A DIAGRAMATIC FRAMEWORK FOR DISASTER RISK MANAGEMENT.

Background Information

This paper is prepared by Chris Piper, a multi-skilled humanitarian and community development practitioner, currently running his consultancy, TorqAid – www.torqaid.com , and residing in Australia[1]. It summarises the key parameters of the Disaster Risk Management Cycle (DRMC) and the Effective Disaster Risk Reduction (DRR) diagrams, which are key teaching tools for the understanding of Disaster Risk Management (DRM). These diagrams, together with other complementary illustrations, have been developed by TorqAid since 2002[2]. The DRMC itself is a diagrammatic representation of what is called PPRR (Prevention, Preparedness, Response, Recovery) in the Australian Emergency Management setting. This paper was updated in July 2011, and draws down on relevant aspects of recent regional and global major disasters.   These include the developing drought and food insecurity situation in the Horn of Africa; the 2011 Japan earthquake/ tsunami; NZ Christchurch earthquake; and Australian floods and Cyclone Yasi; the 2010 Pakistan Floods and Haiti earthquake; the 2009 Victorian 'Black Saturday' bushfires; the 2008 Myanmar/Burma cyclone; the 2007 Bangladesh Cyclone Sidr; and the 2004 Indian Ocean tsunami.

The Disaster Risk Management Cycle (DRMC)[3]

The DRMC as illustrated on the next page outlines the three main stages which most medium to fast onset disasters pass through[4]. A disaster can be described as a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources[5]. The DRMC suggests that there are three main stages in any disaster, these being:

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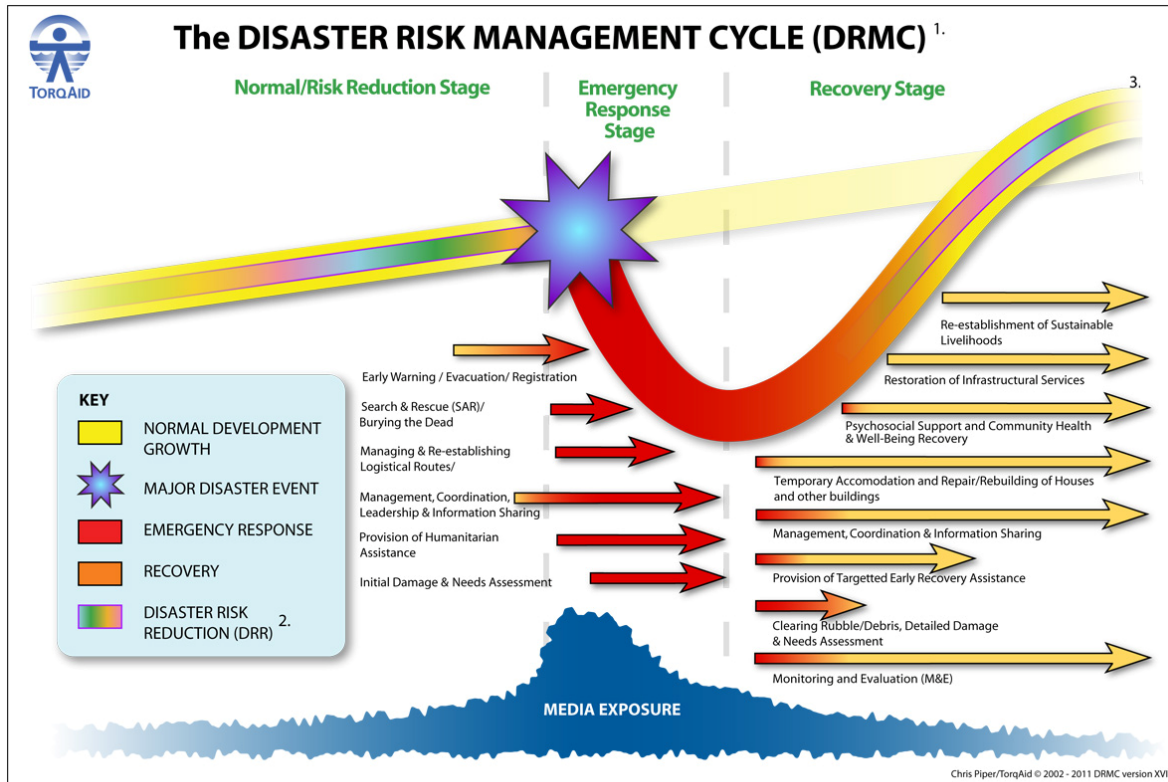
[2] Readers will note that the versions included here are the sixteenth (XVI) since their original design

[3] This can be accessed from the following link: http://www.torqaid.com/images/stories/aartglatestedition.pdf

[4] In other words, floods, cyclones, earthquakes, bushfires etc. It excludes slow-onset disasters such as prolonged drought such as occurring in the Horn of Africa, which can, when accompanied by factors such as conflict (as in Somalia), lead to famine.

[5] This is the definition as used by CRED (the Brussels-based Centre for Research on the Epidemiology). CRED manages the EM-DAT, a world-wide data base on disasters. These statistics are used in the Annual Red Cross World Disaster Report (WDR). In order to be entered as a disaster on the EM-DAT, at least one of the following has to be fulfilled: 10 or more people reported killed; 100 people or more reported affected; declaration of state of emergency; call for international assistance

- The Normal/Risk Reduction Stage
- The Emergency Response Stage
- The Recovery Stage

The DISASTER RISK MANAGEMENT CYCLE (DRMC) [1.]

Normal/Risk Reduction Stage **Emergency Response Stage** **Recovery Stage** [3.]

KEY

- NORMAL DEVELOPMENT GROWTH
- MAJOR DISASTER EVENT
- EMERGENCY RESPONSE
- RECOVERY
- DISASTER RISK REDUCTION (DRR) [2.]

Early Warning / Evacuation/ Registration

Search & Rescue (SAR)/ Burying the Dead

Managing & Re-establishing Logistical Routes/

Management, Coordination, Leadership & Information Sharing

Provision of Humanitarian Assistance

Initial Damage & Needs Assessment

Re-establishment of Sustainable Livelihoods

Restoration of Infrastructural Services

Psychosocial Support and Community Health & Well-Being Recovery

Temporary Accomodation and Repair/Rebuilding of Houses and other buildings

Management, Coordination & Information Sharing

Provision of Targetted Early Recovery Assistance

Clearing Rubble/Debris, Detailed Damage & Needs Assessment

Monitoring and Evaluation (M&E)

MEDIA EXPOSURE

Chris Piper/TorqAid © 2002 - 2011 DRMC version XVI

[1.] This mainly applies to a relatively quick-onset disaster (such as Cyclone, Flood, Earthquake, Tsunami, Bushfire etc), rather than a slow-onset one such as Famine (due to Drought/War)
[2.] For details of this see the Disaster Risk Reduction (DRR) diagram [3.] Ideally in the recovery stage the community is able to 'Build Back Better'

Whilst the Emergency Response Stage may only persist for a number of days or weeks, the Recovery Stage invariably lasts much longer. For example, following the Boxing Day 2004 Indian Ocean tsunami, the Indonesian recovery authority[6] responsible for this stage, operated for four years (ie from April 2005 – May 2009).

