Responding to earthquakes 2008

Learning from earthquake relief and recovery operations

SUMMARY OF LESSONS

INTRODUCTION

This paper aims to provide a distillation of the learning from thirty years of humanitarian response to earthquakes. It concentrates on issues of particular relevance in earthquakes. The paper assumes that readers are already familiar with the more general lessons in the aid sector such as the key roles of needs assessment, effective coordination, accountability and consultation with the affected population.

The main intended audiences are operational decision-makers and relief programme managers working in the response to such sudden-onset natural disasters. Sadly, many of these lessons are not new.

This is a thorough rewriting of two previous briefing papers prepared for the humanitarian and development communities by ALNAP (www.alnap.org) and the ProVention Consortium (www.proventionconsortium.org).[1] The first paper dealt with relief, and the second with recovery. This paper merges both because one of the strongest lessons emerging from recent natural disasters is that providing effective support to recovery, and not disaster relief, is the overarching challenge of responding to earthquakes. This paper builds on 30 years of learning from earthquake responses ranging from the 1976 Guatemala Earthquake (M7.5[2], 23,000 dead) to the 2006 Yogyakarta earthquake (M6.3, 5,749). Lessons are drawn from 29 earthquakes in total, with the main focus on events in the present century including: the 2001 Gujarat earthquake (M7.6, 20,023 dead); the 2003 Bam earthquake (M6.6, 31,000 dead); the 2004 Indian Ocean earthquake and tsunamis (M9.1, 227,898 dead); the 2005 Pakistan earthquake (M7.6, 86,000 dead); and the 2006 Yogyakarta earthquake.

WHAT'S DIFFERENT ABOUT EARTHQUAKES?

Earthquakes and tsunamis are different from other disasters in several ways:

- Destruction of roads (by landslides), bridges, and other infrastructure makes access and communication difficult.
- The effects are concentrated, compared with those of other natural disasters.
- Aftershocks may disrupt operations, pose a threat to staff, and may cause further damage after the first earthquake.
- High mortality - collapsing buildings may kill large numbers of people (30% or more of the population of the affected area).
- Morbidity - high levels of fractures and crush injuries, although low risk of epidemics.
- Earthquakes create large amounts of rubble, which needs to be cleared before reconstruction can start.
- Earthquakes occur rarely, making them a 'harder sell' for risk-reduction measures than more frequent disasters.
- There is no gap or stability phase between relief and recovery as may occur with refugee emergencies or similar complex emergencies. Households begin their recovery efforts immediately after the earthquake.

[1] (Beck, 2005a, 2005b). This briefing paper was written by John Cosgrave.
[2] Magnitude (M) and fatality data are from United States Geological Service (2008a, 2008b).

RECOVERY FIRST

Recovery is the overriding challenge

Agencies need to focus on the recovery phase even from the start of the operation as there is no gap between relief and recovery, and recovery is the biggest challenge in sudden-onset natural disasters.

The distinction between relief and recovery is an artificial one. For a household after an earthquake, relief actions to save the lives or reduce the suffering of household members or neighbours may be accompanied by efforts to protect livelihoods by rescuing assets such as livestock and tools. The distinction between relief and recovery at the donor level is clear in terms of how funding applications are dealt with, but making the distinction in the field is far more difficult – and irrelevant to affected households.

Relief is defined as action that is intended to save lives and reduce suffering. If, for example, it takes more than three years to restore the quality of water available to households to pre-earthquake levels, is this relief or recovery? Poor-quality water increases both morbidity and mortality, and the justification for investing in improved water supply is that it reduces death and suffering.

Surveys of affected populations after the 2004 Indian Ocean tsunami and the 2005 Pakistan earthquake have showed far more dissatisfaction with recovery efforts than with relief efforts. The Fritz Institute noted that after the tsunami *'livelihood restoration programs do not get high satisfaction scores'* (Fritz Institute, 2005c, p. 5). Similarly, the Fritz Institute's survey after the Pakistan earthquake found that 31% of households reported that they had inadequate incomes after the earthquake compared with only 3% before it. Livelihood restoration was the largest problem, with 80% of households identifying this as a great or very great need after 10 months (Bliss et al., 2006, p. 10).

Even in cases where reconstruction advances quickly, restoration of livelihoods can lag behind. A review of the early recovery and cluster approach in the May 2006 Yogyakarta Earthquake[3] found that *'One year after the earthquake, there has been a substantial economic recovery and reconstruction is at an advanced stage'.* The elements of the response thought to have contributed to a fast recovery included: generous Indonesian government funding, an early start to permanent reconstruction, the impact of reconstruction on the economy, and coordinated targeted interventions from relief and recovery actors that bridged the gap to reconstruction (Manfield, 2007, pp. 3-5)., as well as learning from the tsunami response (Wilson et al., 2007, p. 23). However, even with good recovery in several sectors, assistance to restore economic livelihoods was still a major need more than a year after the earthquake (Wilson et al., 2007, p. 7).

Set realistic time-frames for recovery

Affected governments, donors and agency managers need to set realistic time-frames for funding for the recovery phase coherent with the context of the disaster. Planners need to allow for time over-runs in their plans. The recovery phase is likely to last at least three to five years for a major disaster. The greater the impact of the disaster on

[3] The May 2006 earthquake was a major disaster, leaving 5,700 people dead and 38,000 injured, destroying 156,000 houses and damaging more than 200,000. Direct economic losses were estimated at US$3.1 billon (Elnashai et al., 2006, p. 11).

livelihoods, and the weaker the resilience of the community, and the less effective the recovery effort, the longer recovery will take.

Recovery starts immediately but takes time. The recovery time-frames of donors, affected governments and implementers may be defined by politics, bureaucratic rules or media pressure rather than by a sound needs assessment. The time needed for recovery depends on the severity and scale of the disaster, the resilience of the affected community and the scale and depth of the reconstruction effort.

Unrealistically short recovery time-frames are all too common. The World Bank's evaluation of its disaster assistance noted that *'It often happens that activities that might contribute greatly to the recovery effort (and to the borrower's subsequent long-term development) are not included in ERL [Emergency Recovery Loan] projects because they cannot be completed in the three years allotted'* (World Bank, 2006, p. xxi).

One report on reconstruction after the 1986 El Salvador earthquake noted that, while it is common to include an allowance for contingencies in financial budgets, this is never done for time budgets (Lazar et al., 1993, p. 60).

Unfortunately, many agencies have even shorter time-frames (Box 1). The ECHO evaluation of the Pakistan earthquake assistance noted that communities still faced many basic problems due to the earthquake after the initial response (Cosgrave and Nam, 2007, p. 70).

Box 1: Duration of disbursement

During the response to the Gujarat earthquake the UK's Disasters Emergency Committee (DEC) increased the period during which funds should be spent from 6 months (the stated norm) to the maximum of 9 months. The DEC evaluation criticised this period as being too short and suggested a doubling to 18 months (Humanitarian Initiatives UK et al., 2001c, p. 34).

The DEC raised such huge sums (over £350 million) from the public for the tsunami response that the DEC increased the period of expenditure to three years. However the DEC evaluation recommended that this be extended to four years for general spending in Indonesia and to five years for spending on vulnerability reduction (Vaux et al., 2005). None of the recommendations for an extension was accepted by the DEC.

One issue is that much of the humanitarian community is oriented towards complex emergencies in rural settings. Population displacement is a common feature of complex emergencies, and this typically demands three to six months of intense efforts to get people established in camps before settling down to care and maintenance. The 1994 Rwanda crisis and the 1999 Kosovo crisis are examples of this type of emergency. Sudden-onset natural disasters are different. With these, the real issue is providing appropriate support to economic recovery early on rather than addressing only short-term issues. While short-term action is important to save lives and protect assets, much of this work may be done by the community itself.

Avoid compromising recovery

When considering relief interventions, agencies should also consider the likely impact of an intervention on recovery, and whether a different approach might be better for recovery. In general terms, the use of cash and local procurement are to be preferred whenever there are working local markets (subject to considerations of the likely impact on general prices). Agencies should pay close attention to the likely and actual impact of their actions on local markets.

Relief and recovery are closely intertwined, and relief assistance can either support or deter recovery. The World Bank evaluation of its disaster assistance notes that: *'Actions taken during the first weeks and months after a disaster have a major impact on the recovery process to follow, and they need to be planned and implemented accordingly'* (World Bank, 2006, p. xxii).

Relief action in shelter, food or support can have an impact on recovery. Providing tents can meet immediate shelter needs, but providing materials and tools might better promote recovery. Similarly, launching into food distribution may be a mistake as a review of the 1976 Guatemala earthquake found that post-earthquake food shortages were the result of temporary market disruptions rather than the destruction of food stocks (Bates et al., 1979, p. 95). The appropriate course of action depends on the context.

There is always a concern that food distribution might damage agricultural recovery, but a survey in Aceh found that food aid after the tsunami had no impact on farm-gate prices (ICASERD, 2005, pp. i-ii). Similarly, relief and reconstruction programmes may have an impact on local wage rates – good for wage-earners in the short term but creating difficulty for other sectors of the economy. This was a concern in Indonesia (Adams et al., 2005, p. 12), but a thorough survey found that the rates paid by agencies were close to the market rate (ICASERD, 2005, p. 56). In Sri Lanka, agencies paid the same wage rate to women as to men, although this meant that the rate paid to women was above their normally lower market rate (Jayasuriya et al., 2005, p. 23). This highlights the possible conflict between equity and social norms.

The biggest impact on wage rates is probably the increase in wages for semi-skilled construction workers because of demand in the reconstruction phase, rather than agency actions in the relief phase. Wage inflation for skilled workers led to an increase of nearly 40% in the cost of house construction in Sri Lanka (Jayasuriya et al., 2005, p. 34). Two years after the tsunami, wages in Aceh had risen by 30% for unskilled construction workers and by 65% for semi-skilled construction workers.

Paying people for their work can provide much-needed short-term employment (USAID India, 2002, p. 2), especially for those whose principal livelihood is daily labour. The Tsunami Evaluation Coalition's review of the links between relief, recovery and development in Indonesia noted that cash for work was 'enormously appreciated' by recipients (Brusset et al., 2006, p. 28). The Tsunami Evaluation Coalition noted that: *'the tsunami response has again demonstrated that non-financial assistance… is less effective and efficient than cash assistance'* (Telford et al., 2006, p. 95). Beneficiaries generally prefer cash to non-cash assistance (Adams et al., 2005, p. 30, Scheper, 2006 #2092). The World Bank noted that *'Cash Transfer projects can make an extremely important contribution to recovery'* (World Bank OED, 2005, p. 47) because of their impact on the local economy and because they allow families to meet their immediate needs. In the Pakistan earthquake response, cash grants were successful in allowing households to meet their immediate needs (Khalid and Haider, 2006, p. v).

After the tsunami in Indonesia there were concerns that cash-for-work was undermining a tradition of communal labour (Eye on Aceh, 2006, p. 16). These concerns led to agencies avoiding cash-for-work in the earthquake response in Yogyakarta (Wilson et al., 2007, p. 8), where there was a strong tradition of communal work. However, contributions to communal endeavours are not simply an expression of a romantic ideal, but a practical investment in the 'communal labour bank' that provides payback in the longer term when the contributors need assistance themselves. The ability to participate in unpaid work depends on people's overall economic situation, and the extent to which they can forego immediate payment for some future benefit. Where months of work are required it is unrealistic and unjust to rely on

voluntary community labour. The slim evidence against using cash has to be weighed against the very strong evidence in its favour.

Procurement is another area in which relief action can have an impact on recovery. The FAO real-time evaluation of the tsunami response found that, when goods were available in local markets, local procurement was not only faster and more efficient than international procurement but also contributed to local recovery (FAO, 2007, p. 54). Some donor rules can make local procurement more difficult (Prolog, 2006, p. 21). After the Gujarat earthquake those agencies with good knowledge of the local market were able to procure everything locally, while those who relied on expatriates made purchases internationally and airlifted goods in (Humanitarian Initiatives UK et al., 2001b, p. 78).

Don't prolong the relief phase

Agency planning should not overstate the need for relief, and should quickly move into recovery activities. Agencies should provide good information to the affected community on their plans, so that affected families can plan their own recovery strategies.

Prolonging the relief phase can compromise recovery. A study after the 2004 tsunami quoted one informant in Jaffna: *'people are not going to work these days, it is hard to find labour for the fields and fishing because people are going each day to sign up for different items from different donors'* (Ternström et al., 2006, p. 32). The relief phase can end quite quickly when it is well managed. One review of earthquakes in Iran in 1997 noted that 95% of people were rescued within 24 hours and all the affected population were housed in 70,000 tents within 48 hours (Ghafory-Ashtiany, 1999).

Agencies need to know when to phase out support activities in order to avoid discouraging recovery (Goyder et al., 2006, p. 5) without creating excessive hardship. As part of their own recovery planning, families need clear information about when relief support will be phased out (World Bank OED, 2005, p. 47), and they need information on recovery plans in order to make informed choices (Corsellis et al., 2008, p. 22). The availability of information has a large impact on recovery (Wall, 2005, p. 2), and lack of information can encourage dependency.

Advocacy and engagement are vital tools for response

Agencies need to advocate for good policies to promote rapid recovery. Agencies' views of 'good' policies need to be based on dialogue with the community. Agencies need to engage fully with the government and with coordination mechanisms to promote better policies.

The policy environment controls the speed and strength of recovery. For example, policies on land use, planning, shelter type and compensation conditions can have a large impact on the whole recovery process.

Recent responses have highlighted a number of potential policy pitfalls for any earthquake response.

- Separating relief coordination from recovery coordination: this happened in Sri Lanka, post-tsunami, with two separate government task forces for relief and for development (Goyder et al., 2006, p. 53). The same mistake was seen in Pakistan with the dismantling of the cluster coordination mechanism at the official end of the relief phase, later described as 'premature' (Ahmed and MacLeod, 2007, p. 33).
- A lack of policy coherence between different parts of government: in Pakistan, for example, there were policy differences between the rehabilitation agency and the line ministries, and between the central government and the districts (Johansson et al., 2006, p. 8).
- Slow decisions on policy issues vital for recovery: this was the case with government wavering over the coastal buffer zone in Sri Lanka, where reconstruction was forbidden (Goyder et al., 2006, p. 53). It was also the problem with delays in the issuing of approved housing standards after the Pakistan earthquake (UNDP, 2006, p. 8). This meant that those who rebuilt before the dissemination of the final approved plans were denied compensation for lost houses, as their new houses were not compliant.
- A lack of clarity about procedures that would apply: in Pakistan, uncertainty about the rules for compensation delayed reconstruction (Kirkby et al., 2006, p. 9). Similarly, dithering about shelter policy delayed recovery in Sri Lanka (Bhattacharjee et al., 2005, p. 25).
- Lack of general development frameworks or plans: this was a problem after the tsunami in Indonesia (Scheper et al., 2006, p. 20) and in Sri Lanka (Goyder et al., 2006, p. 53).

