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# **Is Queenstown a Sanctuary?**

**A retrospective study of the preparation,  
mitigation and recovery of the Queenstown  
community from the effects of the Queenstown  
flood and hazard slip events of 1999.**

A thesis presented in partial fulfilment of the requirements for the degree of Master of  
Arts in Psychology at Massey University, Palmerston North, New Zealand.

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## **Abstract**

Using a salutogenic paradigm, the present study examined the factors that contributed to hardiness and resilience, in the Queenstown community, following the flood and slip events of November 1999. It was hypothesised that sense of community, coping style, self-efficacy, and social support would predict stress, as measured by the Hopkins Symptom Checklist-21 (HSCL). It was also hypothesised that unique environmental qualities of Queenstown, i.e. the lakes, mountains, small community and being a visitor destination, would make a significant contribution to participants sense of community. Hazard knowledge, preparation and mitigation, with particular reference to flood hazards was also examined. Additionally, in depth interviews with a high intensity sample of participants, were also carried out. This qualitative information was intended to examine the strengths within the community that had helped the community to deal with the flood and slip events. Additionally, the interviews were used as a forum, for participants to raise their own issues, relating to these events. The hypothesis that the selected variables would predict resilience, was not supported, but support was found for the importance of the unique physical and environmental qualities of Queenstown to residents. The interview results provided support for the view that the Queenstown community was able to withstand the effects of the flood and slip events, with recovery of businesses and tourism being almost complete at four months post event. Though some of those properties affected by the event could never be restored, resulting in irreplaceable losses and changes to individuals' lives, the community showed remarkable strengths and had done much to address inadequacies highlighted by the events .

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## **Chapter 1**

### **Introduction and Overview**

Natural hazards are increasing globally and there is a gathering body of research concerned with preparation for and mitigation of some of the social and psychological impacts on individuals and communities. (McLure, Walkey & Allen, 1999) A telephone survey conducted in the United States, found that during the period 1970-1980, almost two million households per year had experienced either injuries or damage, sustained as a result of household fires or the natural hazards of floods, hurricanes and severe tropical storms, tornados and severe windstorms, and earthquakes and severe tremors. (Rossi et al 1983, cited in Solomon and Smith 1994.)

Kaniasty and Norris (1999), note that disaster often results in loss of possessions that have significant economic and symbolic, or emotional significance. Additionally, resources needed to sustain psychological health are also likely to be affected, and previous research has found increases in physical and psychiatric problems following disaster experience. These have included, increases in depression and anxiety, post -traumatic stress disorder, (PTSD), family stress, alcohol abuse, and violent behaviour. However not all those who experience disaster, suffer these negative effects. (Green, 1994, cited in Benight, Swift, Sanger, Smith, A & Zeppelin, 1999)

Factors that influence individual and community ability to withstand hazard effects may be both individual and environmental. The extent to which individuals and communities are able to utilise their strengths to recover from disasters may also be an important factor in considering preparation for, and mitigation of disasters. Examples of

constructs that have been implicated in this process are, self-efficacy, resource loss, and personality traits. (Benight, Swift, Sanger, Smith & Zeppelin, 1994). Additionally it has been noted that there are sometimes positive and beneficial effects reported by individuals who have had hazard experiences. This may occur as a result of cognitive restructuring following trauma that gives meaning and thus provides comfort to individuals. (Thoits, 1995) These positive outcomes and the recovery processes associated with them have been described as salutogenic effects. Research in this area acknowledges that growth experiences may potentially be harnessed in rehabilitation efforts, and in preparation for future hazard or other traumatic events. (Paton, 2000) Central to this concept is the notion that individuals possess resilience and hardiness that allows them, not only to withstand traumatic experiences, but also to derive positive benefits and psychological growth. A resilient person is one who is able to move from a purely individualistic approach to his or her experience, to collaborate with the group, in order to resolve issues resulting from trauma. In combining efforts, group resilience may be facilitated that in turn leads to restoration and growth. (Higgins, 1994, cited in Violanti, J M and Paton, D., 1999) Similarly a strong community may provide a salutogenic environment (derived from salutary-producing good or beneficial effects) (Paton, 200) or 'sanctuary' that provides resources for and thus enables individuals to withstand further hazard experiences. (Bloom, 1997;1998, cited in Violanti, & Paton, 1999). Tobin (1999) describes the resilient community, as one that is organized to minimize the effect of disasters and to quickly restore the socio-economic life of the community. The central theme of this study is to examine the psychological, social and physical factors that may have impacted on the ability of Queenstown to recover from the flood and slip experiences of November 1999.

Chapter Two provides an overview of current psychological literature on hazard preparedness and on selected moderating and mediating factors implicated in psychosocial effects of disasters on communities, and provides the rationale for the present study. Chapter Three describes the research methods used in the study. Chapter Four contains the results. Chapter Five contains the discussion, limitations of the present study, conclusions, and suggestions for further research.



## Chapter 2

### Literature Review

Natural (and other) hazards may be described as a *potential* threat to humans and their welfare. Hazard risk refers to the *probability* that the hazard will occur and result in loss. Assessment of risk is an important factor in hazard preparation and mitigation, and involves both objective and subjective elements and will be considered in more detail below. Disaster is usually said to have occurred when there has been large -scale injury, death or disruption. (Smith, 2000). Psychological research has most often been concerned with larger scale hazard events. For example Giel, 1991; Escobar, Canino, Rubio, Stripe & Barvo, 1992 and Kleber, Brom & Defares, 1992, cited in Smith, 2000. Though the 1999 floods and landslips in Queenstown, represented a small scale 'disaster', many properties sustained extensive damage and homes were lost due to the landslip. Fortunately there was no loss off human life, however a small number of the community suffered substantial personal and economic loss and disruption. Disasters clearly differ from each other and create unique demands and needs, however with continued development of theory and research, more detail and repeating patterns have emerged. Further examination of these patterns may also lead to improved understanding of the effects of disaster on communities. (Van den Eynde & Veno in Gist & Lubin, 1999, and Johnston, Bebbington, Lai, Houghton & Paton, 1999) Thus, this study intends to add to the body of research, the hazard scenario of flooding and landslips, in New Zealand.

The psychological effects of disaster on individuals and communities can include increases in anxiety and depression and an increased incidence of post-traumatic stress

disorder (PTSD), family stress, alcohol abuse, and violent behaviour (Green, 1994, cited in Benight, Swift, Sanger, Smith, & Zeppelin, 1999) Psychological distress is thought to arise as a consequence of depletion of physical and psychological resources following stressful events. However not all individuals are affected in this way. This has lead to a substantial body of research that has aimed to establish, what individual and social factors mediate and moderate the psychological and social effects of disasters. Considering those factors that most influence psychosocial outcomes of hazard experiences, a search of the literature reveals a move toward a holistic approach, where both environmental and individual factors are considered to interact in a dynamic way to produce outcomes. For example, Kaniasty and Norris (1997), emphasise the relationship between individuals, community and the stressor, as influencing social support forces. Environmental factors appearing most frequently in the literature include, social support, community settings and the availability and distribution of resources. Individual constructs, are coping styles and strategies, self-efficacy, optimistic versus pessimistic personality style, perceived social support and sense of community. Recent literature on the constructs relevant to this study is reviewed below.

### **Community Settings and Sense of Community**

The process of community development is concerned with empowering communities through their human, economic and environmental resources. An empowered community should provide individuals with membership, influence, mutual fulfilment of needs and shared emotional ties and support. Community empowerment is suggested to provide an important contribution to the reducing the vulnerability of individuals, to the negative psychological impact of hazard events. This may occur, at least partly, through the greater

likelihood of fostering self-efficacy beliefs and problem solving coping. (Paton, 2000) Reciprocally, increased self-efficacy and problem solving coping, may increase the likelihood of community action in preparation for and mitigation of disaster effects, due to the increased perception of the likelihood of effective action. (Paton, 2000) Additionally, Bishop, Paton, Syme & Nancarrow (2000), found that sense of belonging in the community was correlated with involvement in community level activity, such as belonging to clubs and social action groups. Thus community participation and empowerment may provide individuals with additional strength and motivation that fosters hardiness and resilience, as well as providing a localised forum for the development of mitigation strategies. (Paton, 2000). The individual constructs of self-efficacy and coping styles, that appear important for community empowerment, are discussed further in the following section.

Early research by Maton (1989) found that, following bereavement experiences, individuals in high support settings (e.g. church groups, mutual help groups) experienced less stress than those in low support settings, and concluded that supportive organisations within communities also have a stress buffering effect. The empowerment potential of community settings has also been noted in other research. For example Sampson, Raudenbush & Earls (1997) found that collective efficacy mediated the effect of concentrated disadvantage and residential instability, on violent crime. Psychological sense of community is a central concept in the understanding of the community and in the development of community empowerment. It is proposed by Macmillan & Chavis (1995), to consist of four main concepts. The first is membership that refers to the feeling of belonging or membership and personal relatedness. The second is influence, or a sense of importance to the group. The third is integration and fulfilment of needs and the fourth is a

shared emotional connection. Each of these main concepts consists of groups of attributes. Firstly, membership includes defining community boundaries, emotional safety, a sense of belonging and identification, personal investment and a common symbol system (e.g. language) Secondly, influence refers both to the influence that an individual has over the group and to the influence the group exerts over the individual. Thirdly, integration and fulfilment of needs, describes the reinforcement provided by the togetherness of being a group member. Lastly shared emotional connection is based on the notion that group members must at least identify with the shared history of the group, and in shared events.

Arguably, a desirable outcome of community empowerment and related to it, is the concept of community competence. First described by Cottrell, 1976, cited in Eng & Parker (1994), a competent community is in summary, able to collaborate in identifying problems and needs, achieve a working consensus on goals and priorities, implementation of goals, and carrying out of required actions. This construct was also examined by Eng & Parker (1994), who attempted to capture the effectiveness of community belonging, by developing a measure of the cohesiveness and effectiveness of a community. Evaluating a health promotion programme for a poor rural community, pilot studies to find a measure of community were carried out in the community itself. Interestingly social support was in this case, judged by the community, to be an important part of the assessment of competence. Generally, social support is treated distinctly in psychological research, however these findings demonstrate that social support may be considered a necessary part of a competent community. (Eng & Parker, 1994)

Individual psychological variables may impact on community competence, similarly to that suggested previously, in the discussion on community empowerment. For example,

high levels of self-efficacy, may contribute to an individual's belief that they have control over things that happen to them. This may increase the likelihood of risk reducing behaviours. Reciprocally, this may promote self-efficacy, and result in a greater likelihood that individuals will take part in community initiatives that promote competent communities. (Paton, 2000)

In order for community competence and empowerment to evolve, individuals must implicitly, feel a part of their community. Exploring this further, Riger and Lavrakas, 1981, cited in McMillan & Chavis (1986), describe the concept of community belonging. According to these authors, social bonding and behavioural rootedness were both identified as important factors in their concept of neighbourhood attachment. They found that length of community residence, whether one's home was owned or rented and expected length of residency contributed to the concept described as behavioural rootedness. Additionally the ability to identify ones neighbours, feeling part of the neighbourhood and the number of children known to residents were important contributors to a concept described as social bonding.

Chavis & Newborough (1985) point out, that to fully understand the psychology of a community it is necessary to understand how communities develop within differing systems and settings and with differing values and conceptualisations. Exemplifying this viewpoint, though much research emphasises the dynamics of human relationships in psychological sense of community, the importance of the exceptional physical aspects of Queenstown, appears to the researcher, to be of significance to many Queenstown residents. This is supported by the view of the Queenstown Lakes District Council (QLDC) 1998, who in their proposed district plan, acknowledged that the area was, 'wealthy in

terms of natural and physical resources and amenities, which are important to the economic and social well-being of the community and the identity of the district'. These include: The water resources of the lakes and river, the mountain topography, good flat land for development and agriculture together with outstanding visual beauty. (QLDC, 1998) It might be that the main importance of these attributes for the community lies in the economic benefits such as tourism. However, it is posited by this researcher, that the physical surroundings may also be important to residents' general sense of well being, attachment, and even psychological sense of community. Likewise, Chavis and Pretty (1999), note that that the interdependence between psychosocial well being and physical surroundings has not been much studied in psychological literature. They argue that measurement of sense of community requires further improvement and should also include environmental and systems level indicators of community belonging. This provides some support for an approach to the study of belonging, to include factors other than those most often researched to date.

In 1974, Kasardi & Janowitz, cited in Sampson (1991), found that length of residence was positively related to local friendships, community sentiment and participation in local affairs. Equally, Sampson (1991) suggested that community level instability could impede community level social organisation. The importance of stability in the community as a whole, is also likely to influence whether an individual is able to integrate into a community, regardless of their own length of residence. (Sampson, 1991) This may also affect motivation, if friendships are not expected to be lasting, (Freudenburg, 1986, cited in Sampson, 1991) and to reduce opportunities for organizational contact. (Sampson, 1991) This has relevance for Queenstown, where there is a large transitional element, due both to

visitors (the population swells from around eight and a half thousand to twenty thousand at certain times of the year) and to seasonal workers, during both the ski and summer seasons. This may affect the level of community involvement for individuals, due to the relative instability of the population. Sampson (1999), for example, argued that community residential stability had direct positive effects on local social ties, which in turn increased the level of social cohesion. Equally, that the density of friendships or acquaintances, mediated the effect of structural variations on social cohesion. Examining the contextual or community effects on individual behaviour, Sampson (1991), posited that the length of residency and community residential stability would increase the number of attachments for an individual, and increase attachment to the community. Though there is undoubtedly a large transient population in Queenstown, there also appears to be a core population that provides stability to the community. It is therefore suggested that Queenstown provides the basis for a stable community environment, despite being an important visitor destination.

