

LITERATURE REVIEW:

“The Psycho-Social Impact of a Voluntary Evacuation”

Prepared for Northern Territory Emergency Services

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Executive Summary

This paper, commissioned by the Northern Territory Emergency Services, explores the existing literature on the psycho-social impact of voluntary evacuation. A review of the literature revealed that findings and theoretical frameworks used in studies of any type of evacuation tend to view and group factors in two main ways. To highlight these two areas, the literature review is organised under the headings of *Individual Factors Affecting Decision Making for Evacuation* and *Community Factors Affecting Decision Making for Evacuation*.

The literature about individual factors associated with evacuation and the thought processes in this type of decision making outlines the differences in response patterns. Evidence suggests that an individual's response depends on factors associated with childhood and life experience, history with disasters as well as other psychological processes that influence decision making.

At the community level factors such as the dissemination of information, culture, geographic susceptibility to events and shared meaning are all considered. However, it is also acknowledged that both sets of factors intermingle. While information pertaining to an event may be dispersed across a community in the same way, responses by individuals will vary. As such, factors associated with the individual may influence their response to an evacuation warning in a community setting but may also feed into community understandings and responses.

It is proposed in the next section that the most helpful way to view voluntary evacuation is as part of both a disaster mitigation and a community recovery framework. If viewed as such, voluntary evacuation is seen as a process of empowering individuals to make their own choices in the pre-impact stage. Such an approach is also likely to be more palatable in a political context as it sets the foundation for later community recovery in the event that a disaster does occur. Ongoing, pre-emptive community education is seen as the most important factor in reducing panic and as an inherent part of disaster mitigation and community recovery strategies.

Introduction:

“The Psycho-Social Impact of a Voluntary Evacuation”

This paper examines the available literature on evacuation as a preliminary exploration into the potential psycho-social impact of voluntary evacuation. Research on the broad subject area of disaster indicates that there are four stages in a disaster event. Wolfenstein (1957: xii) suggests that these stages are “when [the event] is in the remote future, when it is imminent, in the moment of impact and when it has passed”. However rather than falling neatly into one of these stages, voluntary evacuation generally sits between the first two stages. Unfortunately there is little research available on this specific stage. In order to build a comprehensive picture of voluntary evacuation, the paper therefore draws on a range of literature on evacuation, disaster mitigation and community recovery while examining the limited literature available specifically on voluntary evacuation.

Studies on disaster for each of these four time frames have generally been carried out after an event has occurred. In addition, they are usually focused on a specific event (either man-made or natural) and if concerned at all with evacuation look at the impact of mandatory evacuation carried out after an event. While some of the studies offer insight into the area of voluntary evacuation, caution must be applied in making any broad conclusions from this limited research.

A review of the literature revealed that findings and theoretical frameworks used in studies of any type of evacuation view and group factors in two main ways and therefore studies focus on either the individual level or the community level. To highlight these two areas this literature review is organised under the headings of *Individual Factors Affecting Decision Making for Evacuation* and *Community Factors Affecting Decision Making for Evacuation*. The literature about individual factors associated with evacuation and the thought processes in decision making explain differences in response, depending on factors associated with the individual’s childhood, previous experience, history with disasters, and other factors that can influence their decision making. At the community level factors such as the dissemination of information, culture, geographic susceptibility to

events and shared meaning are all considered. However, it is also acknowledged that these two sets of factors intermingle. While information pertaining to an event may be dispersed across a community in the same way, responses by individuals will vary. As such, factors associated with the individual may influence their response to an evacuation warning in a community setting but may also feed into community understandings and responses.

Drawing together the knowledge gained from the individual and community levels, the final section offers a way of understanding potential responses and frameworks for viewing voluntary evacuation in the context of disaster mitigation as a precursor to community recovery. As such the focus is on voluntary evacuation being part of the bigger framework of developing strategies for community resilience before, during and after a disaster.

Individual factors Affecting Decision Making for Evacuation

The first group of factors that affect decision making about evacuation are related to individual processes, experiences and understandings. Work in this area generally comes from the field of psychology. Two key authors, Martha Wolfenstein (1957) and Beverley Raphael (1986) have explored individual psychological processes in relation to disaster and evacuation in order to develop theoretical frameworks. The work of these two authors is summarised. The section concludes with a summary of the only identified Australian study in this area which was carried out by Neil Pfister (2004) on the response to a voluntary evacuation in Grafton, New South Wales.

Martha Wolfenstein (1957), the seminal thinker in the area of the psychological impact of disaster, offers a theoretical framework pertaining to the individual's response to disaster. Her book, *Disaster: A Psychological Essay* was published as a result of a meta-analysis undertaken for the *Committee on Disaster Studies of the National Academy of Sciences- National Research Council* published in 1957. While somewhat dated, the work remains as the most comprehensive study in the field drawing together findings from a range of other studies conducted by researchers. While the emphasis is on peace-time disaster events in the United States, she draws on the findings of many other researchers to suggest a series of hypothesis around the psychological impact of disaster. However, she also cautions that these specific hypotheses have not been tested and as such she is providing a theory base from which to conduct future research.

One of the overall findings of Wolfenstein's (1957) work is that for every phase in a disaster event, there will be a wide range of possible reactions. Her work provides some suggestions on the factors that may contribute to these reactions and how we might be able to mitigate some of the negative consequences of a disaster situation. Even at this early stage in the research on disaster the concept of disaster mitigation can be identified as a key theme in the literature.

