

REDUCING VULNERABILITY IN SOUTH PACIFIC SMALL ISLAND DEVELOPING STATES: THE INDIGENOUS OR MODERN WAY?

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Abstract

Despite advances in modern disaster mitigation practices, they continually fail to reduce and in some cases actually exacerbate the vulnerability of indigenous groups in South Pacific Small Island Developing States (SIDS) to natural hazards. This paper reviews the reasons for increased vulnerability to natural hazards amongst indigenous groups in SIDS and looks at both indigenous and 'modern' or scientific strategies. It is proposed that organisations working within disaster relief and mitigation should look more specifically at indigenous and 'modern' or scientific techniques which when combined could provide effective mitigation against natural hazards. A combined or eclectic approach would increase resilience to natural hazards and reduce sensitivity through enabling indigenous communities to preserve their most effective indigenous practices, which form an important part of their cultural heritage, whilst taking advantage of advanced technology. Such approaches are beginning to be adopted by organisations working in the field of disaster mitigation and relief, though a greater awareness is needed. This paper goes some way towards highlighting specific practices in South Pacific SIDS that should be incorporated into relief and development projects if indigenous knowledge is to be preserved and the vulnerability of indigenous groups to natural hazards reduced.

Keywords: [Vulnerability; Risk Management; Coping Strategies; Indigenous/Modern Practices]

INTRODUCTION

Countries such as Guyana, Papua New Guinea or Vanuatu all have something in common. They are considered to be Small Island Developing States (SIDS) as they are either small island countries or low-lying coastal countries which share similar sustainable development challenges (United Nations, 1999). Challenges which include a vulnerability, i.e. a "proneness or susceptibility to damage or injury" (Wisner et al, 2004: p11), to natural hazards. This vulnerability is exacerbated by these countries small size, remoteness, lack of resources and excessive dependence on international trade (Briguglio, 1995; United Nations, 1999). More importantly SIDS are increasingly susceptible to global change, which has contributed to a loss of indigenous knowledge (United Nations, 1999). Global change involves "changes in the environment that may alter the capacity of the

Earth to sustain life” (Moss, 2002) such as climate change and developments in economic, social, cultural and political environments such as Western influences (especially during the colonial period) (McEntire, 1999). All of which demonstrate that human activities are altering the world’s environment at an accelerated pace, which in turn has led to an increase in natural hazards (McGuire et al, 2002).

The vulnerability of SIDS was first highlighted in April 1994 at the first Global Conference on Sustainable Development of SIDS in Barbados. The Barbados Programme of Action (BPoA) was adopted which set forth specific actions and measures to be taken at the national, regional and international levels in support of the sustainable development of SIDS. Though despite this SIDS continue to be one of the most vulnerable regions in the world and on January 7th this year Cyclone Heta virtually wiped out island infrastructure in Niue, in the South Pacific. This destruction demonstrates the increased vulnerability of SIDS to natural hazards as historically such an event would not have wreaked such havoc. Global change has contributed to a gradual loss of coping strategies which have been developed and fine-tuned over centuries amongst indigenous groups in SIDS (Oliver, 1989; Campbell, 1999). Coping is “the manner in which people act within the limits of existing resources and range of expectations to achieve various ends” (Wisner et al, 2004: p113). Coping strategies, therefore, are often complex and involve a number of sequenced mechanisms, which can be physical, social, economic and/or institutional for obtaining resources in times of disaster (Oliver-Smith, 1977; Jigyasu, 2002; Wisner et al, 2004). The culture of survival amongst indigenous groups has been facilitated by the constant threat and occasional devastation brought about by natural hazards (Campbell, 1990).

There is no simple definition of ‘indigenous peoples’ as there is a wide range of ways of seeing the roles and experiences of indigenous peoples within today’s modern world (Poynton, 1998). However, this paper will subscribe to the broad definition utilised by the United Nations and given by Cobo (1986:p1); “Indigenous peoples, communities and nations are those which, having a historical continuity with pre-invasion and post-colonial societies that developed on their territories, consider themselves distinct from other sectors of the societies now prevailing in these territories, or parts of them. They form at present non-dominant sectors of society and are determined to preserve, develop and transmit to future generations their ancestral territories, and their ethnic identity, as the basis of their continued existence as peoples, in accordance with their own cultural patterns, social institutions and legal systems.”