Box 2: Promoting better policies

Agencies can promote better policies by:

- consulting closely with the community so that agency policy is based on community priorities
- engaging fully in coordination mechanisms and promoting inclusiveness
- engaging fully with different levels of government
- supporting good policies by implementing them in their own programmes, and by disseminating information about them
- advocating for better policies where the policies being adopted have strong negative implications for the affected population; this is what happened with the transitional shelter policy after the Yogyakarta earthquake (OCHA, 2007, p. 5)
- advocating for speedy considered decisions so that recovery is not held up by over-long decision processes
- advocating for flexible policies so that the needs of a larger proportion of the affected population are met
- advocating for greater policy coherence between different layers of government, and through the practical measure of supporting the proponents of the best policies with the resources to implement them.

Agencies need three things to be effective advocates for better policy:

1. good understanding of the situation of affected people, and the likely impact of different policies on them; this demands dialogue with the affected community
2. engagement with coordination mechanisms
3. engagement and dialogue with different levels of government.

Recovery is not neutral

Agencies should analyse relief and recovery policies to determine their impact on men and women, on privileged and disadvantaged groups and on the distribution of resources within a society.

Disasters are not neutral. *'Natural disasters do not affect people equally as if by an arbitrary stroke of nature. Instead, the disaster impact is contingent on the vulnerability of affected people, which can and often does systematically differ across economic class, ethnicity, gender and other factors'* (Neumayer and Plümper, 2007, p. 27). Recovery interventions are also not neutral: they can increase, reinforce or reduce existing inequalities. However, interventions are unlikely to lead to improvements unless they are actively planned to do so. Recovery interventions may have a negative impact on poverty, gender roles, the environment and the livelihoods of vulnerable groups. For example, after the 2004 tsunami, recovery aid was concentrated on the fishery sector and there was little aid for agriculture, business or the informal sector (ActionAid et al., 2006, p. 36). Within the fishing sector it was the men who fished on their own account who got the assistance, rather than women who traded fish.

Every disaster widens the gap between rich and poor (Tearfund, 2005, p. 4): the rich have reserves that enable them to recover more quickly, and the poor have far more limited reserves. Delays in setting policies, reconstruction and restoring services all lead to asset erosion. Such delays fall more heavily on the poor and the vulnerable than on the better off (Jayasuriya et al., 2005, p. 39; UNDP, 2006, p. 55). Given this tendency of disasters to increase inequalities, it is vital that agencies pay attention to issues of social protection and economic recovery.

Lack of attention to gender is a recurring failure in disaster response (ALNAP et al., 2003, p. 114; ALNAP et al., 2002, p. 117; ALNAP et al., 2004, pp. 110-111; ALNAP et al., 2001, p. 48). Gender is an important consideration in earthquakes because earthquakes usually kill more women than men,[4] and disrupt gender roles within the community. Gender issues here include not just the impact on women in a disaster but on the differential impact on men and women. After the tsunami, high female mortality left large number of widowers, leading to social problems (Danvers et al., 2005, p. 3) and pressure on livelihoods (Mattock, 2005, p. 128). After the Pakistan earthquake, widows in camps were confined to tents due to cultural norms and could not queue to get registered or present their claims (Strand and Borchgrevink, 2006, p. 19).

Compensation, whether for livelihoods or shelter, involves significant resource transfers. Agencies need to ensure that these transfers do not negatively affect the poor or other vulnerable groups. For example, fisherwomen in India did not get compensation after the 2004 tsunami as they were not members of the fishermen's associations that controlled the compensation (Fletcher et al., 2005, p. 22). Agencies should also ensure that they are not subject to elite capture, where an elite is setting the recovery agenda – as was suspected in one particular project after the Pakistan earthquake (Khalid and Haider, 2006, p. 24). Similarly, gatekeepers for compensation may discriminate and prevent some groups from benefiting, as happened after the 2004 tsunami (Fletcher et al., 2005, p. 24).

[4] Neumayer and Plümper's research shows '*that it is the socially constructed gender-specific vulnerability of females built into everyday socioeconomic patterns that lead to the relatively higher female disaster mortality rates compared to men'* and that the gender difference in disaster mortality rates reduces as women's socio-economic position improves (2007, p. 27).

Disaster response is no magic bullet

Agencies can take advantage of the opportunity for social change introduced by major disasters. However, a single disaster response cannot undo decades of underdevelopment. Agencies should plan for their work in a realistic environment and not on the assumption that the disaster has removed all previous constraints.

The post-disaster context can sometimes present opportunities for promoting social change. However, disaster responses are usually constrained by some of the same issues that constrain development. For example, the Asian Development Bank's evaluation of its programme in Pakistan described the country as having *'provided a challenging context in which to implement a program of development assistance'* and listed a whole range of constraints including, among others, ethnic and cultural divisions, feudal social relations, poor governance and corruption (Nuestro and Mongcopa, 2007, p. iii).

No disaster response can magically sweep away all of these pre-existing problems. The synthesis report of the Tsunami Evaluation Coalition noted that: *'The tsunami response cannot be a magic bullet for recovery from decades of conflict and under-development'* (Telford et al., 2006, p. 73). Thus, response planning needs to be firmly based on the reality of the affected country. While the shock of the disaster may provide opportunities for introducing social and other changes, the window for such changes is quite small.

However, there are examples of successful change initiated in disasters. For example, USAID's decision not to fund roofing sheets with asbestos after the 1986 El Salvador earthquake led to non-asbestos roofing becoming the new standard in the country (Lazar et al., 1993, p. 54). The factory making asbestos-cement roofing went out of business shortly afterwards. Similarly, the promotion of reinforced-concrete-framed housing in Pakistan after the 2005 earthquake has probably established a new norm for houses in lower altitudes in the affected area.

Another area in which disaster interventions have been effective is in changing the pattern of formal house ownership, with new houses registered in the names of both husband and wife. A follow up on the 2001 El Salvador earthquake response, in which the World Bank implemented a joint-ownership policy for new houses, found some communities where 50% of respondents reported that a woman was one of the legal home-owners and that, overall, 37% of the homes were wholly owned by women.

Agencies have also taken advantage of earthquakes to promote girls' schooling and women's access to medical care, as in Pakistan. However, the agencies have not brought about a change in attitudes so much as addressing the absence of female teachers and doctors. The demand for medical services for women is clear, but is largely unmet because of the absence of female medical staff. The demand for education for girls also exists in rural communities in Pakistan (Lloyd et al., 2007, pp. 99-100), but is again unmet because of the lack of girls' schools and the high levels of teacher absence.

Clearly, there are limited opportunities for promoting social changes after disaster.

Include measures to reduce disaster risk

Disaster-risk reduction is a long-term investment. The immediate post-disaster context provides fertile ground for planting the seeds of risk- reduction strategies. However, these strategies must reflect the full range of hazards and risks, rather than

focusing on just one of them. The time for introducing a more hazard-aware approach is limited, and this must be done from the start rather than as a later add-on.

'Natural hazard risks are highly concentrated, so special attention needs to be given to planning ahead for disaster and to reducing long-term vulnerability in countries at highest risk' (World Bank, 2006, p. xxiii). Even the most seismically active place may see major earthquakes only every few generations. In the absence of a recent disaster, this long return period makes it much harder to promote disaster-risk reduction for earthquakes than for more frequent hazards like floods. After an earthquake there is a lot more interest in disaster-risk reduction, and agencies should take advantage of this to promote risk reduction. However, many regions are susceptible to multiple hazards, and it is important that risk reduction is based on an assessment of all hazards and risks, and not just on the most recent disaster.

Possible actions for agencies include:

- raising awareness at the local level about risk assessment, prevention and mitigation in communities (Telford et al., 2004, p. 45)
- training communities in skills, such as first-aid, that are applicable across a wide range of hazards (WHO, 2005, p. 7)
- providing opportunities for community members to discuss future city planning as a first step to community participatory rehabilitation (Nakagawa and Shaw, 2004, p. 7)
- helping at-risk communities safeguard their lives and assets by developing disaster plans or evacuation plans (Battista and Baas, 2004, p. 64)
- helping communities develop community contingency action plans (Holdsworth and Mutale, 2006, p. 11)
- promoting the integration of risk management in long-term planning (Battista and Baas, 2004, p. 7)
- working with communities to identify risks and promoting the safe siting of buildings (Corsellis et al., 2008, pp. 254, 256)
- protection of key infrastructure such as water plant and hospitals (Tearfund, 2005, p. 17)
- building model homes in various communities as examples for others to learn from (McGinn et al., 2006, p. 13).

Community disaster preparedness is important because most survivors are rescued by friends and neighbours rather than by organised rescue teams. This was the case in the Gujarat earthquake (Humanitarian Initiatives UK et al., 2001a, p. 4), the Yogyakarta earthquake (Bliss and Campbell, 2007b, p. 5) and the 2004 tsunami in which 91% of those rescued in Indonesia reported that they had been rescued by private individuals (Fritz Institute, 2005c, p. 3). Rescue operations are normally over in a matter of days, although some rescues may take place after a week or more where people are trapped in collapsed structures or in isolated regions. While international search and rescue teams are often flown in at great expense, they rarely rescue anyone because of the lead-time involved. When they do pull someone from the rubble, they may just be displacing local rescuers.[5] The destruction of transport infrastructure associated with large earthquakes increases the reliance on friends and neighbours.

The Yogyakarta earthquake demonstrated that preparedness pays off. In the regency where nearly one quarter of households had taken part in disaster preparedness training (because of the threat from a nearby volcano), a higher proportion of affected households got

[5] In Gujarat, while thousands of people were pulled from the rubble by neighbours and local officials, the UK media focused on the 69-strong British team which rescued just seven people (Humanitarian Initiatives UK et al., 2001c, p. 44).

assistance quickly, and were happier with the aid provided (Bliss and Campbell, 2007b, pp. 6,12) than in regencies with much lower participation in disaster preparedness.

RELIEF ISSUES

Disease is unlikely

Agencies should not overstate the risk of disease, as this leads to the misallocation of resources, and promotes needless fear in an already traumatised population. This does not mean that precautionary measures such as water disinfection or disease surveillance are not necessary, but simply that the risk of epidemics, though real, is quite low.

One of the recurring myths of natural disasters is that outbreaks of disease inevitably follow disasters (Noji and Toole, 1997, p. 367). One of the biggest concerns is normally about waterborne disease but such outbreaks are rare. Toole's 1997 review of 38 natural disasters between 1970 and 1992 found only two outbreaks of waterborne disease and four other outbreaks of any kind. Only one disease outbreak – of a rare soil-based fungal infection in California – occurred after an earthquake (Toole, 1997, pp. 86-87).

Box 3: Large numbers of dead

Earthquakes are not a major cause of mortality in the overall scheme of things. At around 5–10 deaths per million per year they kill only as many people in a year as TB and fewer than traffic accidents kill in a single day (Spence, 2007, p. 146). However, earthquake risk is not spread evenly around the world but is concentrated in a few regions. Unlike flooding or climate-related disasters, earthquake events are not increasing in frequency.

Individual earthquakes can generate large numbers of fatalities. The Bam earthquake killed about 30% of the population of Bam and injured another 16% (Kuwata et al., 2005). Bilham (2004, p. 9) notes that the 1976 Tangshan earthquake killed at least 35% of the population of Tangshan, and suggests that with the growth of megacities in seismically vulnerable locations we can expect earthquakes in the future that will cause a million or more fatalities. So while the number of earthquakes will not change, their impact, in terms of the number of people affected, will increase.

The biggest cause of fatalities is building collapse, responsible for 75% of all deaths in a survey of 1,100 fatal earthquakes. The remaining 25% of deaths are due to non-structural or follow-on hazards such as fire, landslides and tsunamis (Coburn et al., 1992). This emphasises the need for agencies to ensure that structures they build in earthquake hazard zones should be aseismic.

A recent review of over 600 geophysical[6] disasters since 1985 found only three instances where such disasters led to epidemics (Floret et al., 2006, p. 543). This is hardly surprising as such disasters often lack the aggregation of populations which Topley's work (1988) suggests is a factor in the biology of epidemics. Toole (1997, p. 79) makes the same point, that outbreaks of communicable disease are rare after natural disasters unless large numbers are displaced from their homes and placed in camps.

The problem with basing actions on myths is that resources that could be better used for dealing with real problems are frittered away on imaginary ones. Even though there was no confirmed case of cholera in Aceh, an immunisation campaign targeted 160,000 people with preparations for cholera (Guha-Sapir and Panhuis, 2005, p. 19) using an expensive[7] two-dose oral vaccine.

[6] These are earthquakes, volcanic eruptions and tsunamis.
[7] The wholesale price of the vaccine in the UK was £23.42 for a two-dose pack in 2007 (NHS Business Services Authority, 2007), then equivalent to about US$47.

Disaster response should be based on needs assessment and not on myths. As a review of health action after the 2004 tsunami noted: *'There is no substitute[e], even in emergencies, for evidence based response'* (Guha-Sapir and Panhuis, 2005, p. 19).

The ratio of dead to injured varies widely

There is no simple way of predicting the ratio of dead to injured. This ratio can vary widely. Agencies should base their response on an initial assessment rather than on rules of thumb about casualty ratios.

Earthquakes and tsunamis can kill large numbers of people, but the ratio between the number of dead and the number of injured varies widely (and differs significantly between earthquakes and tsunamis). In the 2004 tsunami the ratio of killed to injured varied with the height of the waves. In Aceh the ratio of dead to injured survivors was 6:1, dropping to 1.5:1 in Sri Lanka and 0.3:1 in India (Cosgrave, 2007, p. 6).

The likely ratio of dead to injured is not an academic question. In the aftermath of the 2004 tsunami, it was suggested, in reference to Indonesia, that there would be one dead for every four injured (1:4) rather than the six dead for every one injured (6:1) that was actually seen in Aceh.[8] This led to an overestimate of the likely number injured in Indonesia and of the need for field hospitals and medical care. The World Health Organisation's report on health aspects of the tsunami noted that there were too many field hospitals in the response (WHO, 2005, p. 84) and that field hospitals have often been inappropriate in previous disasters (WHO, 2005, p. 22).

Although there is some academic research on predicting the likely number of casualties from an earthquake (Coburn et al., 1992), this requires detailed information that will not be available immediately. We know that lower GNP per head and higher public-sector corruption are associated with higher fatality levels (Escaleras et al., 2007, pp. 209, 222).

Let the living bury the dead

In dealing with the dead, agencies should give priority to the needs of the living. De Ville de Goyet (2004, pp. 297-298) notes that the real disease risk posed by dead bodies after natural disasters is not epidemic disease but the risk of mental illness caused by the lack of closure over the missing. Agencies should deal with the dead in accordance with the current guidelines for best practice (ICRC, 2004; Morgan et al., 2006a).