Wolfenstein (1957) attributes individual's response mechanisms to things in the 'person's inner world' which are learned values acquired through family and

culture. She maintains that people who have had emotionally painful childhoods filled with hostility may well expect the same consequence from any situation of threat. The literature is congruent when describing those who have experienced much pain and anguish in their lives in that it suggests that such an individual does not respond appropriately to a range of stimuli. Instead, they will either resign themselves to 'fate' or display avoidance behaviours. The link between the inner world and family and culture is particularly relevant and supports the need to consider the community level factors.

Wolfenstein (1957) states that only a minority of people worry about remote dangers to their safety. She claims that there is clinical evidence to suggest that those who are apprehensive about remote dangers, or are more terrified than others about remote hazards, are usually so because of unresolved emotional factors rather than because they have a more realistic attitude toward the world (Wolfenstein, 1957). When comparing people who are fearful and those who are not worried about remote threats, Wolfenstein (1957) suggests that both reactions may be the result of individuals' internal emotional situations affecting their outlook on the world.

It would follow from the above that those who do not have 'emotional issues' relating to disaster situations would have less anxiety and undertake a more serious attempt to arrive at an appropriate decision when evacuation warnings occur. Wolfenstein (1957: 8) supports this stating that those who are 'relatively free from inner strain will not likely worry a lot about disasters or threats, and such worry may be indicative of emotional disturbance'. However, she also explains that '*Unconscious reasoning*' may play a role. This occurs when individuals are in denial about the warnings of a disaster where the general thought pattern is "it cannot be as bad as that" or "nothing really terrible is going to happen" or "it couldn't happen again". Denial is known to play a part in previous unresolved post-traumatic stress, and in the context of the City of Darwin this could have implications given its history of cyclonic impact.

The work of a range of researchers in the field of stress can be informative in this respect. Caplan (1990) summarises this work explaining that a range of events from personal illness through to major disasters experienced by individuals results

in a higher frequency of psychopathology. The intensity and duration of the event seems to influence the degree to which psychopathology will occur. Events that are seen as outside of the control of the individual are more likely to cause psychopathology. Despite all of that, findings indicate that only a small minority of individuals will experience psychopathology in the longer term. The vast majority will emerge after a period of time from the experience functioning at the same or a higher level.

One of the main concerns about evacuation and disaster response is the potential for public panic. Wolfenstein (1957: 13) points out that while panic is the most anticipated responses to disaster, it is in fact the least occurring response in such situations. She explains how consulting experts and government agencies in Britain during World War II assumed that if London was bombed great masses would flee the area in panic. They anticipated that as a result 'psychiatric casualties would outnumber the physical casualties; and that the death rate would be three times more than what it actually was in reality' (Wolfenstein: 1957: 11). However, this did not prove to be the case. Wolfenstein describes 'panic' as being part of a 'fantasy' or myth of response rather than reality. She contends that humans generally go through a cycle of emotions and reactions when faced with catastrophe. Wolfenstein (1957: 12) explains that this cycle includes three phases:

1. the immediate denial of reality;
2. an exaggeration phase (where we are apt to think about the worst possible scenario); and,
3. a stage where we achieve a realistic estimate of the dangers.

Wolfenstein (1957) suggests that providing information is a way of reducing panic. She claims that reasonable government policies of sharing information with the public and of leaving the possibility of evacuation open, contribute to orderly evacuations. Building further on the work of Wolfenstein, it could be postulated that providing clear pre-emptive information regarding voluntary evacuation along with a broadcast evacuation 'risk alert' system/scale could provide the knowledge and tools to allow people to move to the third stage more effectively. In the longer term this is likely to reduce panic.

Beverley Raphael (1986) draws heavily on the work of Wolfenstein and explores disaster responses and community recovery. Raphael suggests that humans are basically not cognizant of the possibility of disaster, as fear of disaster must be managed. If humans were constantly alert to potential disasters they would not be able to carry out the necessary functions of existence and to develop culturally. Leading on from Wolfenstein, Raphael (1986: 30-31) identifies three types of people whose perceptions of the world influence their responses to disaster:

- 1) '*Personal Invulnerability*' means that most people feel that a catastrophe 'could not happen to them'. This is demonstrated by people who build or re-build in places that have been previously affected by a disaster (e.g. Darwin being rebuilt after Cyclone Tracy or people living in flood prone areas). Raphael seems to believe that this stems from an attachment to place, a shared avoidance to catastrophe and/or a magical belief in goodness and protection.
- 2) On the other hand, there are people who have experienced so much 'catastrophe, pain, deprivation and despair that they expect further disaster'. For such people, there is little or no hope of better outcomes as their lives do not support such optimism. For this reason some people may not respond to the threat of an imminent disaster, as they simply resign themselves to experiencing further catastrophe.
- 3) Thirdly, there are people who have a particular view of the world that is coloured by a 'hyper-arousal, alertness and a searching of the environment for signs, warnings or omens that may help them to anticipate what they fear in order to take steps to protect themselves'. People who operate at this level are likely to over-react to situations and have difficulty in processing or sorting through relevant information.

The hyper-arousal state may be caused for some people by their exposure to previous disasters. According to Raphael (1986:31), this can lead a person to respond to early signs of the same type of disaster. Depending on how frightening the experience was for the individual, the slightest reminders may trigger an extreme response even if there is little likelihood of serious consequences of the disaster. This means that when an individual has lived through a particularly

frightening disaster such as a severe cyclone, weather events such as monsoonal rains and thunder may trigger an extreme response. This can further impact at the community level, as their response may influence others to respond in similar ways. Such issues are discussed later under the section on community factors affecting decision making processes.