It needs to be stated here at the outset, that a number of disaster situations occur in a conflict-related context. This can seriously limit and curtail the range of initiatives which can realistically be carried out in both the Emergency Response and Recovery Stages. Current examples of this include the scenarios such as those existing in Somalia, Darfur, parts of the Democratic Republic of Congo (DRC), etc.

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[6] Aceh & Nias Rehabilitation & Reconstruction Agency (the Indonesian acronym for which was the 'BRR')

In a relatively conflict-free situation, the key parameters summarised below are those which tend to occur in the Emergency Response Stage of a major disaster, namely:
- Early Warning/Evacuation/Registration
- Search & Rescue (SAR)/Burying the Dead
- Managing and Re-establishing Logistical Routes
- Management, Coordination, Leadership and information Sharing
- Provision of Humanitarian Assistance
- Initial Damage & Needs Assessment

Early Warning and *Evacuation* are primarily initiatives designed to save lives. A recent successful example of this was in Queensland prior to the Feb 2011 Cyclone Yasi, where the majority of population in the predicted path of the cyclone were sufficient warned and protected, so that loss of life was minimal. In a similar positive vein, in Bangladesh over the past thirty years, improved early warning systems, combined with construction of cyclone shelters, have been credited with saving countless lives (such as in the 2007 Cyclone Sidr). In the aftermath of a disaster, the Red Cross/Crescent Societies often have a key role in the *Registration* of affected people.

Following a disaster, an immediate priority is to carry out *Search & Rescue (SAR)* operations to find trapped survivors. Whilst the people who immediately tackle this are unaffected community members, they are quickly joined by more specialised search and rescue teams. Extracting people from collapsed major buildings following earthquakes is particularly difficult, and the media has recently given graphic pictures of international SAR teams giving assistance in both Christchurch and Japan. *Burying the dead*, and this includes not just people, but a multitude of deceased animals, then becomes an important process, one ideally taking into account accepted cultural and religious practices.

The *Management and Re-establishment of Logistical Routes* is another critical priority, particularly as this relates both to the evacuation of affected community members, and also to the bringing in of needed humanitarian relief supplies. In recent months we have seen the damage caused by floods, earthquakes and tsunamis to road and rail infrastructures, particularly in Queensland and Japan. Even following cyclones, blown down trees need to cleared away from across roads, to allow access to humanitarian assistance.

The *Management, Coordination, Leadership, and Information Sharing* then become key factors affecting the success or otherwise of an effective emergency response. To work well, many of these parameters need to have been prepared and practiced beforehand. This is the responsibility of the host government, but in exceptional circumstances this may seek assistance from external sources (eg such as the United Nations).

Ideally during a major disaster, the key operational agencies need to be *managed and coordinated* from an single integrated Emergency Operations Centre (EOC)[7], and ideally follow a single common incident management framework[8]. The differing roles between operational agencies needs to clarified, with ideally a single designated position taking overall charge[9]. Impressive examples of *leadership* have been demonstrated over the first part of 2011, these including performances by the Queensland Premier and the Christchurch Mayor.

An effective *Information Sharing* system is then required, particularly for affected people. As the Tsunami Evaluation Coalition (TEC) Synthesis Report[10] stated, 'Information is Power', as it enables affected people to define and demand accountability, based on their own expectations and standards. Recent reports from the Japan earthquake/tsunami situation, where local news-sheets were prepared by hand during the week following the disaster, also highlight the affected community's need for information.

Following a disaster, the *Provision of Humanitarian Assistance* will invariably include the requirement for material and support related to health; water & sanitation; food; temporary shelter; relief kits containing Non-Food Items (NFIs)[11]etc. This will involve a multitude of organisations, agencies and government departments, and a major challenge here will be that of coordination of this humanitarian assistance, to ensure it is used as effectively and efficiently as possible.

Whilst there will be a demand for *Initial Damage and Needs Assessments,* the above-mentioned TEC reports suggested that the optimum solution focuses around coordinated assessments, these involving multiple stakeholders, ideally these including the affected communities themselves. The use of Geographical Information Systems (GIS) such as satellite technology can greatly assist in damage and needs assessments.

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[7] During the Victorian bushfires, operational agencies worked out of the integrated Emergency Coordination Centre (iECC) in Melbourne, which has been re-named as the State Control Centre.
[8] Again in Australia, the Australasian Inter-service Incident Management System (AIIMS) has been adopted by all of the Australian fire and land management agencies, as well as the Australian Council of State Emergency Services
[9] The Victorian Bushfires Royal Commission (VBRC) therefore recommended that the Chief Commissioner of Police take over the role as Coordinator in Chief of Emergency Management. The VBRC also commented on confusion issues which existed between the major operational agencies handling the bushfires.
[10] See the ALNAP reference for this TEC Synthesis report (p.19) in the Selected Bibliography at the end of this paper.
[11] NFI's for example could include hygiene kits, kitchen utensils, bedding, clothing etc

As the disaster moves into the Recovery Stage, the following will be the main parameters, all of which will need to be addressed:

- Management, Coordination and information Sharing
- Clearing of Rubble/Debris. Detailed Damage & Needs Assessment
- Provision of Targeted Early Recovery Assistance
- Temporary Accommodation and Repair/Rebuilding of Houses and other Buildings
- Psychosocial Support and Community Health & Well-Being Recovery
- Restoration of Infrastructural Services
- Re-establishment of Sustainable Livelihoods
- Disaster Risk Reduction (DRR) Initiatives
- Monitoring & Evaluation (M&E)

In transitioning from the Emergency Response to the Recovery Stage, the organisations responsible for *Management, Coordination and Information Sharing* may change. The example of the Indonesian BRR has already been made with its recovery mandate responsibilities following the Indian Ocean tsunami. During the Feb 2009 Victorian Bushfires, designated emergency services[12] coordinated the Emergency Response Stage of the disaster. Within a couple of weeks, the recovery process was passed over to the specially established Victorian Bushfire Reconstruction and Recovery Authority (VBBRA)[13].

Clearing of the rubble and debris resulting from the disaster is an obvious and high priority, and recent disasters in Queensland/Victoria, Christchurch and Japan, illustrate the immensity of this task in extreme situations. This (*clearing of rubble & debris*) is an exercise in which volunteers can play an important role, as has been seen recently in both the Queensland and Victorian floods.

This will also be the time to carry out detailed Recovery Stage *damage and needs assessments.* Ideally this process will include a combination of stakeholders, again ideally including affected community representatives, as well as appropriate technical experts (eg engineers/architects/insurance assessors). The Myanmar/Burma Cyclone included good examples of two detailed assessments[14], involving the host government, ASEAN and the UN (+ NGO) community.