Those working in disasters never forget the smell of death where it takes days or weeks to recover cadavers. Feelings of disgust are natural and are part of our evolutionary defence against disease (Curtis, 2007a; Curtis, 2007b). However, these feelings may prompt us to do irrational things like rushing to bury the dead. We have known for nearly thirty years that the cadavers of those who have died in natural disasters pose little disease risk (de Ville de Goyet, 1979). The most recent research (Morgan, 2004) has reiterated this. Yet the myth

[8] This was said to be based on earlier experience with the Papua tsunami (17 July 1998). The figure was used by Jan Egeland (the UN's Emergency Relief Coordinator) in his press conference of 29 December 2004 (United Nations, 2004 Segment 5:50 to 6:17). The number seems to have been based on a misunderstanding as the actual ratio of seriously injured to dead in Papua was 2.6:1 (Dengler and Preuss, 2003, p. 2001).

continues that there is an urgent need to bury the dead (de Ville de Goyet, 2000, 2004; Morgan and de Ville de Goyet, 2005).

Agencies also overestimate the protective equipment needed for handling the dead. Morgan et al. (2006b, p. 0813) in reviewing the management of the dead after the 2004 tsunami recommended that, for natural disasters: *'Body handlers should follow universal precautions for blood and body fluids, wear gloves, and wash their hands'.* Special protective equipment may of course be necessary when handling the bodies of those who have died of epidemic disease but even here, the risks are not great. The infectious agents responsible for disease may not last for more than a few days in a dead body. This is the case for tuberculosis, hepatitis B and C, and diarrhoeal disease. The AIDS virus can survive for up to six days after death of the carrier (Morgan et al., 2006a, p. 28).

The main problem with rushing to bury the dead is the impact that this has on the living. The lack of proof of death can have an economic impact on survivors, be it on their livelihoods, inheritance or remarriage options. Not knowing the fate of loved ones can have an important psychological impact, and viewing the body may be necessary for closure in the grieving process. All recent guides for dealing with mass deaths recognise this (Home Office, 2004, p. 40; Morgan et al., 2006a, p. 25; Pan American Health Organization, 2004, p. 113).

Prevent further asset erosion

Agencies should provide assistance quickly and flexibly to prevent asset erosion. Cash support for households can be effective at preventing distress sales of productive assets.

Loss of assets may force people into poverty and longer-term dependence. Assets are much harder to replace than to lose and any response should seek to preserve assets. The poor have a narrow asset base and are therefore worse affected by asset erosion. The World Bank notes that failure to meet the cash needs of the poor forces them to sell their productive assets, including land, to the better off (World Bank, 2006, p. 47). Thus asset erosion increases the gap between rich and poor.

Displacement is another cause of asset loss, as in Pakistan where families going to camps had to dispose of livestock. Leaving the disaster site may also lead to loss of assets through looting by those scavenging in the rubble. Asset sales are normally at unfavourable prices for the seller. People in the Allai Valley reported being forced to sell livestock at a fraction of its normal value in the aftermath of the Pakistan earthquake (McGinn et al., 2006, p. 23). Assets may also be sold to fund shelter: after the Yogyakarta earthquake, people reported that they were forced to sell their livestock to finance shelter reconstruction (Wilson et al., 2007, p. 81).

In some disasters lack of access to animal feed may require owners to dispose of their livestock. Earthquakes can destroy fodder in several ways, by burying it in collapsed buildings, exposing stored fodder to water damage, and by destroying irrigation systems for fodder crops. After the tsunami, salinity introduced by the flooding of pasture lands reduced livestock fodder (Asian Development Bank et al., 2005, p. 75). The shortage of feed for surviving animals was a problem in many tsunami-affected countries, including Thailand (Bagai et al., 2005, p. 20).

Clearly quick flexible assistance means that households don't have to sell their assets at unfavourable prices. Good information for beneficiaries about planned interventions can help them make good decisions about selling or retaining their assets.

Pay people to clear rubble

Pay people to clear rubble, but be aware of the possible impact on community self-help mechanisms. Protect the property rights of the owners of the rubble, provide appropriate protective equipment for the workers, and deal with hazardous material responsibly.

Every earthquake generates large amounts of rubble. One relief measure that can be useful is paying people to clear rubble. This can quickly inject some cash into the economy. However, there are several issues to consider here.

- Rubble contains elements such as timber, metal and other scrap that can be used to provide emergency shelter; 40% of respondents in a survey in Aceh reported that they had used salvaged materials to build emergency shelters (IOM, 2005a, p. 57). Scrap also has an economic value that may be quite significant in the post-disaster construction boom. The price of timber tripled in Aceh after the tsunami (Oxfam, 2005, p. 10). Scrap is so attractive that people may engage in risky activities to collect it, whether diving in Aceh (Brusset et al., 2006, p. 24) or risking injury in Pakistan (EERI, 2006, p. 8). Best practice here includes publishing the prices paid for scrap and salvaged materials, as Oxfam did in Aceh after the tsunami.
- Rubble may contain unrecovered human remains.
- Rubble may contain unrecovered personal property.
- Rubble may contain hazardous waste. Asbestos-cement roofing sheets were used extensively throughout the tsunami-affected regions. Such roofing sheets pose a hazard to roofers installing them, as cutting or drilling the sheets can release fibres into the air. If sealed, asbestos-cement roofing sheets pose relatively little hazard in use. However, when the sheets are broken they pose a hazard because they then release fibres into the air. Sharp edges and sharp items such as nails in rubble can pose a safety problem.
- Clearing rubble can be a problem if shelter-compensation payments are based in part on the presence of rubble and obvious damage.
- Paying people to remove rubble raises the concern that this may undermine unpaid community labour systems. However, the scale of the task means that it is often unsuitable for voluntary community labour.
- Rubble removal will need mechanical assistance if reinforced concrete was used extensively.
- Appropriate dumping sites may be needed for rubble that cannot be recycled, or that presents an environmental hazard.

Flexibility is key

With time, agencies should provide assistance in increasingly flexible ways to match the growing diversity of needs as households pursue their individual recovery strategies.

Flexible assistance is key to a successful response as it allows a better fit between needs and assistance. Cash provides the most flexible assistance direct to beneficiaries where there are functioning markets. The World Bank evaluation noted that *'Flexibility and innovation are essential to success with a natural disaster response'* (World Bank, 2006, p. 29). Flexibility is also seen as being at the heart of an agency's ability to respond rapidly (Houghton, 2007, p. 1), and flexibility in the use of resources (together with preparedness) is at the heart of any response system (Adinolfi et al., 2005, p. 39). The Word Bank's review of the Armenian earthquake notes that *'A phased approach to reconstruction programs after*

natural disasters provides flexibility and avoids locking into inappropriate activities' (World Bank OED, 2004, p. 18).

Affected communities in Gujarat said that they would have preferred cheaper and more useful items or cash (Humanitarian Initiatives UK et al., 2001b, p. 25). Save the Children reported that beneficiaries in South Sudan would have found cash grants more useful than the tools and seeds that they received (Prolog, 2006, p. 30). The World Bank's experience in disbursing cash assistance amounting to over $850 million (as cash grant, cash for work, and similar programmes) has been quite positive, with projects representing less than 1% of the total amount being rated as unsatisfactory (World Bank, 2006, p. 147). In Pakistan, Save the Children found that 75% to 85% of those receiving cash grants were using them in ways that Save the Children considered to be appropriate (Khalid and Haider, 2006, p. 23).

On the occasions when cash may not be suitable, voucher systems for credit may be appropriate. Goods in kind may be suitable at the very start of a response, when markets are not functioning and the needs of different families are very similar. However, with time, each family pursues its own recovery and livelihood strategy, and the needs of different families diverge. More flexible assistance is therefore needed later on in a response, as needs become more varied.

MANAGING AID

Use existing social capital

Agencies can support social capital and local networks. The support may be as simple as providing people with the means to contact other members of the network,9 or it may consist of strengthening such networks by asking for their assistance in the response and providing them with some additional resources.

A review of post-disaster response in Indonesia noted that: *'relief and recovery efforts will be more effective if they identify, use, and strengthen existing social capital (community-based skills, programs, and networks). The community-driven approach to post-disaster recovery, which builds on this social capital, requires significant investments of time and human resources but has results in greater client satisfaction, more rapid disbursement, and local empowerment'* (Leitmann, 2007, p. i148).

The World Bank has noted that social networks sustain people during disasters and should be considered at all stages of the response (World Bank, 2006, p. 45). Such social networks can range from links to relatives sending remittances, to complex membership organisations. The risk of undermining social networks is one of the reasons why moving people to temporary camps may not be a good idea (although may be necessary if high-density areas are involved, land is lost, or there are continuing threats such as winter cold). The quick recovery after the Yogyakarta earthquake was attributed in part to the fact that existing community social structures were left intact (Manfield, 2007, p. 4). Awareness of the value of social capital is one reason why communities are reluctant to relocate after a disaster.

[9] This is critically important for areas where there are large flows of remittances (Cosgrave and Nam, 2007, p. 27). Most of the developing world that is at greatest risk of earthquakes has significant income from remittances.

Ask recipients if your assistance is appropriate

Cultural awareness helps to prevent errors at the very start of an operation. However, as needs become more complex, agencies need to check that their aid is appropriate by asking the affected population, and by setting up channels for affected people to raise their concerns about assistance.

Following a 1997 earthquake in Iran it was noted that: *'Most of the foreign help with approximate value of 11 million dollars, even though it was appreciated, was more political than toward the immediate need of the affected people'* (Ghafory-Ashtiany, 1999, p. 17). Aid is appropriate only if it meets the needs of the affected population. This is easier at the start of an operation, when needs are less differentiated.

Inappropriate aid is a feature of all responses, whether it's rice of unacceptable quality in Bam (Calvi-Parisetti, 2004, pp. 14-15); unneeded high-energy biscuits in Pakistan (Reed et al., 2007, p. 10), unsuitable clothing in Gujarat (Humanitarian Initiatives UK et al., 2001b, p. 21), expired medicines in Yogyakarta (IFRC, 2007, p. 6) or a wide range of goods in the tsunami response (Telford et al., 2006, p. 52). Nowadays, inappropriate aid is normally associated with less experienced aid actors, but even experienced aid agencies sometimes get it wrong – as was the case with culturally inappropriate hygiene kits in the Pakistan earthquake (Crawford et al., 2006, p. iv in Appendix A).

Every year, the ALNAP review of humanitarian action highlights the need for agencies to consult with beneficiaries. Ideally, agency relief and recovery plans should be based on a profound knowledge of the context of the community. Existing context knowledge may have to serve at the beginning, but this should quickly be supplemented by consultation with beneficiaries. Asking the affected people about their satisfaction with the assistance delivered is the best measure of agency performance.

One of the most welcome developments of the response to the 2004 tsunami was the large number of beneficiary surveys undertaken (Fritz Institute, 2005a, 2005b; IOM, 2005a, 2005b; IPS, 2005a; Lindgren et al., 2005; UNORC, 2006; Wall, 2005), as well as studies for individual TEC reports and for the DEC evaluation. Unfortunately this good example has not been followed since. Internet searches show only one published independent beneficiary survey after the Pakistan Earthquake (Bliss et al., 2006) and one interagency one (McGinn et al., 2006). The Fritz institute has continued its sterling work with surveys after the 2006 Java tsunami (Bliss and Campbell, 2007a), and the 2006 Yogyakarta earthquake (Bliss and Campbell, 2007b).

Complaint and feedback mechanisms are a powerful tool for improving programme quality and ensuring that aid is appropriate. MedAir changed its non-food-item package in Sri Lanka after the 2004 tsunami on the basis of beneficiary feedback (Lee, 2005, pp. 14-15). Tearfund used a beneficiary complaints mechanism in the 2005 Pakistan earthquake to improve the quality of its programme (Iqbal et al., 2008). In the 2006 Yogyakarta earthquake, CRS gave out the mobile phone numbers of senior officers to give people a channel for complaints (Wilson et al., 2007, p. 19).

LIVELIHOODS AND SHELTER

Livelihoods are closely tied to shelter

Agencies need to link their livelihood and shelter approaches.

Shelter is closely associated with livelihoods. This may be as simple as having a secure place for possessions and allowing easy travel to work (Humanitarian Initiatives UK et al., 2001c, p. 13). It may be because some livelihood activities such as petty trading, gardening or production are based in the home. One example of good practice in understanding the link between shelter and livelihoods was the cash disbursement scheme in Indonesia of the British Red Cross Society (Bhattacharjee et al., 2005, p. 22).

Setchell (2005, pp. 9-10) notes four ways in which shelter impacts on the economy. Sheppard (2005) essentially consolidates these into two: backward linkages caused by the economic demand generated by construction activity; and forward linkages due to the economic impact of shelter, through its contribution to health, through its role as a capital resource, or by supporting home-based enterprise.

Shelter is also linked to livelihoods in that the location of the home controls the livelihood strategies that may be adopted. This is a common problem with resettlement projects that take people quite a distance away from the sites where their livelihoods were formerly based, This was the case with 80% of relocation projects funded by the World Bank in the last 20 years (World Bank, 2006, p. 46).

Box 4: Seven economic impacts of shelter

1. Income increases faster for families provided with shelter than for others.
2. Emergency shelter investment generates an economic payback conservatively valued at 3 to 8 times the value of the initial investment.
3. Shelter has a positive economic return for the poorest and most vulnerable, even in the short term.
4. Shelter benefits last well beyond the recovery period.
5. Shelter benefits are larger after a year or two because of forward linkages.
6. Shelter has a vital, but under-appreciated role as capital for development.
7. Beyond capital, but linked to it, shelter also has an under-appreciated role as a platform for increasing incomes.

Based on Sheppard et al. (2005, pp. 10-11)

Livelihoods are also connected to shelter through employment opportunities arising from shelter construction (Anderson, 2006, p. 5). One job in housing provides at least one other job in the general economy, if not two (UNHCS and ILO, 1995, p. 129). Shelter reconstruction may even be significant enough to promote more general economic recovery, as happened after the Yogyakarta earthquake (Manfield, 2007, p. 5).

Livelihoods are the key to recovery

Agencies should give the same priority to livelihoods as does the affected population. This implies that agencies should consult affected people about their priorities.

Livelihoods support to affected populations will include relief assistance as an important component until people have restored their pre-disaster livelihoods. Beck (2005b, p. 9) notes that attention to livelihoods has been problematic in the past, due to the emphasis on large-scale infrastructure, the complexities of livelihood strategies and limited understanding by government and agencies of these complexities.

For the affected population, livelihoods are the key recovery issue. Disasters can affect family livelihoods in several ways.