Other individuals may respond by developing ‘avoidance behaviours’, such as not riding on trains if they have been involved in a train crash, or leaving a place that is vulnerable to storms if they have experienced a devastating hurricane or cyclone. Overall, Raphael (1986: 31) maintains that ‘learning has occurred in response to certain disaster-relevant stimuli; and a range of behaviours, from overreaction to under-reaction may follow’. In essence, this is learned behaviour where the psychological response varies over a continuum but has significance for the community of Darwin in light of the events of Cyclone Tracey.

Raphael highlights the importance of individuals’ ability to consider the risks and benefits of remaining in the community. This requires the basic capacity to comprehend and quantify the future possibilities and outcomes. Boscarino, Figley and Adams (2003) believe that when people have information and the ability to evaluate that information then the risk of panicking about an imminent disaster is minimized. This indicates the need for clear, concise, widely disseminated and accessible information as a basis for decision making. As mentioned earlier, some codified and publicised ‘evacuation risk scale’ may provide a tool for public decision making.

Raphael (1986: 33) suggests that information is needed to address the following questions to facilitate decision making around voluntary evacuation.

- ◆ What are the likely human and economic effects?
- ◆ How severe might these effects be?
- ◆ Might there be any counterbalancing positive effects?
- ◆ What is the likelihood of this event to occurring?

It is also important that this information is available as early as possible to allow people maximum time to think through such issues. This would suggest that ongoing education and awareness-raising would give the opportunity for people to

consider their plans during a period of non crisis. The impact of false alarms is significant in this regard and is explored further in the next section.

The only relevant evidence-based study on voluntary evacuation was carried out by Neil Pfister in the aftermath of floods in Grafton, NSW in March, 2001. Preceding the flooding of the town, the State Emergency Services issued a voluntary evacuation announcement. However, in the nine hours that the evacuation was in effect less than ten per cent of the twelve thousand residents left the area (Pfister: 2004: 19).

Pfister (2004: 21) subsequently conducted a study to

- ◆ estimate the level of response to the evacuation announcement;
- ◆ investigate the factors that impacted on their decision making; and
- ◆ explore the impact of an evacuation announcement which was subsequently seen as a “false alarm” as the levee was not breached.

The research methodology included both a telephone questionnaire and face to face interviews conducted between two and three weeks after the peak of the flood. The total sample for the telephone questionnaire was drawn from two major sources. The larger group of respondents were selected randomly from the New South Wales North Coast telephone directory with an address in Grafton or South Grafton. The second group was drawn from a register of those who had evacuated to ensure that those who had chosen to evacuate were represented.

This methodology resulted in 205 questionnaires being completed in the phone survey and of these, 191 were from random sample and 14 were from the ‘evacuee’ sample (Pfister, 2004: 22). One hundred and seventy of the 191 people surveyed lived in flood prone areas (about 90%) (Pfister, 2004: 22). Twelve people from the questionnaire survey subsequently participated in face-to-face interviews which lasted from ten to ninety minutes.

Investigating the level of response to the evacuation announcement, Pfister (2004:22) found that of the random sample of 191 only 29 respondents left their homes. Of this 29, 7 had moved to friends and relatives homes which were still in the evacuation area. Of the total sample only 22 respondents evacuated to a safe

area. Although not included in the study's sample, Pfister (2004) notes that 600 hospital patients and residents of nursing and aged homes were evacuated to a safe area.

It was found that a further 47 respondents of the 191 in the random sample were considered to be 'ready to evacuate' (Pfister:2004, 22). The reasons stated for why they didn't actually leave included:

- ◆ *They would have gone if they had been door-knocked*
- ◆ *They were waiting for the final order to evacuate*
- ◆ *They had packed and were ready to go*
- ◆ *They were waiting until the last minute, and*
- ◆ *They had actually started to go but the evacuation had been terminated.*

Pfister notes that a large number of people were receptive to the idea of evacuation but were delaying action until the last minute. Pfister claims that a 'last minute' rush to evacuate could have been potentially disastrous due to the fact that a two-lane bridge was the only way out of the town.

Pfister (2004) then speculated on some of the factors that may have played a role for those residents who chose not to evacuate or prepare for evacuation. Pfister (2004: 21) investigated the impact of the following factors: awareness of evacuation announcement, need for confirmation of information of flood, role of the issuing agency, fears about home security, concerns for pets, confusion about content of evacuation message and proximity of home to threatened area.

Awareness of the Evacuation Announcement:

Ninety-seven per cent of the random sample reported that they were aware that an evacuation announcement had been issued. However, three per cent were unaware, and Pfister (2004: 22) claims that this result is worrying, considering that three per cent equates to 360 residents in the total Grafton area.

Confirming the Flood Threat:

The results suggest that people take steps to confirm the threat of an event. All of the people interviewed reported that they spoke with either authorities, neighbours,

friends, relatives and/or other community residents about the flood and the evacuation announcement. The residents predominantly looked to neighbours and friends for indications and confirmation that the threat of flood was imminent. Many of the telephone survey respondents reported that they had spoken with older, longer-term residents of Grafton. These long term residents passed on information that they had experienced large floods in the town previously and that the water 'never gets up to here' (Pfister, 2004: 24). Such a finding is congruent with the work of Caplan (1961 in Caplan, 1990: 28) who found that "during crisis, people become temporarily more dependent on others and more open to their influence".