There will be an ongoing need to *provide targeted early recovery assistance* to affected communities. The challenge here will increasingly be to strike a balance between

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[12] These included the Victorian Police; the Country Fire Authority (CFA); and the Department of Sustainability & Environment (DSE).

[13] The challenge for the VBRRA was then to work closely with both Local Government Authorities (LGAs) and the State Government Department of Human Services (DHA), as both of these also had responsibilities under the existing State emergency management legislation to help coordinate the recovery process.

[14] These being the Post Nargis Joint Assessment (PONJA), and the Post Nargis Recovery & Preparedness Plan (PONREPP). See ASEAN references in the Selected Bibliography.

supporting these communities; encouraging resilience; and not creating dependency. Needs assessments will especially need to target vulnerable stakeholder groups, these including the young; the elderly; the infirm or disabled; and disadvantaged minority or other social groups.

The provision of *temporary accommodation, and the repair/rebuilding of houses and other buildings* is a complex area, and one which stakeholders such as international NGOs sometimes struggle with[15]. Initially, families affected by disasters seek temporary accommodation with relatives; are placed in community buildings such as schools or sports centres; or go into temporary shelter such as tented camps. In the medium term many of these people may be moved into other custom-build temporary buildings or camps; before they are able to later return to their repaired or reconstructed homes. This sector is complicated by legal issues (such as land rights, or {lack of} possession of land/house tenure documents); insurance claims; and new more stringent building or land-zoning regulations.

The affected community, together with the care-givers or humanitarian aid workers who render assistance, both potentially need support following a disaster. This is the sector related to *psychosocial support and community health & well-being recovery.* The Selected Bibliography at Appendix A includes a number of useful references related to this, from both Australia and overseas[16].

Following a major disaster, the *Restoration of Infrastructural Services* can be a time-consuming and invariably expensive process. Whilst the re-establishment of telecommunications, power, water and sewerage services can take weeks, the reconstruction of more complex infrastructure such as the rebuilding of an industrial base or transport network (eg roads, rails, bridges, culverts, ports) may well take months or years.

In order to assist affected communities to complete the recovery process, a complex range of initiatives are required whose complementary purpose is the *re-establishment of sustainable livelihoods'.* This will include a range of activities across the business, agricultural, pastoral, fishing, industrial and mining sectors; these ranging from support for individual businesses or communities, up to the reconstruction of nationally important economic sectors.

Finally there is the need for the recovery process to include a range of improved *Disaster Risk Reduction (DRR)* initiatives, which will allow the at risk community to be better

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[15] This was reported to be the case following the Indian Ocean Tsunami (see Tsunami Evaluation Coalition = TEC reports) in the ALNAP reference in Appendix A.
[16] These include the article by Fisher on psychosocial support for communities affected by tsunamis; the Victorian State Government's 'After the Bushfires: Victoria's Psychosocial Recovery Framework'; and the various resources produced by the Mandala Foundation.

prepared to withstand future similar natural or man-made disasters. The complexity and composition of DRR will be explored in more detail in the next section of this paper.

The final parameter of the Recovery Stage is that of *Monitoring and Evaluation (M&E).* Whilst it is relatively easy to report on *outputs* (which are normally handled through reports), what is more challenging is to both articulate and then attempt to measure, the *outcomes*[17] of the recovery process.

Ideally all these recovery processes will, together, allow the community in question to 'Build Back Better', which could well place it in a stronger overall position than would have been the case before the disaster struck.

The final aspect to note in the DRMC diagram is that of *Media Exposure.* This inevitably is strongest during the Emergency Response Stage of the DRMC. Media attention inevitably then tends to tail off during the recovery process, and the challenge is to both maintain interest here, as well as in the 'Normal/Risk Reduction Stage' of the DRMC. There is strong relationship between *media exposure* and funding, with the challenge again here being that the majority of accessed finances are in fact needed for the longer term Recovery (as opposed to the Emergency Response) Stage.

A final comment before we leave the DRMC. What this diagram finds difficult to convey is the central and vital role of active community participation, particularly that throughout the long complex recovery process. The saying below encapsulates well this sentiment:

> *'If your intention is truly to help our people, then you must listen to them, respect them and treat them as equal partners, not as passive recipients of your aid'*
> Xanana Gusmao, the current Prime Minister of Timor Leste as quoted in Kirtsy Sword Gusmao,   'A Woman of Independence', Macmillan, Sydney, 2003

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[17] This basically analyses whether the *Purpose and Goal* of the initiatives carried out have indeed been achieved.   A key global agency which specialises in humanitarian M&E is ALNAP – see www.alnap.org , and a number of ALNAP publications are referenced in Appendix A (Selected Bibliography),

The Effective Disaster Risk Reduction (DRR) Diagram[18]

Attention is now turned to the second main illustration, namely the 'Effective Disaster Risk Reduction (DRR)' diagram.   Before analysing the key components of this, it is important to clarify what is meant by 'Risk Reduction', as well as explain the historical framework within which many DRR initiatives are taking place.

Risk Management in Australia is based on the AS/NZS 4360:2004 Standard, which consists of the following steps: Establishing the Context; Identifying Risk; Analysing Risk; Evaluating Risk[19]; Treating Risk. Once risks have been evaluated, they can either be accepted, or they need to be treated. 'Risk Reduction' is basically a combination of the four main ways in which risks are treated, namely by:

- Prevention or elimination of risk. This may be relatively rare
- Mitigation of risk. This means efforts designed to minimise either the impact and/or likelihood of the risk in question.
- Preparedness initiatives designed to deal with residual risk
- Transfer of risk (eg through insurance).
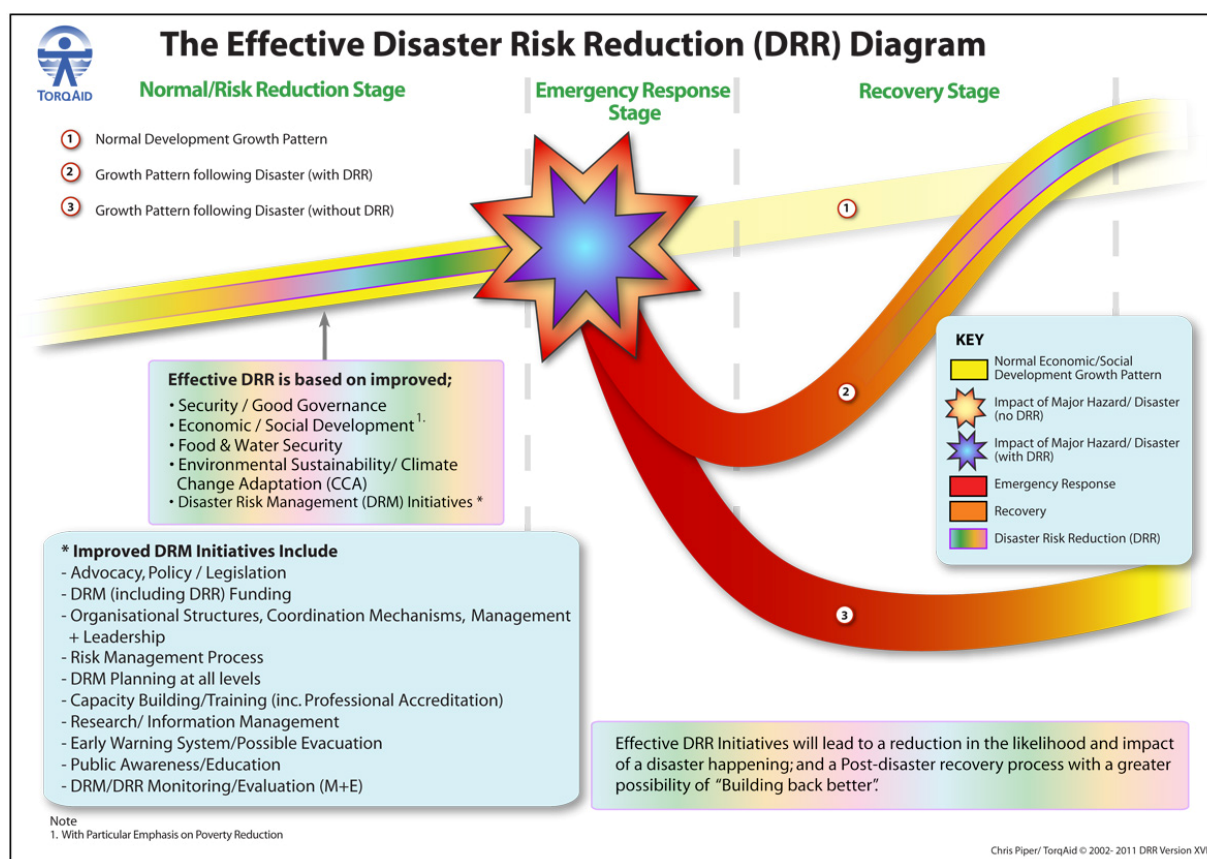
[18] http://www.torqaid.com/images/stories/EffectiveDRR_Summary.pdf

[19] Analysing risk & Evaluation Risk are sometimes jointly described as 'Risk Assessment'. This is similar to the Community risk assessment (CRA) process as practiced by many NGOs as they develop their Community Based Disaster Risk Management (CBDRM) initiatives.

The current period (2000-2015) is called the International Strategy for Disaster Reduction (ISDR) – see www.unisdr.org. This is designed to build more resilient international communities with a strong focus on DRR. One key ISDR initiative was the 2005 World Conference on Disaster Reduction (WCDR), held in Kobe, Japan - see www.unisdr.org/wcdr. This resulted in the *Hyogo Framework for Action (HFA) 2005-2015,* which encouraged all countries to improve their DRM initiatives, particularly in the Normal/Risk Reduction Stage.

In reverting back to the Effective Disaster Risk Reduction (DRR) diagram, this illustration suggests that DRR in practice consists of five key complementary components, these being the following:

- Security & Good Governance
- Economic & Social Development with particular emphasis on Poverty Reduction
- Food and Water Security
- Environmental Sustainability and Climate Change Adaptation (CAA)
- A range of Disaster Risk Management (DRM) Initiatives

Overall the Effective DRR diagram argues that, if a combination of these five complementary DRR components work together effectively, then they should be able to minimise both the likelihood of a major disaster occurring, as well as its impact. However, if a disaster situation does unfortunately take place, this should be able to move more quickly out of the Emergency Response into the Recovery Stage, than would have been the case if the range of DRR initiatives were absent.

Security & Good Governance is the first of these DRR components. If the country is at war with itself, this makes it almost impossible to develop an effective DRR system. Good *governance* is equally as important as security, and this means confidence that financial resources will be well spent, with the minimum of corruption or nepotism. Indeed it could be argued, as illustrated here in the smaller diagram, that *governance* determines the effectiveness of the other main four DRR components.

Effective Disaster Risk Reduction (DRR) Components

Diagram Conceptualised by Debbie Ake,   Chris Piper/ TorqAid © 2010
PNG DRM Workshop 2010   Version I

The second major DRR component is that of *economic and social development,* particularly that with a strong emphasis on *poverty reduction.* This approach is crucial, particularly in developing countries or emerging economies. Here national governments have a responsibility in both working towards achieving their required targets from their Millennium Development Goals

(MDGs), and also liaising closely with the World Bank and International Monetary Fund (IMF) in developing their Poverty Reduction Strategic Papers (PRSPs).

Food and Water Security are growing global concerns, and it is argued here that these are the third major component of an effective DRR strategy. The global food crisis from 2007/8, resulting from a complex mix of factors, unfortunately appears to be re-emerging, this bringing issues of food insecurity to an increasing number of mainly poorer emerging economies. *Water security* is the complementary side of this, where a combination of poor water resource management, and over-usage of this precious and essential commodity, is creating water scarcity or inaccessibility to increasing numbers of people. The dual challenge water and food insecurity can lead to political and social unrest, and polarisation of relationships both within and between nations.

It is important for communities and nations to also both introduce and maintain *environmentally sustainable* practices designed to safeguard their natural environment. At the same time they should take seriously the challenges of Climate Change, and make concrete efforts to limit the six main pollutants[20] which cause global warming. That being said, global warming is, and will continue to take place, and it therefore will be equally necessary to develop a range of Climate Change Adaptation (CCA) initiatives designed to work within this changing framework.

The final component relating to effective DRR are the ten key DRM Initiatives summarised below. Crucially, all of these initiatives or issues should ideally be addressed in the Normal/Risk Reduction Stage of the DRMC – ie before a potential disaster is ever faced !
- Advocacy, Policy & Legislation
- DRM (including DRR) Funding
- Organisational Structures, Coordination Mechanisms, Management, and Leadership
- Risk Management Process
- DRM Planning at all levels
- Capacity Building & Training
- Research & Information Management
- Early Warning Systems & Possible Evacuation
- Public Awareness & Education
- DRM/DRR Monitoring & Evaluation (M&E)

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[20] These being carbon dioxide; methane; black carbon; carbon monoxide (CO) and volatile organic compounds (VOCs); halocarbons; and nitrous oxide.

Following the Victorian Black Saturday 2009 Bushfires, a Victorian Bushfires Royal Commission (VBRC) was established. The Final Report from this included 67 Recommendations, most of which the State Government accepted[21]. Many of these recommendations are now currently in the process of being implemented into existing and new *legislation, policies, amendments and procedures.*

The role of *funding* is of paramount importance in disaster risk management. At international level, a United Nations-managed Central Emergency Response Fund (CERF) now exists, funds from which, operational UN and some large international NGOs, are able to draw down from, in order to finance Emergency Response initiatives in times of major disasters. In the Recovery Stage, generally there is consistently the challenge of tracking and coordinating funds from multiple donors, and, again at international level, this is assisted by the UN's Financial Tracking Service (FTS)[22].