Indigenous knowledge on the other hand is more easily described and is distinguished from scientific knowledge as: “Modern scientific knowledge is centralized and associated with the machinery of the state; and those who are its bearers believe in its superiority. Indigenous technical knowledge, in contrast, is scattered and associated with low prestige rural life; even those who are its bearers may believe it to be inferior” (Chambers, 1980 cited in Sillitoe, 1998: p224).

This article aims to review the reasons for increased vulnerability of indigenous groups in South Pacific SIDS, whilst examining the broader often underlying processes, which place these communities at risk such as global change. It is accepted that it is no longer possible for any Pacific society to use its pre-industrial tradition as the sole formula for living, however it is not accepted that as a result of constantly evolving social, economic and political environments, the vulnerability of South Pacific SIDS is steadily increasing (Wallace, 2002), There needs to be a compromise where indigenous and western societies are able to work together to magnify protection measures.

POVERTY, VULNERABILITY AND LOSS OF INDIGENOUS KNOWLEDGE IN SOUTH PACIFIC SMALL ISLAND DEVELOPING STATES

SIDS exposure to a wide range of natural hazards such as cyclones, tsunamis, earthquakes and drought is similar to many other parts of the world with one exception: the severity (United Nations, 1999). The small size and relatively high population densities in SIDS often results in higher damage per unit area and higher costs per capita, which is further exacerbated by high levels of poverty (Briguglio, 1995).

Poverty levels, particularly in developing countries such as SIDS are increasing (Wisner et al, 2004). Although poverty and vulnerability to hazard are not synonymous as “poverty is determined by historical processes that deprive people of access to resources, whilst vulnerability is signified by historical processes that deprive people of the means of coping with hazards without incurring damaging losses that leave them physically weak, economically impoverished, socially dependent, humiliated and psychologically harmed” (Jigyasu, 2002: p316), hazardous events are claiming more lives and destroying more livelihoods than was the case twenty years ago (Twigg & Bhatt, 1998). To some extent this is because the poverty that drives people to precarious and unsustainable means of survival creates a range of hazards, which become disasters (Twigg & Bhatt, 1998). Obvious examples of this include building shantytowns in low-lying areas subject to flooding or on hillsides that are prone to landslides such as in Rio de Janeiro, Brazil. However, whilst poverty in SIDS is severe, vulnerability increases amongst indigenous populations can be more often attributed to global change in social, economic, cultural, natural and political environments as reports from early explorers, missionaries, traders and colonial officers who began to interact with Pacific islanders some 150 or more years ago, show that the Pacific islands, which are now classed as SIDS, were comprised of thriving communities (Campbell, 1990).

Whilst natural hazards created hardship they did not create destruction. Communities were extremely resilient and relied on a number of successful traditional adaptations to natural hazards including inter-island exchange, agricultural diversity, intra community cooperation, food preservation and traditional

building construction methods (Laughlin & Brady, 1978; Campbell, 1951; Loomis, 2000).

Fiji is no exception and historically, especially prior to European contact, communities were rarely under stress from natural hazards such as droughts or cyclones (Campbell, 1990). Neither were these communities totally dependent upon their own resources as inter-village and inter-island trade flourished (Campbell, 1990). Since contact with the Europeans began, Fiji and other SIDS in the South Pacific have experienced large social, economic and political changes, many of which have contributed to the loss of indigenous knowledge and coping strategies (Campbell, 1990). The most significant modifications have been to agriculture, with the replacement of resilient and diverse agro-ecosystems with mono-cropping for commercial agriculture (Campbell, 1951). Other changes included the abandonment of traditional housing as new (but not necessarily effective) materials were introduced and the provision of short-term disaster relief or humanitarian aid which replaced the need for self-sufficient responses to disaster losses (Campbell, 1990). Whilst, it could be argued that the provision of relief is a replacement strategy for 'inter-village' and 'inter-island' trade practices which have been lost due to social, economic and political change, and therefore a necessity, it is not sufficient in itself to reduce the vulnerability of indigenous groups. The provision of humanitarian aid has focused on short-term immediate needs rather than the longer term developmental needs of indigenous people, increasing rather than reducing their vulnerability (Oliver, 1989; Paton & Johnston, 2001).