Role of the Issuing Authority

It was found that seventy per cent of those surveyed knew that the SES had the authority to issue an Evacuation Warning. Pfister (2004) confirms that this percentage was the same for both the residents who remained in Grafton and for those who evacuated. However, the research also suggests that knowledge of such authority does not translate to confidence in the issuing agency. Pfister (2004: 25) suggests that the lack of response may be evidence of a lack of confidence in the SES' judgement on the need to evacuate.

Fears about home security:

A few of those who had evacuated reported that they were concerned about their home security. Only eight per cent of the total sample mentioned home security as a concern despite the fact the local press had raised this issue in the week before this survey was conducted. There were no reports of looting but Pfister (2004: 25) attributes this to so few people evacuating.

Concern for pets:

Only a few people reported that they would not evacuate because of their pets. Pfister (2004: 25) contends that this small number may be explained by two factors:

1. Most people who did evacuate did so by car, and went to a place of their choice (such as friends or relatives so they presumably could take their pets with them).

2. People did not evacuate the town because they did not consider themselves to be at risk and therefore pet concerns did not need to be considered.

Confusion about the content of evacuation messages

The study found that Grafton residents generally comprehended the voluntary nature of the evacuation. Only a small minority of the evacuees believed they were compelled to leave (Pfister, 2004: 26). It was also found that some people found the warnings 'confusing'. One commented that they did not understand the term 'self-evacuation', while another two stated they found the warnings to be very general and not clear on specific details of who needed to evacuate. Another respondent claimed that they were unsure about whether they lived in the first priority area for evacuation. Pfister (2004: 26) states that this suggests the need for State Emergency Services to use plain language and be clear about the concepts behind the wording of any warnings that are issued.

Proximity of home to threatened area

A third of the evacuees described themselves as 'cautious' people and they used phrases such as; 'better to be safe than sorry' (Pfister, 2004: 23). Pfister claims that this is congruent with the expectation that personal risk aversion is a critical psychological factor in the decision to evacuate.

A few people reported that they were influenced by others to stay, but many more people were actually advised to go (Pfister, 2004: 24). Investigating this further, three quarters of the survey respondents who did not evacuate believed that they were not under any threat for a variety of reasons, including the fact that they lived in elevated houses or that they lived in the higher parts of Grafton.

It was found that most people were aware of the river height predictions during the flood. Eighty-four per cent of the random sample reported that they were aware of the predictions, and most were listening to their radios or speaking to neighbours or friends. Several people also stated that they had logged on to the Bureau of Meteorology web site to obtain the latest information about the height of the river (Pfister, 2004: 25).

The research found that while residents believed that the levees could be breached, very few of them actually evacuated. Pfister (2004: 24) highlights the fact that the behaviour of the residents did not correlate with their beliefs about the levees and suggests that this may be due to a low consciousness of a flood threat. However, it could also be postulated that Wolfenstein's concept of unconscious reasoning may be playing a key role. People may know that the levee can be breached but may also unconsciously reason that the current situation is not that bad or that it is unlikely to happen. Wolfenstein (1957) also looks at individuals' perception that authorities will do something to ward off the threat. This may be combined with the belief that the individual can do nothing and subsequently result in an apathetic response.

While most residents in the town did not evacuate, respondents indicated that some aspects of life in Grafton were a 'little out of the ordinary'. Examples included queues at the service station petrol pumps, supermarkets being inundated with shoppers stocking up on bread and milk, business owners relocating stock and equipment, evacuation announcements being on the radio and Emergency Services vehicles cruising the streets with flashing lights (Pfister, 2004: 24). At the same time some things remained 'normal' such as levels of patronage at the local pubs and clubs. The disco at the Royal Hotel was full of people which gave the impression that it was just an ordinary Saturday night (Pfister, 2004: 24).

Pfister (2004: 27) concludes his research findings highlighting the importance of ongoing community education which provides an opportunity to lay the foundation for a successful evacuation in a period of non-emergency. He claims that it may also increase the public's faith in the State Emergency Services and the seriousness about issuing evacuation warnings. If people doubt the ability of emergency managers they will in effect have little faith in the call to evacuate. Pfister (2004: 28) believes that 'enhancing the public profile of the State Emergency Services would help ensure that people would have greater faith in any future decision to evacuate'.

Some miscellaneous findings from Pfister indicate that the following must also be instigated for an evacuation operation:

- ◆ *Messages to the public have to be credible and consistent;*

- ◆ *headquarters staff have to come across to the public as competent;*
- ◆ *door-knocking and other field operations during an evacuation must be well-planned and executed efficiently.*

Pfister (2004: 28) highlights the importance of examining worst-case scenarios if a critical mass of people comprehended the seriousness of the flood threat and decided to evacuate next time the levees are threatened. He contends that a cumulative, snow-ball effect is likely to happen which would increase the number of people who choose to evacuate. This has serious implications as residents may choose to evacuate within a short time frame leading to significant problems due to the limited access routes out of Grafton. Such a position is linked to the impact of false alarms which is dealt with in the next section.

Pfister (2004: 27) states that the overall finding of the research was that the 'key to a successful evacuation is the readiness of the public to respond to an evacuation warning'. He concludes that the low rate of voluntary evacuation was due to the fact that the residents of Grafton just 'weren't ready to evacuate' (Pfister: 2004: 27). The results from Pfister's research would indicate the importance of comprehensive public information on 'self evacuation' linked to tools to assist people in the decision making process.

