systems
- Direct social losses including casualties and displaced households
- Direct economic losses of buildings and lifelines
- Indirect economic losses such as those related to supply shortages and demand effects

[25] Federal, State and local government agencies and the private sector can order HAZUS-MH free-of-charge from the FEMA Publication Warehouse.

[26] With an increasing interest in the application of the HAZUS loss estimation methodology and software application for international use, the National Institute for Building Sciences (NIBS) has led efforts to evaluate steps that need to be taken to develop an internationally applicable version.

In the following the methodology for estimating direct economic building losses and indirect economic losses will be briefly explained.

Direct economic losses: buildings. The HAZUS-MH MR3 Earthquake Model converts damage state information for buildings and lifelines[27] into estimates of dollar loss for structural and non-structural repair costs caused by building damage and the associated loss of building contents and business inventory. Building damage can also cause additional losses by restricting the building's ability to function properly. To account for this, business interruption and rental income losses are estimated. This estimation module is limited in its consideration of the economic loss to those losses that can be directly derived from building and infrastructure damage, and that lend themselves to ready conversion from damage to dollars. The types of economic data that the user will be expected to supply include repair and replacement costs, contents value for different occupancies, annual gross sales by occupancy, relocation expenses and income by occupancy. Based on the availability of data and the desired depth and accuracy of analysis default values provided by the model can be used.

Indirect economic losses. The Indirect Loss Module is a computational algorithm that accounts for earthquake induced supply shortages and demand reductions. It is a version of a computable general equilibrium model designed to rebalance a region's inter-industry trade flows based on discrepancies between sector supplies and demands. It is based on input-output modelling techniques, which are widely utilised to assess the total economic gains and losses caused by sudden changes in the demand for a region's products[28]. Running this module requires a number of user inputs such as the current level of employment and income or the composition of the economy. The module produces two reports on the results: i) The percent and level of indirect economic impact for the study region economy in terms of employment and income effects for a region that receives outside aid after the disaster. ii) The percent and level of indirect economic impact for the study region economy in terms of employment and income effects for a region that does not receive outside aid after the disaster.

As outlined above, the HAZUS-MH MR 3 Earthquake Model is based on complex algorithms in order to arrive at estimated damage and loss assessments. Economic assessments are used for the estimation of direct and indirect losses with results of direct economic loss estimations being dependent on the quality of direct damage estimates. A major benefit of the model is the provision of default values which allows a fast and easy calculation of loss estimations. It is apparent that the provision and use of default values is based on a comprehensive compilation and calculation of historic data for the U.S. and cannot be readily applied in damage and loss assessments elsewhere.

3.6. Socio-economic impact assessment (SEIA) model for emergencies

The SEIA model was developed by a Ministerial Taskforce on Bushfire Recovery of the Victorian Government (Australia) with the aim to address in particular one issue that has been challenging the EMA Disaster Loss Assessment Guidelines and similar frameworks, i.e. the challenge of capturing the socioeconomic impact for intangible elements such as health, the environment, and memorabilia. With the development of the SEIA it was sought to provide a framework for measuring the socio-economic impact of emergency incidents

[27] Damage state information is the result of the direct physical damage calculation and is predicted in terms of one of four ranges: slight, moderate, extensive, and complete.

[28] Input-output modelling traces the flows of goods and services among industries and from industries to household, governments, investment, and exports. These trade flows indicate how much of each industry's output is comprised of its regional suppliers' products, as well as inputs of labour, capital, imported goods, and the services of government.

that would also enable identifying the resilience and recovery ability of a regional economy and that regions' social wellbeing.

The model's distinctive features include:

- A 'with and without the emergency' comparison:

  A comparison of social and economic impacts and conditions based on the occurrence of the bushfire, compared to circumstances if the bushfire had not occurred was made. This comparison included the benefits from government, State Government Recovery insurance and other non-government recovery support sources in order to establish the net-economic impact. It has to be noted that this is a methodologically inappropriate approach. Rather the appropriate methodology of an economic analysis is to compare social and economic conditions with and without the emergency, to establish the impact of those bushfires.