Sense of community is believed to contribute to the likelihood of social support being available following hazard events and is therefore suggested to be an important predictor of, and resource for, community resilience (McMillan & Chavis, 1995; Paton, 2000). The sense of community questionnaire used in this study was derived from research that emphasises the relationship aspects of community belonging and was used to allow some comparison with previous hazard research. However, the present study also provided an opportunity to explore the possible contribution of the unique physical attributes aspects of Queenstown, to residents' sense of belonging, and this was incorporated into the questionnaire. From the author's personal experience of Queenstown, it is suggested that there may also be a conflict between those who regard these assets of the area, in more



economic terms, and those to whom these assets are considered integral to the community. For example, many residents express concern that, the continuing development in tourism and building developments is exploitation and may adversely affect the community.

### **The Salutogenic Paradigm**

This paradigm represents an important movement away from the pathogenic paradigm, which was based on learned helplessness theories. It involves a concentration of resources, on developing hardiness and resilience in individuals, by providing positive input and developing environments that encourage growth and development following negative life events. Since the salutogenic position is essentially holistic, it concerns the total well being of the individual and the group. To find meaning in the outcome of negative life events, a sense of coherence, manageability and meaningfulness is required, leading to salutary outcomes. By concentrating on coping and positive outcomes, the salutogenic approach to coping with negative life events is made both meaningful and manageable. (Antonovsky, 1993, cited in Violanti and Paton, 1999)

The research of Tedeschi and Calhoun (1996), cited in Violanti & Paton, (1999), which included the development of the Post Traumatic Growth Inventory (PTGI), identified three categories of perceived benefit to individuals, associated with a traumatic experience. Described as, changes in self-perception, interpersonal relationships and life philosophy, these benefits were associated with positive reinterpretation, reframing, and interpretative control or reconstrual of events. It appears that if meaning and benefits can be found in coping with the trauma, then individuals may find comfort from this process.



Further, the existence for individuals, of positive others following trauma, has been correlated with better physical and psychological outcomes. (Violanti & Paton, 1999)

It may be that cognitive restructuring which allows individuals to find meaning in the traumatic event helps to maintain perceptions of control and competence. Paradoxically, it appears that these need not be entirely realistic to be helpful and may be a natural cognitive coping mechanism. (Violanti & Paton, 1999) According to Higgin's (1994), conceptualisation of resilience, it can be cultivated in individuals and the group can influence the individual into post-traumatic growth. Higgin's (1994), conceptualisation of the resilient individual is summarised as follows: The resilient individual will: remain fiercely committed to reflection and new perceptions, look at every experience as a source of emotional mileage, grapple actively with personal accountability and self- scrutiny, absorb information well and take most suggestions readily, believe that knowledge is power and that the future can be improved by learning and insight, negotiate emotionally hazardous experience pro-actively rather than re-actively, thus solving problems flexibly, make positive meanings out of their experience, actively constructing a positive vision, recruit other people's invested regard, and finally, reduce their discrepant views of themselves and take a measured perspective of what happened. (Higgins 1994, cited in Violanti & Paton, 1999)

Hardiness describes the characteristic way in which individuals deal with traumatic experience. Attributes of control, challenge and commitment, individually make up and influence hardiness. Hardiness in turn, is thought to moderate the effect of negative events on individuals. Together with resilience and learned resourcefulness, this forms the basis of the salutogenic or wellness paradigm, of recovery from traumatic events. (Violanti &

Paton, 1999). Examination of individual and contextual factors that contribute to community resilience may be helpful in influencing the severity of the stress experienced. This in turn may influence, both immediate and long term psychological health.

### **Coping Style and Self-Efficacy**

One definition of coping is “a response to external life strains that serves to prevent, avoid or control emotional distress” (Pearlin & Schooler, 1978, p.1). In general, stressors call for both behavioural and emotional efforts to cope, and the coping process is dependent upon personal and social resources. (Schwarzer & Schwarzer, 1996) Depletion of these resources increases the likelihood that illness, injury, disease or psychological disorder will ensue. Though some research has shown that it is negative, threatening or highly disruptive events, that are likely to precipitate psychological distress, other research has demonstrated that it may be only unresolved negative events that lead to psychological damage (Wheaton, 1990, cited in Thoits, 1999) Individuals also attempt to solve problems and may therefore learn and grow from negative experiences. (Riessman, 1990, cited in Thoits, 1999) Assessment of the meaning of the event is also considered to be an important factor in determining whether events will have negative psychological effects, (Brown & Harris, 1979, cited in Thoits, 1999) For example, divorce or job loss may appear to be a negative event, but may be intentionally brought about and could be considered to be a problem –solving act, that may result in improvements to an individual’s situation. (Thoits, 1999) The sequence of negative events may also be important in determining the likelihood of negative psychological effects. Further, stressors occurring at one stage in life may influence psychological well being both at the time, and at later life stages. (Thoits, 1999)

According to Pearlin & Schooler (1978) coping responses are specific behaviours, cognitions and perceptions, that represent what individuals actually do in response to stress. They may consist of, changing the stressful situation, controlling the meaning of the situation in order to avoid stress occurring, and controlling the stress after it has emerged. Folkman & Lazarus, 1985, cited in Scheier, Carver & Weintraub, 1989, described the concepts of problem solving versus emotion focussed coping styles. The first is aimed at reducing or managing the stress and the second at reducing the emotional distress that is caused by the stressful situation. In general, a problem focussed coping style, or tendency to be proactive when faced with an adverse situation, has been associated with better psychological outcomes. Conversely, an emotion focussed coping style, where the individual is concerned with dealing with the emotional effects of the situation, has been associated with poorer outcomes. However, it appears that the majority of people actually use a combination of both problem focussed and emotion focussed style and that problem solving style is most likely to be used when the event is seen as controllable, whereas a emotion focussed style is more likely to be used when the event is seen as uncontrollable. Further, the type of stressful situation may be important in determining which type of coping strategy is best (Thoits, 1999). Though problem focussed coping has been generally thought of as being more beneficial to psychological health (Thoits, 1999) certain aspects of emotion-focussed coping are not necessarily detrimental. For example, it has been noted that whereas some emotion-focused coping involves denial, others may involve a positive re-interpretation of events and others may involve seeking social support. Equally, problem- solving behaviours may involve taking direct action but also planning, seeking

out assistance, screening out other activities or contra to expectations, waiting before acting. (Carver, Scheier & Weintraub, 1989)

Carver, Scheier & Weintraub (1989), offered an expanded theory on problem versus emotion focussed coping styles. They suggested that the groups of behaviours used in problem versus emotion scales, be re-considered and grouped as adaptive or non-adaptive. Additionally, using other available coping literature, other conceptually related behaviours were included in the new scales. Exploring this theory, the authors distinguished two groups of behaviours, which appeared to fit these concepts. Results of their experiment demonstrated that, active coping and planning, suppression of competing activities, restraint coping and positive reinforcement and growth were all correlated, and they considered these to be conceptually adaptive. To a lesser degree, seeking social support for emotional reasons, seeking social support for instrumental reasons and positive reinterpretation of the event, also correlated with this group of behaviours. Equally, denial, disengagement, focussing on venting of emotions, and alcohol use, were correlated, and they considered these to be conceptually non-adaptive behaviours. Despite these findings, the authors concluded that the patterns of behaviour were nevertheless, similar to those found by Lazarus, 1984, cited in Carver et. al, 1989, in that a higher level of active coping were still found where the situation was seen as controllable.

Self-efficacy is related to, both the perceived controllability of a situation and to the belief that an individual has in his or her power, the ability to influence personal outcomes. As with social support, it is perceived self-efficacy that appears important in coping efforts. This is described as 'coping self-efficacy' and is defined as "the perception of one's capability for managing stressful or threatening environmental demands"(Benight, Swift,

Sanger, Smith, & Zeppelin, p. 2444,1999). In disaster studies, global self-efficacy was found by Murphy, 1987, cited in Benight et. al, 1999, to account for as much as twenty-five percent of the variance in predicting psychological distress. Following Hurricane Andrew, Benight et. al (1997) found that coping self-efficacy accounted for fifty-one percent of the variance in predicting PTSD symptoms after, estimated damage, perceived life threat, educational level, income, and immune status had been controlled for. Thus there is evidence that self-efficacy is a significant component of hardiness, or the individual's ability to withstand psychological trauma. These findings suggest that in the event of hazards, the degree to which the hazard effects are perceived as controllable may also be considered an important influence on individuals' engaging in active coping.

### **Dispositional Optimism**

Dispositional optimism appears to be a relatively stable individual characteristic. Defined as the belief that, the future for an individual is likely to be positive, it is thought to result in more likelihood of coping efforts being made. (Scheier & Carver, 1992) Studies have shown that optimism has beneficial effects on health (Taylor, 1992, cited in Scheier & Carver, 1992). Benight, Swift, Sanger, Smith, & Zeppelin (1999) demonstrated that loss of resources had a direct effect on distress but that this was mediated by coping self-efficacy and dispositional optimism. Studies have shown that optimists tend to rely on active, problem focused coping even though they also use emotion-focused coping strategies. They also have a tendency to accept the reality of a situation, to see the situation in the best possible light and to personally grow from experiences they face. Conversely, pessimists tend to cling to denial, and to their particular worldview, that is not conducive to a

restructuring of meaning that allows adjustment necessary to deal with a situation. (Scheier & Carver, 1992) Further an optimistic attributional style, (internal, stable and global for positive events and external, unstable and specific for negative events) (Yule, 1999) might be an important determinant in stress response. This is suggested to be because it may influence coping behaviour and social support seeking. (Scheier & Carver, 1992.) Disaster studies have found that optimism was related to lower reported physical illness burden in patients suffering from chronic fatigue syndrome following Hurricane Andrew, and decreased anxiety, less depression and less palliative coping strategies in a community, following the Persian Gulf war. (Lutgendorf et al, 1995 and Zeidner & Hamner, 1992, cited in Scheier & Carver, 1992) It appears from the literature, that optimism is influential on psychological outcomes, at least partly through its effect on coping. (Scheier & Carver, 1992).

Optimism is also believed to be associated with lower risk –taking behaviour, because of the resulting belief in a positive future. (Benight et al, 1994). As previously mentioned, risk perceptions are an important factor in the assessment of risk. Objective and subjective assessments of risk may be the result of individual differences and factors such as location, occupation and lifestyle. This may be important to consider in preparedness for disaster. For example, Mclure, Walkey & Allen (1999) found, lower risk taking behaviour was more likely to result in the seeking out of hazard knowledge and preparedness. In an interesting investigation into reasons why individuals' often fail to prepare for hazard eventualities, Mclure et al. (1999) examined risk taking behaviour and type of locus of control. Having an internal locus of control, infers a belief that circumstances are largely a consequence of individuals' own actions, whereas having an external locus of control

infers a belief that outcomes are determined by outside circumstances and fate. Locus of control appears conceptually similar to self-efficacy, as both concepts suggest a belief in likely personal effectiveness from personal action in a situation. However McLure et al (1999) found that the preparation for earthquakes was actually more likely to be related to risk taking, than to individuals' belief in their ability to influence outcomes. Low risk takers were more likely to have made more preparation for earthquake eventualities and tended to see distinctive damage, (for example to an unsafe building) as more preventable than global damage. Conversely individuals' with an external locus of control tended to view all earthquake damage, as liable to be extreme, and to have a fatalistic view of earthquake outcomes. Also individuals' with an internal locus of control, were more likely give complex explanations of earthquake damage, a viewpoint that it was suggested, might be more amenable to hazard mitigation strategies. The authors suggested that the tendency for individuals with internal locus of control to offer complex explanations for earthquake damage also suggested a need to deal with specifics of prevention rather than focusing on the likelihood of mass destruction. (McLure et al 1999) The findings of Millar, Paton & Johnston, (1999) support the need to deal with specifics. They demonstrated that economic and employment consequences of volcanic activity were more salient to individuals, than information about physical hazards per se. Thus Paton (2000) suggested that "identification of the salience of different potential threat factors and community needs" is an important issue.



## Social Support

Social support can also be considered a coping resource (Thoits, 1995). It may include both actual assistance provided to individuals and perceived support, resulting from being a member of a valued group or dyad. Received social support therefore refers to helping behaviours and perceived support, to the belief that support would be provided when needed. Wethington and Kessler (1986) argued that the stress buffering effect of social support was more strongly linked to the perception of availability of support than to actual support provided. Further, that perceived support might be considered to be a personality characteristic. This observation has resulted partly because measurements in perceived social support have been shown to remain stable for up to three years, despite major changes in circumstance. Also because these measures have been shown to correlate positively with measures of extraversion and negatively with measures of neuroticism and trait anxiety. (Pierce, Sarason & Sarason, 1996) Additionally, Sarason & Sarason, 1991, cited in, Pierce, Sarason & Sarason, 1996, found that persons high in perceived support were both more accurate, and more positive about the attributes of others. Equally, ratings of their peers and parents perceptions towards them were positively related to their ratings of these counterparts. These authors posited therefore, that perceived support might be called an attitude, since it seems to reflect a belief about relationships in general.