COMMUNITY FACTORS AFFECTING DECISION MAKING FOR EVACUATION

This section deals with the community factors associated with decision making for voluntary evacuation. This involves looking at the impact of culture, shared meaning, geographic location, community experience and vulnerability to disasters, levels of community awareness and education in relation to disasters, community confidence and understanding of authorities. Work in this area has been focussed on disaster mitigation to assist communities to promote community resilience and community recovery in the event of a disaster.

Culture operates at a number of levels in a community and will feed into the individual's understanding and response to a situation. For example in 'western culture', we find that it is often thought of as 'shameful' to show response in a situation of danger (Wolfenstein: 1957). It could be viewed as 'brave' and 'courageous' to face disaster head on rather than avoiding it. Given the Australian culture of facing danger, the ANZAC spirit which supports and reinforces this and the more laid back colloquial "she'll be right, mate" attitude, such a cultural norm is likely to prevail. Anecdotal evidence would suggest that this type of attitude is particularly prevalent in the Northern Territory and this factor on its own may have a huge impact on the Darwin Community's response to evacuation warnings.

Religious and/or spiritual beliefs, connected to culture, can be very influential in reactions to potential disasters and evacuation. Wolfenstein (1957: 18) discusses '*communal immunity*' which involves a belief in factors associated with protection. One example comes from a community of Native Americans in a town where tornado warnings went unheeded. It was subsequently found that the lack of response was related to the fact that the Indian Chief had told the settlers that the particular location was safe from tornados. The unification of individual belief in the power of nature and protection and communal acceptance of this belief was shown to influence the community's response, or lack of response to such warnings.

In the context of Darwin, culture specific research would need to be undertaken to attempt to obtain information about the nature of Indigenous culture and how

factors associated with this would influence the community's response to weather warnings. Cultural beliefs are therefore connected to the development of shared meaning.

Pfister's study (2004: 20) also explored the concept of 'shared meaning' among community members. He found that a lack of shared meaning was a contributing factor to the low rate of voluntary evacuation during the 2001 Grafton floods. In this section, he focused on how potential disaster is viewed by a community and the level of perceived risk. He found that informal personal networks can either support or contradict official communication and therefore directly impact on the development of shared meaning. For example, discussing the situation with neighbours and observing other community members, may either support or undermine official reports and/or advice.

However, Pfister (2004:20) acknowledges that shared meaning is difficult to achieve. "Typically the population at risk will be anything but homogenous. This diversity may mean that there are different priorities, languages and levels of understanding." In addition, a range of individual factors will also impact on how one understands and views events (Pfister, 2004). Considering the various factors, Pfister concludes that shared meaning can be achieved with some groups but not others.

Given the cultural diversity of Darwin's population and the multiple languages spoken, there are some significant challenges to building shared meaning. At a cultural level, belief systems may influence understandings of disaster and subsequent responses. Language may pose some difficulties in building shared meaning during the pre disaster phase as well as in the critical imminent and recovery phases. However, pre-disaster education can play a vital role in building shared meaning to engage the community in effective disaster mitigation. A key finding throughout the literature was that the availability of information about the anticipated disaster assists to increase the level of calm in the community during an event (Boscarino, Figley and Adams: 2003: 199).

The University of California at Berkeley ran a disaster mitigation project called "The Spirit Still Lives!" The project engaged political support and inter-agency

technical assistance in developing partnerships among many sectors to raise awareness of potential disasters and develop appropriate responses throughout the community. This has resulted in genuine community engagement and involvement in thinking about and preparing for any disaster through the process of building shared meaning. It is important to note however that this Project's success could be at least in part attributed to factors associated with the current socio-economic viability of the community of Berkeley, its pre-existing shared cultural values and minimal language barriers.

While offering some important tools for building shared meaning, it cannot be assumed that the findings of the Berkley project could be easily replicated in Darwin. Some significant challenges would be the much higher level of cultural diversity and the extreme socio-economic differences in Darwin compared to Berkley. If a similar project were to be conducted for the Darwin community, factors that would need to be considered include:

- ◆ the cultural diversity of the Darwin community (including ethnic background, language background, age structure and the relevant implications);
- ◆ enabling equal access to resources and information for those who have reading/writing difficulties;
- ◆ taking into account people who may not have the mental or physical capacity to access these resources; and,
- ◆ feeding information through the community using different methods, such as Community Elders or utilization of Community Patrols.

A similar project launched in 2001 in Taiwan called the "Integrated Community-Based Disaster Management Program" (hereafter referred to as ICBDMP) developed a framework to strengthen community resilience to disaster (Chen et. al; 2006). This project was precipitated by a felt need to strengthen the community's ability to cope with disaster due to Taiwan's location which predisposes it to natural disasters. The objective of the project was to "enhance community knowledge and skills to protect the community from the hazardous environment through the use of professional teams." (Chen et. al, 2006: 209). Strategies used in this project included contributions from key stakeholders, community based organisations and experts in the field of disaster to hold seminars, training and

information dissemination sessions to raise awareness and understanding of disaster mitigation strategies. A review of this project found that the programme had an impact on residents' ability to identify and analyse vulnerable conditions, discover problems, develop solutions and take action (Chen et. al, 2006). A recommendation was subsequently put forward that such programmes be included as a key part of government policy on disaster.