- Social and economic profile:

  A social and economic profile of the residential and business sectors of the region prior to the emergency was established in order to assist in the analysis of intangible and indirect costs and benefits. For this local government profile data and population based surveys (household surveys) were used to collect data on a range of indirect and intangible impacts and costs.

- Other concepts that assisted in measuring intangible losses include the 'expected value procedure' as a method of estimating 'willingness-to pay', defining criteria to address 'household disruption' as an indirect loss element and specific economic formulae such as 'contingent valuation method' and 'value added forgone' to measure the cost and value for example of environmental loss and impact.

The SEIA model was tested in the economic assessment of the 2006/07 Great Divide bushfires.

Challenges and obstacles faced were:

- Sourcing of relevant data and information: a major obstacle was lack of data and the variable means of data collection which affected data quality. There were major data gaps in particular with regards to small business other than tourism where there is usually limited post-emergency impact data collected and where information is only obtained through survey and direct interview.

Best practice process steps and success factors:

- In order for the SEIA-Model to be replicable for emergencies that occur in Victoria, and to enable it to be efficiently implemented, it is essential to identify and use existing data sources and regularly collected post-emergency databases.
- The SEIA-Model's implementation essentially relies on a whole of government approach, whereby the collection, use and analysis of post-emergency information is shared and coordinated across various government departments and organisations.
- A commitment to standardise and consistently collect essential loss, damage and impact data post an emergency incident.
- Where there are difficulties in obtaining the specific data required, averaging and extrapolation techniques become relevant.[29]

[29] Office of the Emergency Services Commissioner, 2008

4. Review of post-disaster assessment reports

A look at past post-disaster assessments indicates an evolution from an approach focussing on damages and losses to an approach taking increasingly into account post-disaster needs through JDLNAs or PDNAs. A number of post-disaster assessment reports are provided on the GFDRR website[30] and the World Bank website[31].

Earlier post-disaster reports focused on preliminary estimates of a disaster's damage and reconstruction costs. The 2005 Pakistan Damage and Needs Assessment Report[32], for example, presents estimates for the loss of public and private assets (direct damage at book value), the loss in income (indirect loss), and the cost of short and medium to longer term reconstruction of private and public assets (at replacement costs). Reconstruction costs measure the cost of rebuilding lost assets and restoring lost services and in the case of this report, are defined to include the additional costs incurred for earthquake resistance. The report focuses on damage and needs estimates for the following sectors: social and environmental aspects, housing, livelihoods, agriculture, transport, education, health, water supply and sanitation, energy, governance and institutions, and the industry and services.

In Indonesia the DaLa approach was applied to both the assessment after the 2006 Yogyakarta Earthquake and the 2004 Tsunami in Aceh Province. Both assessments were conducted by a multi-agency expert group including the National Development Planning Agency (BAPPENAS), Provincial Development Planning Agencies (BAPEDAs) and international donor agencies such as The World Bank, ADB, GTZ, JBIC, ILO, and various UN organisations. Both assessments included an estimation of damages and losses as well as of the economic and social impacts for the following sectors and areas

- Social sector, e.g. housing, education, health, family planning, religion and culture
- Infrastructure, e.g. transport, energy, communications, water supply and sanitation
- Productive sector, e.g. agriculture, fisheries, enterprises, industry, trade, and tourism
- Cross-cutting sectors, e.g. public administration, financial sector, and environment

In addition the economic and social impact was evaluated which included a closer look at impacts on employment, livelihoods and the fiscal system. Results of the assessment were used to derive recommendations for the rehabilitation and reconstruction process. Experience from these assessments showed that a strong involvement of provincial governments and local communities and other relevant local stakeholders is crucial in order to arrive at a realistic picture of damages, losses and needs as well as recovery capacities.[33]

After the 2008 earthquake in Wenchuan China the National Disaster Reduction Center of China initiated a rapid assessment of the affected population and infrastructure. Based on historical and socio-economic data of the affected region it was possible to complement the rapid assessment with a vulnerability analysis. Dynamic monitoring of the affected area was made possible through the usage of remote sensing images from 22 satellites provided by the international community as well as aerial photographs. The rapid assessment was followed by a more comprehensive assessment to determine the spatial intensity distribution of the earthquake and by an assessment of direct economic losses. Indirect economic losses were evaluated qualitatively while direct economic losses were assessed through