Though perceived support appears to be consistently related to the promotion of psychological health, in times of stress, studies on actual support have demonstrated the beneficial effects in some instances but in others, have been shown to produce none. Possible negative effects have also sometimes been observed. It was suggested by Kaniasty and Norris (1999) that this may be because many factors may impact upon the giving of



actual social support. For example, the type and severity of the stressor, and the psychological reactions of the individual, may render the support inappropriate or insufficient. Kaniasty & Norris (1996) further hypothesised that the stress effects on an individual might be mediated by the loss of perceptions of social support, somewhat independently of actual support measurements.

The authors were particularly interested in the notion that nature of the stressor might influence global perceptions of availability of support. They noted that long term stresses, including adverse marital, economic and parenting situations have been demonstrated to diminish perceptions of support and suggested that, stress resulting from exposure to hazard events might diminish support perceptions in a similar fashion. Thus the support deterioration deterrence model was proposed. This model holds that “the most proximal consequence of the *actual* support mobilization after a stressful event is the *maintenance* of the perception of social support’ (Kaniasty & Norris, p 499,1996; emphasis added). Support for this model was demonstrated using data obtained previously obtained following Hurricane Hugo and Hurricane Andrews. Measures of scope of exposure, received support, perceived support and psychological distress were analysed and the socio-demographic variables, race, sex, marital status age and education were controlled for in the analysis. Results showed that exposure to hazard events, reduced perceived social support but when actual support was adequately mobilized, adverse effects were significantly suppressed. An additional finding was that social support was not all-inclusive. For example, perceived support was positively associated with education and negatively associated with minority status and age. These results were in accord with previous research by Kaniasty & Norris (1990) that had also included pre-disaster

assessment measurements of social support, lending extra weight to their findings. Since received support appears to reduce stress through the maintenance of support perceptions, it was argued that the focus of social support should be on support mobilization following disaster. Additionally, where existing social networks were scarce due to lack of individual and/or social resources, access to social support was reduced. This led to certain "patterns of neglect". Therefore an emphasis on the improvement and strengthening of existing social networks might encourage all inclusive support networks and should thus be fostered within the community. (Kaniasty & Norris, 1996) These findings support the hypothesis that perceived support may be an important contributor to an individual's ability to cope following a hazard event.

## **Summary**

It emerges from this review that the concept of competent communities appears to rely on both individual and group characteristics, which are proposed to lead to action, in the event of natural hazards. This may be realised in several ways. For example, by the reduction of risk taking behaviour, as evidenced by specific preparation for hazard events. Equally, high levels of self-efficacy and perceptions of social support, may lead to a higher likelihood of group activity and involvement in preparation for and recovery efforts following, natural hazard events. It appears that these may be present in a competent community, or may be fostered in a salutogenic environment. Problem-solving coping style, may also lead to more individual and group action, in both preparation and recovery. Optimism is thought to mediate the effects of stress on resource loss, and to be implicated in risk-taking behaviour. Community competence implicitly requires involvement and

commitment of individuals within the community. These concepts contribute to hardiness and resilience, which in turn protect individuals and communities from the deleterious effects of stress following hazard events.

## **Rationale for the Study, Research Questions and Hypotheses**

Utilising the salutogenic paradigm, emerging insights may assist communities to better prepare and recover from hazard events. (Paton, 2000) Since there is considerable research material on which to draw, the first part of this study focusses on the aspect of hardiness and resilience in individuals and communities, which is an essential part of the salutogenic paradigm. In parallel, the constructs sense of community and community belonging are also further explored. In a previous study, Miller, Paton & Johnston, (1999) examined the ability of self-efficacy, problem solving coping style and sense of community to predict community resilience, during and following the Mount Ruapehu, New Zealand eruptions of 1995. This model for resilience was based upon Tobin's (1999) model for resilience and sustainability. Paton & Smith (1996), cited in Paton (2000,) point out, that the model describes complex inter-relationships, with many elements to be considered. Accordingly, variables contained within the model, that had established measurement qualities, were selected in order to operationalise the model and test it's efficacy for hazard planning. It was suggested that, sense of community, coping style, self-efficacy and social support had been previously shown to be important in predicting resilience to hazard effects in communities, therefore this model was further tested by Miller, Paton & Johnston. (1999) (Paton, 2000). Using measurements of stress on the Hopkins Symptom Checklist-21 (HSCL), as a measurement of resilience, these authors found that self-

efficacy, problem solving coping style and age were correlated with lower levels on the HSCL. Carrying out a regression analysis, the authors also found that, self-efficacy, problem solving coping style and age, significantly predicted resilience. Previous studies, for example, Bachrach & Zandra (1985), and Bishop, Paton, Syme & Nancarrow (2000), have also used the HSCL as an indication of resilience.

The first hypothesis therefore that is relevant to this part of the present study, is that self-efficacy, coping style, perceptions of social support and psychological sense of community can predict levels of stress as measured by the HSCL. The above variables were chosen to enable some comparison with previous research and because some support has already been shown for this model. As pointed out by Paton (1999) “the utility of a model is a function of its ability to predict differences in resilience when assessed against a range of hazards.” (p.10) However, no previous research in New Zealand has tested the model following a flood hazard scenario. Additionally, to the best of the researchers knowledge, no other study of natural hazards in New Zealand has included the personal experiences of those experiencing a natural hazard. The present study was intended to address these gaps.

The Queenstown environment is also unique, having exceptional physical beauty and in being a small town, but with a large tourist and transient population. A further aim of the present study was to investigate whether this would have an effect on the concept of sense of community. As pointed out by Chavis & Pretty (1999), the relationship between psychosocial well-being and the physical aspects of home, have not been studied much in the sense of community literature, as this has tended to focus on human relationships. Yet previous qualitative observation of the Queenstown community, points to the possible

importance of its special environmental features to individuals' choices of residency, and this may be important to sense of community. It was therefore hypothesised that the physical or spiritual relationships that residents had with the lake and mountains, Queenstown being a visitor destination and Queenstown being a small township, would be demonstrated to be significant factors in attachment to the community. Given the relatively regular flooding, associated with proximity of the lake and ecology of the area, a further research question was whether particular characteristics of Queenstown, were instrumental in individuals' judgements to remain in the area, despite the high risk of the occurrence of natural hazards. Further, assessment of community knowledge, effectiveness of communication, risk perception and preparedness for natural hazards is considered important in measuring community preparedness, and response to natural hazards. (Paton, 2000), so this was included in the present study, and will add the hazard scenario of flooding, to the present New Zealand data.

The second part of the study utilised qualitative information gained through the use of unstructured interviews with a high intensity sample of individuals who were directly affected by flooding or landslide. Additionally, archival information drawn from the local press was utilised. This aim of this was to attempt to identify any alternative important factors that contributed to or hindered individuals' or the community's ability to cope with the hazard event, with particular emphasis on any positive outcomes and lessons learned. This was in accordance with the salutogenic paradigm around which this research is based. It also included some qualitative examination of the effectiveness of the community and civil defence response. However, it was also intended that this qualitative information be

utilised in an inductive way, keeping an open mind in order to allow the emergence of issues of importance to the participants. (Patton, 1990).

## **Research Setting**

The study was carried out in Queenstown, New Zealand, in March 2000. Queenstown is situated on the shores of Lake Wakatipu and is surrounded by mountains that form a part of the Southern Alps. (See appendix A for map of area affected by floods and slips) High rainfall, combined with the effects of rapid run-off after a heavy rainfall, and snowmelt contribute to the risk of flooding in this area. At these times the lake level rises slowly but steadily, while outflows from the lake are significantly slower. Eight times in the last fifty years, the lake level has risen sufficiently to cause flooding, with four of these being in the last five years. In November 1999, the lake level exceeded the previous highest recorded level of 1878. This event also triggered two landslides in the Queenstown area. These were in close proximity to each other and approximately seven kilometres from the Queenstown Township and close to Frankton village. Both the flooding and slips occurred in the area administered by Queenstown Lakes District Council and the Otago regional Council. (Becker & Richardson, 2000)

On the evening of 18<sup>th</sup> November 1999, the lake level had risen to 1.5 metres above the commercial area of Queenstown. Additionally a burst disused dam at Brewery Creek (situated approximately two kilometres from the commercial area) caused destruction to property. This also caused Queenstown to be cut off from industrial place, where the sandbagging supplies were held. A total of five residential properties, fifty commercial properties and the waterfront area were affected by significant flooding. Additionally, a

further one hundred and ten properties were flooded in the nearby towns of Kingston and Glenorchy (Adams (2000), Otago regional Council, 200a, cited in Becker& Richardson, 2000). It was beyond the scope of this research project to include all the surrounding areas affected by the flood event. Therefore the study involved only the Queenstown and Frankton areas.

On the evening of 19<sup>th</sup> November, due to landslips, a civil emergency was declared and residents from twenty- four households and an apartment block were evacuated. They were allowed only thirty minutes to gather possessions. However a further eleven houses were declared to be in a 'no go zone' and residents of these households were evacuated with no time allowed for the gathering of possessions. Remedial stabilisation work on the slip in Frankton road was undertaken, however it was eight days before thirteen of the residents were allowed back into their homes and apartments. The civil defence emergency remained in place until November 29<sup>th</sup>, ten days after the flood and slip events. (Becker& Richardson, 2000) At the time the study was conducted, eleven households were still in temporary accommodation, or had left the area. Three of these (two couples and a single gentleman) were interviewed for the purpose of this study.



## **Chapter 3**

### **Method**

#### **Participants**

The first part of the study consisted of the distribution of a flood hazard questionnaire via a 'Kiwi mail' letterbox drop. The second part involved a series of unstructured interviews, and involved an examination of the local press reports at the time of the flood and slip events. The participants of the second part of the study were flood and slip victims, members of the civil defence emergency response team and a victim support counsellor. One member of local council was among those involved in the civil defence emergency response. Additionally, attendance at meetings with a further three members of council, and coverage by the two main local newspapers, at the time, have added to the information included in this study. A notice was placed in the local newspaper requesting interviews with anyone who had been personally affected by the flood or slip. Also, the victim support counsellor recruited volunteers from those individuals, who she knew had been evacuated from their homes, due to the slip or flooding. A total of twelve participants volunteered for the unstructured interview sessions. The findings from these interviews are reported in narrative form.

#### **Ethical Issues**

The present study was designed in accordance with the ethical guidelines presented by the New Zealand psychological society. The study was funded by, the Institute of Geological and Nuclear Sciences, as part of their public good funding policy.



## Measures Used

The flood hazard questionnaire, (Appendix B) was adapted from a previously developed earthquake questionnaire, used in studies by Miller, Paton & Johnston (1999) and Johnston, Bebbington, Lai, Houghton & Paton (1999). It was made up of sections requesting demographic information, hazard knowledge and preparedness information, individuals' sources of flood hazard information and the most trusted source of information. The Hopkins Symptom Checklist-21 (HSCL-21, Green et al, 1988) was used to measure psychological vulnerability. Self-efficacy, coping style and sense of community scales developed by Bachrach and Zandra (1985) and adapted by Bishop, Paton, Syme & Nancarrow (2000) were also used. Perceived social support was measured, using The Social Support Questionnaire (SSQ6); (Sarason, 1983) Since there were no questions directly relevant to the unique physical characteristics of Queenstown, a new variable was added that asked specific questions about the importance of these special attributes to individuals. In this section, participants were asked how important the following characteristics were to them: having a physical/spiritual relationship with the lake: having a physical/ spiritual relationship with the mountains: living in a small township, and finally: Queenstown being a visitor destination.

## Procedure

Five hundred copies of the questionnaire were put into post office boxes, by Kiwi mail. Some were put into rural boxes, however the majority were divided equally between business and private box numbers. It was hoped that the return would therefore yield a number of responses from individuals' both directly and indirectly affected by the flood

and landslip events. There are a large number of uninhabited, holiday and rental premises in Queenstown and Frankton and it was hoped that the use of postal boxes would decrease the amount of wasted questionnaires, from that of a random letter box drop. The questionnaire began with an explanation of the purpose of the study and it was explained that completion of a returned questionnaire, implied consent to participate in the study. The questionnaires were anonymous and not coded in anyway. A return envelope was included and was pre- addressed to the Institute of Geological and Nuclear Sciences. The questionnaire results were analysed using the student SPSS statistical package.

Participants in the second part of the study were contacted and an appointment made to interview them in their homes. Each participant received an information sheet and was asked to sign a consent form prior to the commencement of the interview sessions. (Appendices C and D) Interviews lasted for approximately one hour each, and participants were invited to talk about their experiences during and since the flood and slip event. They were specifically asked to consider anything positive they felt had come out of the event, and anything they had learned that might change what they would do in the event of future floods. These narratives were used to help identify any common themes of the localised experience of those involved in the flood and slip events. Also to identify any factors which participants considered had contributed positively, to the recovery of the community as a whole, from the events. This was in accordance with the use of the salutogenic paradigm to identify positive outcomes and indications of personal growth.