- Loss of human capital through death, injury, or psychological trauma (as in those afraid to live near the shore in Sri Lanka after the 2004 tsunami, or those dealing with the loss of family and friends). Training programmes can compensate in part for some of these impacts.
- Loss of assets including land, livestock and shops. This can include tangible assets such as surfing conditions off the island of Simeulue (which changed due to sea-bed changes after the tsunami and the March 2005 earthquake), or intangibles like tourist perceptions of a resort. Assets may be lost during the relief phase. This happened in Pakistan when people sold their livestock to raise money. Agencies can intervene to prevent the further loss of assets by providing flexible assistance.
- Loss of employment, in either the formal or informal sectors. The decline of tourism in Sri Lanka after the tsunami had a knock-on effect for many of those who earned a living from tourists. Providing employment opportunities locally in the reconstruction phase can counter this. The employment of outsiders for reconstruction in Aceh was a point of contention for the affected population (ActionAid et al., 2006, p. 10).
- Loss of markets or access to them. After the tsunami, fishermen in Aceh could not sell fish, as people did not want to buy them from fear that they had eaten the dead. Agencies may be able to provide assistance to help re-establish markets.
- Opportunity costs of relief or recovery measures. This was a feature in the Pakistan response where male family members returned from work elsewhere in Pakistan or abroad to assist their families directly, resulting in a loss of remittance income. Opportunity cost can be as simple as the time needed to queue for assistance. After the Gujarat earthquake women complained that *'women were unable to queue for hours as we were looking after children'* (Humanitarian Initiatives UK et al., 2001b, p. 18). Agencies can reduce the opportunity cost of accessing relief and recovery measures by consulting beneficiaries and through careful programme design.

Agencies sometimes allot livelihoods a lower priority than the affected population does. This was the case in Bam where interveners gave a low priority to irrigation for orchards, ranking such support lower than shelter, schools and drinking water. The affected population gave water for orchards their highest priority because of the risk of losing their orchard assets (Fallahi, 2007, p. 33). This was also the case after the Gujarat earthquake where the DEC evaluation noted that *'People constantly emphasised the need to restore livelihoods rather than receive relief and expressed some frustration that outsiders did not listen to them on this point'* (Humanitarian Initiatives UK et al., 2001c, p. 16).

Allow for complex livelihoods

Agencies should provide support as flexibly as possible, reflecting the complexity of real livelihoods rather than the simplicity of imagined ones. Agencies should be clear whether their actions are intended to provide a temporary livelihood, or to support the development of sustainable livelihoods. Consider subsidised credit for supporting livelihoods where large investments are needed.

Livelihood strategies for the poor, and in developing countries generally, can be quite complex. In the *Reducing Disaster Risk* report UNDP noted that: *'The rural poor, who are most at risk, are often no longer subsistence peasants. Instead, rural dwellers depend on complex livelihood strategies, including seasonal migration or inputs from remittances sent from relatives living in cities or overseas'* (UNDP, 2004, p. 5). After the Pakistan earthquake, research in the isolated and very rural Allai valley found that only a quarter of household heads gave some form of agriculture as their main occupation (McGinn et al., 2006, p. 22).

Thus there is a difference between the imagined single-strand livelihood of 'farmer' and the real livelihood of 'farmer, herder, petty trader, casual labourer'.

Small businesses are often important sources of employment and income. Small businesses and shops were identified as the second-biggest area of job losses (after agriculture) in the Pakistan earthquake (Asian Development Bank and World Bank, 2005, p. 14). In Bam, small businesses were the second-most-important sources of income after administrative work. (Fallahi, 2007, p. 27). In Yogyakarta, many women lost livestock and their small businesses, and needed loans to restart (Wilson et al., 2007, p. 81).
Replacing assets raises a basic problem of equity. Any programme of like-for-like replacement means that the better off get more assistance than poorer people. While replacing multi-day boats (boats that make trips of several days to fish further out to sea) for those affected by the 2004 tsunami represents a large subsidy for the better off, it does create employment that would not otherwise exist. In such cases, and for the private sector generally, subsidised credit may be more appropriate than grants, as UNDP suggested for recovery in the private healthcare sector after the Pakistan earthquake (UNDP, 2006, p. 55). In Yogyakarta, *'cash has not only proved to be the most flexible form of assistance but has also had a significant impact on the recovery of the local economy'* (Manfield, 2007, p. 13). One study presented at a Cash Learning Project workshop in Aceh found that the use of cash is more flexible and empowering, although it also creates some problems (Adams et al., 2005, p. 30).

Cash has been used extensively for post-earthquake livelihood assistance. The government provided cash grants to over 250,000 families after the Pakistan earthquake (ERRA, 2007, p. 5). In Sri Lanka, the livelihood cash grant was criticised as being too small, and paid for too short a duration (Jayasuriya et al., 2005, p. 42). However, it appears that the Sri Lankan grants were intended to provide livelihood support rather than the capital to rebuild sustainable livelihoods.

Don't recreate unsustainable livelihoods

Agencies should not attempt to restore particular livelihoods unless these livelihoods are probably going to be viable in the changed circumstances after the disaster.

The rush to recovery sometimes automatically assumes that restoring pre-disaster livelihoods will be adequate. This is not necessarily so. Pre-disaster livelihoods may have been under threat from market or other forces. The case of fishing livelihoods after the tsunami is a good example. Over-fishing was a problem before the tsunami (Christoplos, 2006, p. 53; Scheper et al., 2006, p. 22), and was worsened by the post-tsunami oversupply of fishing boats, estimated at 2,000 additional boats in Sri Lanka (de Ville de Goyet and Morinière, 2006, p.

Box 5: Livelihood recovery can be expensive

Livelihood recovery is a difficult area for agencies to address, due not only to complexity but also to cost. The lost assets may represent the accumulation of years (education and training), decades (as for shelter or livestock), or even centuries (as in the case of irrigation systems in the Pakistan or Bam earthquakes). After the Mozambique floods it was low-cost cropping agriculture that got the most assistance, rather than the more capital-intensive livestock or fishing sectors (Wiles et al., 2005, p. xi). This was not the case after the 2004 tsunami where there was an oversupply of fishing boats (IPS, 2005b, p. 10; Srinivasan et al., 2005, p. 14), many of which were unsafe or inappropriate (Alexander, 2006, p. 11; Eye on Aceh, 2006, p. 30). But even in the tsunami response, it was the cheaper inshore fishing boats that were replaced rather than the more expensive multi-day boats (Bilateral Donor Group, 2005, p. 2).

109). Clearly there is a danger that over-fishing will destroy fishing as a sustainable livelihood.

Christoplos (2006, p. 58) makes the point that the changes wrought by the 2004 tsunami created new livelihood opportunities. World Vision found that 20% of respondents to a survey in South India were working in a different job after the 2004 tsunami (TANGO International, 2007, p. 18). The central issue for agencies is supporting these new livelihoods rather than trying to recreate previous livelihoods.

A single asset does not make a livelihood

Agencies need to consider the complexity of livelihood strategies, and that interventions may be needed on a number of levels, and not just at the level of own-account producers, to restore destroyed livelihoods.

The fishing saga after the tsunami illustrates a further lesson: replacing a single asset does not restore a livelihood. For example, many boats distributed by agencies remained unused as recipients had not also received assistance to replace and repair nets and other fishing gear (Srinivasan et al., 2005, p. 15).

Livelihoods depend not only on assets but also on skills, and even without the over-fishing problem, boats may not guarantee livelihoods if people do not have the appropriate skills (Srinivasan et al., 2005, p. 34). So many boats were distributed in India after the tsunami that there was a shortage of crew, as those who had previously worked as crew now had their own boats (Srinivasan et al., 2005, p. 34). In the 2000 Mozambique flood response, the chickens distributed died within a year from Newcastle's disease, suggesting that the recipients did not have the resources to care for the types of chickens distributed (Wiles et al., 2005, p. 52).

Livelihoods may depend not just on personal assets, but also on communal or private-sector assets. Again, fishing after the 2004 tsunami illustrates this point: fishermen needed fish-landing places and ice factories to restore their livelihoods, but agencies were concentrating on boats (Christoplos, 2006, p. 54; ICASERD, 2005, p. 53). Christoplos makes the general point that support was generally for own-account fishermen with little support for multi-day boats that provide employment and exploit different fish-stocks from those accessed by the small inshore boats.

Similarly, while fishermen received compensation and assistance in rebuilding their livelihoods, others associated with the fishing industry, such as fish sellers, did not (Ketel et al., 2005, p. 25). Those who had worked as labourers on large boats did not receive meaningful compensation (ActionAid et al., 2006, p. 36).

Be cautious about planning restrictions

Planning restrictions on land use, well-intentioned or otherwise, are common after natural disasters. However, settlement patterns are not arbitrary, but are dictated by social and economic factors. Quite often the affected population is expected to bear the economic cost of such regulations without compensation, and the history of such regulations is poor.

Planning restrictions on rebuilding are common after natural disasters. After the 2004 tsunami, Indonesia, Sri Lanka, and India[10] all introduced zones along the coast where housing reconstruction was forbidden. These restrictions were quickly relaxed in the case of Indonesia, only very slowly in the case of Sri Lanka, and partially in the case of India.

In Gujarat, planning restrictions introduced nearly two years after the earthquake provoked large demonstrations by property owners (Nakagawa and Shaw, 2004, p. 18 in reprint). In Kobe, rehabilitation was delayed after the city administration introduced planning rules without consultation (Nakagawa and Shaw, 2004, p. 7 in reprint). In Gujarat, policy uncertainty resulted in householder reluctance to enter into reconstruction agreements with agencies in the hope that future policies would be more advantageous (USAID India, 2002, p. 3).

In Pakistan rebuilding was prohibited in high-risk zones after the earthquake. While such restrictions may seem sensible at first glance, their cost needs to be balanced against the risk.[11] There is also the question of effectiveness, as others may occupy the unsafe land once the original occupants are relocated (World Bank OED, 2005, p. 38). The problems with all of these restrictions are that:

- settlement patterns are not arbitrary, but reflect underlying economic and social realities; resettling people away from the high-risk zone may affect their livelihoods
- families may have considerable investment in housing plots in the areas where construction is now forbidden, leading to economic hardship as they cannot use the plot or sell it to allow them to buy another
- land outside the restricted zone may dramatically increase in price (IPS, 2005a, p. 9).

People commonly return to forbidden zones. This happened after the 1992 Flores earthquake and tsunami (Norio et al., 2003), and in 7 of the 30 relocation projects funded by the World Bank in the last 20 years (World Bank, 2006, p. 46).

Limit relocation to what is essential for safety

Agencies should, if at all possible, support people's desire to remain near their homes, as relocation damages social networks. However, some families may need to be resettled away from the hazard zone for safety reasons, or because they have been traumatised by the disaster.

Relocating populations brings large risks. Large-scale relocation into crowded and insanitary camps increases the risk of epidemic disease outbreaks (Toole, 1997, p. 79). Relocation may also have a negative impact on livelihoods: it moves people away from the sources of their livelihoods, and it may force them to leave behind livelihoods assets such as livestock or goods buried in the rubble.

Displacement also means that families cannot protect their property from scrap and salvage scavengers. Salvaging scrap was an important livelihood activity for some after the 2004 tsunami (Brusset et al., 2006, p. 24; FAO, 2005, p. 5) but it was at the cost of the owners of the scrap. Moving away from the former residence may mean a loss of property rights where

[10] In India this was the application of existing regulations from 1991 that had not been enforced (ActionAid et al., 2006, p. 17).
[11] In the case of the tsunami in Sri Lanka, an event of the same size will probably not be experienced for another 2,000 years. Planning controls were less relevant there than in Pakistan where an earthquake similar to that of 2005 can be expected well within 100 years.

these are not registered.[12] When people are displaced they also risk losing their local social support network, and may have to establish a new one in their new location.

All of these reasons explain why people generally prefer to remain at the sites of their former homes, as was the case in Bam (Ghafory-Ashtiany and Hosseini, 2008, pp. 231-232), Pakistan (United Nations, 2005, p. 14; USAID, 2006, p. 9) and Yogyakarta (Manfield, 2007, p. 4). However, immediately after the tsunami, many people in Sri Lanka wanted to move away from the sea rather than rebuild at their former home sites. One survey in Sri Lanka in August 2005 found that 74% of those who had lived within 100m or 200m of the sea wanted their new homes further away from the sea (IPS, 2005a, p. 8). The same phenomenon was not seen in Aceh.

However, even when people want to move away in the immediate aftermath, they may later return. This was also the case after the 1992 Flores earthquake and tsunami were the only people left at the resettlement site after ten years where those who had no land at the original location (Norio et al., 2003).

The fact that population displacement was negligible in Yogyakarta, with less than 5,000 families in camps four months after the earthquake, was seen as a factor in speeding up recovery. The minimal disruption to existing communities allowed community-based reconstruction assistance to start immediately (Manfield, 2007, p. 4). Relocation may mean dissolving social networks established for generations (World Bank OED, 2005, p. 38). The World Bank found that social networks were successfully preserved in only 1 of 30 relocation projects it had funded (World Bank, 2006, p. 46).

Don’t rebuild vulnerability

Any new construction should be designed and built to resist the likely major hazards. Agencies should consider the environmental impact of their reconstruction programmes.

Reconstruction provides an opportunity for incorporating disaster-resistant features into buildings and infrastructure. It is important that the previous vulnerability to disaster is not rebuilt (Corsellis et al., 2008, p. 23). Yet this is precisely what happened after the 1992 Flores earthquake. Bridges were rebuilt using a standard design that was not earthquake resistant (ADB, 2000, p. 7).

Sometimes, even building models promoted as earthquake resistant may be inadequate. In Ghaen, Iran supposedly resistant buildings built after the 1980 earthquake collapsed in the earthquake of March 1998. The buildings were deficient both in design and in construction quality (Ghafory-Ashtiany, 1999, pp. 7-10).

However, while all construction in an earthquake zone should be earthquake resistant, earthquakes are not the only hazard. Flood, cyclones and other hazards also need to be considered. It is particularly important that social infrastructure should be disaster resistant, because of its role in facilitating response. It is notable that in the 2006 Yogyakarta earthquake, one of the factors that facilitated fast recovery was the low level of damage to social infrastructure (Manfield, 2007, p. 18).

[12] Properties may not be registered due to the cost or complexity of doing so. In Honduras, it was found that no title deeds were issued for half of the 85,000 new houses built by agencies after Hurricane Mitch (Telford et al., 2004, p. 17).

All the assets destroyed in an earthquake were created at some environmental cost, and replacing assets involves a further environmental cost. This might itself provoke future vulnerability, as in the case of the impact of deforestation caused by logging for construction.

Shelter is complex and needs special skills

Shelter is always a problem area in humanitarian response. Agencies need to support the construction of hazard-resistant shelter, and flexible shelter solutions that meet the needs of the affected population. Agencies that engage in shelter provision need to invest in the resources to deal with the complexity of the sector.

Christoplos describes shelter as *'the Achilles heel of humanitarian response'* (2006, p. 48). A review of four decades of post-earthquake shelter reconstruction projects in Iran found that the houses provided had *'only been partially successful in meeting peoples' rebuilding needs'* (Fallahi, 2007, p. 26). In Gujarat, shelter interventions were regarded as insufficient in over half of the communities interviewed for the DEC evaluation (Humanitarian Initiatives UK et al., 2001b, p. 20), and there were many complaints about shelter after the tsunami.