[30] Post-disaster assessment reports by GFDRR available at http://gfdrr.org/index.cfm?Page=Track%20III:%20DRR%20in%20Recovery&ItemID=14

[31] Post disaster assessment reports by World Bank available at http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTURBANDEVELOPMENT/EXTDISMGMT/0,,contentMDK:20196047~menuPK:1415429~pagePK:148956~piPK:216618~theSitePK:341015,00.html

[32] Asian Development Bank and World Bank, 2005

[33] The Consultative Group on Indonesia, 2005 and The Consultative Group on Indonesia, 2006

applying the replacement cost, market comparison and income approach. Experience from the Wenchuan Earthquake assessment showed that large-scale disasters require consecutive assessments of different scope and analytical precision which should ideally start with baseline data arrangements before a disaster occurs.[34]

An increasing number of reports go much further in assessing post-disaster needs. The Yemen Damage, Losses and Needs Assessment Report[35] for the October 2008 tropical storm and floods, for example, does not only provide an estimation of damages and losses but also reports on estimated recovery and reconstruction needs

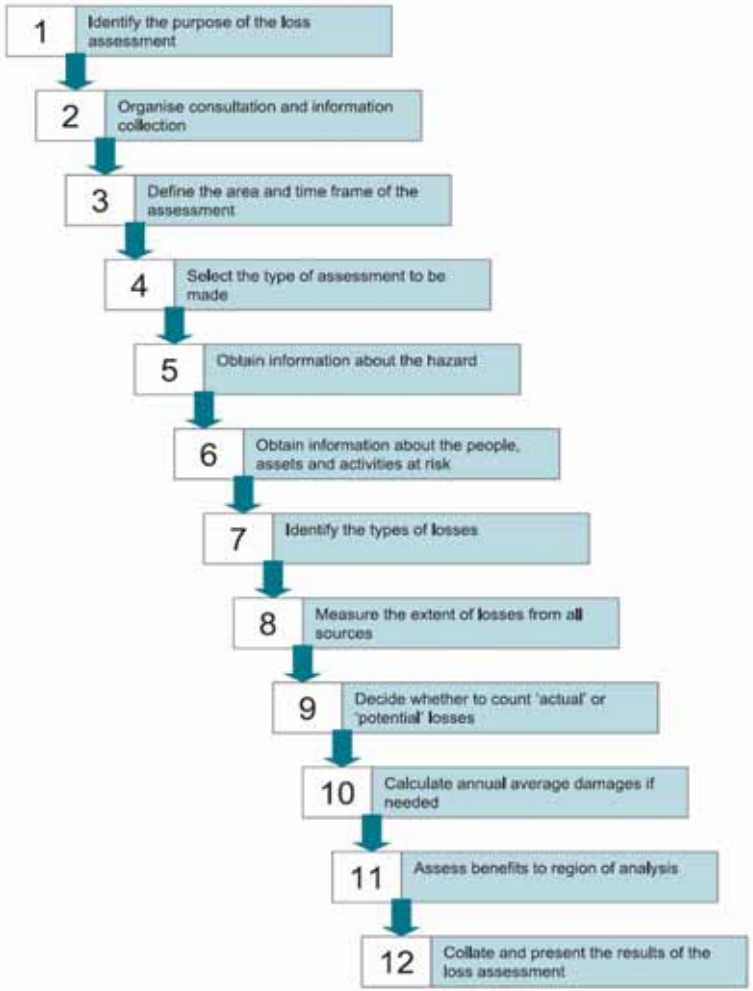
- to restore the livelihoods of the affected individuals and households and the output of enterprises back to pre-disaster levels and
- to rebuild back the destroyed physical infrastructure assets and restore the services to their pre-disaster functioning level.

The recovery and reconstruction needs, which serve as the basis for the preparation of a detailed recovery and reconstruction plan, are expressed in monetary terms are outlined for the following sectors: productive sector, social sector, infrastructure, cross-cutting sectors (including religious facilities, cultural heritage, and environmental protection) and livelihoods.