## Chapter 4

### Results

#### Part 1

Part 1 of this section will describe the results obtained from the survey. Part 2 will describe the results of the interviews and is in narrative form. A principal aim of the study was to investigate how the variables of self-efficacy, coping style, sense of community and perceived social support might act to reduce psychological impact. Age, gender, ethnicity, education and income have all been demonstrated to influence vulnerability and social support in individuals', following hazard events. (Gist & Lubin 1999) In view of this, the demographic factors for the participants who completed the questionnaire are shown in Table 1. Of the 500 questionnaires distributed, 84 (16%) were completed and returned. There were slightly fewer female than male participants in this part of the study and the majority of participants were Pakeha/European. No participants described themselves as Maori; therefore the indigenous population of New Zealand is not represented in this study.

The age range of participants was 20 to 70 years. ( $M = 43.37$ ,  $SD = 12.58$ ) The average educational status of the participants was roughly normally distributed, however income was positively skewed with just over 60% earning > \$50,000 in the previous year. The occupational status of the sample was generally high, with 86.8% holding professional, managerial or technical positions. The level of employment was also high, with 86.8% being in full or part-time employment and a further 3.6% being casually employed. Families with or without children accounted for 77.1% of the sample surveyed. Further > 68% of participants were in professional or managerial positions. This sample therefore,

had a high representation of more highly educated, and financially comfortable participants than would be expected from an average New Zealand population.

The tendency for individuals who have higher socio-economic status to receive greater social support has been noted in previous hazard studies, for example, Eckenrode & Wethington, 1990, Umberson & Landis, 1998 and Vaux, 1988, cited in Gist & Lubin, 1999. The skewed nature of this sample, in this respect, was expected to impact on the results and have implications for their interpretation and generalisation to a wider New Zealand population. This is particularly pertinent when considering the wider Wakatipu valley population, who were also affected by the flooding, but who could not be included in the study, due to restrictions on the research. This will be discussed further in a later section.

**Table 1**

Demographic Characteristics of Participants

<u>Characteristics</u>	<u>Participants</u>	
	<u>n</u>	<u>%</u>
<i>Gender</i>		
Male	45	54
Female	37	44.6
<i>Ethnicity</i>		
Asian	1	1.2
Maori	0	0
Pacific Island	0	0
Pakeha/European	73	88
Other	7	8.4
Missing	2	2.2

Table 2

<u>Education</u>	<u>Participants</u>	
	<u>n</u>	<u>%</u>
No school qualifications	7	8.4
School certificate passes	11	13.3
School qualifications, University entrance and above	17	20.5
Trade certificate or professional Certificate or diploma	22	26.5
University undergraduate degree (e.g., diploma or Bachelor's degree.)	19	22.9
University postgraduate degree (e.g., Master's. Ph.D.)	5	6
Missing	2	2

Table 3

<u>Gross household income for 1999. (NZ dollars)</u>	<u>Income</u>	
	<u>n</u>	<u>%</u>
5-15,000	3	3.6
15,001- 20,000	2	2.4
21,001- 30,000	8	9.6
30,001- 40,000	6	7.2
41,000- 50,000	12	14.5
51,001- 60,000	15	18.1
> 60,000	35	42.2
Missing	2	2.4

**Table 4**Living Circumstances

	<u>Participants</u>	
	<u>n</u>	<u>%</u>
Family with children	41	49.4
Family without children	23	27.7
Alone	6	7.2
With non-family	4	9
Other	2	2.4

---

**Table 5**Type of Employment

	<u>Participants</u>	
	<u>n</u>	<u>%</u>
Managerial or professional speciality occupation.	57	68.7
Technical sales or administrative support.	15	18.1
Service occupation.	6	7.2
Farming, industry or fishing occupation.	1	1.2
Operator, fabricator or labourer.	2	2.4

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**Table 6**Current Employment Status

	<u>Participants</u>	
	<u>n</u>	<u>%</u>
Employed full time.	61	73.5
Employed part-time.	11	13.3
Not in paid employment.	7	8.5
Casually employed.	3	3.6

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## **Flood Damage**

Participants, who lived away from the flood and slip areas, completed 25% of the questionnaires. Of those who had directly experienced either the 1999 or a previous flood event, 48% reported severe, and 14% reported moderate damage to their neighbourhood, rather than their own homes. None of the participants, or their household members had experienced injuries resulting from the flood.

## **Hazard Knowledge and Preparation**

Hazard knowledge included a question about the type of hazard participants considered to be most threatening, to themselves or their properties and estimates of risk (in years) and the results are shown in Table 7. Not surprisingly, 43.45% considered floods to be the most threatening hazard to their area of residence. Risk of earthquakes was considered to be highest by 22.9% of participants. This is also reflected in the finding that only 25% of the sample had personally experienced flooding and probably reflects a higher salience of the risk of earthquakes, consistent with the earthquake risk associated with living in New Zealand. Severe storms were estimated by 12.5% to be the most threatening hazard and this is likely to be related to the landslips that occurred during the heavy rains that preceded the flooding. According to the Institute of Geological and Nuclear Sciences' hazard maps of the area, the risk of landslips in the area is considerable (pers.com., Phil Glassey, 2000).

Table 8, demonstrates that participants were certainly aware of the likelihood of flood risk to the area. The most conservative risk estimation was that a damaging flood would occur within 5 years (20.5% of the sample). Statistics held by the council, based on past

occurrence of floods, indicate the risk of a flood of this severity to be 1%, with the risk of less severe flooding to be 4%-10%. Perceived likelihood of occurrence of flooding therefore appears fairly accurate.

Table 7

<u>Hazard Considered to be most Threatening to Area of Residence</u>		
<b>Hazard type</b>	<b>Participants</b>	
	<u><b>n</b></u>	<u><b>%</b></u>
Cyclones	0	0
Floods	36	43.4
Severe storms	10	12.5
Earthquakes	19	22.9
Volcanic eruption	0	0
Chemical or toxic waste spills	0	0
Water contamination or other pollution	3	3.6
Scrub or forest fire	6	7.2

Table 8

<u>Perceived Likelihood (in years) of Flood Occurrence Causing Injury or Damage, to Participant, Family or Home.</u>		
<u><b>Years</b></u>	<u><b>n</b></u>	<u><b>%</b></u>
1	5	6
5	30	36.1
50	14	16.9
>50	14	16.9
Don't know	17	20.5

Questions concerning sources of information received, the reliability of information and the consistency of information concerning preparation for a major flood, were also used to assess hazard knowledge levels and results of these are shown in Tables 9,10 and 11 respectively. Table 9 illustrates the sources of information on flooding and flood



preparations that participants recalled. 41 (49.1%) did not complete this section of the questionnaire. Of the remainder, the main sources were television and radio, 15.7%, local government including civil defence, 8.4% and newspapers, 5.6%. Only 4.8% cited the telephone book, equal to those who cited central government. Interestingly, as shown in table 6, 30.1% thought that the single most reliable and trustworthy source of information was that sent received through the post. Flood preparation information is sent out regularly with the rate accounts in Queenstown (pers. comm., QLDC, 2000) and this may have contributed to this perception.

**Table 9**

Sources of Information About Major Flooding or Preparation for Major Flooding

<u>Source of information</u>	<u>Participants</u>	
	<u>n</u>	<u>%</u>
None	1	1.2
Central government	4	4.8
Regional Council (includes Regional Civil Defence	1	1.2
District or City Council (includes Local Civil Defence)	7	8.4
Police or Fire Service	2	2.4
Earthquake Commission (EQC)	2	2.4
Institute of Geological and Nuclear Sciences	0	0
Television or Radio	13	15.7
Newspapers or magazines	3	5
Meetings, seminars or workshops	1	1.2
Workplace	1	1.2
Telephone book	4	4.8
Insurance company/agent	1	1.2
Missing	41	49.4

Table 10

Perceived *Single* most Reliable and Trustworthy Source of Information

<u>Source</u>	<u>Participants</u>	
	<u>n</u>	<u>%</u>
Public meetings	4	4.8
Telephone communication	1	1.2
Information sent by post	25	30.1
Television	16	19.3
Radio	17	20.5
Newspaper	8	9.6
Other	3	3.6
Missing	9	10.8

Table 11

Perceived Consistency of Information

<u>Consistency</u>	<u>Participants</u>	
	<u>n</u>	<u>%</u>
No information	3	3.6
Consistent information received	9	10.8
Fairly consistent information received	31	37.3
Unsure	14	16.9
Fairly inconsistent information received	14	16.9
Inconsistent information received	11	13.3

Preparation for flooding was assessed both by asked about perceived preparedness of participants’ households, the local community, and central and local government. (See table 12) and by asking participants about specific measures taken. Most participants considered their households to be somewhat prepared (44.6%), and their community also to be somewhat prepared (53%). However, central and local government were mainly considered by participants to be not very well prepared, at 33.7% and 39.8% respectively. On specific measures taken to prepare for floods, 48.2% had taken none more than a year

previously and slightly fewer (41%) had taken none in the previous year to the present study. Out of a possible score of 11 (see appendix D for complete list) the highest number of activities in previous years was 8, completed by only 2.4% of participants. In the past year, the highest score was 11, completed by only 1.2% of participants. The final question in this section asked what the reasons were that individuals had not done more to prepare for a large-scale flood. Table 13 shows that approximately one third (33.7%) felt that they were as ready as they could be. A substantial number of the sample (41%) was in an area they considered to be away from flood risk. Interestingly, 21% felt that further preparation would not help.

**Table 12**

Perceived Preparedness for a Damaging Flood, as Judged by Participants (%)

Group	<u>Preparedness level %</u>				don't know
	very	somewhat	not very	not at all	
Your household	2.17	44.6	18.1	12	1.2
Your community	9.6	53.0	21.7	12	1.2
Central government	0	27.7	33.7	26.5	8.4
Local / regional government	10.8	30.1	39.8	16.9	1.2

---

**Table 13**  
Reasons Why Participants had not Prepared More for a Large Scale Flood

Reason	Participants	
	<u>n</u>	<u>%</u>
Couldn't afford it.	5	6
Didn't have time.	5	6
Didn't think it would help.	18	21.7
As ready as could be	28	33.7
Wouldn't happen in area	34	41.0
Someone else's responsibility (e.g. local or central government)	4	4.8
Other reasons:		
Waiting for public consultation after previous flood.	1	1.2
Current home above flood risk	2	2.4
Couldn't be bothered	1	1.2
Surprised at extent of flood	1	1.2
Hadn't been told what to do	1	1.2

**Belonging and Sense of Community**

Information collected included rental or buying status, length of residency, presence of relatives in the area, expectations of moving away from the area and a sense of community questionnaire, adapted from Bachrach & Zandra (1985). Twenty -one (25.3%) of the sample were renting and sixty (72.3%) were buying or owned their own homes at the time of the survey. Table 14 shows length of residency in the region. Table 15 shows the likelihood of moving away. Twenty- nine (34.9%) of participants had relatives, other than those in the same household, living in the area. Fifty-one (61.4%) did not. Ratings for sense of community were generally high (see Table 16). When the scores in the sense of community scale were summed, these scores were significantly correlated with age ( $r=.261, p<.05$ ), scores on attempts to gain flood knowledge ( $r=.246, p<.05$ ), owning own

house ( $r=.300, p<.01$ ), length of residency in the same region ( $r=.373, p<.01$ ), number of floods experienced ( $r=.340, p<.01$ ), social support ( $r=.329, p<.01$ ) and negatively correlated with family size ( $r=-.258, p<.05$ ) Though the likelihood of moving away from the region, was not significantly correlated with other factors suggesting belonging, more than 78% of those surveyed thought it unlikely or very unlikely that they would do so. These results support the notion that residential stability may be an important factor in a sense of community belonging (Sampson, 1991) and that belonging may be an important factor in flood knowledge. Social support and a family structure, may also contribute to belonging. These findings are explored in more detail in discussion section that follows.

Table 14

Length of Residency in the Region

<u>Time in years</u>	<u>Participants</u>	
	<u>n</u>	<u>%</u>
> 1	2	2.4
1	6	7.2
2-5	17	20.4
6-10	16	20.4
11-15	10	12.0
16-20	11	13.2
21-25	9	10.8
26-30	3	3.6
31-36	4	4.8
37-43	2	2.4

---

Table 15

Likelihood of Moving Away From the Area

	<u>Participants</u>	
	<u>n</u>	<u>%</u>
Very likely	5	6
Likely	9	10.8
Not very likely	24	28.9
Not likely at all	41	49.4

Table 16

Summary Ratings of a Sense of Community (% of participants)

	Not at all	To some extent	Very much
I feel at home in this community.	0	9.6	88.8
I am satisfied living in this community.	0	10.8	87.9
I am useful member of this community.	1.2	28.9	68.7
I have the same values and beliefs as my neighbours.	3.6	51.8	38.4
I feel I don't belong in this community	80.7	9.6	1.2
I am interested in knowing what goes on in this community.	1.2	20.5	75.9
I would be happy to leave this community.	56.6	33.8	1.2
I know my neighbours and/or other community members.	2.4	32.5	62.6
I have no active involvement in this in this community	61.4	21.7	3.6

**Sense of Control and Social Support**

Participants were asked about satisfaction with their lifestyles. One scale dealt with the extent to which they felt they had control over their lives and surroundings. Another, with the amount and satisfaction with their social support networks. The results of these are shown in Tables 18 and 19, respectively.