Both the Berkeley project and the ICDMP are premised on community participation and seek to give residents the knowledge and skills to empower them to take steps to reduce vulnerability, to protect their lives and property as well as to minimise the impact of disaster. Voluntary evacuation can be considered as part of this approach. Knowledge about particular types of disasters and potential outcomes which the community is vulnerable to (i.e. cyclones in Darwin) lay the foundation for post disaster recovery. Such a model can be considered a useful approach for the Northern Territory if voluntary evacuation is considered. However, the irregularity of natural disasters and potential for false alarms in Darwin may have an impact on residents' willingness to engage in the process. However, developing it as an option would enable and empower those considering self evacuation with a regulated, risk managed choice.

The idea of ongoing pre-emptive education is vital to the community resilience and levels of response. When people receive good quality, clear information about a potential disaster, their likelihood of panicking is minimised as the ability to analyse the available information enables them to make informed decisions about whether to evacuate or not (Boscarina, Figley & Adams, 2003). While little evidence is available, it follows that community participation approaches will lay the foundation for better outcomes in terms of longer term community recovery in the event of a disaster due to development of existing networks, preparation and understanding.

Community participation is the foundational approach as this project has empowered community residents to take steps to reduce vulnerability, to protect their lives and property as well as to minimise the impact of disaster. Again knowledge associated with the disaster and factors surrounding the disaster as well

as the understanding of 'hosting' the disaster may also be inclusive to assist in immediate crisis management and in post-disaster recovery.

The strength of the community participation models and the concurrent importance of geographic location for disaster mitigation is supported by the work of Monday and Myers (2004). They suggest that 'disasters' could be seen to be created by localities and highlight government, social and economic policies and norms which lead to what is described by Pfister as shared meaning. They advocate the need to build resilience in communities at various political levels while integrating disaster management, mitigation and recovery policies with underlying social and environmental conditions. They argue that we cannot understand or find strategies to cope with "hazards in isolation from the broader factors such as social, political, environmental, psychological, economic and geographic location of places that shape our world" (Monday & Myers, 2004: 9). Their approach would be more akin to community development in that they put forward a "participatory approach that uses consensus-building instead of 'majority rules' mindset and starts from the grass roots level" (Monday & Myers, 2004: 9). The work of Monday and Myers suggests that while we may learn from other communities, responses and strategies must be considered in the context of the locality they serve.

The link between disaster mitigation and recovery is further supported by literature on disaster relief. Brown (1980) argues that disaster relief efforts are hampered by a range of factors including the coordination of relief organisational networks and a lack of preparation. The attitude often prevails that communities or governments will rise to occasion. Brown (1979) argues that while the community may have the will to be resilient, they may not have the means or know the way to achieve this. The idea of voluntary evacuation as an educated option within a larger disaster mitigation and recovery strategy is thus supported.

The geographic location of a community will increase the likelihood of disaster and will in many cases lead to a number of 'false alarms'. At a community level this will feed into shared meaning as there may develop a culture of response or understanding about what has happened in the past and what may happen in the future. There is however, some controversy in the literature about the impact that previous false alarms have on a community.

Dow and Cutters (1998) conducted a study in the United States and found that false alarms have minimal influence on decision making processes about evacuation. Contrary to this, Raphael (1986) speculates that when numerous warnings have occurred and a disaster does not eventuate, this may influence individuals in the community not to respond appropriately to future warnings. Raphael (1986) uses the example of Cyclone Tracy which hit Darwin in December of 1974, when many people failed to take notice of the cyclone warning and suggests this may have been the result of earlier warnings of another cyclone that subsequently veered away. Raphael speculates that previous warnings that did not eventuate may have played a pivotal role in the community's lack of response to the warnings of Cyclone Tracy. However, the connection between false alarms and preparedness was not tested empirically and the literature does demonstrate that there are many other factors that impact on responses that may be applicable in the case of Tracey such as a lack of education, information and awareness of the dangers.

Raphael's (1986:30) notion of the community's 'shared avoidance' or 'magical belief in goodness and protection' is connected to shared meaning and cultural beliefs discussed above but may also may have affected responses to Tracey. Raphael suggests that this may have played a key role in Darwin due to the fact that the Cyclone actually hit on Christmas Eve, a spiritual time of year for many residents.

Wolfenstein (1957) also broadens this to consider the role of drills and how these might impact on responses. She discusses the events of World War II in the United States where air-raid drills were a regular occurrence. These drills resulted in the majority of people perceiving the sounding of the sirens as a 'dull routine' with little thought being given to the potential danger of a real event. This would suggest that the number of 'false alarms' or too frequent drills may become an issue rather than simply the false alarm itself. Wolfenstein (1957) contends that this is related to assumptions about the potential for the threat to materialise or to affect oneself similar to Raphael's concept of magical thinking and personal immunity. However, Wolfenstein (1957) also states that such a perspective can

carry over into situations of more imminent threat which feed into shared meaning at a community level.

Gruntfest (2004) contends that despite the lack of empirical evidence, perceived attitudes toward false alarms affect forecasters and Emergency Managers' willingness to issue warnings. 'The conventional wisdom is that the public-at-risk will most likely be de-sensitized by repeated warnings that do not result in the occurrence of the anticipated disaster. This premise is related to the perceptions that official warnings drive public decisions and may cause a hesitation in issuing warnings'. In addition, it may also affect the willingness of authorities to issue voluntary evacuation notices. As such, a clear set of guidelines would be necessary to increase consistency in the process.