[34] Yuan Yi, 2009
[35] Government of Yemen et al., 2009

Annex 1: The loss assessment process according to the Queensland Guidelines

Figure 3: The loss assessment process (EMA, 2002)



Annex 2: Methodological considerations for estimating cross-sectoral and macroeconomic effects

Economic assessment of the impact of a disaster on the environment

To carry out the economic assessment of the impact of a disaster on the environment, the UN ECLAC Handbook outlines a procedure of successive stages which are to be conducted in close co-operation between environmental specialists, sectoral specialists and macroeconomists. Those stages are as follows:

1. Description of the environmental state before the disaster, representing the baseline for assessment
2. Identification of the impacts of the natural disaster on the environment;
3. Qualitative environmental assessment
4. Classification of the effects on the environment
5. Economic valuation of the environmental impact
6. Overlap with other sectors

This procedure is based on the acknowledgement of the use value of natural resources which from an economic perspective, are considered assets (natural capital) from which goods and services are derived that help increase people's well-being.

(UN ECLAC, 2003)

Macroeconomic assessment

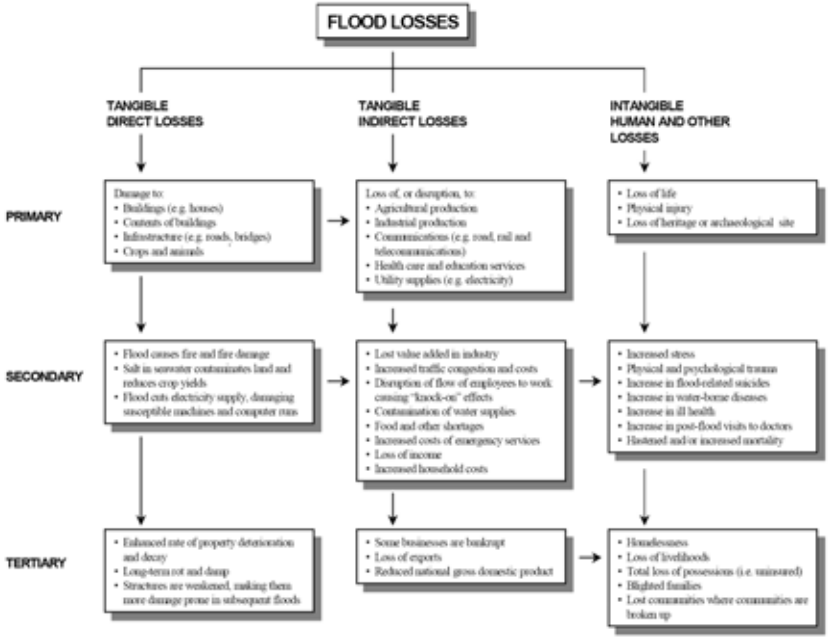
The macroeconomic assessment should provide a summary of the damage that offers an overview of the full magnitude of the disaster's socio-economic impact, both for the country's economic development as a whole and for each of its main variables. It should determine and specify the sectors or areas in which the effects were most severe and the period of time for which they will continue to be felt. Consequently, it should include, not only the disaster's effects on the economic growth rate, income, the external sector, public finances, employment, price levels and inflation, but also possible damage to natural resource endowments.

The overall assessment essentially measures a "delta" value, that is, the difference between the situation expected in the period before the disaster happened and the situation that the affected country or region is expected to experience as a result of the direct and indirect damage.

(UN ECLAC, 2003)

Annex 3: Categorisation of flood losses by WMO and GWP

Figure 4: Categorisation of flood losses (WMO and GWP, 2007)



Annex 4: Applying economic analysis to disaster mitigation measures

Table 3: Factors to be considered in applying economic analysis to disaster mitigation measures, compared to flooding (EMA, 2002)