Table 17

Ratings of Control Over Life Events and the Community  
**(% of Participants)**

	<b>Disagree strongly</b>	<b>Neither agree no disagree</b>	<b>Agree strongly</b>
I feel I have control over things that happen in my life and in the community.	7.2	48.2	42.1
There is no way I can solve some of the problems I have by myself.	34.9	47.0	14.4
I can't do much to change what happens in my life or in the community.	32.5	56.6	6.0
Somehow problems in my life usually solve themselves.	21.7	49.4	27.7

Participants were asked to record the number of individuals (to a maximum of nine) that they felt they could rely on to be supportive under different sets of circumstances. (See appendix for full details) The results showed that most participants had several sources of social support. (M=6.14, SD=2.67) Satisfaction with the social support received was measured on a Likert scale (Table 19). Results demonstrated generally high levels of overall satisfaction with support received.

Table 18

Ratings of Social Support Satisfaction

	<u><b>Participants</b></u>	
	<u><b>n</b></u>	<u><b>%</b></u>
Very satisfied	42	50.6
Fairly satisfied	18	21.7
A little satisfied	3	3.6
A little dissatisfied	0	0
Fairly dissatisfied	2	2.4
Very dissatisfied	9	10.8

Coping Style

Ratings on problem and emotion focussed coping styles were measured using a scale adapted by Bishop, Paton, Syme & Nancarrow (20000). Paired samples t test results on emotion versus problem solving coping style, showed no correlation between the two styles. Most participants scored higher on the emotion than the problem focussed style scale, indicating in fact, that a problem focussed style was more commonly used ( $t = 10.911, p<.01$ ). Pearson’s correlation results showed that a higher score (less emotion) on the emotion-focussed scale was negatively associated the self-efficacy variable “There is no way I can solve some of the problems I have by myself”. ( $r = 0.271, p<.05$ ). A higher problem focused coping style score (i.e. less used) was associated with a higher score on the self-efficacy variable “I can’t do much to change what happens in my life or in the community.” ( $r = .230, p<.05$ ) Thus lower use of a problem focussed, coping style was associated with a lower sense of self-efficacy.

Table 19

Ratings of importance of a combination of features, suggested to be unique to the Queenstown environment.

	<u>(% of Participants)</u>		
	Not at all	Moderately	Extremely
Having a physical/spiritual relationship with the lake	19.3	33.8	43.4
Having a physical/spiritual relationship with the mountains.	13.3	25.3	56.6
Queenstown as a small township.	15.7	38.6	43.4
Queenstown as a visitor destination.	10.8	32.5	54.2



Table 20

Pearson Correlations between Stress and Demographic and Psychological Variables

\* correlation is significant at the 0.05 level.  
\*\* correlation is significant at the 0.01 level

	1	2	3	4	5	6	7	8	9	10	11	12	13
Stress													
Age	-.118												
Income	-.236*	.077											
SOC	-.100	.118	.059										
EC	.030	-.072	.087	.165									
PC	.174	-.197	-.168	-.040	.167								
SE.1	-.184	.265*	.245*	.282*	-.060	.019							
SE.2	.229*	-.059	-.061	-.003	-.271*	.172	.085						
SE.3	.144	.051	-.085	-.363**	-.170	.230*	-.153	.239*					
Ch.1	.067	.097	-.140	-.167	-.212	-.177	.004	-.047	.037				
Ch.2	.130	.030	-.187	-.133	-.108	-.151	.017	.076	.075	.801**			
Ch.3	.147	-.173	-.001	-.144	.124	-.108	.002	-.036	-.018	.343**	.343**		
Ch.4	-.101	.071	.140	.097	-.025	-.066	.251*	-.054	.090	.096	-.004	.033	
Ss.	-.189	-.052	.106	.259*	-.212	-.234*	.203	.208	-.074	-.002	-.018	-.021	.135

The Relationship Between Stress, and Demographic and Psychological Variables

Pearsons correlations were carried out between stress and the demographic variables of age and income. There was no significant correlation between stress and age but higher stress and income were negatively associated ( $r = -.236, p<.05$ ). Thus higher incomes were associated with less stress. This is consistent with the findings of Hobfall (1993), Thoits (1995) and others, who have found that financial resources can provide a buffer against stress, in times when resources would be stretched for most. The correlations between stress (Stres) and sense of community (SOC) and coping styles were insignificant. One of the self-efficacy variables, “There is no way I can solve some of the problems I have by

myself" (SE 2) was significantly positively associated with higher levels of stress ( $r = .299$ ,  $p < .05$ ), lending support for the notion that higher self-efficacy is associated with greater resilience. Age and Income (Inco) were also positively associated with the self-efficacy variable; "I feel I have control over things that happen in my life and in the community". (SE 1) ( $r = .265$ ,  $p = .05$ ;  $r = .245$ ,  $p = .05$ ) respectively. Interestingly, age was also positively associated with the self-efficacy variable, "There is no way I can solve some of the problems I have by myself." (SE 2) ( $r = .229$ ,  $p < .05$ ). This could represent a realistic view, gained from experiences, or may be associated with a higher level of social support, perhaps consistent with longer residential status. Equally, sense of community was positively associated with the self-efficacy variable, "I feel I have control over things that happen in my life and in the community" (SE 1) ( $r = .282$ ,  $p < .05$ ). This supports a link between community belonging and personal control. Social support (Ss) was significantly positively correlated with sense of community, ( $r = .259$ ,  $p < .05$ ), lending support for the relationship between belonging and social support. Finally, problem style coping was significantly negatively associated with social support, ( $r = -.234$ ,  $p < .05$ ). Since a measurement of perceived support was used for this study, this may represent a sense of needing less support, when problem-solving style coping was used.

One aim of the study was to investigate whether the unique situational and environmental qualities associated with Queenstown, were important to participants' sense of community and belonging. Table 19 shows the ratings for these attributes. Summed scores of these ratings were generally high, demonstrating that these factors are probably important to Queenstown residents. "Queenstown being a visitor destination" was significantly correlated with the sense of control variable "I feel I have control over what

happens in my life and in the community” ( $r=.25, p<.05$ ) and this may reflect the large community investment in tourism. The items are highly correlated with one another ( $p<0.1$ ). This is explored further in the discussion section that follows.

To further investigate the relationship between stress and the psychological variables of interest in this study, a regression analysis was performed to determine whether self-efficacy, sense of community problem style coping and social support could predict levels of resilience as measured by the Hopkins Symptoms Checklist (HSCL). To do this, scores on all three self-efficacy variables were summed. Age and Income were also entered into the regression model. The standard ‘Enter’ method was used. There were no significant Beta results obtained for any of the variables entered. The Beta co-efficients from the regression analysis are listed in table 21, below. Thus the model failed to predict resilience on this occasion. Possible reasons for this will be covered in the discussion section that follows.

**Table 21**

Regression analysis

	<b>Standardised Beta Co-efficients</b>	<b>t value</b>	<b>Significance</b>
Age	-.125	-.955	.343
Income	-.192	-1.594	.116
Belonging (SOC)	-.011	-.084	.933
Control (SE,1,2&3)	.097	.703	.485
Emotion (EC)	.009	.076	.940
Problem (PC)	.023	.171	.865
Social support (Ss)	.441	.271	.117

## Part 2

### Qualitative Section

The questionnaire used in the first part of the study, provided quantitative information, particularly useful for measuring demographics and for assessing the areas of hazard knowledge and preparation. Equally, collection of data on psychological variables, gathered in this way, was used to test the model that self-efficacy, sense of community and coping style could predict stress levels, and thus resilience, in the community. However, it was felt that interviewees might provide additional insights into their experience which might bring to light different considerations useful in the attempt to establish those factors which are important for communities to be competent and provide a salutogenic environment, that fosters development of resilience. The purpose of gathering responses from the interviewees was to attempt to understand and capture their points of view, through open-ended questioning. (Patton, 1980) This allowed the participants the flexibility of talking about aspects of their flood and slip experience, and to emphasise those issues that were important to them. It was intended that the combination of these two methods of data collection, also add strength to the study design, by reducing systematic bias in the data. The use of this methodology is called data triangulation (Denzin, 1988, cited in Patton, 1990)

Additionally, further data was obtained from local press clippings, relevant to the flood and slip events. In this way, it was possible to compare the reporting by newspapers, to the knowledge and impressions gained from the interview participants. This added a further type of data collection, enabling a degree of cross-data validity checking to be carried out. The collection of qualitative data was also intended to add an inductive

approach to the main hypothetic-deductive approach used in this study. (Patton, 1998)

There have been criticisms against the mixing of research paradigms in this way. Notably, Guba & Lincoln, cited in Patton, 1998, argue that the logic underpinning each paradigm so differs, that this mitigates against the mixing of the different enquiry modes. However the experience of the researcher in this regard was positive and supported by the view of Patton (1981), cited in Patton, (1998), that methodological openness may better satisfy the practical mandate in evaluation. It was intended that these research findings provide feedback for the Queenstown community, as to the effectiveness of the community response to the hazard events, and to bring to light lessons learned and areas where changes might be made. Additionally, qualitative information gained both informally and formally, prior to the commencement of the study and during the study, was used inductively to provide additional research questions and suggestions for further research. For example, the awareness that a core community exists, despite the large tourist and seasonal fluctuations in the population of Queenstown, led the researcher to speculate whether these and other unique qualities of Queenstown could be influencing residents' sense of community. This led to the inclusion of this aspect in the questionnaire and was also examined from the perspective of information gained at interviews. The following section describes the findings from the interviews and press analysis. All interviews were transcribed verbatim, and to enable some comparisons to be made with the questionnaire findings, results were reported in narrative form, under similar headings. Following this, any further themes or patterns that emerged were also recorded and are included below.

## **Interview Participants**

Twelve participants were interviewed for the purposes of this study. The age range of these participants was estimated to be between thirty-five and seventy years. For confidentiality reasons, detailed profiles of the participants cannot be included. However, interviewees included one slip victim, four slip and flood and five flood victims who were all business people. Two persons were involved in management or support at the time of the flood.

## **Hazard Knowledge and Preparation**

Interviews indicated that preparedness was related to previous flood experience rather than new information or the worst- case flood scenario. For example, though no flood - waters had previously entered one lake- front hotel premises before, the premises had been previously (on at least two occasions) completely surrounded by flood- waters. Nevertheless the owners did not anticipate a possible worsening of the flood beyond those previously experienced. However, as they were able to observe that the lake level continue to rise, they were alerted to the worsening situation and had started sandbagging earlier than most other affected businesses.

Visitors and community members helped with the initial sandbagging attempts on the lakefront. However those interviewed felt that, the responsibility for property and possessions fell entirely on operators and their staff. People acted on “previous behaviour, instinct and initiative”, as they felt they lacked specific information about what to do. Most were aware of the information available in the emergency section of the phone book. However this was regarded as very limited. Where possible, people raised furniture and

vulnerable items off the floor. In some instances having no upper floor prevented movement of vulnerable items to higher levels and people tried stacking items on top of boxes and cans. One business was dependent on a lift to move furniture reach the next floor, because of a narrow stair- well. Therefore when their power was disconnected, due to the risk of electrocution, they were forced to leave items as large as fridge freezers in the flooded area. These eventually fell over and were floating around. This constituted a safety risk, as injuries could have occurred from falling items, but fortunately none were reported

There were no preparations for the rescue of perishable food items, so these had to be sacrificed. In some instances people did not dispose of perishables appropriately, therefore these eventually rotted and contributed to the contamination of the flood- waters. Equally, people were not prepared for the disconnection of power. Interviewees reported that these appeared to occur haphazardly, with some people losing power without warning, some asking for power to be disconnected and others continuing to use power while knee deep in water.

## **Communications**

The loss of power also meant a loss of communication for some. Reliance by some, on new technology was apparent, as people lost phone and radio contact, e-mail was down and computer files inaccessible. Cell-phones were available to some, but a number of these became accidentally immersed in water during the chaos. One interviewee also reported that the cell-phone network was subject to overloading during this period.

Residents were advised to boil water due to the risk of contamination from broken sewer and water supply pipes. Most people seemed to be aware of this. However, as noted,

not all people had access to radio or newspapers to keep them informed of these events. Also some interviewees stopped boiling water before the recommended time. This suggests that insufficient information concerning the nature of risks was reaching individuals. There were several instances of similar situations. For example contamination notices, advising people to keep clear of premises, were attached to affected buildings but these were in some cases already inaccessible to the owners. Some business- persons felt that they had not been adequately warned of the worsening situation of the flooding. This especially affected those who lived away from their businesses as they were not aware of the worsening situation overnight and had not anticipated the extent of the flooding.

Most people interviewed however, were aware that something was different from previous floods experienced, because they had noted that flooding of the lake had started earlier than was usual. Previously, flooding had occurred after the rain stopped. However, on this occasion, the flooding had started while the rain still continued and it had been raining solidly for three days. Despite these observations, most residents apparently continued life as normal. As they had received no formal information on the flood, they felt that nothing unusual could be happening. Hourly updates on the flood situation were expected to occur from 11am on the morning after the first night of serious flooding. However one interviewee had not heard any reports by 2pm. This may have been because the lake measurement facilities were themselves flooded and out of use for a time.