Shelter is always a problem area for a number of reasons.

- Shelter is expensive. A house may represent the largest single investment that many families make, especially for those that don't have large investments in livelihood assets like herds of livestock. Even the most basic house of mud and thatch may represent several person-months of work. The high value of shelter transfers encourages opportunism.
- Shelter needs are uneven. What suits one family will not suit another because of their different livelihood mix. There may also be significant differences in the shelter approaches of different cultural groups, and between rural and urban areas. Shelter and shelter needs also vary with climate, landforms and resources.
- There is often a conflict between replacement and minimum provision: should the international community replace lost homes, acting as a global insurer, or should social justice drive the effort to provide everyone with a basic home? The same issue arises with livelihoods, but it is more complex for shelter. Most people are interested in getting a house that is better than the one they had before, or is at least as good.
- Land rights and property rights are always an issue; title for shelter may traditionally be invested in men only.
- The proportion of landless, renters and apartment dwellers is increasing in an urbanising world - these are particularly difficult groups for aid agencies to deal with.
- Disasters may be used as an excuse to dispossess further those at the margins of society who don't have documented title to their properties.
- There are often disputes and uncertainty about standards that are to apply to reconstruction, whether a menu of design, strict standards or professional certification of the code-compliance of a design.

After any earthquake, there must be an effort to improve the quality of shelter to reduce vulnerability. The World Bank notes that rebuilding shelter using disaster-resistant techniques, and in line with the needs of the occupants, reduces vulnerability (World Bank, 2006, p. xxii). Shelter that is merely disaster-resistant, and does not meet the needs of the occupants, will have little impact on vulnerability as it is highly unlikely to be used in the long term.

Improved post-earthquake shelter can be introduced in a number of ways, listed here in order of increasing flexibility:

- providing houses built to an agency's specification (this was used in several of the tsunami-affected countries)
- providing a menu of approved house plans (this was the approach taken by the British Red Cross in Indonesia)
- specifying key details for housing of a limited number of types (this was the approach in Pakistan)
- providing design support and certification to ensure code compliance (this was the approach in Bam).

In any case, shelter should be at least compliant with the Sphere minimum standards (Sphere Project, 2004).[13] The Sphere standards are for relief and emergencies, and standards for recovery may need to be more comprehensive. The approach taken will depend on how the shelter is to be funded and on the context of the disaster. The approach in Bam allows families the option to have their shelter match their needs, but does demand a large building-design capacity, nationally. All approaches will require training on earthquake-resistant design and construction.

The basis on which shelter is to be replaced is often contentious. Even the number of houses destroyed may be disputed. Sri Lanka adopted a one-for-one policy where those who had lost houses would get a replacement house for every one they had lost. This raises basic questions of equity. In both Pakistan (interviews by author) and Sri Lanka (Ternström et al., 2006, pp. 17-18), extended families split to become multiple nuclear families to take advantage of reconstruction aid. Rules for reconstruction that require prior investment by the affected people (for example, buying permits) may discriminate against the poorest. In Bam the government provided building licenses free of charge for houses of up to 100m2 (Ghafory-Ashtiany and Hosseini, 2008, p. 235).

Reconstruction in urban and rural environments is fundamentally different. Urban shelter is often more expensive than rural shelter.[14] Space is generally less of a constraint in rural locations and it is often possible for people to build both transitional shelters and new houses on the same site. Space is a much bigger constraint in urban areas, and families may not have the space for both transitional and permanent shelter on their site. Urban areas also raise the issue of how to address the needs of those living in multi-storey, multi-tenanted buildings. Community social structures may be much stronger in rural areas, allowing community-based approaches that would be impossible in urban areas subject to significant in-migration. Urban areas may sometimes have more effective local government because of their perceived economic importance.

Transitional shelter – only when appropriate

Agency policies on transitional shelter should be based on a needs assessment and pragmatic considerations rather than a doctrinaire position. Transitional shelter works best when it is integrated with the permanent shelter solution.

The question of transitional shelter is a difficult one. Using transitional shelter means that recovery takes longer, and is more expensive, as part of the resource stream for permanent

[13] This refers to the standards rather than to the indicators. Standard 3 for shelter states that *'People have sufficient covered space to provide dignified accommodation. Essential household activities can be satisfactorily undertaken, and livelihood support activities can be pursued as required'*, whereas the indicators include having 3.5m^2 of floor area per person (Sphere Project, 2004, p. 219).

[14] In Bam, grants for urban housing were 235% of the value of grants for rural housing (Ghafory-Ashtiany and Hosseini, 2008, p. 235).

reconstruction must be diverted to transitional shelter.[15] In Iran temporary shelter cost up to one-third of the cost of permanent shelter (Ghafory-Ashtiany, 1999, p. 5).

For these reasons, the government and the World Bank did not want to finance large-scale transitional shelter after the Yogyakarta earthquake (Manfield, 2007, p. 11). Another objection to transitional shelter is that there are many cases of transitional shelters that have become permanent (Bhattacharjee et al., 2005, p. 22). The World Bank's evaluation notes that temporary shelter is rarely temporary, and should be built accordingly (World Bank, 2006, p. 45).

However, it may take years to provide permanent shelter. It sometimes happens that a response starts with the intention of avoiding transitional shelter. This was the case in Indonesia and Sri Lanka after the tsunami, but this position was reversed after three months in Sri Lanka and seven months in Indonesia (Scheper et al., 2006, p. 40). In Yogyakarta pressure from the Transitional Shelter sub-cluster led to a change in policy within six months (OCHA, 2007, p. 5).

A further problem is that the provision of transitional shelter may be nearly as slow as that of permanent shelter. In Aceh, it was projected that it would be more than two years after the tsunami before everyone was in transitional shelter, never mind permanent shelter (Oxfam, 2005, p. 2). Transitional houses were still being built 18 months after the earthquake in Pakistan.

Transitional shelter, like permanent shelter, can be supported by grants, materials or pre-built units. In urban areas of Pakistan, pre-built units were the norm, whereas providing materials for transitional shelters (timber, plastic and roofing sheet) was the norm in rural areas. In Bam there was a mix of owner-built transitional shelters and government-supplied pre-built dwellings

The question of whether to use transitional shelter is complex. The most sensible transitional shelter arrangements are those which can later be incorporated into permanent dwelling, as happened in rural areas in Pakistan (Cosgrave and Nam, 2007, p. 29), or was the design intention in Indonesia (Wilson et al., 2007, p. 13). Ideally, transitional approaches should preserve existing social relationships (World Bank, 2006, p. 45).

Gear up for land-ownership issues

Agencies should be aware of the difficulties around land-ownership, and prepared to support the land rights of the poor. Agencies should also advocate for accelerated procedures for resolving property disputes and for fair rules on property title. Title to new housing for families should be joint, except where the household is headed by a single parent. Agencies may need to recruit specialist staff to address this area adequately.

Land-ownership emerges as a critical issue in all earthquake disasters. First, there are property disputes even before the disaster. The loss of documentation, the destruction of landmarks, the deaths of property owners, and the need to formalise previously informal arrangements all add a new layer of complexity to existing land-ownership issues.

[15] In Yogyakarta the $100 cost of a transitional shelter compared very favourably with the $300 cost of a tent (Manfield, 2007, p. 4).

The people worst affected are often the poorest; they may have been squatting rather than having full legal title to their former house sites. It is also common that people have lost title documents. If people are to be resettled (as a last resort), the issue of rights to land for resettlement must be quickly resolved. This is a frequent source of delays, experienced for example after the Southern Italy earthquake of 1980 (Maged et al., 1986, p. 21) and following the 2004 tsunami. After the 1998 Papua earthquake and tsunamis, uncertainties about land-ownership caused delays in reconstruction (Dengler and Preuss, 2003, p. 2019). Such delays were widely seen after the 2004 tsunami, even in countries whose response was well organised such as India (Srinivasan et al., 2005, p. 10).

Agencies that do not address land-ownership issues before beginning construction create problems for aid recipients. One evaluation reported that in some cases in Sri Lanka people who had been provided with transitional shelter were evicted as soon as the work was completed on the shelters (Lee, 2005, p. 24).[16] A disaster may be used to dispossess marginal groups without formal title, as in the case of some Mocken (sea-gypsy) villages in Thailand where companies claimed the land that they had used for generations (ActionAid et al., 2006, p. 18).

Box 6: Assisting with access to entitlements

After the Pakistan earthquake the Norwegian Refugee Council set up the Information, Counselling and Legal Aid (ICLA) project for earthquake-affected persons. The project helped people to claim their entitlements by letting them know what they were entitled to and how they could claim, and assisting them to get the documents necessary for claiming their entitlements. The project also arranged for visits from mobile registration teams and provided counselling and legal assistance where necessary (Cosgrave and Nam, 2007, p. 38; Strand and Borchgrevink, 2006, p. 25).

Similarly in the Gujarat earthquake the DEC evaluation report singled out ActionAid for praise for the emphasis it placed on helping people, and especially the most vulnerable, to get their entitlements (Humanitarian Initiatives UK et al., 2001c, p. 34).

In many developing countries, there is low female land-ownership, because of either current legal restrictions or the legacy of historical restrictions. Gender discrimination over land and property rights persists. In Tonga, after a disaster in 2002, any woman whose house was not damaged by the cyclone had to give up her home to a male relative who had lost his house (World Bank, 2006, p. 52). In contrast, the post-tsunami land-titling policy in Aceh provided for joint ownership of houses by husbands and wives (BRR, 2006, p. iii).

Use shelter grants or advocate for them

Because of the complexity and uniqueness of livelihood strategies, different households have very different shelter needs. If possible or appropriate, agencies should use (or advocate for) grants for shelter coupled with advice and technical support. Even where grants are being disbursed by the government there is still a role for agencies in ensuring the vulnerable have access to the grants and that everyone has access to good information on earthquake-resistant construction.

In the case of shelter, cash grants seem to have been more effective than having agencies build houses (Cosgrave and Nam, 2007, p. 69). The Tsunami Evaluation Coalition noted that owner-driven reconstruction was faster than agency-driven reconstruction despite the low

[16] In this particular case, the transitional shelters were demountable and could be moved by the evictee to a new site. However, the latrines and wells that had been built fell into the hands of the landlords.

levels of subsidy for owner-driven shelter (de Ville de Goyet and Morinière, 2006, p. 44). After the Yogyakarta earthquake the use of shelter grants in a community-mediated process was one of the factors credited with promoting fast recovery (Wilson et al., 2007, p. 46) and *'one of the fastest reconstruction programmes of recent times'* (Manfield, 2007, p. 5).

There are a number of caveats. Owner-built housing (either directly or via a contractor employed by the owner) is probably not appropriate where home rental is common, and where owner-built housing is not the pre-disaster norm.

Those in rented housing need at least access to transitional housing. Sometimes they have benefited from the provision of permanent housing, as in the aftermath of the 1999 Colombia earthquake where 2,600 of the poorest families became first-time home-owners through the provision of serviced sites for families to build on (USAID Colombia, 2002, p. 7). Given that the poorest are more likely to be renters, providing both renters and home-owners with houses seems equitable – why should the poorest be denied the large resource transfer of a new house simply because they are poor?

Generally, affected populations prefer grants as this gives them much more say on the house type. One survey in Sri Lanka – which asked people if they preferred a house built by an agency, housing credit or building materials – found that 48% of households preferred an agency-built house (interviewees were not give a housing grant as an option). However, traders, minority communities, tenants, those with higher incomes, the non-literate, and those who had lost a house that was either smaller or larger than average, preferred to rebuild themselves (IPS, 2005a, pp. 27-28). Some of these factors were related to the social context of Sri Lanka, rather than being generic indicators.

Grants on their own are not enough – it is also essential to provide information on earthquake resistance to grant recipients and their builders, plus a system to control quality, especially for earthquake resistance. This can be done by providing a limited number of approved designs, or a set of strict design rules (as was the approach in Pakistan), or design advice and quality control (as adopted in Bam). In Bam, the Iranian government used a combination of grants and low-interest loans for shelter reconstruction,[17] but also provided outreach programmes providing free design services, licensing, certification and quality control (Ghafory-Ashtiany and Hosseini, 2008, p. 235).

[17] The loans were up to $5,500 and $16,000 for rural and urban areas respectively, with grant elements of $2,000 and $4,700. Commercial properties got a flat $1,200 plus a loan of $150/$m^2$.

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REFERENCES AND RESOURCES

Resources on the web

Key findings of ALNAP's work on humanitarian action can be found at:
www.alnap.org/alnappubs.html

The ALNAP Evaluative Reports Database can be accessed at:
www.alnap.org/database.html

The ProVention Consortium lesson-learning studies can be found at:
www.proventionconsortium.org/publications

The ProVention Consortium has compiled various needs-assessment tools and manuals at:
www.proventionconsortium.org/CRA_toolkit

A summary of the World Bank review of responses after natural disasters is available at:
www.worldbank.org/oed/disasters/lessons_from_disasters.pdf

The World Bank's Independent Evaluation Group (IEG) published an evaluation of World Bank assistance for disasters. It is available from the IEG website at:
http://www.worldbank.org/ieg/

The work of the Tsunami Evaluation Coalition can be found at:
http://www.tsunami-evaluation.org/

The Shelter Library maintained by the Shelter Centre is available at:
http://www.sheltercentre.org

Of particular interest is the May 2007 guide, 'Transitional settlement and reconstruction after natural disasters: Field Edition' at:
http://www.sheltercentre.org/shelterlibrary/publications/584.htm

The Humanitarian Accountability Partnership site is a good source for information on accountability and complaint mechanisms:
http://www.hapinternational.org/

Cited references

ActionAid, People's Movement for Human Rights Learning, Habitat International Coalition, & Housing and Land Rights Network. (2006). Tsunami response: a human rights assessment. London: ActionAid International. Last viewed on 8 June, 2008 at: http://www.actionaidusa.org/pdf/176_1_tsunami_HR.pdf

Adams, L., Meehan, L. M., & Satriana, S. (2005). Overseas Development Institute/United Nations Development Programme (ODI/UNDP) Cash Learning Project Workshop in Aceh, Indonesia: To share experience and learning for cash interventions. Workshop report: June 16th and 17th 2005. London: Overseas Development Institute. Last viewed on 8 June, 2008 at: http://www.odi.org.uk/HPG/meetings/Cash_learning_workshop.pdf

ADB. (2000). Project Performance Audit on the Flores Emergency Reconstruction Project in Indonesia. Asian Development Bank. Last viewed on 8 June, 2008 at: http://www.oecd.org/dataoecd/14/6/35267706.pdf

Adinolfi, C., Bassiouni, D. S., Lauritzsen, H. F., & Williams, H. R. (2005). Humanitarian Response Review: An independent report commissioned by the United Nations Emergency Relief Coordinator & Under-Secretary-General for Humanitarian Affairs, Office for the Coordination of Humanitarian Affairs (OCHA): New York; United Nations. Last viewed on 8 June, 2008 at: http://www.humanitarianinfo.org/iasc/content/documents/other/Humanitarian%20Response%20Review%202005.pdf