Today natural hazards can threaten the very survival of SIDS, through, for example devastation of the agricultural sector, the wiping out of entire villages, disruption or devastation of infrastructure, and injury or death of a high proportion of inhabitants (Campbell, 1951). Fiji, in 1985 lost approximately 30 per cent of its agricultural production capacity when four hurricanes swept through these 361 islands over two months (Wisner et al, 2004). Recovery from this hurricane raised many questions about dependency on a single export crop and dependence of people on imported food (McEntire, 1999; Campbell, 1951). However, despite appeals for "modern recovery measures [that] should merge with traditional and time-proven practices" (Chung, 1987: p48) there is little evidence of movement in this direction or of measures to ensure survival of indigenous coping strategies (Wisner et al, 2004). Fiji continues to suffer damaging cyclones with the most recent in 2003; therefore there is much to be done to reduce vulnerability and highlight the value of indigenous knowledge within natural hazard risk management today (Wisner et al, 2004).

SOUTH PACIFIC SIDS: SCIENTIFIC DISASTER PLANNING & PREPAREDNESS

Disaster planning, now undertaken by governments was up until recently incorporated within general security arrangements by the national police. Preparations for disasters in most South Pacific SIDS are made by the national

disaster management office (NDMO), responsible for coordination of all disaster management activities including production of a national disaster plan.

However, the NDMO's activities are heavily dependent on political will and natural hazard risk management is difficult to sell to politicians who believe 'our nation is too poor to afford the required standards' (Napwatt, 2002). The result is an influx of assistance from external agencies such as non-governmental organisations (NGOs) or countries, in the form of cash and/or resources.

The expansion of disaster relief in the last thirty years has made relief operations more feasible and with no regulations in place to deal with such a situation the governments of SIDS often overwhelmed, may unwittingly accept offers of aid, only to see the dependency of their population upon the government in terms of aid requirements actually increase (Ali, 1992; Oliver-Smith, 1993), as demonstrated in Vanuatu by Napwatt (personal communication 2002):

"People in Vanuatu have been conditioned in a very short time to believe that in the event of a disaster, we need France, Australia, New Zealand etc, to see to our recovery. People in the islands will not go back to the gardens unless the government makes a move. I have tried (as a Senior Agriculture Extension Officer) in 99-2000 to introduce the idea of growing specific crops that would withstand varying seasonal conditions in Vanuatu. There is no secret to these ideas because that's how we've survived until late 80's when food aid started coming in. Strictly speaking if we farm right...we wouldn't need food aid at all. We have more than 10 food crops in the form of roots, tubers and trees that can practically keep us going if we plant them at the right times. Our ancestors used to do just that. The practise is rapidly diminishing because it's not being promoted, also the idea of Food Aid being ever ready who would want to toil in the sun?" (Napwatt, 2002).

Torry (1978), Marshall (1979) and Waddell (1983) suggest that dependency on the developed nations has been increased rather than reduced by humanitarian aid. Their criticisms go so far as to say that external aid destabilises cultural norms and the indigenous coping mechanisms already in place to the point that there is no return and dependency is then placed on food aid and relief (Waddell, 1983). External food aid results in "a growing sense of powerlessness to cope with their [Pacific Island Communities] own needs" (Hezel, 1978 cited in Marshall, 1979: p270). Whereas the "nexus of traditional coping strategies was community-island-island group, it has become community-island-nation-international" (Campbell, 1990:p418).