Factor	Bushfire	Cyclone	Earthquake	Flood	Severe storm*
Risk definition					
Ease of mapping exposure to hazard	Good, but event extent depends on many local factors	Good, but individual tracks unknown until happen. Much loss is from associated weather	Good for known faults and soil conditions. Poor for intra-plate earthquakes. Micro-zonation possible	Good from past data and models. Events have predictable extents but floods can occur anywhere	Poor
Probability estimates for AAD	Difficult. Risk changes over time with fuel load	Possible	Possible but requires detailed study	Good, for river floods on basis of past records	Some information
Past records	Yes	Yes	Yes	Yes	Poor
Loss severity					
Function of parameters	Locational factors (for example, slope). Hazard characteristics (for example, fuel, wind). Building parameters	Hazard parameters (distance from coast, velocity, depth of storm surge etc). Building parameters	Hazard parameters (shake etc). Soil conditions. Building type and details. Associated fire risk	Function of flood depth and velocity, duration, warning time. Building types and contents	Local storm characteristics(wind, rain, hail, floods). Building construction
Past loss records	Some, percentage salvaged not clear	Some, needs to be disaggregated	Good for major events. Poor otherwise	Yes, but financial rather than economic. Can be estimated	No. Difficult to standardise
Frequency	Recurrent, quite frequent	Annual season. But strikes infrequent for most areas	Infrequent, little experience	Relatively frequent and recurrent in hazardous areas	Frequent, but rare in same area
Mitigation opportunities					
Prevention/ exclusion	Yes. Requires public participation	No for high winds Yes for storm surge	No	Yes. Either for larger area or individual properties	No
Long-term individual loss reduction	Yes: construction improvements	Yes: improved buildings, sea defences	Yes: improved buildings	Yes: improved buildings	Yes: improved buildings
Short term loss reduction	Yes: individual responses, fire fighting	Yes: response to warnings	Yes: save lives and reduce building and other losses	Yes: response to warnings and flood information	Yes: in response to warnings

*Tornadoes, very heavy rain, flash floods, hail, and high winds.

Annex 5: The three approaches to loss assessment

Table 4: Review of basic elements of the three approaches to loss assessment (EMA, 2002)

Loss assessment approach	Direct loss			Indirect loss	Intangible loss
	Houses/small business	Commerce, farming (>1000 m^3)	Infrastructure		
I Averaging	Average loss per flooded structure	Average loss per m2 for types of enterprise and surveys	Average per km of road and surveys	Examine $ flow and use surveys or % of direct	Identify types and magnitude Surveys
II Synthetic	Standard stage: damage curves for type of property	Stage: damage curves applied to m3 for different types of business	Stage: damage and average loss per km depending on type of infrastructure	Examine $ flow and use surveys	Identify types and magnitude Surveys
II Survey (based on sampling)	Survey: new stage-damage curves	Surveys	Surveys	Surveys	Surveys

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Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/020

Emergency Management Volunteers

Submitted by: Australia

Asia-Pacific
Economic Cooperation

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Emergency Management Volunteers

Submitted by: Australia

The third Emergency Management CEOs' Forum
Viet Nam
September 15 - 17, 2009

Background

Australia is a nation prone to a range of natural hazards and emergencies. These include fire, flood, severe storm, cyclone, tsunami, earthquake and others.

Volunteers are a vital and significant component of Australia's emergency management sector. Some 500,000 people of the total 20 million population in Australia volunteer their services in some emergency management capacity on an annual basis.

Some 350,000 of those are directly involved in emergency first response. First responders include the various rural fire services, the State Emergency Services (SES) and volunteer ambulance services.

And the employers who support those emergency management volunteers that are full-time workers, to leave work and volunteer in times of emergency or disaster, are also much valued.

Support for Emergency Management Volunteers

The Australian Government supports and encourages the emergency management volunteer sector, including the employers of the volunteers – refer **Appendix One** attached.

Challenges Ahead

There is growing evidence that the changing nature of volunteering in the emergency management sector and an increasing number of external pressures are affecting the capacity to attract and retain such volunteers, and for employers to support the volunteers. The attributed factors relate to economic and demographic changes, such as the changing nature of Australian industry and an ageing population profile for Australian rural communities. This is occurring at a time when disaster events appear to becoming more frequent and more severe, possibly related to Climate Change factors.