Funding of DRR initiatives, particularly those in the Normal/Risk Reduction Stage of the DRMC diagram, is particularly challenging. In recent years, donors such as the British Dfid have proved progressive in this, in that they now allocate up to 10% of their humanitarian aid budget for DRR initiatives.

In Australia and New Zealand, an 'All Hazards Approach'[23] to so-called Emergency Management is adopted, which includes involving all key stakeholders and all levels of government. This then requires the DRM *organisational structures* to be clarified, these cutting across all levels of governance and the full range of involved government departments. *Coordination* mechanisms, at both Emergency Response and Recovery Stages, need also to be clarified. In the international setting, this is where the role of the 'Humanitarian Cluster Approach'[24] has helped, both in information sharing and planning. Finally, what is also required in major disasters is *leadership,* and inspired examples of this from the Queensland floods and NZ Christchurch earthquake have already been mentioned.

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[21] The Victorian State Government accepted in full 60 of these Recommendations; 6 in part; and rejected 1.

[22] Details relating both to the CRF and the FTS can be analyses on the relef web website – www.reliefweb.int

[23] This includes assessing all potential hazards; including all geographical areas; involving all levels of government; including all potential stakeholders
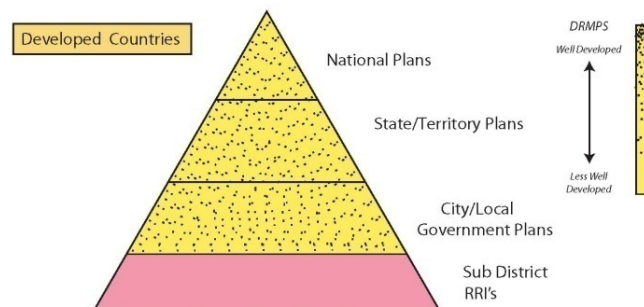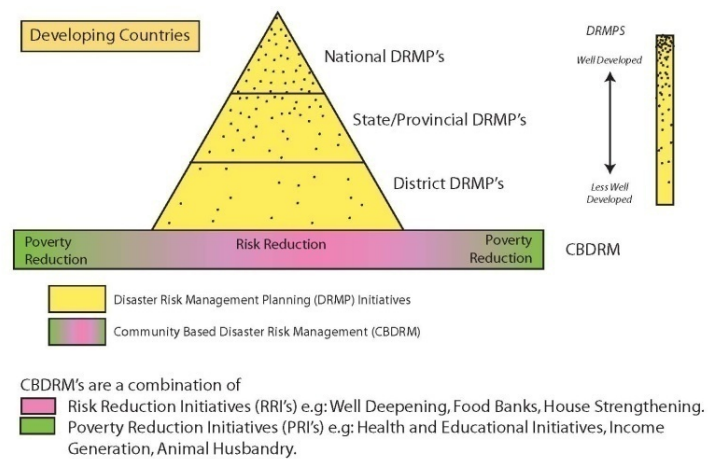
[24] So, for example, by the end of January 2010, just two weeks after the Haiti earthquake, the following twelve clusters had already been established in the capital, Port-au-Prince. Camp Coordination/ Management; Protection; Emergency Shelter & Non Food Items (NFIs); Food; Health; Water; Sanitation & Hygiene; Nutrition; Logistics; Emergency; Telecommunications; Agriculture; Early Recovery.

The AS/NZS 4360:2004 *risk management* process has already been clarified in this paper. This process includes understanding the background context; risk identification; risk analysis[25]; risk evaluation; and risk treatment. In practice risk treatment includes risk acceptance and risk reduction, where the latter combines prevention/elimination; mitigation; preparedness; and transfer (eg insurance). The recent Japanese earthquake/tsunami dramatically showed that the risk reduction initiatives for earthquakes generally worked well[26], but that those for the subsequent tsunami (and indeed damage to the Fukushima nuclear reactor) were less effective.

The enclosed Disaster Risk Management Planning (DRMP) illustrates clearly the fact that government authorities carry out DRM Planning at all levels of government. At the lowest levels, these plans may well be complemented by so-called Community Based Disaster Risk Management (CBDRM) initiatives carried out by stakeholders such as NGOs. In practice, these CBDRMs will consist of a combination of both Risk Reduction Initiatives (RRIs) and Poverty Reduction Initiatives (PRIs).

The DISASTER RISK MANAGEMENT PLANNING (DRMP) Diagram

Disaster Risk Management Planning (DRMP's) take place at National, State/Provincial and District levels. This is primarily a Government responsibility. This is complemented by Community Based Disaster Risk Management (CBDRM) at Sub-District levels, often initiated by communities and/or NGO's.

CBDRM's are a combination of
Risk Reduction Initiatives (RRI's) e.g: Well Deepening, Food Banks, House Strengthening.
Poverty Reduction Initiatives (PRI's) e.g: Health and Educational Initiatives, Income Generation, Animal Husbandry.

In developed countries, ideally well developed DRMP's at all levels of government are complemented by Risk Reduction Initiatives (RRI's), run by communities and individuals e.g; the Country Fire Authority (CFA), Community Fireguard in Victoria, Australia

Chris Piper/TorqAid © 2009 DRMP version VII

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[25] Risk analysis & risk evaluation are sometimes called 'risk assessment;

[26] Examples being the manner in which high-rise modern buildings in the earthquake-affected urban areas were able to 'ride out' the violent bucking of their underlying foundations, this bearing witness to care which had gone into their architectural and construction design.

Once DRM planning at all levels of government has taken place, and the range of stakeholders identified, then a systematic approach to *training and capacity building* can be developed. Within the international humanitarian sector, there are now moves underway to improve the professionalization of the humanitarian sector, this including the development of a competency framework[27].

Research and information management is reflected in the number of national and international institutions which research into the causes and effects of a variety of natural hazards and threats. Examples of these in Australia include the Bushfire Cooperative Research Centre (CRC), and Geoscience Australia[28].

The crucial importance of *early warning and possible evacuation* has already been underscored by the Queensland State Government's response in the run-up to Cyclone Yasi. Other countries have equally impressive systems. In Bangladesh, on-going initiatives by the Government's Comprehensive Disaster Management Program (CDMP) – www.cdmp.org.bd ; combined with NGO CBDRM initiatives; and the work of the Red Crescent-supported Cyclone Preparedness Programme (CPP) have, together, helped create safer environments for coastal communities affected by tropical cyclones[29].

In order for the community at large to be sensitised and prepared for possible disasters, a comprehensive *public awareness and education* program needs to be effectively in place. The media and a range of educational initiatives play key roles in helping promote this.

The final DRM initiative is that of *DRM/DRR monitoring and evaluation (M&E)* . Developing a framework for this is a relatively new (and complex) area, but one which is being addressed by a number of practitioners and agencies[30].