However, SIDS are poverty stricken countries with a severe lack of resources, therefore external aid agencies regardless of their capacities are an important resource in the South Pacific SIDS natural hazard risk management arena (Ali, 1992). Rather than concentrating on short term relief external agencies need to work with local people to rebuild their capacity to cope with such events in the long term. It is essential that 'long term development assistance' rather than 'short term

relief' becomes the norm. In this way indigenous communities retain control and are able to work with the donors rather than depend upon them (Loomis, 2000). In order to facilitate this it is essential that the governments of South Pacific SIDS recognise that it is cost-effective to invest in mitigation of natural hazards (Oliver, 1989). Also, that a large resource exists on their doorstep which is yet to be exploited; that of indigenous knowledge. Thousands of lives could be saved by even the simplest of indigenous measures, without the need for humanitarian aid. For example in the high mountains of India, indigenous people hang chimes on ropes above rivers upstream of villages (Tearfund, 2004). These bells then give warnings of flash floods. In Bangladesh, communities at risk of flooding bury supplies of quality seed and non-perishable food in watertight bags under ground so that they can be retrieved when the flood subsides (Tearfund, 2004).

Scientific strategies such as the national disaster plan will be far more efficient and effective if they operate and are combined with existing onshore mechanisms such as indigenous coping strategies and knowledge. Scientific natural hazard risk management needs to be compatible with local cultures and respect traditional customs if it is to be successful.

LOCAL KNOWLEDGE: INDIGENOUS NATURAL HAZARD RISK MANAGEMENT IN SOUTH PACIFIC SIDS

South Pacific SIDS image of vulnerability seems to be belied by the statistics of disaster effects. Despite the surge of outside aid indigenous communities in SIDS in the South Pacific still show considerable resilience (Paton & Johnston, 2001; Ellemor, 2003). Strong levels of intra-community cooperation exist and many indigenous groups still utilise traditional building and food preservation techniques (Campbell, 2003; Ellemor, 2003). However, whilst some traditional coping strategies are no longer viable in today's society such as the use of forests as providers of food, due to heavy deforestation, others have emerged such as the widespread migration of Pacific Island people to metropolitan countries such as Australia and New Zealand (Ellemor, 2003). Migrants are still members of their village communities and therefore are an important resource in times of disaster. There is also a growing mutual assistance appearing amongst indigenous groups in SIDS, not only in sharing resources when disasters occur but also in building disaster management capabilities, indicating that indigenous groups are able to adapt to change and their knowledge extremely valuable in ensuring a communities recovery (Loomis, 2000; Campbell, 2003).

As a result Campbell (2003) rightly questions the utility of the concept of vulnerability in framing community safety and disaster management issues amongst Pacific islanders in SIDS. He argues that a 'vulnerability label' indicates a weakness within communities and that "accordingly their resilience becomes invisible and the vulnerable entity often becomes identified as the problem" (Campbell, 2003: p9). This often results in the assumption that the only person capable of offering

solutions is the invulnerable expert. He argues that this is not a useful outcome when seeking to enhance community responsibility and it is contrary to contemporary approaches in development practice that emphasise participation and empowerment (Campbell, 2003). Furthermore, the invulnerable expert frequently seeks solutions from within the vulnerable entity, rather than examining the broader often underlying processes which place these communities at risk such as global change (Twigg & Bhatt, 1998).

REDUCING VULNERABILITY THROUGH A COMBINATION OF INDIGENOUS AND SCIENTIFIC KNOWLEDGE

Progress in the science and technology of natural hazards and of related coping mechanisms has made it possible over the past years to introduce significant changes in the approach to the problems posed by natural disasters (Rouhban, 1999). However, solutions offered by a disaster mitigation effort based on scientific and technological parameters may still fail if they are unable to integrate successfully with local traditional cultures. A technical know-how adapted to indigenous wise practices can magnify protective measures (Rouhban, 1999). Local knowledge about natural hazards, especially among community elders, enables in many cases, some of the communities at risk to capitalise on technology in achieving self-protection (Rouhban, 1999).