Alexander, R. (2006). Tsunami: build back better: mantra aside, an aid gone wrong story? A livelihood sector review. Bangalore: Development Consultancy Group. Last viewed on 8 June, 2008 at: http://www.ideas-int.org/Documents/Tsunami%20Aid.pdf

ALNAP, Beck, T., Christoplos, I., Goyder, H., Mitchell, J., & Houghton, R. (2003). ALNAP Annual Review 2003: Humanitarian Action: Improving Monitoring to Enhance Accountability and Learning. London: Active Learning Network on Accountability and Performance in Humanitarian Action. Last viewed on 8 June, 2008 at: http://www.alnap.org/publications/rha.htm

ALNAP, Borton, J., Robertson, K., Kawalek, J., Hammond, R., & Beck, T. (2002). ALNAP Annual Review 2002: Humanitarian Action: Improving Performance through Improved Learning. London: Active Learning Network on Accountability and Performance in Humanitarian Action. Last viewed on 8 June, 2008 at: http://www.alnap.org/publications/rha.htm

ALNAP, Houghton, R., Beck, T., Borton, J., Lakeman, J., & Wiles, P. (2004). ALNAP Review of Humanitarian Action in 2003 : Field Level Learning. London: Active Learning Network on Accountability and Performance in Humanitarian Action. Last viewed on 8 June, 2008 at: http://www.alnap.org/publications/rha.htm

ALNAP, Houghton, R., Robertson, K., Borton, J., Carver, L., Beck, T., & Apthorpe, R. (2001). ALNAP Annual Review 2001: Humanitarian action: Learning from Evaluation. London: Active Learning Network on Accountability and Performance in Humanitarian Action. Last viewed on 8 June, 2008 at: http://www.alnap.org/publications/rha.htm

Anderson, M. (2006). Report of Listening Project, Aceh Indonesia, November 2005: CDA Collaborative Learning projects. Last viewed on 8 June, 2008 at: http://www.tsunami-evaluation.org/NR/rdonlyres/A8727B88-9BD2-4045-8155-517CDD616AC6/0/listening_project_aceh_nov_2005.pdf

Asian Development Bank, United Nations, & World Bank. (2005). India: Post Tsunami Recovery Program: Preliminary Damage and Needs Assessment. New Delhi: Asian Development Bank. Last viewed on 8 June, 2008 at: http://www.undp.org/cpr/disred/documents/tsunami/india/reports/dnassessment.pdf

Asian Development Bank, & World Bank. (2005). Pakistan 2005 Earthquake: Preliminary Damage and Needs Assessment. Islamabad: Asian Development Bank and the World Bank. Last viewed on 8 June, 2008 at: http://siteresources.worldbank.org/PAKISTANEXTN/Resources/Publications-and-Reports/CompleteReport.pdf

Bagai, D. S., Björkman, H., Kulthanan, S., Suwanraks, R., Pitt, A., Irving, A. L., Orlandini, B., Chockanapitaksa, P., Illangovan, P., Phetmanee, T., Pinnoi, N., Pongsurapipat, S., Tansanguanwong, P., Hirunwatsiri, W., Leawphairat, A., & Bhaopichitr, K. (2005). Tsunami Thailand: One Year Later: National Response and Contribution of International Partners. Bangkok: UN Country Team and the World Bank. Last viewed on 8 June, 2008 at: http://www.unisdr.org/asiapacific/ap-publications/docs/un-tsunami-thailand-one-year-later.pdf

Bates, F. L., Killian, C. D., Daniel G, R., & Klein, R. E. (1979). Emergency Food Programmes following the 1976 Guatemalan Earthquake: An Evaluation: Final Report No 1. Washington: USAID. Last viewed on 8 June, 2008 at: http://pdf.usaid.gov/pdf_docs/PNAAQ014.pdf

Battista, F., & Baas, S. (2004). The role of local institutions in reducing vulnerability to recurrent natural disasters and in sustainable livelihoods development: Consolidated report on case studies and workshop findings and recommendations. Rome: FAO. Last viewed on 8 June, 2008 at: ftp://ftp.fao.org/docrep/fao/007/ae190e/ae190e00.pdf

Beck, T. (2005a). South Asia Earthquake 2005: Learning from previous earthquake relief operations. London: ALNAP and Provention. Last viewed on 8 June, 2008 at: http://www.alnap.org/publications/pdfs/ALNAP-ProVention_SAsia_Quake_Lessonsa.pdf

Beck, T. (2005b). South Asia Earthquake 2005: Learning from previous recovery operations. London: ALNAP and Provention. Last viewed on 8 June, 2008 at: http://www.alnap.org/publications/pdfs/ALNAP-ProVention_SAsia_Quake_Lessonsb.pdf

Bhattacharjee, A., Rajasingham-Senayake, D., Fernando, U., & Sharma, S. (2005). Real time evaluation of tsunami response in Asia and East Africa, second round: Synthesis Report. Geneva: IFRC. Last viewed on 8 June, 2008 at: http://www.ifrc.org/Docs/pubs/Updates/RTE2synthesis.pdf

Bilateral Donor Group. (2005). Bilateral Verification Missions to Tsunami Affected Districts in Sri Lanka January to February 2005: Bilateral Donor Group

Bilham, R. (2004). Urban earthquake fatalities: a safer world, or worse to come. Seismol. Res. Lett, 75, 706–712. Last viewed on 8 June, 2008 at: http://cires.colorado.edu/~bilham/UrbanFatalitiesSRL.pdf

Bliss, D., & Campbell, J. (2007a). The immediate response to the Java Tsunami: Perceptions of the Affected. San Francisco: Fritz Institute. Last viewed on 8 June, 2008 at: http://www.fritzinstitute.org/PDFs/findings/JavaTsunami_Perceptions.pdf

Bliss, D., & Campbell, J. (2007b). Recovering from the Java earthquake: Perceptions of the affected. Last viewed on 8 June, 2008 at: http://www.fritzinstitute.org/PDFs/findings/JavaEarthquake_Perceptions.pdf

Bliss, D., Larsen, L., & Fritz Institute. (2006). Surviving the Pakistan Earthquake: Perceptions of survivors one year on. San Francisco: Fritz Institute. Last viewed on 8 June, 2008 at: http://www.fritzinstitute.org/PDFs/findings/PakistanEarthquake_Perceptions.pdf

BRR. (2006). Aceh and Nias: Two Years After the Tsunami: 2006 Progress Report. Jakarta: BRR28 June 2007). Last viewed on 8 June, 2008 at: http://e-aceh-nias.org/upload/Adv%202yr%20Report%20lo-res.pdf

Brusset, E., Pramana, W., Davies, A., Deshmukh, Y., Pedersen, S. B., Team C Voter, Davies, R., & Vaux, T. (2006). Links between relief, rehabilitation and development in the tsunami response: Indonesia Case Study. London: Tsunami Evaluation Coalition. Last viewed on 8 June, 2008 at: http://www.tsunami-

evaluation.org/NR/rdonlyres/0176AC61-2F42-4DCE-80A0-3A0BE3F14AFC/0/lrrd_indonesia.pdf

Calvi-Parisetti, P. (2004). Report: Workshop of lessons learnt on the national and international response to the Bam earthquake: Kerman, Islamic Republic of Iran,14-15 April 2004. Geneva: UN Office for the Coordination of Humanitarian Affairs. Last viewed on 8 June, 2008 at: http://www.reliefweb.int/rw/RWFiles2004.nsf/FilesByRWDocUNIDFileName/SZIE-5Z3P85-ocha-irn-15apr.pdf/$File/ocha-irn-15apr.pdf

CARMA. (2006). CARMA Report on Western Media Coverage of Humanitarian Disasters. Retrieved 19 April, from http://www.carma.com/research/CARMA%20Media%20Analysis%20-%20Western%20Media%20Coverage%20of%20Humanitarian%20Disasters.pdf

Christoplos, I. (2006). Links between relief, rehabilitation and development in the tsunami response. London: Tsunami Evaluation Coalition. Last viewed on 8 June, 2008 at: http://www.tsunami-evaluation.org/NR/rdonlyres/01E8DB26-7306-4B30-B6D3-F6272D0ECF3A/0/lrrd_final_report.pdf

Coburn, A. W., Spence, R. J. S., & Pomonis, A. (1992, July). Factors determining human casualty levels in earthquakes: Mortality prediction in building collapse. Paper presented at the Tenth World Conference on Earthquake Engineering, 19-24 July, 1992, Madrid, Spain. Last viewed on 8 June, 2008 at: http://books.google.com/books?hl=en&lr=&id=uHtDvBvWGREC&oi=fnd&pg=PA5989&dq=BUILDING+DAMAGE+AND+HUMAN+CASUALTIES&ots=KwQ0Hn6_gT&sig=rmqm9xuE_9CkKabZGbLAgyHXhx4#PPA5993,M1

Corsellis, T., Vitale, A., Muyser-Boucher, I. d., Secula, F., Vita-Finzi, L., Brighton, N., Earp, H., Maroun, V., Scott, J., Slater, M., Stone, V., Troger, A., O'Donnell, I., Aysan, Y., Burton, C., Davis, I., Fitzpatrick, D., Pelling, M., Vatsa, K., & Gloor, H. (2008). Transitional settlement and reconstruction after natural disasters: Field Edition. Geneva: OCHA, Shelter Centre, DFID. Last viewed on 6 June, 2008 at: http://www.sheltercentre.org/shelterlibrary/items/pdf/TransitionalSettlementandReconstructionAfterNaturalDisasters.pdf

Cosgrave, J. (2007). Synthesis Report: Expanded Summary: Joint evaluation of the international response to the Indian Ocean tsunami. London: Tsunami Evaluation Coalition. Last viewed on 8 June, 2008 at: http://www.tsunami-evaluation.org/NR/rdonlyres/32424F75-2C95-41BB-8D22-FA6867C67A96/0/Syn_Report_Sum.pdf

Cosgrave, J., & Nam, S. (2007). Evaluation of DG ECHO's Actions in response to the Pakistan Earthquake of 2005. Brussels: ECHO. Last viewed on 8 June, 2008 at: http://ec.europa.eu/echo/pdf_files/evaluation/2007/pakistan.pdf

Crawford, P., Bysouth, K., Nichols, D., & Thompon, F. (2006). CAER Cluster Evaluation: Pakistan Earthquake. Canberra: AusAid. (AusAid No. Last viewed on 8 June, 2008 at: http://www.ausaid.gov.au/publications/pdf/pakistan_eval.pdf

Curtis, V. A. (2007a). Dirt, disgust and disease: a natural history of hygiene. J Epidemiol Community Health, 61(8), 660-664. Last viewed on 8 June, 2008 at: http://jech.bmj.com/cgi/content/abstract/61/8/660

Curtis, V. A. (2007b). Stanier Lecture 2005: A natural history of hygiene. The Canadian Journal of Infectious Diseases and Medical Microbiology, 18(1), 11-14. Last viewed on 8 June, 2008 at: http://www.hygienecentral.org.uk/pdf/NatHistHy%20Proof.pdf

Danvers, K., Somasundaram, D. J., Sivayokan, S., & Sivashanka. (2005). Qualitative assessment of psychosocial issues following the tsunami. Jaffna: Mental Health Task Force in Disaster. Last viewed on 8 June, 2008 at: http://www.who.int/hac/events/tsunamiconf/presentations/2_14_non_governmental_actors_canagarathnam_doc.pdf

de Ville de Goyet, C. (1979). Maladies transmissibles et surveillance épidémiologique lors de désastres naturels. Bulletin de l'Organisation Mondiale de la Santé, 57(2), 153-165. Last viewed on 8 June, 2008 at: http://whqlibdoc.who.int/bulletin/1979/Vol57-No2/bulletin_1979_57(2)_153-165.pdf

de Ville de Goyet, C. (2000). Stop propagating disaster myths. Lancet, 356(9231), 762-764. Last viewed on 8 June, 2008 at: http://download.thelancet.com/pdfs/journals/0140-6736/PIIS0140673600026428.pdf

de Ville de Goyet, C. (2004). Epidemics caused by dead bodies: a disaster myth that does not want to die. Rev Panam Salud Publica, 15(5), 297-299. Last viewed on 8 June, 2008 at: http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=15231075

de Ville de Goyet, C., & Morinière, L. (2006). The role of needs assessment in the tsunami response. London: Tsunami Evaluation Coalition. Last viewed on 8 June, 2008 at: http://www.tsunami-evaluation.org/NR/rdonlyres/8A8A61A4-4533-4CCA-A3E9-F2EE094AB9F7/0/needs_assessment_final_report.pdf

Dengler, L., & Preuss, J. (2003). Mitigation Lessons from the July 17, 1998 Papua New Guinea Tsunami. Pure and Applied Geophysics, 160(10), 2001-2031. Last viewed on 8 June, 2008 at: http://dx.doi.org/10.1007/s00024-003-2417-x

EERI. (2006). The Kashmir Earthquake of October 8, 2005: Impacts in Pakistan: Learning From Earthquakes: EERI Special Earthquake Report: February 2006: EERI. Last viewed on 8 June, 2008 at: http://www.eeri.org/lfe/pdf/kashmir_eeri_2nd_report.pdf

Elnashai, A. S., Kim, S. J., Yun, G. J., & Sidarta, D. (2006). The Yogyakarta Earthquake of May 27, 2006. Urbana-Champaign: Mid-America Earthquake Centre. Last viewed on 8 June, 2008 at: http://mae.cee.uiuc.edu/documents/MAE_Center_Yogyakarta_Report.pdf

ERRA. (2007). Progress Report as on 1st September 2007. Islamabad: Earthquake Reconstruction and Rehabilitation Authority. Last viewed on 8 June, 2008 at: http://www.erra.gov.pk/Reports/ProgressReport01Sep2007.pdf

Escaleras, M., Anbarci, N., & Register, C. A. (2007). Public sector corruption and major earthquakes: A potentially deadly interaction. Public Choice, 132(1), 209-230. Last viewed on 8 June, 2008 at: http://www.springerlink.com/content/j386176732260478/

Eye on Aceh. (2006). A People's Agenda? Post Tsunami aid in Aceh: Eye on Aceh/Aid Watch. Last viewed on 8 June, 2008 at: http://www.reliefweb.int/library/documents/2006/eoa-idn-28feb.pdf

Fallahi, A. (2007). Lessons learned from the housing reconstruction following the Bam earthquake in Iran. Australian Journal of Emergency Management, 22(1), 26-35. Last viewed on 8 June, 2008 at: http://www.ema.gov.au/agd/EMA/rwpattach.nsf/VAP/(A80860EC13A61F5BA8C1121176F6CC3C)~AJEM_Feb07_fallahi.pdf/$file/AJEM_Feb07_fallahi.pdf