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[27] Note the selected Bibliography which includes a 2010 Scoping Study produced by ELHRA. Competency training is now separately being developed in both the UK (through the Consortium of British Humanitarian Agencies, and their Core Humanitarian Competency Framework); as well as in Australia, by NGO's and training providers involved in the Development and Humanitarian Assistance (D&HA) Competency Development Project.

[28] Which plays an important role in earthquake-related research role in the Australian-Indonesian Facility for Disaster Reduction (AIFDR) – www.aifdr.org in Indonesia.

[29] This is highlighted by Cyclone Sidr which struck Bangladesh in November 2007. With a combination of these early warning/evacuation (as well as other DRR) initiatives in place; this resulted in a death toll, although still in the 3-4,000 range, which was much smaller than those, when similar intensity cyclones had struck the country over the previous 30 years.

[30] An example of this is the TorqAid Idealized Solution Tree for DRM Initiatives (in the DRMC Normal/Risk Reduction Stage), see http://www.torqaid.com/images/stories/DRR_Tree4.pdf

Concluding Remarks

This paper suggests that the complex area of Disaster Risk Management (DRM) can be more clearly understood by the use of two key diagrams, namely the Disaster Risk Management Cycle (DRMC), complemented by the Effective Disaster Risk Reduction (DRR) diagram. The DRMC illustrates that, whilst the events taking place in the Emergency Stage are the most easily recognisable, the challenges lie in key stakeholders being actively involved, motivated and engaged in the longer-duration; more costly; less media-attractive, Recovery Stage. One of the key parameters in this recovery process, contributing to a society or community being able to 'Build Back Better', is the inclusion of so-called Disaster Risk Reduction (DRR) initiatives. The second diagram, that of the Effective DRR diagram, clarifies in practice what is meant by 'DRR', suggesting that this includes the development of five complementary areas or components.

These diagrams are obviously models of what would or could happen in an ideal world. In reality, a number of potential or actual disaster situations are complicated by degrees of insecurity or conflict, which in turn adversely affect a number of the initiatives highlighted in both illustrations. Ultimately hazards and potential disasters are about people however, and one of the key stakeholder groups is the community at risk. Perhaps the single largest challenge is engaging this particular group to play a major role in contributing to the effective working out of all three stages of the DRMC.

Chris Piper, Director, TorqAid – www.torqaid.com   July 2011.   *Version 5*

SELECTED BIBIOGRAPHY

ALNAP (*authors M.Buchanan-Smith & K.Scriven),* 2011, *Leadership in Action; Leading effectively in Humanitarian Operations,* http://www.alnap.org/pool/forum/leadership-in-action-alnap-study.pdf

ALNAP, 2011, *Harnessing the Power of Evaluation in Humanitarian Action,* http://www.alnap.org/pool/files/evaluation-alnap-working-paper.pdf

ALNAP et alia, 2011, *Haiti Earthquake Response: Mapping & analysis of gaps and duplications in evaluations*, http://www.alnap.org/pool/files/haiti-mapping-february-2011.pdf

ALNAP, 2011, *ALNAP Meeting Paper. The role of national governments in international humanitarian response*, http://www.alnap.org/pool/files/meeting-paper-2011.pdf

ALNAP, 2010, *The State of the Humanitarian System. Assessing performance and Progress*, http://www.alnap.org/pool/files/alnap-sohs-final.pdf

ALNAP, 2009, *Real-time Evaluations of Humanitarian Action,* http://www.alnap.org/pool/files/rteguide.pdf

ALNAP, 2009, *A Ripple in Development ? Long-term Perspectives on the Response to the 2004 Indian Ocean Tsunami,* http://www.alnap.org/pool/files/a-ripple-in-development-main-report.pdf

ALNAP & Proventium Consortium, 2008, *Slow-onset Disasters: Drought, and Food &Livelihoods Insecurity: Learning from past Relief & Recovery Responses.* http://www.alnap.org/pool/files/ALNAP-ProVention_lessons_on_slow-onset_disasters.pdf

ALNAP, 2008, *The Global Food Price Crisis: Lessons & Ideas for Relief Planners & Managers,* http://www.alnap.org/publications/pdfs/ALNAPLessonsFoodPriceCrisis.pdf

ALNAP, 2008, *Responding to Earthquakes 2008. Learning from earthquake relief and recovery operations,* www.alnap.org/publications/pdfs/ALNAPLessonsEarthquakes.pdf

ALNAP, 2008, *Flood Disasters: Learning from previous relief & recovery operations,* http://www.alnap.org/pool/files/ALNAP-ProVention_flood_lessons.pdf

ALNAP, 2006/7, *Synthesis Report and Thematic Evaluation Set,* www.alnap.org/initiatives/tec.aspx. This was the major multi-donor (Tsunami Evaluation Coalition = TEC) evaluation following the 2004 Indian Ocean Tsunami,. It consists of a Synthesis Report, and five thematic studies.

ALNAP, 2006, *Evaluating Humanitarian Action using the OECD-DAC Criteria. An*

ALNAP Guide for Humanitarian Agencies, www.alnap.org/pool/files/eha_2006.pdf

The Association of South East Asian Nations (ASEAN) et alia, 2008, *Post Nargis Joint Assessment (PONJA).* http://www.aseansec.org/21765.pdf

ASEAN et alia, 2009, *Post-Nargis Recovery & Preparedness Plan (PONREPP),* http://www.aseansec.org/CN-PONREPP.pdf

AusAID, 2009, *Investing in a Safer Future: A Disaster Risk Reduction policy for the Australian Aid Program,* http://www.ausaid.gov.au/publications

Barnet, M., 2011, *Empire of Humanity: A History of Humanitarianism,*
http://www.cornellpress.cornell.edu/cup_detail.taf?ti_id=9918

CBHA, 2010, *Core Humanitarian Competency Framework,*
http://www.thecbha.org/news/2010/08/20/cbha-launches-core-humanitarian-competency-framework/

Clarke, M., I.Fanany, S.Kenny, 2010, *Post-Disaster Reconstruction: Lessons from Aceh,* Earthscan.
www.earthscan.co.uk

Climate Change, Agriculture & Food Security (CCAFS), 2011, *Mapping hotspots of Climate Change and Food Insecurity in the Global Tropics,*
http://www.ccafs.cgiar.org/sites/default/files/assets/docs/ccafsreport5-climate__hotspots_advance-may2011.pdf

Climate Commission Secretariat, 2011, *The Critical Decade: Climate Science Risks and Responses,*
http://climatecommission.govspace.gov.au/files/2011/05/4108-CC-Science-Update-PRINT-CHANGES.pdf

Community Services & Health Industry Skills Council (CSHISC), 2010, *Development & Humanitarian Assistance (D&HA) Competency Development Project,*
https://www.cshisc.com.au/index.php?option=com_content&task=view&id=84&Itemid=162