The experience of indigenous groups in hazard prone areas such as SIDS in the South Pacific has enabled them to acquire a vast body of disaster protection knowledge that has become an integral part of their cultural heritage (Rouhban, 1999). Every society harbours its own distinct way of determining ways to act and react to hazards, making indigenous knowledge a precious natural resource for its' ability to facilitate the process of disaster preparedness in cost effective, participatory and sustainable ways (Yodmani, 2001).

Scientific hazard risk management techniques within SIDS in the South Pacific either tend to be short-term relief measures or do not take in to account the value of indigenous knowledge and coping mechanisms, whereas indigenous hazard risk management techniques are struggling to adapt to a constantly evolving global world (Yodmani, 2001). This suggests that perhaps an eclectic approach, whereby valuable indigenous knowledge is combined with modern scientific knowledge to reach an appropriate solution would be more beneficial. This is in line with Rouhban's (1999) and Sillitoe's (1998) findings that there is a need for combined use of both indigenous and scientific knowledge to reach sound methods of disaster preparedness acceptable to indigenous communities, which do not increase their vulnerability.

Salter (1999) has indicated that there exists a number of shifts in what he calls 'emergency management' as detailed in table 1. To better meet the needs of indigenous communities in South Pacific SIDS I would argue that there needs to be

a further shift from the delivering of aid i.e. 'short-term relief' to developing resilience and decreasing vulnerability i.e. 'long-term community driven development'. Thereby enabling indigenous populations to enhance their resilience rather than relying on short-term relief which in the long term increases their vulnerability.

Table 1: Shifts in Emergency Management (adapted from Salter, 1999)

From:	To:
Hazards	Vulnerability
Re-active	Pro-active
Single agencies	Partnerships
Science Driven	Multi-disciplinary approach
Response Management	Risk management
Planning for communities	Planning with communities
Communicating to Communities	Communicating with communities
Delivering (short term response)	Developing (long term community driven development)

The Philippines is one such example where natural hazard risk management combining indigenous and scientific knowledge amongst indigenous populations has been a success. The Philippines response to the obvious 'disaster' of their natural hazard risk management policies, which failed to take into account indigenous knowledge and long-term development planning, was to set up the Citizen's Disaster Response Network (CDRN) (Luna, 2001; Victoria, 2001). The village of Agagama, an indigenous community in the Cordillera, Northern Luzon, Philippines regularly experiences typhoons, drought, pest infestation, and earthquakes (Victoria, 2001). However, with help from the CDRN and through a combination of indigenous and scientific knowledge, these potentially disastrous events have become windows of opportunity for preparing and strengthening community capacities for the next disaster that is most likely to happen (Victoria, 2001).

CONCLUSION

How to mitigate effects of hazards and reduce disaster consequences, seem destined to be major issues of academic enquiry within this century, if for no other reason than they are inseparably linked to questions of environmental conservation, resource depletion and migration patterns in an increasingly globalised world. But if the vulnerability of indigenous societies to natural hazards is to decrease and their cultural heritage to be preserved, then we must recognize that other societies have their own 'effective' science and resource use practices (Howell, 2003).

The lack of focus of South Pacific governments on indigenous disaster management strategies results from the influence of external agents such as Western governments and NGO's and a lack of political will. This paper concludes that the vulnerability of indigenous societies in SIDS is at a crisis point; 'scientific' disaster management strategies seem to increase vulnerability, yet at the same time the use

of indigenous strategies has declined and some are no longer viable in today's society.

We have missed many opportunities to encourage indigenous disaster management and planning. Therefore, it is essential if cultural heritage is to be preserved, that a return to participatory approaches, local governance and long term sustainable development is implemented thereby ensuring indigenous communities are able to use their knowledge to decrease their vulnerability and improve their overall sustainability. For this to occur there needs to be a rethink on how humanitarian aid/disaster relief is delivered. It is no longer adequate to just respond to a disaster and 'pull survivors from the wreckage'. Disasters can be prevented and for vulnerability to be reduced NGOs and governments need to work with indigenous populations to enable them to successfully mitigate against disasters in the context of a 'modern' world.