FAO. (2005). Tsunami communities reborn: Rebuilding livelihoods better than before. Rome: Food and Agriculture Organisation of the United Nations. Last viewed on 8 June, 2008 at: http://www.fao.org/docs/eims/upload/198077/Tsunami_en.pdf

FAO. (2007). Real Time Evaluation of the FAO Emergency and Rehabilitation Operations in Response to the Indian Ocean Earthquake and Tsunami: Final Report: Final Version. Rome: Food and Agricultural Organisation of the United Nations. Last viewed on 8 June, 2008 at: http://www.fao.org/pbe/pbee/common/ecg/333/en/TsunamiRTEFinalReportEN.pdf

Fletcher, L. E., Stover, E., Weinstein, H. M., Morgan, A. A., Nababan, A., Widjaya, A. A., Cohen, D., Chusri, D., Naidu, V. C., Bunde, K. M., Berger, J. T., Burstein, M., & Reilly, C. (2005). After the Tsunami: Human Rights of Vulnerable Populations. Berkeley: East-West Center; Human Rights Center, University of California, Berkeley. Last viewed on 8 June, 2008 at: http://www.hrcberkeley.org/pdfs/tsunami_full.pdf

Floret, N., Viel, J.-F., Mauny, F., Hoen, B., & Piarroux, R. (2006). Negligible risk for epidemics after geophysical disasters [Electronic Version]. Emerging Infectious Diseases, 14, 543-548. Retrieved 20 April, 2006, from http://www.cdc.gov/ncidod/EID/vol12no05/05-1569.htm

Fritz Institute. (2005a). Lessons from the Tsunami: Survey of Affected Families in India and Sri Lanka. San Francisco: Fritz Institute. Last viewed on 8 June, 2008 at: http://www.fritzinstitute.org/PDFs/findings/AffectedFamilies.pdf

Fritz Institute. (2005b). Lessons from the Tsunami: Top Line Findings. San Francisco: Fritz Institute. Last viewed on 8 June, 2008 at: http://www.fritzinstitute.org/PDFs/Programs/Findings_Sept2605.pdf

Fritz Institute. (2005c). Recipient perceptions of aid effectiveness: rescue, relief and rehabilitation in tsunami affected Indonesia, India and Sri Lanka. San Francisco: Fritz Institute. Last viewed on 8 June, 2008 at: http://www.fritzinstitute.org/PDFs/findings/NineMonthReport.pdf

Ghafory-Ashtiany, M. (1999). Rescue operation and reconstruction of recent earthquakes in Iran. Disaster Prevention and Management, 8(1), 5-20. Last viewed on 8 June, 2008 at: http://www.emeraldinsight.com/Insight/viewContentItem.do?contentType=Article&contentId=870944

Ghafory-Ashtiany, M., & Hosseini, M. (2008). Post-Bam earthquake: recovery and reconstruction. Natural Hazards, 44(2), 229-241. Last viewed on 8 June, 2008 at: http://dx.doi.org/10.1007/s11069-007-9108-3

Goyder, H., Coventry, C., Adams, J., Kaiser, T., Williams, S., & Smillie, I. (2006). Links between relief, rehabilitation and development in the tsunami response: Policy Study. London: Tsunami Evaluation Coalition. Last viewed on 8 June, 2008 at: http://www.tsunami-evaluation.org/NR/rdonlyres/9A99A415-296F-4FC8-AFE8-26F344B3D278/0/lrrd_policy_study.pdf

Guha-Sapir, D., & Panhuis, W. v. (2005). The Andaman Nicobar earthquake and tsunami 2004: Impact on diseases in Indonesia. Brussels: Centre for Research on the Epidemiology of Disasters (CRED). Last viewed on 9 June, 2008 at: http://www.cred.be/docs/cred/publications/Tsunami.report.pdf

Holdsworth, P., & Mutale, M. (2006). Ex-ante Evaluation of Potential DIPECHO Interventions in South East Africa and South West Indian Ocean. Brussels: SHER and Transtec.

Home Office. (2004). Guidance on dealing with fatalities in emergencies. London: Home Office and Cabinet Office. Last viewed on 23 February, 2008 at: http://www.ukresilience.info/upload/assets/www.ukresilience.info/fatalities.pdf

Houghton, R. (2007). Surge capacity in the humanitarian relief and development sector. London: People in Aid. Last viewed on 8 June, 2008 at: http://www.peopleinaid.org/pool/files/publications/surge-final.pdf

Humanitarian Initiatives UK, Disaster Mitigation Institute, & Mango. (2001a). Independent Evaluation: The DEC Response to the Earthquake in Gujarat January - October 2001: Volume One: Executive Summary. London: Disasters Emergency Committee. Last viewed on 8 June, 2008 at: http://www.actionaid.org.uk/content_document.asp?doc_id=347

Humanitarian Initiatives UK, Disaster Mitigation Institute, & Mango. (2001b). Independent Evaluation: The DEC Response to the Earthquake in Gujarat January - October 2001: Volume Three: Sector Reports. London: Disasters Emergency Committee. Last viewed on 8 June, 2008 at: http://www.actionaid.org.uk/content_document.asp?doc_id=349

Humanitarian Initiatives UK, Disaster Mitigation Institute, & Mango. (2001c). Independent Evaluation: The DEC Response to the Earthquake in Gujarat January - October 2001: Volume Two: Main Report. London: Disasters Emergency Committee. Last

viewed on 8 June, 2008 at:
http://www.actionaid.org.uk/content_document.asp?doc_id=348

ICASERD. (2005). Food and Labor Market Analysis And Monitoring System in Nanggroe Aceh Darussalam (NAD) Province: Final Report: Indonesian Center for Agro Socio Economic Research and Development. Last viewed on 8 June, 2008 at: http://www.tsunami-evaluation.org/NR/rdonlyres/EC5EB876-4799-402B-8074-4FF62A3DEE7C/0/ICASERD_Food_LabouR_Market_Survey_20050731.pdf

ICRC. (2004). Operational best practices regarding the management of human remains and information on the dead by non-specialists: For all armed forces: For all humanitarian organizations. Geneva: International Committee of the Red Cross. Last viewed on 8 June, 2008 at:
http://www.icrc.org/Web/Eng/siteeng0.nsf/htmlall/p0858/$File/ICRC_002_858.PDF!Open

IFRC. (2007). Report of the Middle East Forum on International Disaster Response Laws, Rules and Principles (IDRL): Abu Dhabi, 19-20 June 2007. Abu Dhabi: IFRC, UAE Crescent Society, UAE Government. Last viewed on 8 June, 2008 at:
http://www.ifrc.org/docs/pubs/idrl/me-forum-report.pdf

IOM. (2005a). Settlement and Livelihood Needs and Aspirations Assessment of Disaster-Affected and Host Communities in Nanggroe Aceh Darussalam: 2005. International Organisation for Migration. Last viewed on 8 June, 2008 at: http://www.tsunami-evaluation.org/NR/rdonlyres/BACEADC3-051A-44F9-B920-AB839D0CB8DE/0/IOM_Needs_Aspirations_Assessment_20050506.pdf

IOM. (2005b). Settlement and Livelihood Needs and Aspirations Assessment of Disaster-Affected and Host Communities in Nias and Simeulue. International Organisation for Migration. Last viewed on 8 June, 2008 at:
http://www.humanitarianinfo.org/srilanka/catalogue/Files/Info%20Centre/TEC/TEC018_IOM_eeds_aspirations_nias_id_20050701.pdf

IPS. (2005a). Listening to those who lost: Survey and Analysis of Rebuilding and Relocation of Tsunami affected Households in Sri Lanka. Colombo: Institute Of Policy Studies. Last viewed on 8 June, 2008 at:
http://www.ips.lk/news/newsarchive/2005/news2005_jul_dec.html

IPS. (2005b). Livelihoods post tsunami: build back better?:1st-2nd December 2005 workshop organized by Institute of Policy Studies (IPS) at BMICH, Colombo - Workshop Report. Colombo: Institute of Policy Studies. Last viewed on 8 June, 2008 at:
http://www.ips.lk/news/newsarchive/2005/01122005_p_tsun/workshop_report.pdf

Iqbal, S., Dilloway, S., & Tuck, E. (2008). Accountability to beneficiaries in Kashmir. Teddington: Tear Fund. Last viewed on 10 June, 2008 at:
http://www.hapinternational.org/pool/files/tearfund-accountability-to-beneficiaries-in-kashmir.pdf

Jayasuriya, S., Steele, P., & Weerakoon, D. (2005, October). Post-Tsunami recovery: Issues and Challenges in Sri Lanka: Draft for Comments. Retrieved 3 May 2006, 2006, from http://www.adbi.org/files/2005.10.dp39.tsunami.recovery.srilanka.pdf

Johansson, M., Foerster, B., Kishore, K., Lynch, M., & A.Planitz. (2006). Joint OCHA/DGO/UNDP Mission to Pakistan, 16 – 19 August 2006: Final Report: United Nations. Last viewed on 8 June, 2008 at:
http://www.undp.org/cpr/iasc/content/docs/Sep_Links/doc_8.pdf

Ketel, H., Bhat, M., Fernando, U., Marut, D., & Louwes, K. (2005). Real-Time Evaluation of ACT International Tsunami Disaster Programs Appeal - Asia Earthquake & Tsunamis - ASRE51: ACT International

Khalid, N., & Haider, M. N. (2006). Pakistan earthquake emergency response in Azad Jammu and Kashmir, 2005—2006. London: Save the Children

Kuwata, Y., Takada, S., & Bastami, M. (2005). Building damage and human casualties during the Bam-Iran Earthquake. Asian Journal of Civil Engineering (Building and

Housing), 6(1-2), 1-19. Last viewed on 8 June, 2008 at: http://www.bhrc.gov.ir/Publication/AJCE/PDF/Vol6No1-2/Kuata-1.pdf

Lazar, D., Lane, W., & Taylor, L. B. (1993). El Salvador Earthquake Reconstruction Project Evaluation. Washington: USAID. Last viewed on 8 June, 2008 at: http://pdf.usaid.gov/pdf_docs/XDABG543A.pdf

Lee, A. C. (2005). Final Report: Real Time Evaluation of Medair's 'Tsunami Emergency Response' Programme in Sri Lanka: Field visit May 29 - June 9, 2005. MedAir. Last viewed on 8 June, 2008 at: http://www.tsunami-evaluation.org/NR/rdonlyres/1C0BF002-3A97-4395-96D8-C0276E90A6D2/0/Medair_srilanka_evalution_report_2005_3.pdf

Leitmann, J. (2007). Cities and calamities: learning from post-disaster response in Indonesia. Journal of urban health: bulletin of the New York Academy of Medicine, 84(3 Suppl), i144-153. Last viewed on 8 June, 2008 at: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1891651

Lindgren, D., Matondang, M., & Putri, D. (2005). Tsunami Relief Study: Effectiveness of the Tsunami relief effort (PowerPoint Presentation PowerPoint Presentation prepared for Unicef). Jakarta: TNS

Lloyd, C., Mete, C., & Grant, M. (2007). Rural Girls in Pakistan: Constraints of Policy and Culture. In M. Lewis & M. Lockheed (Eds.), Exclusion, Gender and Schooling: Case Studies from the Developing World. (pp. 99-118). Washington: Center for Global Development. Last viewed on 7 June, 2008 at: http://www.cgdev.org/doc/books/lewis-lockheed-eduCaseStudies/lewis-lockheed-chapter4.pdf

Maged, C., Neu, P., Clennon, M., & Robinson, J. (1986). Southern Italy Earthquake Reconstruction Prograpmme (SIERP): Part I: Final evaluation of the PVO component. Washington: USAID. Last viewed on 8 June, 2008 at: http://pdf.usaid.gov/pdf_docs/PDAAU455.pdf

Manfield, P. (2007). Java Earthquake 2006/7: Part I: Early Recovery. Jakarta: UN Humanitarian Coordinator/Resident Coordinator's Office. Last viewed on 8 June, 2008 at: http://www.humanitarianreform.org/humanitarianreform/Portals/1/cluster%20approach%20page/Evaluation/Evaluation%20for%20Early%20Recovery%20in%20Java%20v5.pdf

Mattock, J. L. (2005). Resource Loss and Psychosocial Distress: An Application of the Conservation of Resources (COR) Model to the 2004 Asian Tsunami in Sri Lanka. University of Northumbria, Newcastle. Last viewed on 8 June, 2008 at: http://www.tsunami-evaluation.org/NR/rdonlyres/419DF8A0-BF94-4A0F-90A0-934095297192/0/mattlock_psychosocial_distress_tsunami_nov_2005.pdf

McGinn, C., Anis, R., Bari, A., Kasi, M., Ambreen, A., Bay, J., & Khan, A. (2006). As If All Happiness Vanished In the Wink of an Eye: An Assessment of Relief, Transition, and Development Needs of the Earthquake-Affected Population of Allai Valley, NWFP. Washington: Save the Children USA. Last viewed on 8 June, 2008 at: http://apps.odi.org.uk/erd/ReportDetail.aspx?reportID=3435

Morgan, O. (2004). Infectious disease risks from dead bodies following natural disasters. Rev Panam Salud Publica, 15(5), 307-312. Last viewed on 8 June, 2008 at: http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=15231077

Morgan, O., & de Ville de Goyet, C. (2005). Dispelling disaster myths about dead bodies and disease: the role of scientific evidence and the media. Rev Panam Salud Publica, 18(1), 33-36. Last viewed on 8 June, 2008 at: http://www.omorgan.info/download/papers/Dead%20&%20Media%20-%20PAHO%202005.pdf

Morgan, O. M., Tidball-Binz, M., & Van Alphen, D. (2006a). Management of dead bodies after disasters : a field manual for first responders. Washington, D.C.: Pan American

Health Organization. Last viewed on 8 June, 2008 at: http://www.paho.org/english/dd/ped/DeadBodiesFieldManual.pdf

Morgan, O. W., Sribanditmongkol, P., Perera, C., Sulasmi, Y., Van Alphen, D., & Sondorp, E. (2006b). Mass Fatality Management following the South Asian Tsunami Disaster: Case Studies in Thailand, Indonesia, and Sri Lanka. PLoS Medicine, 3(6), 0809-0815. Last viewed on 8 June, 2008 at: http://medicine.plosjournals.org/archive/1549-1676/3/6/pdf/10.1371_journal.pmed.0030195-L.pdf

Nakagawa, Y., & Shaw, R. (2004). Social Capital: A Missing Link to Disaster Recovery. International Journal of Mass Emergencies and Disasters, 22(1), 5-34. Last viewed on 8 June, 2008 at: http://www.iedm.ges.kyoto-u.ac.jp/publication/papers/2005/25%20Social%20Capital%20A%20missing%20link%20to%20disaster%20recovery.pdf

Neumayer, E., & Plümper, T. (2007). The Gendered Nature of Natural Disasters: The Impact of Catastrophic Events on the Gender Gap in Life Expectancy, 1981-2002. London: LSE. Last viewed on 8 June, 2008 at: http://www.reliefweb.int/rw/lib.nsf/db900sid/SHIG-7ELHDA/$file/GenderedNature_NaturalDisasters_Jan2007.pdf?openelement