Discussion Point

Australia would be interested in the experiences of other APEC member economies in terms of harnessing, attracting and retaining emergency management volunteers. If member economies were interested, Australia would be happy to share its experiences and challenges in greater detail.

Options

If there was interest in exploring the issue further:

(i) CEOs could agree to discuss the matter further at the 2010 APEC Emergency Management CEOs Forum; and/or

(ii) The TFEP could be encouraged to hold a workshop on emergency management volunteers in 2010 or 2011, possibly leading to the development of APEC principles on emergency management volunteers.

APPENDIX ONE: SUMMARY OF CURRENT AUSTRALIAN GOVERNMENT INITIATIVES FOR EMERGENCY MANEMENT VOLUNTEERS

Support for Emergency Management Volunteers

The Australian Government supports and encourages the emergency management volunteer sector.

Within the Attorney-General's Department key aspects of this assistance include:

1. Support for the Australian Emergency Management Volunteer Forum – the Forum is a peak advocacy body, which aims to attract, retain and recognise volunteers. Some of the key issues currently before the Forum are:

    - The cost of being a volunteer
    - Proposals for volunteer leadership training
    - Improved links to 'culturally diverse' groups in the community
    - Greater support and recognition for employers

2. The Australian Government provides funds for a National Emergency Volunteer Support Fund. The money is made available in grants for projects which are aimed at boosting the recruitment, retention, skills and training of volunteers. These projects range from the purchase of audio-visual training equipment and enhancing the quality of training provided to volunteers, to recruitment campaigns, targeted volunteer training activities, and the construction and fit-out of dedicated training facilities.

Furthermore, other Australian Government Departments and also the State and Territory Governments also provide support for emergency management volunteers, within a broader context of a rich tradition of community volunteering that involves most of the Australian population.

Looking ahead, the Ministerial Council for Police and Emergency Management, which is responsible for providing national leadership and strategic direction on emergency management in Australia, has agreed that firm action is required to ensure the future sustainability of Australia's emergency management volunteers. A broad range of options for the attraction, support and retention of emergency management volunteers is currently being developed for consideration by the Council in November 2009.

Asia-Pacific
Economic Cooperation

Code e.g. 2009/TFEP01-2009A/021

The 4th APEC/TFEP CEO Forum

Submitted by: Japan

The 4th APEC/TFEP CEO Forum

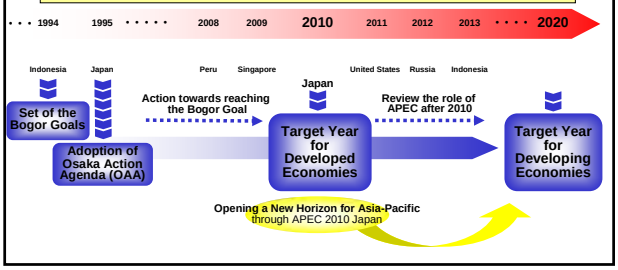
18-20 January 2010, Kobe, JAPAN

Takuya SASAYAMA
Director, APEC Division
Ministry of Foreign Affairs

September 2009

1. APEC Milestones and APEC 2010 Japan

Japan will host APEC in 2010, the target year for achieving the Bogor Goals for developed economies in APEC. Japan will exercise its leadership over reviewing the role of APEC after 2010 and actively contribute to forming the community in the Asia-Pacific by hosting APEC 2010.
Year 2010 is a good chance to show the way this region should proceed.