Networks of researchers, engineers and social scientists need to be set up to promote a combination of indigenous technology with advances in science and technology, and to develop area-specific technological solutions (Torry, 1978; Brokensha et al, 1980; Agrawal, 1995; Sillitoe, 1998; Rouhban, 1999). Social and cultural considerations are as much a part of an enduring and equitable solution as science and technology but without the blending of science and technology with traditional modes of protection, natural hazard risk management cannot reach maximum effectiveness and the vulnerability of SIDS will continue to increase.

REFERENCES

- Agrawal, A.** (1995) 'Dismantling the Divide between Indigenous and Scientific Knowledge'. *Development and Change*. Vol.26, No.3: pp413-439.
- Ali, L.** (1992) 'Symbolic Planning and Disaster Preparedness in Developing Countries: The Presbyterian Church in Vanuatu'. *International Journal of Mass Emergencies and Disasters*. Vol. 10, No.2: pp293-314.
- Briguglio, L.** (1995) 'Small Island Developing States and their Economic Vulnerabilities'. *World Development*. Vol. 23, No.9: pp1615-1632.
- Brokensha, D., Warren, D.M. and Werner, O.** (1980) *Indigenous Knowledge Systems and Development*. Lanham: University Press of America.
- Campbell, J.R.** (1951) *Dealing With Disaster: Hurricane Response in Fiji*. Honolulu: Pacific Islands Development Program, East-West Centre.
- Campbell, J.R.** (1990) 'Disasters and Development in Historical Context: Tropical Cyclone Response in the Banks Islands, Northern Vanuatu'. *International Journal of Mass Emergencies and Disasters*. Vol. 8, No.3: pp401-424.
- Campbell, J.R.** (1999) Pacific Island Vulnerabilities towards the end of the Twentieth Century. In Ingleton, J. (Ed), *Natural Disaster Management: A Presentation to Commemorate the International Decade for Natural Disaster Reduction (IDNDR)* (pp90-93). Leicester: Tudor Rose.

- Campbell, J.R.** (2003) *Geography, Vulnerability and Nature*. Paper presented at the New Zealand Geographical Society Annual Conference, Auckland, July 6-11, 2003.
- Chung** (1987) 'Fiji, Land of Tropical Cyclones and Hurricanes: A Case Study of Agricultural Rehabilitation.' *Disasters*. Vol. 11, No.1: pp40-48.
- Cobo, J.R.M.** (1986) 'Study of the Problem of Discrimination against Indigenous Populations'. United Nations Document E/CN.4/Sub.2/1986/7.
- Ellemor, H.** (2003) *Emergency Management and Remote Indigenous Communities: Reconsidering Key Concepts*. Paper presented at the Australian Disaster Conference, 2003.
- Howell, P.** (2003) *Indigenous Early Warning Indicators of Cyclones: Potential Application in Coastal Bangladesh*. London: Benfield Hazard Research Centre.
- Jigyasu, R.** (2002) *Reducing Disaster Vulnerability through Local Knowledge and Capacity: The Case of Earthquake Prone Rural Communities in India and Nepal*. PHD Thesis Norway: Norwegian University of Science and Technology.
- Laughlin, C.D. and Brady, I.A.** (Eds) (1978) *Extinction and Survival In Human Populations*. Guildford: Columbia University Press.
- Loomis, T.M.** (2000) 'Indigenous Populations and Sustainable Development: Building on Indigenous Approaches to Holistic, Self-Determined Development'. *World Development*. Vol. 28, No.5: pp893-910.
- Luna, E.M.** (2001) 'Disaster Mitigation and Preparedness: The Case of NGOs in the Philippines'. *Disasters*. Vol. 25, No. 3: pp216-226.
- Marshall, M.** (1979) 'Natural and Unnatural Disaster in the Mortlock Islands of Micronesia'. *Human Organization*. Vol. 38, No.3: pp265-271.
- McEntire, D.A.** (1999) 'Issues in Disaster Relief: Progress, Perpetual Problems and Prospective Solutions'. *Disaster Prevention and Management*. Vol. 8, No.5: pp351-361.
- McGuire, B., Mason, I. and Kilburn, C.** (2002) *Natural Hazards and Environmental Change*. London: Arnold.
- Moss, A.** (2002) *Global Change Research*. America: American Meteorological Society.
- Napwatt, P.** (2002) Personal correspondence by Email.
- Oliver, J.** (1989) 'Determining the Future Policies for Disaster Management in the Southwest Pacific'. *Disasters*. Vol. 13, No.4: 322-333.
- Oliver-Smith, A.** (1977) 'Disaster Rehabilitation and Social Change in Yungay, Peru'. *Human Organization*. Vol. 36, No. 1: pp5-13.
- Oliver-Smith, A.** (1993) Anthropological Perspectives in Disaster Research. In Quarantelli, E.L. and Popov, K. (Eds) *Proceedings of the United States – Former Soviet Union Seminar on Social Science Research on Mitigation for and Recovery from Disasters and Large Scale Hazards* (pp94-117). University of Delaware: Disaster Research Centre.
- Paton, D. and Johnston, D.** (2001) 'Disasters and Communities: Vulnerability, Resilience and Preparedness'. *Disaster Prevention and Management*. Vol. 10, No.4: pp270-277.
- Poynton, P.** (1998) 'Who are Indigenous Peoples'? In Howitt, R., Connell, J. and Hirsch, P. (Eds) *Resources, Nations and Indigenous Peoples: Case Studies from Australasia, Melanesia and Southeast Asia* (pp10-19). Oxford: Oxford University Press.