NHS Business Services Authority. (2007, 24 September). Freedom of Information Request 379779 of 29 September 2007. Retrieved 9 June, 2008, from https://www.ppa.org.uk/foiRequest/foiRequestDetail.do?bo_id=777

Noji, E. K., & Toole, M. J. (1997). The historical development of public health responses to disaster. Disasters, 21(4), 366-376. Last viewed on 8 June, 2008 at: http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=9455008

Norio, M., Ken, M., Masami, K., & Haruo, H. (2003). Relocation process at resettlement site after 1992 Flores earthquake and tsunami disaster (Original in Japanese - only the abstract is available in English). Journal of Architecture, Planning and Environmental Engineering(Transactions of AIJ), 566, 1-8. Last viewed on 9 June, 2008 at: http://sciencelinks.jp/j-east/article/200311/000020031103A0295137.php

Nuestro, O., & Mongcopa, C. J. (2007). Pakistan Country Assistance Program Evaluation: May 2007. Manila: Asian Development Bank Operations Evaluation Department. Last viewed on 8 June, 2008 at: http://www.adb.org/Documents/CAPES/PAK/CAPE-PAK-2007/CAPE-PAK-2007.pdf

OCHA. (2007). Cluster Approach: Lessons learned: Yogyakarta and Central Java Earthquake, Indonesia (revised 5 March 2007). Yogyakarta: Office of the United Nations, Yogyakarta and central Java. Last viewed on 8 June, 2008 at: http://www.humanitarianreform.org/humanitarianreform/Portals/1/cluster%20approach%20page/training/CSLT%20March%2007/best%20practices/AppendixDLessons%20LearntYogyakarta.pdf

Oxfam. (2005, 14 December). A place to live, a place to stay: Challenges in providing shelter in India, Indonesia, and Sri Lanka after the tsunami. Oxfam Briefing Note Retrieved 4 May 2006, 2006, from http://www.oxfam.org.uk/what_we_do/issues/conflict_disasters/downloads/bn_tsunami_shelter.pdf

Pan American Health Organization. (2004). Management of dead bodies in disaster situations. [Washington, DC]: Pan American Health Organization and World Health Organization. Last viewed on 8 June, 2008 at: http://www.paho.org/english/dd/ped/DeadBodiesBook.pdf

Peek-Asa, C., Kraus, J. F., Bourque, L. B., Vimalachandra, D., Yu, J., & Abrams, J. (1998). Fatal and hospitalized injuries resulting from the 1994 Northridge earthquake. Int. J. Epidemiol., 27(3), 459-465. Last viewed on 2 July 2008 at: http://ije.oxfordjournals.org/cgi/content/abstract/27/3/459

Petal, M. A. (2003). Epidemiology of deaths and injuries in the August 17, 1999, 3: 02 am m= 7.4, Kocaeli earthquake: Paper No: AE-045. Paper presented at the Fifth National Conference on Earthquake Engineering, 26-30 May 2003, Istanbul, Turkey. . Last viewed on 8 June, 2008 at: http://www.probina.com.tr/5UDMK/PDF/AE045_FP.pdf.

Prolog. (2006). Evaluation of the DG ECHO – Save the Children UK Partnership: Final Report. Brussels: ECHO. Last viewed on 8 June, 2008 at: http://ec.europa.eu/echo/pdf_files/evaluation/2006/sc_uk_final.pdf

Reed, S., Giossi Caverzasio, S., & Nuttall, P. (2007). Evaluation of ICRC Rapid Deployment following the 8 October 2005 Earthquake: Executive Summary. Geneva: Channel Research

Scheper, E., Parakrama, A., & Patel, S. (2006). Impact of the tsunami response on local and national capacities: Indonesia country report (Aceh and Nias). London: Tsunami Evaluation Coalition. Last viewed on 8 June, 2008 at: http://www.tsunami-evaluation.org/NR/rdonlyres/239C7E21-913E-4150-A060-2CCD0804191B/0/capacities_indonesia.pdf

Setchell, C. A. (2005). Reducing vulnerability through livelihoods promotion in shelter sector activities: an initial examination for potential mitigation and post-disaster application: (Feinstein International Famine Center Working Paper No 5). Boston: Tufts University. Last viewed on 10 June, 2008 at: http://www.reliefweb.int/rw/lib.nsf/db900sid/LGEL-5DHDPY/$file/Reducing%20vulnerabilty.pdf?openelement

Sheppard, S., Hill, R., Tal, Y., Patsi, A., Mullen, K., Ladek, S., Husen, K. V., & Barrows, B. (2005). The Economic Impact of Shelter Assistance in Post-Disaster Settings. Washington: CHF International and USAID. Last viewed on 10 June 2008 at: http://www.sheltercentre.org/shelterlibrary/items/pdf/EconomicImpactOfShelterAssistanceInPost-DisasterSettings.pdf

So, E. (2007). LessLoss Project: Sup-Project 10: Disaster scenarios and loss modelling in urban areas. Presentation at Lisbon Dissemination Workshop of 25 May 2007. Lisbon: Laboratório Nacional de Engenharia Civil (LNEC)). Last viewed on 2 July 2008 at: http://www-ext.lnec.pt/LNEC/DE/NESDE/downloads/LESSLOSS_Workshop_Lisboa_Maio_2007/ComunicationsSP10/UCAM_United_Kingdom.pps

Spence, R. (2007). Saving lives in earthquakes: successes and failures in seismic protection since 1960. Bulletin of Earthquake Engineering, 5(2), 139-251. Last viewed on 8 June, 2008 at: http://dx.doi.org/10.1007/s10518-006-9028-8

Sphere Project. (2004). Humanitarian charter and minimum standards in disaster response (2004 ed.). Geneva: Sphere Project. Last viewed on 8 June, 2008 at: http://www.sphereproject.org/component/option,com_docman/task,doc_download/gid,12/Itemid,26/lang,English/

Srinivasan, K., Venkatesh, K., & Nagaraj, V. (2005). The State and Civil Society in Disaster Response: An Analysis of the Tamil Nadu Tsunami Experience. Mumbai: Tata Institute of Social Sciences. Last viewed on 8 June, 2008 at: http://www.un.org.in/untrs/reports/care2005rep.pdf

Strand, A., & Borchgrevink, K. (2006). Review of Norwegian Earthquake Assistance to Pakistan 2005 and 2006. Bergen: Christian Michelsen institute. Last viewed on 8 June, 2008 at: http://www.cmi.no/publications/file/?2449=review-of-norwegian-earthquake-assistance-to

TANGO International. (2007). Final Evaluation Report: A Multi Component Review: End of Project study of Tsunami Impacted communities in Southern India World Vision Foundation of India. Last viewed on 8 June, 2008 at: http://apps.odi.org.uk/erd/download.aspx?rep=rep&ID=3536

Tearfund. (2005). Learn the lessons: Governments must change the way they do aid work after thousands of needless deaths in recent disasters. London: Tearfund. Last

viewed on 8 June, 2008 at: http://www.tearfund.org/webdocs/Website/News/Disasters%20Media%20Report%20-%20SMALLER%20VERSION.pdf

Telford, J., Arnold, M., Harth, A., & ASONOG. (2004). Learning Lessons from Disaster Recovery: The Case of Honduras (Disaster Risk Management Working Paper 8). Washington: World Bank. Last viewed on 8 June, 2008 at: http://siteresources.worldbank.org/INTDISMGMT/Resources/honduras_wps.pdf

Telford, J., Cosgrave, J., & Houghton, R. (2006). Joint Evaluation of the international response to the Indian Ocean tsunami: Synthesis Report. London: Tsunami Evaluation Coalition. Last viewed on 8 June, 2008 at: http://www.tsunami-evaluation.org/NR/rdonlyres/2E8A3262-0320-4656-BC81-EE0B46B54CAA/0/SynthRep.pdf

Ternström, B., Girard-Barclay, E., Rajasingham, D., Deshmukh, Y., & Pedersen, S. B. (2006). Links between relief, rehabilitation and development in the tsunami response: Sri Lanka Case Study. London: Tsunami Evaluation Coalition. Last viewed on 8 June, 2008 at: http://www.tsunami-evaluation.org/NR/rdonlyres/1205347D-B2C9-403E-8392-DDF4DED60125/0/lrrd_sri_lanka.pdf

Toole, M. (1997). Communicable Diseases and Disease Control. In E. K. Noji (Ed.), The public health consequences of disasters (pp. 79-100). New York: Oxford University Press. Last viewed on 8 June, 2008 at: http://books.google.com/books?hl=en&lr=&id=J3N7_Ed8-wYC&oi=fnd&pg=PR2&dq=The+public+health+consequences+of+disasters&ots=AN58JjLzQU&sig=P5cKwzkN9ggEMYci7yDelKxm0Ps#PPA79,M1

Topley, W. (1988). The Biology of Epidemics: Croonian Lecture delivered 17 July 1941. In C. Buck, A. Llopis, E. Najera & M. Terris (Eds.), The challenge of epidemiology: issues and selected readings (pp. 731-747). Washington DC: Pan American Health Organization

UNDP. (2006). Gender Mainstreaming in Recovery Phase - post Earthquake, Pakistan. Islamabad: United Nations Development Programme. Last viewed on 8 June, 2008 at: http://www.undp.org.pk/publication/Gender%20Mainstreaming%20in%20Recovery%20Phase-Post%20Earthquake%20Pakistan.pdf

UNDP, B. (2004). Reducing disaster risk : a challenge for development. New York: United Nations Development Programme, Bureau for Crisis Prevention and Recovery. Last viewed on 8 June, 2008 at: http://www.undp.org/cpr/disred/documents/publications/rdr/english/rdr_english.pdf

UNHCS, & ILO. (1995). Shelter provision and employment generation. Nairobi and Geneva: UNHCS and ILOhttp://hq.unhabitat.org/downloads/docs/3579_4894_HS-339.pdf

United Nations. (2004). Press Conference of 29 December 2004 by Jan Egeland UN Emergency Relief Coordinator on the Asian Tsunami (Webcast ed., Length: 50:43). New York: United Nations Webcast). Last viewed on 3 April, 2008 at: http://webcast.un.org/ramgen/ondemand/pressconference/2004/pc041228.rm

United Nations. (2005). Pakistan 2005 Earthquake: Early Recovery Framework: with preliminary costs of proposed interventions. Islamabad: United Nations. Last viewed on 8 June, 2008 at: http://www.reliefweb.int/library/documents/2005/un-pak-16nov.pdf

United States Geological Service. (2008a). Historic Worldwide Earthquakes. Retrieved 3 July 2008, from http://earthquake.usgs.gov/regional/world/historical.php

United States Geological Service. (2008b). Earthquakes with 1,000 or More Deaths since 1900. Retrieved 3 July 2008, from http://earthquake.usgs.gov/regional/world/world_deaths.php

UNORC. (2006). Sample Survey on IDPs Living with Host Communities: Findings and Analysis: Office of the United Nations Recovery Coordinator for Aceh and Nias1 May

2006). Last viewed on 1 May 2006 at: http://www.reliefweb.int/library/documents/2006/unorc-idn-28mar.pdf

USAID. (2006). Pakistan Quake Relief. Washington: United States Agency for International Development. Last viewed on 8 June, 2008 at: http://www.usaid.gov/locations/asia_near_east/documents/south_asia_quake/pakistan_quakerelief.pdf

USAID Colombia. (2002). Final Report: Special Objective: Earthquake Reconstruction. Washington: USAID. Last viewed on 8 June, 2008 at: http://pdf.usaid.gov/pdf_docs/PDACI643.pdf

USAID India. (2002). Strategic Objective Close-out Report: Gujarat Earthquake Recovery Initiative. Washington: USAID. Last viewed on 8 June, 2008 at: http://pdf.usaid.gov/pdf_docs/PDACF364.pdf

Vaux, T., Bhatt, M., Disaster Mitigation Institute, Bhattacharjee, A., Lipner, M., McCluskey, J., Naik, A., Stevenson, F., Muse, I. A., Rawal, V., Routley, S., Silva, K. T., & Wiles, P. (2005). Independent evaluation of the DEC tsunami crisis response: Report to the Board: December 2005. London: Disasters Emergency Committee

Wall, I. (2005). Where's My House? Improving communication with beneficiaries: an analysis of information flow to tsunami affected populations in Aceh Province. UNDP. Last viewed on 8 June, 2008 at: http://www.humanitarianinfo.org/sumatra/reference/assessments/doc/other/UNDP-WhereMyHouseFinal.pdf

WHO. (2005). Draft Report of the Health Aspects of the Tsunami Disaster in Asia: WHO Conference Phuket, Thailand, 4-6 May 2005. Geneva: World Health Organisation. Last viewed on 8 June, 2008 at: http://www.tsunami-evaluation.org/NR/rdonlyres/12927FED-C776-45A4-9CF6-3767C0F6292B/0/who_conference_draft.pdf

Wiles, P., Selvester, K., & Fidalgo, L. (2005). Learning Lessons from Disaster Recovery: The Case of Mozambique (Disaster Risk Management Working Paper12). Washington: World Bank. Last viewed on 8 June, 2008 at: http://siteresources.worldbank.org/INTDISMGMT/Resources/mozambique.pdf

Wilson, P., Reilly, D., Russell, R., Wright, M., Arini, A., Cempaka, D., Diastami, E., Narulita, L., Anindita, M. A., Bowo Santosa, Y. J. D., Handani, Y., & Wahyuningsih, Y. T. (2007). CARE, Catholic Relief Services, Save the Children and World Vision Indonesia: Joint Evaluation of Their Responses to the Yogyakarta Earthquake. Jakarta: CARE, Catholic Relief Services, Save the Children and World Vision Indonesia. Last viewed on 8 June, 2008 at: http://crs.org/publications/pdf/M&E200707_e.pdf

World Bank. (2006). Hazards of nature, risks to development: an IEG evaluation of World Bank assistance for natural disasters. Washington: World Bank, Independent Evaluation Group. Last viewed on 8 June, 2008 at: http://www-wds.worldbank.org/record?docid=000160016%5F20060629133433

World Bank OED. (2004). Project Performance Assessment Report: Armenia Earthquake Reconstruction (Credit 2562-AM). Washington: World Bank Operations Evaluation Department. Last viewed on 8 June, 2008 at: http://lnweb18.worldbank.org/oed/oeddoclib.nsf/DocUNIDViewForJavaSearch/EEADD6C0FAF99B3E85256E7B0052B6A9/$file/ppar_28312.pdf

World Bank OED. (2005). Project Performance Assessment Report: Turkey: Erzincan Earthquake Reconstruction Project; Turkey Emergency Flood and Earthquake Recovery Project; Emergency Earthquake Recovery Project. Washington: Operations Evaluation Department, World Bank. Last viewed on 8 June, 2008 at: http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2005/07/15/000160016_20050715144818/Rendered/PDF/326760TR.pdf