The above controversy highlights the need for further research into the impact that false alarms may have on people. The study conducted by Dow and Cutters (1998) focused on the perceptions of residents of the United States to false alarms, whereas Raphael uses Northern Territory residents as an example but did not study this aspect specifically or empirically. Given the importance of geographic location, research based overseas or even interstate should be considered cautiously. Factors such as the cultural understandings, community education, the number and regularity of disasters will all influence perceptions and response mechanisms. This suggests the need for good quality research within a specific locality to provide evidence on which to base policies on voluntary evacuation.

Pfister (2004:19) also supports the need for further research to improve potential responses. He advocates the value of using debriefing techniques after events to inform future situations. He states that a series of key indicators should be investigated after an event. These include:

- ◆ The level of evacuation that occurred
- ◆ Primary motivations for evacuation or non-evacuation
- ◆ Perceived clarity of evacuation messages
- ◆ Effectiveness of information dissemination
- ◆ Evacuation location
- ◆ Language or cultural barriers that impeded the process

The opportunity for such investigation though is directly related to the geographic susceptibility of a location to an event. Locations where potential threats are rare are less likely to have thought through these questions. This poses problems as a rare event may need long-term action to prepare for it. Raphael discusses this point on a political level. She claims that it may not suit political systems to have risks acknowledged concerning a rare disaster because of the short-term political goals (Raphael, 1986: 33). However consideration of such questions and use of voluntary evacuation as a strategy for community recovery may be more politically palatable in light of recent events in the United States and Queensland.

Linking Voluntary Evacuation to a Community Recovery Framework

In modern society, the ability to predict disasters means that the consequence of disaster may be lessened in human terms (Raphael, 1986). However, this is dependent on how prepared the locality is for the disaster to strike and the resilience of individuals. As such, pre-disaster factors are seen as having some impact on recovery processes (Raphael, 1986). The idea that pre-disaster functioning including preparation and prevention are linked to community recovery is evident in the work of Raphael. However, she is not explicit about the role of voluntary evacuation in this context.

Voluntary evacuation in a pre-disaster stage can be seen to sit in the area of disaster mitigation as in the case of the Taiwan ICDMP however this can also be linked to disaster recovery frameworks. Disaster mitigation refers to the lessening of the impact of disaster while recovery is more concerned with returning a community to their pre-disaster level of functioning. A common theme running through the literature on disaster mitigation and community recovery is the importance of education and the empowerment of individuals to make appropriate decisions.

Common reactions in the post-disaster phase are shock, fear, disbelief, anger, helplessness, sadness and shame (Lindemann, 1944; Raphael, 1986; Worden, 1991). This adds a different layer for those who have left in a voluntary evacuation and may return to their community to find homes and communities that are destroyed and friends and neighbours who have perished. In some cases this may complicate or intensify such emotions or alternatively it may provide the basis for lessening some of these emotions. There is no evidence for either conclusion. However, it could be speculated that if one has sufficient information to make a choice about staying or going in the face of a disaster, some of the felt helplessness may be mitigated. Gerald Caplan (1961; 1964; 1970; 1986; 1990), the father of the crisis intervention model, states that there are key benefits to what he refers to as “‘anticipatory guidance’ to prepare people ahead of time to handle

expectable crisis more effectively” (Caplan, 1990: 28). As such community recovery can be seen to start in a pre-disaster stage.

Raphael sees psycho-social care as central to the community recovery framework while also acknowledging that this sometimes pushes the boundaries of what is seen as necessary. In her model the first formal step in the process post disaster is the recognition of the pain and suffering that the community is experiencing. However, it is equally important to acknowledge the strengths of the community. In a model that includes voluntary evacuation and the pre-emptive education that must proceed it, making informed choices could be considered a strength rather than being viewed as fleeing the event. For example, the minimisation of inconvenience by generating a mindset on self evacuation as a ‘family safety exercise’ could be explored. As such one can begin to work at challenging and changing the cultural mindset related to disaster events. Raphael acknowledges the importance of pre-disaster work and incorporates in this raising awareness of variables that affect behaviour at the various stages of disaster which includes the nature of both adaptive and non-adaptive behaviour. In this context, choices in voluntary evacuation could be seen as adaptive regardless of if the decision is made to stay or go.

Caplan (1990: 31) discusses the concept of ‘competence’ where some individuals have certain characteristics that “make them resilient in the face of adversity”. Competence is seen as being the result of both “constitutional and acquired elements” (Caplan: 1990: 31). Constitutional elements are those that people seem to be born with, a certain strength of character that allows them to overcome challenges and emanates from self-efficacy – “that centres on the individual’s expectation that [they] will master any difficult situation” (Caplan, 1990: 31). Acquired elements are those problem solving and application skills that can be taught. The main work done in this area by Shure & Spivak (1987 in Caplan: 1990: 32) focused on teaching children the skills in three key areas:

- ◆ Interpersonal and Cognitive Problem solving skills relating to causal thinking
- ◆ Alternative Solution Thinking
- ◆ Consequential Thinking

This allows people to think clearly about the cause of the problem, the range of solutions and the possible outcomes for each solution. The conclusion from these studies is that problem solving skills can be taught and subsequently lead to a higher level of self-efficacy (Caplan, 1990). This would suggest that educational programmes around voluntary evacuation should include the basis of decision making. If such an approach was taken, this can contribute to a higher level of resilience in a community which is in turn linked to longer term community recovery strategies.

The argument for seeing voluntary evacuation as a preliminary stage of community recovery has not been tested empirically nor is it something that is discussed in the literature. Community recovery is most often conceived of as something to swing into action post disaster. However, most Disaster Plans do make provision for community recovery. They generally advocate the need for recovery to be community led. For example Displan Victoria states that:

Importantly, the social perspective recognises that recovery is more than just replacing what was destroyed and rehabilitating individuals. It acknowledges that recovery is a complex social process which involves all levels of the community, and is best achieved when the affected communities exercise a high degree of self determination.