A number of interviewees felt confused over whom to ask for help and advice, particularly during the main flood and slip events. In some cases this was due to role changes undertaken by the authorities, as part of the civil defence response. For example, one couple commented that the police, who were normally regarded as being informative



and helpful, did not appear to be in charge as expected. Members of the civil defence team made efforts to delegate their normal business responsibilities, in order to concentrate on flood and slip issues. Nevertheless, some interviewees felt that there remained a potential conflict of interests, both in terms of time priority and the same businesses being involved in clean-up and repair operations. Similarly, as providers of accommodation, charged normal rates for housing some evacuees, these were inevitably viewed as potentially benefiting from the circumstances. In most cases, the evacuees did receive insurance payouts for their temporary accommodation, but this was not always the case.

## **Contamination**

Because flood- waters swept through the buildings, there was a huge amount of mud and silt covering everything. Additionally, this water was contaminated from regurgitating grease traps. Therefore, all wooden and plastic objects that came into contact with this water were declared contaminated and had to be condemned. Individuals had themselves to arrange and pay for the removal of these items. One family was very upset when they were told, after having seven skip loads of wooden and fabric goods condemned, that these goods were in fact being recycled and sold at auction. They subsequently approached a council member and were told that this was a perk and no moves were apparently taken to prevent this recurring. The family then ensured that further goods were completely destroyed before discarding them and were further distressed by having to take this action. Experiences such as this highlight the disillusionment that can occur during the clean-up period, when individuals realise that others may benefit from their losses. (Golec, 1983, cited in Gist & Lubin, 1999)

The stench of the water was reported by interviewees to have been really awful. Therefore, after initial attempts at rescuing possessions, individuals were unwilling to go through the waters and also were advised by health officials against this. Some businesses were noted by some interviewees, to have done little or nothing to rescue goods, but had relied upon insurance payouts. This caused some bad feeling, among those who had tried hard to rescue as much as they could, because they felt that the insurance companies did not give them extra credit for their efforts.

## **Evacuation**

One lakefront hotel had tried to evacuate clients and had experienced obstruction by the police, in doing so. This was apparently due to some confusion about correct procedure. As no civil emergency had been declared, hoteliers thought that their clients were entitled to come and go as they pleased but the police disagreed with this. Clients were understandably concerned and wanted to leave the area and additional problems were created as some of them did not speak English and there were no translators on hand. One hotelier organised his own evacuation. Others evacuated themselves when it became obvious to them that they needed to. However some of these were subsequently (initially) refused rent rebates that some who were forcibly evacuated had obtained.

The Frankton lakeside residents who were involved in forced evacuations due to the landslides, experienced problems with possessions that had been hurriedly removed from their premises. Two of the families had also been flooded, and one family later discovered, that wet and dry goods and perishable had all been put together into temporary storage. Consequently further goods were lost through damage sustained as a result of the

evacuation procedure. This family was further inconvenienced when the storage facility, housing their goods, was sold and their household goods were transferred to a different town, without their knowledge.

According to interviewees, some evacuees from the Frankton slip went to friends and relatives at first and an evacuee centre was supposed to be operating at the local memorial hall. However one evacuee went there twice and found nobody there and no instructions on what to do. The whereabouts of the evacuees had not been recorded and this caused subsequent difficulty for those trying to assist them. This also meant that the evacuees could have been injured or missing. One evacuee commented that it had become stressful for those he was staying with and he had moved into accommodation that he had found unsatisfactory in several ways. This is an example of the breakdown in social support often found following disasters. (Kaniasty & Norris, 1990). Riad & Norris (1996), cited in Gist and Lubin (1999), note that relocation can be a stressful experience, as pressures on the host family may cause conflicts to arise and the disruption to the evacuees' lives are an added source of stress.

Volunteers from a film crew, who happened to be operating in the area, were an unexpected source of aid during this time, as they helped move furnishings and also built evacuation boxes for the many creatures that had to be evacuated from the zoological gardens. The flooding of one of the outlet- rivers for the lake was the cause of the flooding of this area. As this happened quickly, unfortunately many of the smaller animals could not be moved in time and so drowned. A white peacock also drowned. These were the only fatalities from the flood.

## **Psychological and Secondary Effects**

Interviewees reported preliminary shock (especially at the degree of destruction), exhaustion, tearfulness, a reduction in social activities, and disruption of life routines (in one case resulting in a drunk in charge conviction). Most support received was either from friends and other victims, or from Victim Support who were involved mainly with evacuees from the residential slip and flood victims, both during and after the evacuations. The Salvation Army were also involved in providing food and drink to the victims of both the residential and business communities. One family commented that it had been difficult to reach their family, who lived outside the area. For at least two families, their religion and relationship to their church provided a major source of comfort. Most interviewees felt comforted and cared for by the actions of the helping agencies and other victims. There was a sense of camaraderie and of needing to help one another to get through the crisis. The experiences of the evacuees support findings of disaster studies that an “altruistic community” often emerges during the immediate post disaster phase (Kaniasty & Norris (1999) in Gist & Lubin, 1999)

The main source of concern for business people was financial, (particularly whether insurance cover would be adequate) The realisation that so much had to be destroyed before the rebuilding could take place, the seemingly endless wait for the drying process to be completed and on-going practical problems caused by damp, were some additional concerns. For example, lifts rusting up and fans not working. For slip victims, a sense of loss of their immediate environment (particularly the lakeside and Towne Place communities) and loss of the many belongings that were of sentimental value appeared to be the major concern. One interviewee had a terrifying experience of being trapped in the

upper floor of her house when a disused council dam had burst and a creek had flooded her premises. This was probably the closest incident to a fatality, because a large tree trunk had been flung through the building and had narrowly avoided the resident.

Most interviewees experienced on-going inconveniences in trying to sort out insurance claims, though most felt that insurance investigators and their companies had been prompt and helpful. Security of the evacuated properties and businesses was also a concern. Though no looting was reported in the business area, some trespassing on the zoological gardens was apparent, at the time of the disposal of contaminated goods. One resident of Towne Place expressed dissatisfaction with the security provided after the evacuation. Though a security firm was in charge of this, he had returned on at least one occasion to find his premises and belongings apparently unprotected.

Other effects reported by interviewees included, a change in philosophy involving a resolution to no longer place importance on material things because of "the loss of treasured family items and memories". One family had recently permanently relocated to a home that had always been a summer home and had lost all their belongings in the flood. The disruption of this lakeside community affected two families interviewed. Though they remained in contact with one another, they felt that the community (which they considered to be quite separate from the larger Queenstown community) was permanently destroyed. This was probably the case, because one house was destroyed and one initially condemned and there was some doubt as to whether insurance would again be obtainable for buildings at that location. This forced relocation and permanent disruption of social networks has been noted in previous research findings e.g. Hutchins & Norris, (1989), cited in Gist and

Lubin, (1999). All interviewees cited the beautiful surroundings as being their main reason for staying in the Queenstown area.

Though a civil emergency was called as a result of the Frankton slips, relatively few of the total of the approximate eight thousand residents in Queenstown were actually affected. Twenty- four households were evacuated, five residential properties and fifty commercial properties and the waterfront area were affected by flooding. The effects on those involved were of course devastating, but were experienced by only a small percentage of residents. Further there were no reported human injuries or deaths. Therefore the level of community stress was probably not high (Hobfall, 1993) and restoration to normal living was complete for most, at the time of this research, three months post event. It appeared that the impact on the community as a whole was mainly felt as a reduction in tourism that occurred over the New Year period and through until June 2000. This will be examined in more detail in the discussion section.

## **Lessons Learned and Precautions for Future Floods**

All interviewees had a heightened awareness of the risk of serious flooding to the area and also of the possibility of landslides. Though the business people interviewed, also had no intentions to leave the area but commonly expressed the view, that if another flood should occur within the next three to five years, they may be emotionally and financially unable to endure the process again. All had taken advice from the insurance companies regarding the rebuilding of their properties. Though some of these suggestions were a condition of re-insurance, those interviewed were highly motivated to reduce future repercussions from the flood.

The main works included, raising electrical points to higher levels, installing concrete flooring, and using floor coverings that were easily lifted or expendable. Where wooden flooring was still used, every fourth board had been screwed down, instead of nailed, to allow easier lifting, in the event of flooding and also would make the placing of drying equipment under the flooring easier. There was no plan by council to raise the recommended height above lake level in the building recommendations. However, those premises that had flooded would in future have this information on their building titles.

Most interviewees affected by the flooding or slips, felt that others were worse off than themselves. For example, one owner operator felt that he would have been more adversely affected had the event involved the destruction of his home. Another owner operator cited the floods overseas as being an example of how much worse things could have been, and expressed having a new sympathy for, and greater understanding of the plight of other victims. A slip victim, who was unlikely to be able to live in his house again, was especially sympathetic towards the business community because their livelihoods had been threatened. Yet all of those interviewed had themselves, undergone harrowing experiences and sustained substantial losses. These downward comparisons, may be beneficial to some, but may increase fears that things may become worse, for others (Wills, 1981, cited in Gist & Lubin, 1999). Only one couple interviewed expressed any intention of leaving the area and that was expected to be for a limited time only. Reasons given for remaining in the area were all related to the local beauty, tranquillity and natural attributes of the area.

## **Perceptions of Causality**

Most interviewees felt that the flood was an “act of God”, however that some responsibility for the extent of the flood damage lay with local and regional government. Research has found that victims may still appraise natural disasters as not solely outside human control (Rochford & Blocker, 1991, cited Gist & Lubin, 1999). Evidence for this was found in this study as interviewees felt that previous flooding had not resulted in local government action to reduce effects of further floods. For example, implementation of an early warning system had been considered in 1996 but had never been implemented (Becker & Richardson, 2000). Those affected by the additional flooding of the Kawaru river, had previously requested that the willows be cleared from the river, as these were felt to obstruct the outflow but this had not been done. However following the 1999 flood, further flood mitigation measures, were suggested by Queenstown Lake District council and it is not known at the time of writing whether these have been implemented, but a full list of these is appended. Conflicts such as these are not uncommon following disasters and may fragment the community. Bowler, Mergler, Huel & Cone (1994), cited in Gist & Lubin (1999), observed that 69% of residents of a town affected by chemical spill, felt that the division between those affected and those unaffected caused hurt, including that caused by those unsympathetic to their plight.



## **Chapter 5**

### **Discussion**

The main purpose of this research was to examine those psychological factors that may have been implicated in the Queenstown community's ability to withstand and recover from the effects of the flooding in November 1999. This included individual concepts of self-efficacy, sense of community, coping style, and perceived support. (Paton, 2000) Similarly, sense of community has been noted in other hazard research (e.g. Miller, Paton & Johnston, 1999; Bishop, Paton, Syme & Nancarrow, 2000) to contribute to hardiness and resilience, through encouraging a co-operative approach to dealing with and recovering from hazard scenarios. This was further examined in consideration of the unique physical features of Queenstown, posited to be sufficiently important to Queenstown residents, to contribute to their sense of belonging.

In general terms, it was noted that at the time of conducting this research, (three months post event) the Queenstown community had recovered and moved on from the flood and slip events. It is suggested that Queenstown, with a combination of a strong community and the features that make it a desirable location, provides a sanctuary that contributed to, or promoted this recovery. It was also hoped through this research, to highlight both some of the difficulties encountered, and the ways individuals may have learned from their experiences. In the case of future hazard events, it is hoped that these findings may contribute to the better preparation and recovery of the community. The findings are also compared to those of, Johnston, Bebbington, Lai, Houghton & Paton,

(1999), who conducted similar research following the Mount Ruapehu volcanic eruptions of 1995.

## **Demographic Information and Sample Size**

Though 500 hundred questionnaires were distributed; only 84 (16%) were completed and returned. As Queenstown has a resident population of approximately 8000, this return represented only a small number of the total number of residents who may have been affected by the flood and slip events. As previously mentioned, some expected associations were not found on statistical analysis. Therefore the possibility that the sample was not representative must be considered. Conversely more than half of the respondents had experienced severe or moderate damage to their neighbourhood. This suggests that these respondents were sufficiently affected by the events to have experienced community level effects. For example, the reduction in tourism over the Christmas 1999 period, having to boil drinking water and disruption to some retail and entertainment facilities. Additionally, they may have been involved in clean up procedures or provided support or temporary accommodation for friends, acquaintances and associates, though this was not explored in the questionnaire. To some extent, this gap was counteracted by the interviewing of the high intensity sample interviewed, who were all either direct victims of the event, or support personnel directly involved in the events and aftermath.

## **Hazard Knowledge and Preparation**

The first section of the hazard questionnaire was designed to examine individuals' beliefs about floods and other hazards and to assess perceptions of flood information

received. As Johnston et al (1999) pointed out; it would seem reasonable to assume that the salience of information regarding the hazard event would be increased following the hazard experience. These results were consistent with findings in this study, which demonstrated that most participants had a realistic idea of both the likely timing, and nature of potential hazards. None of those who completed the questionnaire had been subjected to any personal injury (there were in fact no human injuries) and 25% of the sample had not personally experienced any of the effects of the flooding. However of those who had direct experience, 62% reported moderate or severe damage to their neighbourhood rather than their own homes. Most of the damage in the area surveyed, was sustained by the business community (fifty commercial compared to five residential properties), therefore the inclusion of the business community as “neighbourhood” tends to support the researcher’s observation, that the business sector is very much at the centre of the community.