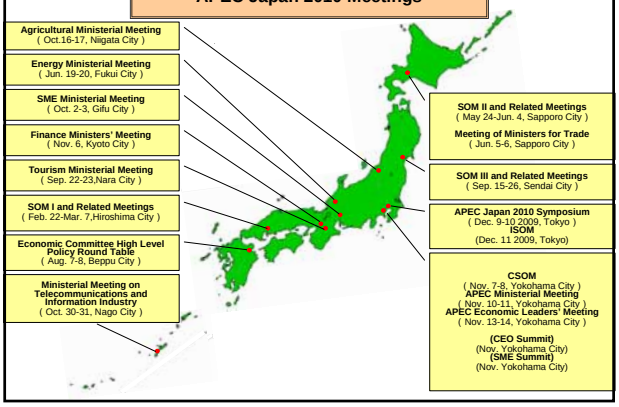


APEC Japan 2010 Meeting Schedule

DATE	MEETING	VENUE
9-10 Dec.2009	APEC 2010 Symposium	Tokyo, Japan
11 Dec.2009	Informal Senior Officials Meeting (ISOM)	Tokyo, Japan
22 Feb.-07 Mar.	Senior Official Meeting (SOM1) and related Meetings	Hiroshima, Japan
24 May -04 Jun.	SOM2 and Related Meetings	Sapporo, Japan
05-06 Jun.	Meeting of Ministers Responsible for Trade (MRT)	Sapporo, Japan
19-20 Jun.	Energy Ministerial Meeting	Fukui, Japan
07-08 Aug.	Economic Committee High Level Policy Round Table	Beppu, Japan
15-26 Sep.	SOM3 and Related Meetings	Sendai, Japan
22-23 Sep.	Tourism Ministerial Meeting	Nara, Japan
2-3 Oct.	SME Ministerial Meeting	Gifu, Japan
16-17 Oct.	Agricultural Ministerial Meeting	Niigata, Japan
30-31 Oct.	Ministerial Meeting on Telecommunications and Information Industry	Nago, Japan
07-08 Nov.	Concluding SOM (CSOM)	Yokohama, Japan
10-11 Nov.	22nd APEC Ministerial Meeting	Yokohama, Japan
13-14 Nov.	18th APEC Economic Leaders' Meeting	Yokohama, Japan

In addition, an Oceans-Related Ministerial Meeting (Chair: Peru) will be held in Peru and a Human Resources Development Ministerial Meeting (Chair: China) will be held in Beijing, China.

APEC Japan 2010 Meetings



2. BACKGROUND – The 4th CEO Forum

- A high-incidence and increasing impact of natural disaster in the region due to climate change & growing urbanization.
- APEC Leaders and Ministers agreed on the need to further strengthen APEC's efforts to build community resilience & preparedness for natural disasters through enhanced international cooperation & coordination with private sector, international organizations & NGOs.
- TFEP decision to hold the CEO Forum annually for 2009-2013.
- Japan's host year 2010 marks the 15th anniversary of the Great Hanshin-Awaji Earthquake & the midpoint for Hyogo Framework for Action 2005-2015.

3. The 4th CEO Forum

Date : 18-20 January 2010

Venue : Kobe, Hyogo, JAPAN

Title :"International Symposium & Expert Meeting on Urban Risk Management for Sustainable Development"

Co-host : Ministry of Foreign Affairs, Japan, UNCRD, (APEC)
Yomiuri Shimbun,
Hyogo Prefecture Government

DAY 1: Monday, 18 January 2010
Open Symposium (half-day)

DAY 2: Tuesday, 19 January 2010
Expert Meeting (whole-day)

DAY 3: Monday, 18 January 2010
Field Trip

DAY 1: Monday, 18 January 2010
Open Symposium
Venue: Yomiuri Kobe Hall

13:00-13:05 Opening Remarks by Director of UNCRD
13:05-13:10 Opening Remarks by MOFA, GOJ
13:10-13:15 Welcome Remarks by Governor of Hyogo Prefecture
13:15-13:20 Remarks by President of Yomiuri Shimbun Co.Ltd

13:20-16:55
Keynote Speech (TBC)
Part I : Economy Reports (selected APEC economies)
Part II : Public-Private Partnership in Urban DRR
Part III: Urban DRR, incl. response to H1N1
Part IV: Recovery from Disasters
Part V : Panel Discussion

16:55-17:00 Closing Remarks

DAY 2: Tuesday, 19 January 2010
Expert Meeting (Closed)
Venue: TBC

Topics of Discussion (Tentative):
Climate Change Adaptation (CCA)
Gender in Urban DRR
Disaster Education
Strategies of Strengthening Facilities for DRR
Community-Based Disaster Management (CBDM)

DAY 3: Wednesday, 20 January 2010
Field Trip

Mark the Calendar!

Look forward to your active participation in the 4th CEO Forum from 18-20 January 2010 in Kobe, Japan.