DARA, 2011, *The Humanitarian Response Index,* http://daraint.org/wp-content/uploads/2010/10/Folleto-HRI-2010-INGLES.pdf

Dept. for Business Innovation & Skills (BIS), 2011, *Foresight Global Project: The Future of Food & Farming,* http://www.bis.gov.uk/foresight/our-work/projects/current-projects/global-food-and-farming-futures/reports-and-publications

Dfid, 2011, *Humanitarian Emergency Response Review (HERR),*
http://www.dfid.gov.uk/Documents/publications1/HERR.pdf

Disasters Emergency Committee (DEC), 2011, *Urban Disasters – Lessons from Haiti,*
http://www.dec.org.uk/item/494

Edwards, C., 2009, *Resilient Nation,* Demos, UK – www.demos.co.uk/publications/resilientnation

ELRHA, 2010, *Professionalising the Humanitarian Sector: A Scoping Study,*
http://www.elrha.org/uploads/Professionalising_the_humanitarian_sector.pdf

Emergency Capacity Building Project (ECB), 2007, *Impact Measurement and Accountability in Emergencies,* http://www.ecbproject.org/Pool/good-enough-guide-book-en.pdf

Feinstein International Centre, 2008, *Humanitarian Agenda 2015: Final Report – The State of the Humanitarian Enterprise,*
https://wikis.uit.tufts.edu/confluence/display/FIC/Humanitarian+Agenda+2015+--+The+State+of+the+Humanitarian+Enterprise

Feinstein International Center Updates, Major Reports, and Country Studies, https://wikis.uit.tufts.edu/confluence/display/FIC/Reports

FAO, 2011, *FAO Food Price Index,* http://www.fao.org/worldfoodsituation/wfs-home/foodpricesindex/en/

FAO/WFP, 2010, *Annual State of Food Insecurity in the World (SOFI): Addressing Food Insecurity in Protracted Crises,* http://www.fao.org/publications/sofi/en/

Fisher, S., 2009, *Training for Impact: The International Training Programme development-orientated Psycho-social Care for Communities affected by the tsunamis and Other Disasters,* Basic Need*s,* http://basicneeds.org/download/BasicNeeds International Training Publication_WEB.pdf

The Fletcher School, Tufts University, *2011, Resilience: Inter-disciplinary Perspectives on Science & Humanitarianism* http://fletcher.tufts.edu/resilience/current-issue.shtml

Garnaut, R., 2011, *The Garnaut Climate Change Review Updates (total of 8 update Papers)* http://www.garnautreview.org.au/update-2011/update-papers.html

Gender & Disaster Network (GDN), 2009, *Gender & Equality in Disasters: Six principles for Engendered Relief and Recovery,* http://www.gdnonline.org/resources/GDN_GENDER_EQUALITY_IN_DISASTERS.pdf

Geneva Declaration on Armed Violence, 2009, *Annual Global Burden of Armed Violence (GBAV),* http://www.genevadeclaration.org/fileadmin/docs/GBAV/GBAV_Summary_English.pdf

Global Humanitarian Forum, 2009, *Human Impact Report- Climate Change; The anatomy of a Silent Crisis.* http://www.phaa.net.au/documents/humanimpactreport.pdf

Gore, A., 2009, *Our Choice: A Plan to Solve the Climate Crisis,* http://ourchoicethebook.com/

Inter-Agency Standing Committee (IASC) – DARA – www.daraint.org *Inter -agency Real-time Evaluation (RTE) of the Humanitarian Response to Pakistan's 2010 Flood Crisis,* http://reliefweb.int/sites/reliefweb.int/files/resources/Full_Report_5.pdf

Inter-Agency Standing Committee (IASC) – Authors Grunewald, F., A.Binder, & Y.Georges, 2010, *Inter-agency Real-time Evaluation (RTE) in Haiti: 3 months after the Emergency,* http://www.alnap.org/pool/files/haiti-ia-rte-1-final-report-en.pdf

Handicap International Bangladesh, 2005, *How to Include Disability Issues in Disaster Management,* Handicap International, Bangladesh, www.handicap-international.org/index.html

Hawe, P., 2009, *Community Recovery after the February 2009 Victorian Bushfires: A Rapid Review,* http://www.health.vic.gov.au/environment/downloads/bushfire_rapid_review.pdf

Helpage International, *Older People in Disasters and Humanitarian Crises: Guidelines for Best Practice.* HelpAge International, http://www.helpage.org/Resources/Manuals

Humanitarian Policy Group (HPG) Publications – eg HPG Reports; HPG Briefings; Humanitarian Exchange; Network Papers; Good Practice Reviews – http://www.odi.org.uk/hpg and www.odihpn.org

Inter-Agency Standing Committee (IASC), 2010, *IASC: Response to the Humanitarian Crisis in Haiti (6 month Report): Achievements, Challenges & Lessons to be Learnt.* http://www.alnap.org/pool/files/ocha.pdf

Intergovernmental Panel on Climate Change (IPPC), *Four Assessment Reports (AR1-4) already produced. Two Special Reports being produced during 2011. Fifth Assessment report (AR5) due in 2014.* www.ipcc.ch

International Federation of Red Cross and Red Crescent Societies (IFRC), 2010, *World Disasters Report: Focus on Urban Risk* www.ifrc.org/Global/Publications/disasters/WDR/WDR2010-full.pdf

International Federation of Red Cross and Red Crescent Societies (IFRC), 2009, *World Disasters Report: Focus on Early Warning, Early Action* www.ifrc.org/Global/WDR2009-full.pdf

International Federation of Red Cross and Red Crescent Societies (IFRC), 2004, *World Disasters Report: Focus on Community Resilience* http://www.climatecentre.org/site/publications/280/world-disaster-report-2004?type=5

International Federation of Red Cross and Red Crescent Societies (IFRC), 2002, *World Disasters Report: Focus on Reducing Risk* http://www.climatecentre.org/site/publications/18/world-disaster-report-2002?type=5

International Federation of Red Cross and Red Crescent Societies (IFRC), 2001, *World Disasters Report: Focus on Recovery* http://www.climatecentre.org/site/publications/282/world-disaster-report-2001?type=5

International Food Policies Research Institute (IFPRI) et alia, 2010, *2009 Global Hunger Index: The Challenge of Hunger. Focus on the Crisis of Child Undernutrition,* http://www.ifpri.org/sites/default/files/publications/ghi10.pdf

International Strategy for Disaster Reduction (ISDR) , 2008, *Indigenous Knowledge for Disaster Risk Reduction: Good Practices and lessons Learned from Experiences in the Asia-Pacific Region,* http://www.unisdr.org/eng/about_isdr/isdr-publications/19-Indigenous_Knowledge-DRR/Indigenous_Knowledge-DRR.pdf

JKTS – A Japanese Medical Aid Workers Blog (following the 2011 earthquake/ tsunami), jkts-english.blogspot.com