It is noted that, had the survey included those in the outlying areas, the results would probably have been quite different, as a further one hundred and ten residential properties were affected in the nearby towns of Kingston and Glenorchy, which are mainly residential and where there is less commercial activity. Media reports at the time of the flooding indicate that residents in these outlying areas had felt a degree of neglect, due to the concentration of resources in the centre of Queenstown. However there were logistical difficulties that arose from the difficulty of accessing these areas, due to the slips and flooding along the Glenorchy road (see map of area affected). Additionally resources were concentrated around the area where the slips occurred because of the immediate risk to the safety of residents and to motorists on the Frankton Road. The response from participants interviews, generally supported the “rule of relative needs” suggested by Kaniasty &

Norris, 1995, p467, where patterns of support which mobilize immediately after a disaster, tend to result in those who most need help, receiving the most assistance. This will be discussed further in the section on social support.

Results of the preparedness section of the questionnaire demonstrated that 21.7% of individuals considered themselves to be very prepared, compared to the community at 9.6%, local government at 10.8% and central government at 0%. It is noted that slightly more (53%) of participants rated the community somewhat prepared, than their own households (44.6 %) The latter results are suggestive of a degree of dissatisfaction with the handling by the community, of the recent flood event, but overall, individual ratings were still higher. Together with the finding that, on specific measures to prepare for hazards, respondents ratings were generally low, (only one or two individuals had taken the maximum number of measures advised) this may support the suggestion that, there is a tendency for individuals to rate themselves as better prepared than the community, or local and central government (Johnson et al., 1999). This tendency has been implicated in the discrepancies found between awareness of threat and actions taken to prepare for hazard events (Johnston et al, 1995 and Paton, 2000) It should be noted that this part of the questionnaire referred specifically to flood threat and could have reflected 41% stating it wouldn't happen in their area. However many of the precautions, would be valid for any hazard scenario (see Questionnaire, appendix B for complete list), confounding these findings.

Further, the researcher is well aware that the majority of businesses did take a number of specific measures to mitigate the effects of future flooding (Becker & Richardson, 2000) One possible reason for this, is that extent of the flood, compared to floods previously

experienced by businesses, was greater and there was greater property damage, and thus more lost trading hours. Another possible contributing factor was that most businesses accepted recommendations for mitigation measures, as from their insurance companies, as conditions of re-insurance. (See p.58 of results section for list of measures). This was also expected to lead to a reduced increase in their insurance premiums. As both of these examples had economic implications to the business community, these findings support the suggestion that mitigation attempts are more likely if the strategy is salient to the concerns affecting the community. Similar to the findings of, Miller, Paton & Johnston (1999), economic rather than safety concerns were greater, and the evidence suggests that this had a bearing on the salience of the mitigation strategies.

The regression analysis that was carried out to test the hypothesis that self-efficacy, coping style, sense of community and social support, could predict resilience, produced a non-significant result for all variables. However there were significant correlations between some of the variables of interest, as previously noted and this will be covered further in the discussion section.

## **Belonging and Sense of Community**

The sense of community index (SOCI) used in this study was developed by Bachrach & Zandra (1985) and used in the study by Miller, Paton & Johnston, (1995) which also examined hazard resilience issues. In the study by Bachrach & Zandra 1985, cited in Miller, Paton & Johnston, 1999, the authors found that a stronger sense of community (as measured by the SOCI) led to problem focused coping behaviours that increased community involvement post disaster. This in turn was posited to lead to a greater

perceived control over events. This finding contributed to increased interest in the notion, that increased community involvement might be a factor in increased hardiness and resilience in individuals following hazard events. Further, that encouraging communities to develop strategies from within to deal with hazards might lead to more effective preparation and coping in the event of hazards occurring (Paton, 2000)

Ratings on the SOCI in the present study, were generally high and were correlated with age, home ownership, length of residency, social support and negatively, with family size. These findings are similar to those reported by other researchers (McMcmillan & Chavis, 1996) and seem to suggest that the SCI measures one aspect of sense of community, or sense of belonging, but that the idea of feeling part of a community, may be made up of variables other than those that refer to the relational aspects, (Chavis & Pretty, 1999) These authors also point out the importance of “relationships between psychosocial well-being and physical surroundings” (p638) and Chipeur & Pretty (1999) comment “The question as to whether we need an individual response based solely on a quantitative measure of SOC begs asking” (p638). Results of interviews conducted for this study, demonstrated that the lake and mountains were a major factor in decision of Queenstowners to move to, and remain in the area. The threat of floods or slips did not deter them. This finding is supported by the findings of Palm, 1979, cited in McClure, 1997, who found that disclosure of property hazard (that included earthquake and flooding) did not affect choice or purchase of homes and size; design and location were more important. Further the Queenstown Lakes District Council acknowledges the importance of the natural assets of the district in its 1999 plan for sustainability of the area.

Examining this further, the questionnaire contained a section on the physical attributes of Queenstown. Participants were asked how important it was to them having a physical/ spiritual relationship with the lake, with the mountain, how important living in a small township was to them and how important Queenstown being a visitor destination was to them. Results showed that more than three quarters of the ratings were at the moderate to extremely important end of the scale, with the majority being at the extreme end. These four items were chosen at face value, from the researchers previous experience of living in the area. Not surprisingly, they were highly correlated with one another. However, 'Queenstown being a visitor destination' and 'being a small township' encompass many factors and need further investigation. For example the small population may be a measure of a neighbourhood effect. (Sampson, 1991) Equally, being a visitor destination was significantly correlated with having control over life and community and this may reflect economic interest in tourism, individual extraversion, or other related but unexplored features. Though this was a small sample however, together with the qualitative information obtained, it is suggested that these factors may be implicated in belonging for the Queenstown population. The findings may also have a bearing on the willingness of the population to live in a flood prone, landslip prone area.

The relational nature of the SOCI is also supported by the findings of Bishop, Paton & Syme (2000) who examined the effects of sense of community on concerns about the environmental hazard of salinity. These authors factor analysed the SOCI and concluded that it consisted of two factors. The first being mainly concerned with, instrumental value or activity in the community, and the second related to a sense of belonging. This seems to add support to the notion that the SOCI measures relational aspects of feeling part of the



community. In this vein, Chipeur & Pretty (1999) highlighted a need to look for different ways of conceptualising and measuring sense of community. They noted that little attention had been given to the importance of attachment to place, because as noted previously, most of the research has concentrated on the relational aspects.

To some extent it appears that the terms, sense of belonging and, sense of community have been used interchangeably in research. For example, Bishop et al (2000) conclude that social factors were important to salinity concerns because there were “small significant correlations between social factors such as *sense of belonging* in the community and a sense of control over one’s destiny” (italics added) However, the correlating variable was described in the study as *period in the community*, and there were no significant correlations for the factor, sense of belonging. In another study, Miller et al (1999) tested a model of vulnerability, where vulnerability was measured by the HSCL, a measure of stress symptoms. It was hypothesised that higher ratings of self-efficacy, a problem solving coping style and strong sense of community would predict reduced vulnerability in individuals, following disaster. The results of their study showed no correlation for sense of community either but in the regression analysis, self-efficacy, problem- focussed coping and age were significant predictors of stress.

Though these studies have not demonstrated a direct effect of sense of community, as measured by SOCI on stress, it appears that most researchers conclude that sense of community is in some way important, to community resilience. One contributing reason why correlations may not have reached statistical significance, could be that sense of community ratings as measured by the SOCI, appear commonly be to be high, as was the case in the present study and that of Bishop et al, 1999. This observation was also made by



Haines & Beggs (1996), who noted that measures of community satisfaction are often positively skewed and so used another measure of community satisfaction; satisfaction with local government. Another possible reason is that at least in the present study, measures on the HSCL appear low, with a mean of only thirty-one, with most scores falling in the categories; not at all, or a little bit, for adverse symptoms. This absence of variability, which may be partly due to the small sample size, makes the likelihood of significant correlations with other variables rather low and increases the possibility of type 2 error. A further possible reason may be that the SOCI is not a sufficient measure of sense of community. As discussed earlier in the section, neighbouring, length of residency, planned length of residency and home ownership are examples of additional factors that have been found to be important to feeling part of a community, (McMillan & Chavis, 1986) and were noted to be important in the present study.

### **Sense of Control, Coping Style and Stress**

The majority of those surveyed felt that they had control over their lives and of things that happened in the community. Having a sense of control has been implicated in individual resilience because it is has been linked to a problem solving approach to coping, making it more likely that individuals will involve themselves in post disaster community activities. (Bachrach & Zandra, 1985,cited in Miller, Paton & Johnston, 1999) The study by Miller, Paton & Johnston (1999) found that coping style and self-efficacy were significant predictors of community stress levels. In the present study, a problem focussed coping style was most commonly reported and was significantly, negatively correlated with the sense of control or self-efficacy variable 'there is no way I can solve some of the problems I have

by myself'. Interviews with participants and informal exchanges with residents not directly involved in the study indicated to the researcher, that most individuals played an active part in the rescue of goods and evacuation procedures. Equally there were narrative reports of stress symptoms from interviewees, which included shock, exhaustion, tearfulness and reduction in social activities. There are several possible reasons for the apparent contradictory findings between the survey and interview narratives. Firstly, the HSCL asks respondents about symptoms experienced within the last seven days, and as previously mentioned, the community generally appeared to be almost back to normal at the time of the survey. Conversely, the interviewees were describing the hazard event, and their experiences and feelings at that time, as well as, since the occurrence. Therefore, it is not surprising that, this group reported more stress effects. Lastly, as previously mentioned, the survey respondents represented a small sample, and many did not suffer personal loss of effects. Kaniasty & Norris (1997) noted that those who live in an affected area but do not suffer personal injury or damage might still experience psychological and social consequences. However the degree to which individuals in the Queenstown survey suffered as a result of secondary effects on the community, (e.g. loss of tourism) may not have been sufficient to elicit a statistically significant cross sectional result.

## **Social Support**

Survey results indicated that perceived levels of social support were generally high. Those interviewed also reported high levels of received support at the time of the flood and slip events, and for the period leading up to the study. However most interviewees reported disruption in routine and social activities, including organised activities and daily contacts

with previous neighbours. These had not been fully restored, due to some of the evacuees having to leave the immediate neighbourhood, to find temporary accommodation. In cases where houses were to be demolished, or building land continued to be unsafe, these contacts would never be completely restored. As previously pointed out by Kaniasty & Norris (1997), the disruption of community level activities appeared to interfere substantially with pre-existing social support networks. Most of the interviewees spontaneously referred to these losses, indicating their personal importance.

Support from family and friends, was commonly reported in this study. This was of a practical and emotional nature. Some interviewees were unable to contact their families who lived outside of the area. It is therefore suggested by the researcher that where practical, police or other agencies, should be encouraged to help this occur, since research has found family support to be the most utilized source of support. (e.g. Smith, 1983 and Solomon, 1986, cited in Kaniasty & Norris, 1997) Victim Support and the Salvation Army appeared particularly valued, and it is interesting to note that victim support offered considerable follow up care. For example, by helping to sort out cases of overpayment of electricity etc., where residents had evacuated their premises.

## **The Role of the Media and QLDC**

Interviewees were asked whether they thought that the two local newspapers had provided accurate reporting of events during and since the flood and whether the reporting had, had positive or negative effects on them. Most interviewees felt that the reporting had been accurate and did not report either positive or negative effects. Previous research has demonstrated that the media may have both positive and negative effects. Positive effects

may include publicizing availability of services and normalizing victims' responses. (Gist & Stolz, 1982, cited in Gist & Lubin, 1999) Negative effects may include both the overdramatization of experiences, and exaggeration of emerging heart-warming stories, that may compound the sense of trauma for some victims. (MacFarlane, 1995b, cited in Gist & Lubin, 1999) One interviewee felt that the newspapers were somewhat better informed about the possible long term effects of the flood for residents, than the residents themselves, and this was a source of some frustration. On examining the newspaper content, accounts from the flood event up until the time of the study, appear to accurately reflect both the details of events, and the general and more specific concerns of participants and interviewees. Of specific concern to most residents, was whether sufficient measures were being taken by QLCD, to mitigate the effects of future flooding. To some extent, this may have reflected a general perception that suggestions previously put forward had not been acted upon. These concerns were also reflected in the newspaper reporting. There was also concern that the public did not at the time have access to information regarding the areas most prone to landslips. Most of these issues had been addressed at the time of writing. Adams (2000) had produced a progress report, as a basis for mitigation of further flooding in the area. (see appendix E) Further suggestions being discussed included, the installation of a wave barrier and implementation of an early warning system. A hazards register was being developed that would also include information on the November 1999 floods, and it was felt that some information would need to be included on the district plan, that would indicate the level of risk for a given area. Based on some of the difficulties that residents had experienced with communication and evacuation procedures, the welfare section of the district plan had already been revised. (Becker & Richardson, 2000)

## **Chapter 6**

# **Limitations, Conclusions and Recommendations for Further Research**

### **Limitations of this Study**

Though this study has provided some additional insight into the possible factors affecting recovery from the flood event of November 1999, in Queenstown, New Zealand, certain limitations of the study should be acknowledged. The areas covered are; use of the postal survey method, the Questionnaire content and, timing of the study, including the limited time to prepare for the data collection. Each of these will now be discussed in more detail.