- Rouhban, B.** (1999) Scientific Knowledge, Technical Experience and Traditional Wisdom. In Ingleton, J. (Ed) *Natural Disaster Management: A Presentation to Commemorate the International Decade for Natural Disaster Reduction (IDNDR)* (pp164-165). Leicester: Tudor Rose.
- Salter, J.** (1999) A Risk Management Approach to Disaster Management. In Ingleton, J. (Ed), *Natural Disaster Management: A Presentation to Commemorate the International Decade for Natural Disaster Reduction (IDNDR)* (pp90-93). Leicester: Tudor Rose.
- Sillitoe, P.** (1998) 'The Development of Indigenous Knowledge'. *Current Anthropology*. Vol. 39, No.2: pp223-251.
- Tearfund** (2004) *Before Disaster Strikes: Why Thousands are Dying Needlessly Each Year in Preventable Disasters*. London: Tearfund.
- Torry, W.I.** (1978) 'Natural Disasters, Social Structure and Change in Traditional Societies'. *Journal of Asian and African Studies*. Vol.XIII, No.3-4: pp167-183.
- Torry, W.I.** (1978) 'Bureaucracy, Community and Natural Disasters'. *Human Organization*. Vol. 37, No.3: pp302-307.
- Twigg and Bhatt** (1998) *Understanding Vulnerability: South Asian Perspectives*. London: Intermediate Technology Publications.
- United Nations** (1999) *Management of Natural and Environmental Disasters in Small Island Developing States*. Report: E/CN.17/1999/6/Add.13.
- Victoria, L.P.** (2001) *Community Based Disaster Management in the Philippines: Making a Difference in People's Lives*. Philippines: Center for Disaster Preparedness.
- Waddell, E.** (1983) Coping with Frosts, Governments and Disaster Experts: Some Reflections based on a Papua New Guinea Experience and a Perusal of the Relevant Literature. In Hewitt, K. (Ed) *Interpretations of Calamity* (pp33-43). Boston: Allen and Unwin.
- Wallace, H.** (2002) 'Turbulence and Change in the Pacific'. *Development*. Vol. 45, No.3: pp81-85.
- Wisner, B., Blaikie, P., Cannon, T. and Davis, I.** (2004) *At Risk: Natural Hazards, People's Vulnerability and Disasters, Second Edition*. London: Routledge.
- Yodmani, S.** (2001) *Disaster Risk Management and Vulnerability Reduction: Protecting the Poor*. Thailand: Asian Disaster Preparedness Center.