Voluntary evacuation can be seen as one part of the empowerment of individuals and communities as it validates the individuals' right to make an informed decision based on clear information. Such a strategy can address the criticism that few communities consider these issues prior to a disaster.

There is a consistency in the literature in that clear and full information is seen as imperative in reducing the psycho-social impact of disaster. This theme runs through the work done on individual and community factors influencing decision making as well as disaster mitigation and community recovery work.

Key Findings and Recommendations

Given the interplay between individual and community factors that affect reactions and decision making, the applicability of findings from any study conducted outside the specific location should be viewed cautiously. However, the following high level findings do provide some guidance around the factors that should be considered in future work conducted regarding voluntary evacuation in the Darwin region.

Individual responses will vary across a broad continuum. Such responses are dependent on a range of factors which vary between individuals but some of the key elements to be considered include exposure to previous trauma and emotional stability.

Geographic location and pre-disposition of that location to natural disaster provides the foundation on which to view and anticipate individual responses. Locations that are prone to natural disaster are more likely to plan ahead but are also more likely to have experienced a previous disaster which may influence individual responses.

Cultural beliefs and understandings play a role in how the community views the potential for and the impact of an event as well as their responses. Culture in this sense includes beliefs and understandings that occur at various levels and well as in specific groups. As such factors such as the Aussie “she’ll be right” culture, ANZAC spirit, the Territory mindset, Indigenous beliefs and worldviews of people from various ethnic backgrounds should be considered.

There is no conclusive evidence on the impact of false alarms. The limited available literature is contradictory and as such no clear conclusion can be drawn about how false alarms will impact on individuals.

Voluntary evacuation should be viewed as part of the larger disaster mitigation and community recovery strategy. Voluntary evacuation, seen as part of a community recovery strategy sets the foundation for longer term positive outcomes in the event of a major disaster.

Ongoing education is seen as vital and the basis for good decision making and empowerment on the part of the community. If voluntary evacuation is considered in a community, an education campaign should be initiated well in advance of any event. This will reduce the potential for panic as it will allow individuals to think through the various alternatives in a stress free environment.

The need for timely, clear information and education is a key recommendation of virtually every study reviewed. This includes in situations of an actual event, in a false alarm situation, to reduce the potential for panic, to make good decisions and in disaster mitigation strategies.

Based on these findings, a recommendation is put forward that **further study is required to make any clear assessment on the psycho-social impact of voluntary evacuation in the Darwin community.** Such investigation could include research into the views of the Darwin community on the potential for a disaster, how such disaster might be viewed, amenability to the idea of voluntary evacuation and the impact of false alarms.

Given the sensitive nature of voluntary evacuation, it is clear that such plans must be implemented in a carefully structured manner with adequate information available. **Further work would be required to integrate the information from this paper into a well-planned voluntary evacuation programme.** It is further recommended that should voluntary evacuation be seen as a viable strategy and incorporated into the Northern Territory Emergency Services plans, **the process should include a research methodology to provide for future data collection** in the event of evacuation.

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Dr Deborah West is Senior Lecturer in Social Work and Welfare Studies at Charles Darwin University. She has undertaken a range of research studies and publications related to social work and the interface of the individual and their environment.

Dr West was involved in the development of social work units in the area of grief, loss, and trauma (which incorporates community recovery principles) at The Flinders University of South Australia and has taught in this area for the past five years. As such she has a thorough understanding of the theories and frameworks that underpin community recovery. Dr West has held affiliations with the South Australian Centre for Loss and Grief and has worked as a clinical practitioner in this field while living in South Australia.

Dan Baschiera a member of the research team has substantial experience in emergency management and planning since 1980. This includes the successful drafting of the Carnarvon emergency welfare plan which was successfully operationalised by colleagues in the Gascoyne flood of 1980. In addition, he has researched and drafted the Emergency welfare plan in Alice Springs, trained at Mt. Macedon, and has been an active volunteer with the Palmerston Unit of NT Emergency Services.

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Post Script: Cyclone Monica

The events of Cyclone Monica in Darwin on ANZAC Day 2006 provide a good opportunity to conduct preliminary investigation into self evacuation and the impact of false alarms. Preliminary thinking suggests that this could take the form of a small study to gather data relating to:

- Rate of self evacuation on this and previous occasions
- The decision making process in the preparation stage relating to evacuation

If self evacuation occurred, focus groups could be conducted to explore:

- Chosen location for evacuation
- Mode of evacuation
- Timing
- Reasons for evacuation
- Impact of evacuation
- Decision making process (what factors were considered? When?)
- Previous occasions of evacuation (e.g. during Cyclone Ingrid)
- Likelihood of future evacuation (how has Cyclone Monica impacted on thinking about self-evacuation? E.g. impact of false alarm)

A separate set of focus groups could be held with people who did not self-evacuate to investigate if this was considered and what factors may have gone into such a decision making process.

Such a study is in line with the literature reviewed and the subsequent recommendations proposed in the paper. It is most appropriate to carry out such a study in a short time frame following the event to reduce the impact of confounding variables. It would also provide a good foundation for future work in this area in line with consideration of voluntary evacuation strategies.

The authors would be pleased to discuss and develop such a proposal if it is of interest to Northern Territory Emergency Services.