Keneally, T., 2010, *Three Famines,* Knopf Publishing, http://blog.booktopia.com.au/2010/10/01/three-famines-by-tom-keneally/

Kett, M., S.Stubbs, R.Yeo, 2005, *Disability in Conflict and Emergency Situations: Focus on Tsunami-affected Areas*. International Disability and Development, http://www.disabilitykar.net/research/thematic_conflict.html

Mandala Foundation, 2010, *Psychological Readiness for International Aid Work,*
mandala@mandalafoundation.org.au

Mandala Foundation, 2011, *Psychosocial Risk Management Tool,*
risktool@mandalafoundation.org.au

Mitchell, T., M.Ibrahim et alia, *2010, Climate Smart Disaster Risk Management (CSDRM),*
Strengthening Climate Resilience, IDS, Brighton, UK
http://community.eldis.org/.59e0d267/SCR%20DRM.pdf
http://community.eldis.org/.59e0d267/SCR%20DRM%20overview.pdf

Munich Re, 2010, *Topics Geo – Natural Catastrophes 2009,*
http://www.munichre.com/publications/302-06295_en.pdf

OXFAM, 2011, *Growing a Better Future – Food justice in a Resource-constrained World,*
http://www.oxfam.org.uk/resources/papers/downloads/growing-a-better-future-010611-en.pdf

Oxfam, 2009, *Suffering the Science: Climate Change, People & Poverty,* Oxfam Briefing Paper 130,
Oxford, UK, http://www.oxfam.org/en/policy/bp130-suffering-the-science

People in Aid, 2011, *Building Resilient Managers in Humanitarian Organisations: New Research,*
http://www.peopleinaid.org/publications/resilienceenglish.aspx

People in Aid/Interhealth, 2009, *Approaches to Staff care in International NGOs,*
http://www.interhealth.org.uk/news-approaches-to-staff-care.html

Ploughshares, 2010, Armed Conflict Report, http://www.ploughshares.ca/libraries/ACRText/ACR-TitlePage.html

Ploughshares, 2010, *2010 Armed Conflict Report Poster,*
http://www.ploughshares.ca/imagesarticles/ACR10/ACR10poster.pdf

Schneider, S., 2009, *Science as a Contact Sport: Inside the Battle to Save the Earth's Climate,*
http://stephenschneider.stanford.edu/SAACS/saacs_book.htm

The Sphere Project, 2011 *The Sphere Project: Humanitarian Charter and Minimum Standards in
Humanitarian Response,* - www.sphereproject.org

State Government of Victoria, 2011, *Victorian Floods Review: The Review of the 2010-11 Flood
Warnings & Responses*,   http://www.floodsreview.vic.gov.au/

State Government of Victoria, 2010, *Victorian Bushfires Royal Commission Final Report*
www.royalcommission.vic.gov.au/Commission-Reports

State Government of Victoria, 2009, *After the Bushfires: Victoria's Psychosocial Recovery
Framework,* Department of Human Services,
https://www.dhs.vic.gov.au/mentalhealth/.../after_the_bushfire_report.pdf

State Government of Victoria, 2005, *The Emergency Management Manual, Victoria*
http://www.oesc.vic.gov.au/emergencymanual

Stockholm International Peace Research Institute (SIPRI), 2010,*SIPRI Yearbook: Armaments, Disarmament, and International Security.* http://www.sipri.org/yearbook

Stoddard, A & A.Harmer, 2010, *Humanitarian Outcomes: Supporting Security for Humanitarian Action. A review of critical issues for the humanitarian community,* http://www.aidworkersecurity.org/resources/SupportingSecurityforHumanitarianActionMarch20104.pdf

Stoddard, A.,A.Harmer & V.Didomenico, 2009, *Providing aid in insecure environments: trends in violence against aid workers, and the operational response,* http://www.odi.org.uk/resources/download/3250.pdf

Transparency International, 2010, G*lobal Corruption Report 2009,* http://www.transparency.org/publications/publications/global_corruption_report/gcr2009

Thorburn, C. et alia, 2007, *The Acehnese Gampong Three Years On: Assessing Local Capacity & Reconstruction in Post-tsunami Aceh,* Report of the Aceh Community Assistance Research Project (ACARP). http://www.indo.ausaid.gov.au/featurestories/acarpreport.pdf

Tufts Online Seminar '*From Haiti to Afghanistan, and the Future of Humanitarian Assistance'* http://www.learningtimes.net/tufts/access-walker

Twigg, J., 2004, *Disaster Risk Reduction: Mitigation and Preparedness in Development and Emergency Planning*, Good Practice Review No 9, Humanitarian Practice Network (HPN), http://www.proventionconsortium.org/themes/default/pdfs/CRA/HPN2004_meth.pdf

United Nations, 2011, *Latest Millennium Development Goals Reports,* http://www.un.org/millenniumgoals/bkgd.shtml

United Nations, 2011, *2011 Global Assessment on Disaster Risk Reduction.* United Nations, http://www.preventionweb.net/english/hyogo/gar/2011/en/home/index.html

Van Brabant, Koenraad & others, 2010, *Operational Security Management in Violent Environments (Revised Edition),* Good Practice Review No. 8, HPN, ODI, London, UK, http://www.alnap.org/pool/files/gpr-8-new.pdf

US National Oceanic & Atmospheric Administration (NOAA), 2010, *State of the Climate Report 2010,* http://www1.ncdc.noaa.gov/pub/data/cmb/bams-sotc/climate-assessment-2009-lo-rez.pdf

Von Braun, J., 2007, *The World Food Situation: New Driving Forces & Required Action,*   International Food Policy Research Institute (IFPRI), Washington DC, USA http://www.ifpri.cgiar.org/publication/world-food-situation-2

Webster, R., J.Ginnettio, P.Walker, D.Coppard, R.Kent, 2009, *The Humanitarian Costs of Climate Change,* Feinstein International Center, Tufts University, Massachusetts, USA, http://www.preventionweb.net/files/8058_FeinsteinTuftsclimatechange.pdf

Winkworth, G., C.Healey, M.Woodward, P.Camilleri, 2009, *Community Capacity Building: Learning from the 2003 Canberra Bushfires,* the Australian Journal of Emergency Management, Vol.24, No.2, May 2009
http://www.ema.gov.au/www/emaweb/rwpattach.nsf/VAP/(966BB47E522E848021A38A20280E2386)~ajem+24+2+community+capacity.pdf/$file/ajem+24+2+community+capacity.pdf

Wisner.B., Blaikie P., Cannon T., Davis I., 2004, *At Risk (2nd ed): Natural Hazards, People's Vulnerability and Disasters,* http://www.routledge.com/books/At-Risk-isbn9780415252157

Women's Commission for Refugee Women and Children, 2008, *Disabilities among refugees and conflict-affected populations,*
http://www.womensrefugeecommission.org/docs/disab_fulll_report.pdf

World Bank, 2011, *World Development Report 2011: Conflict, Security & Development,*
http://www.worldbank.org/wdr2011