### **Postal Survey Method and the Questionnaire**

The postal survey method used in this study, offers the advantages of giving a wider range of individuals the opportunity to be involved in the study. It is also relatively inexpensive. (Coolican, 1999) Low return rates are a common problem with postal surveys. (Leong & Austin, 1996) However an attempt to counteract this effect was made, by the addition of a covering letter (see appendix B) and by enlisting the help of the local newspaper and radio station, in informing the public about the aims of the research. As the postal survey was completely anonymous, individual follow up as recommended in Leong & Austin, 1996 was not effected. Unfortunately, the response rate in this study was low (16%), despite a follow up radio interview attempting to prompt more responses. It is

therefore unknown whether the sample was truly representative of the Queenstown population.

One possible reason for this relates to the length of the questionnaire. This was similar to that used by Miller, Paton & Johnston (1999), which was used to allow some comparison with other New Zealand hazard research. However, to obtain information particular to flooding, and on the unique characteristics of Queenstown, the questionnaire was necessarily adapted. Though some omissions of material considered less relevant to this study were made, the questionnaire remained quite lengthy, and this could have contributed to the poor response rate. Miller, Paton & Johnston (1999) experienced a similarly low response rate (16%) and a lower response (57% of the initial respondents) to the follow up survey.

### **Timing of the Study**

This study was carried out four months after the flood and slip events of November 1999. Though it would not have been desirable to add an extra burden to residents at the time of the hazard events, it has been noted previously that for the majority of residents, life had already returned to normal. This may have been another reason for the low questionnaire response rate, as it may have engendered disinterest, as has been noted by previous researchers (Kaniasty & Norris, 1995). Further, feedback from some of the respondents, indicated that some of the questions were seen as irrelevant. This highlights the necessity that material presented be salient to individuals. Paton (2000) argued this to be an important consideration, in the preparation of hazard communication material. Equally, it could be argued, that in the aftermath of the hazard event, participants may have

been less inclined to give their time, where they felt that the information requested was not directly addressing their concerns.

Another associated issue was the difficulty encountered in organising and co-ordinating a study, around the unexpected event of a natural hazard. For example, travel arrangements and alterations to the questionnaire had to be made at short notice, to enable the data collection to be started as soon as possible. Additionally, follow up interviews, though desirable were untenable, due to time restrictions on the researcher. This is discussed further in the section on suggestions for future research. An unexpected advantage for the study was that the researcher had visited Queenstown informally, in January 2000 when the waterfront was still in almost entire disarray. This allowed some qualitative comparison to be made, and probably aided communication and improved insight during interviewing. That the researcher has previously lived in the community, also may have improved co-operation from those approached for assistance in finding interviewees. To some extent, this counteracted the effects of potentially difficult research situation.

## **Conclusions**

Natural Hazards have the potential to destroy lives and communities. Global warming, rising sea levels and increasing population growth are all factors that increase the likelihood that natural hazards will continue to increase. Death and economic loss therefore cannot be avoided, especially in third world countries, where most impact is felt. A major aim is to reduce the effects of disaster, in these areas, to the point where stable investment



can be made. This would allow efforts to be concentrated on essential sustainable development. (Smith, 2001)

This small study contributes to a growing body of research recognizing the global importance of social, economic and political dimensions of hazards and hazard planning. Importantly, mitigation strategies should be available to, and understood by all those at risk. Community participation in planning for and recovery from disaster has become more important and studies of small communities such as Queenstown are expected to help in understanding and effecting progress in this area, from within the communities themselves. (Smith, 2000) The aim of this study was to examine some of the social and psychological factors that impact on individuals involved in hazard events, with particular emphasis on the development of strategies, within a salutogenic paradigm.

The strong local community and commitment of Queenstown residents to their home, is something that is intuitively felt by the researcher, but also demonstrated in the results of this study. The unique environment of Queenstown, with its stunningly beautiful but high hazard risk topology, also highlights the finding that individuals will continue to risk personal loss and safety, to continue living in such an environment. Though there was no loss of human life following the Queenstown flood, there was considerable property damage and economic consequences. However the Queenstown community appears to have recovered well from the events of November 1999. The results of this study demonstrate that there is an awareness of hazard risk in the Queenstown community and that changes have been made in response to the lessons learned from the event. These encouraging changes have occurred from individual to local government level and are likely to better protect the community in the event of future hazards.



## **Suggestions for Further Research**

This study began to explore the relationship between the concept of belonging and the importance of the unique physical environment of Queenstown. Preliminary results have demonstrated that these features are an important consideration for the residents in settling and remaining in the area. This might be utilised in developing a sense of community measure that includes other non-relational factors, as previously discussed. Further, Queenstown is primarily mono-cultural with the exception of tourists, however New Zealand as a young multicultural society should look at ways of incorporating language and cultural difference into hazard management policy. The spiritual importance of the land and environment in general, is well documented as being of special importance to the Maori culture. Understanding the Maori perspective requires specific future research.

Research into the importance of the physical environment also has implications for risk assessment, since consistent with the findings of McClure et. al (1999), individuals appear likely to remain in topologically hazardous areas, regardless of the possible consequences. Associated with this is the risk to tourists and seasonal workers, who are drawn to these environments but who may not be aware of hazard risk, procedures, and consequences. This problem was highlighted in this study by the communication problems experienced by one hotelier, who needed to evacuate non- English speaking visitors at short notice and without an interpreter. The scale used for measuring the importance of the environment in this study, was constructed on the basis of the researcher's personal experiences with the Queenstown population, but further research could be aimed at developing and expanding this concept.

The questionnaire used in this study was primarily designed to broadly assess several areas of interest to hazard management and as previously mentioned, this placed some restrictions on the amount and type of further information that could reasonably be requested. For this reason measures of Optimism were not included, though this factor was discussed in the literature review. However the exchanges during interviews contributed a great deal to the understanding of the recovery processes of the Queenstown community, and this highlights the need for more qualitative information. In particular, stress effects were more evident, and areas of communication breakdown specifically identified by those interviewed in this study. Equally, the local newspapers provided a perspective that enhanced understanding of the process that the community had experienced during the event, and over the months that followed. It is therefore suggested that future research using qualitative methods of data collection and analysis may add to the understanding and the development of a salutogenic paradigm for hazard management.

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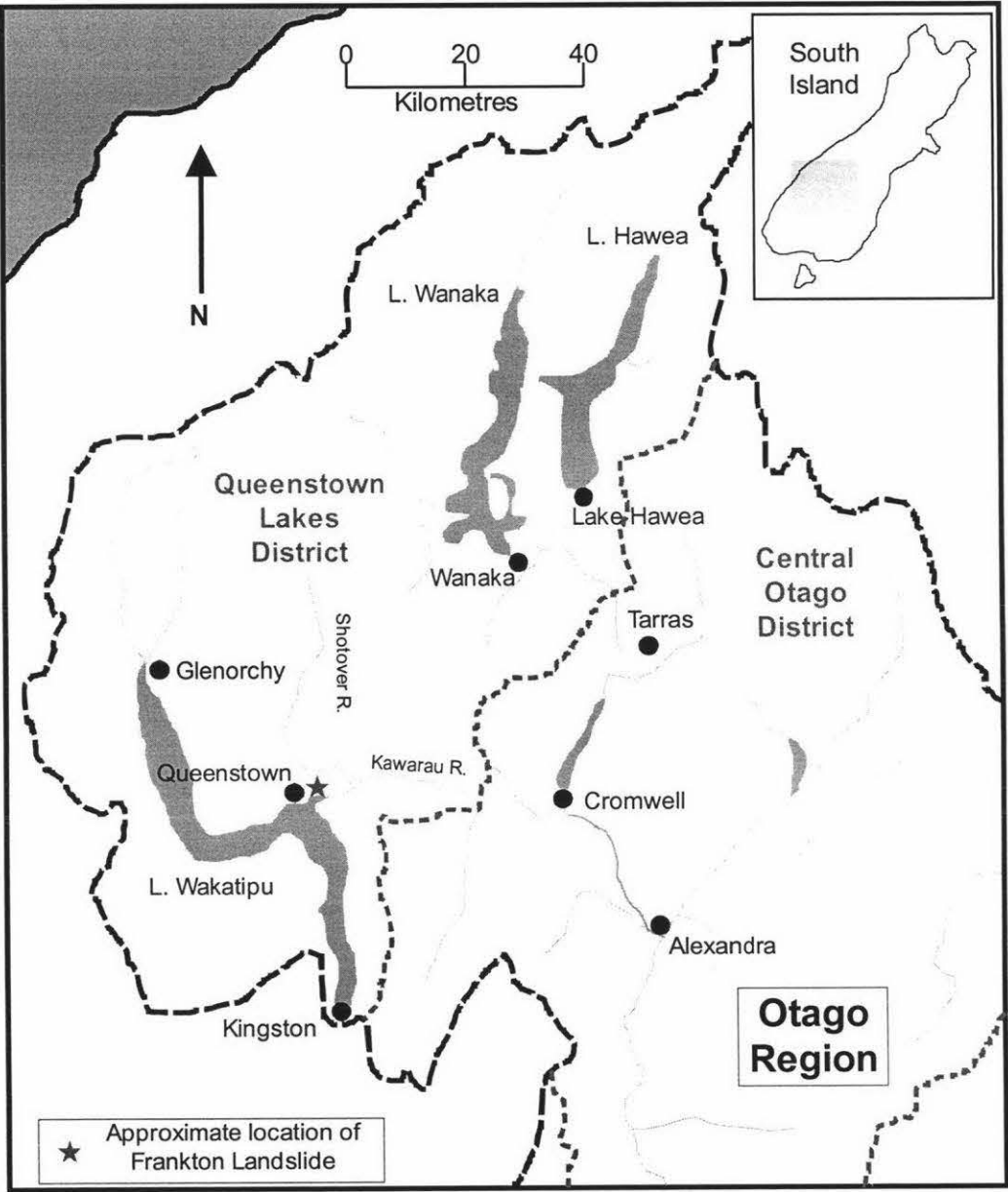
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Appendix A

The Location of Queenstown (from Otago Regional Council, 2000)

(Courtesy of Institute of Geological and Nuclear Sciences Ltd.)



## Appendix B

### FLOOD HAZARDS RESEARCH PROJECT QUESTIONNAIRE

Please read the following instructions carefully.

Please do not write your name on this questionnaire. All information that you give us is confidential and will be used only for the purposes of this study. It is assumed that by filling in the questionnaire, you consent to taking part in the research.

A summary of the results and findings of the research will be made available to you later this year.

The questionnaire will take about 15-20 minutes to complete. We would like you to find a time when you will not be disturbed, and to answer all the questions in one session if possible. Please do this at the earliest convenient time for you after receiving the questionnaire.

It is important that you give your own answers to the questions. Therefore, we would ask that you do not discuss the questions with others.

When you have finished, please return the questionnaire in the envelope provided. You do not need to put a stamp on it.

**The first set of questions addresses beliefs you may hold about floods and other hazards.**

1. Thinking about the chances of property damage, and loss of life and injuries, which of the following hazards is the most threatening to the area you live in? **(Tick one)**
  1. Cyclones
  2. Floods
  3. Severe storms
  4. Earthquakes
  5. Volcanic eruption
  6. Chemical or toxic waste spills
  7. Water contamination or other pollution
  8. Scrub or forest fire
  
2. A flood is likely to occur in the area I live and cause me, my family, or my home injury or damage within: **(Tick one)**
  1. 1 year
  2. 5 years
  3. 50 years
  4. More than 50 years
  5. Don't know

3. How prepared do you believe the following are for a damaging flood?

	Very prepared	Somewhat prepared	Not very prepared	Not at all prepared	Don't know
Your household	1	2	3	4	5
Your community	1	2	3	4	5
Central government	1	2	3	4	5
Local/regional government	1	2	3	4	5

The following set of questions asks about any information you may have received about major flooding or what to do to get ready for it.

4. Have you heard or received information about preparing for floods from any of the following?  
(Tick all that apply)

- 1. I haven't heard or received any information
- 2. Central government (for example, Ministry for Emergency Management)
- 3. Regional Council (Includes Regional Civil Defence)
- 4. District or City Council (includes local civil defence)
- 5. Police or Fire Service
- 6. Earthquake Commission (EQC)
- 7. Institute of Geological and Nuclear Sciences (IGNS)
- 8. Television or radio
- 9. Newspapers or magazines
- 10. Meetings, seminars or workshops
- 11. Businesses (for example, pamphlets in power or phone accounts)
- 12. School hand-outs (for example, brochures, homework)
- 13. Friends or relatives
- 14. Service organisations (for example, the Red Cross)
- 15. Neighbourhood watch groups
- 16. Marae
- 17. Where you work
- 18. Posters or postcards
- 19. Telephone book
- 20. My insurance company/agent
- 21. Other, specify \_\_\_\_\_

Of those sources you ticked, indicate by number the **single source** you consider to be the most reliable and trustworthy: \_\_\_\_\_

In your opinion, what is the most effective way to give out information about major flooding that may occur in the future? **(Tick one only)**

1. Public meetings
2. Over the telephone
3. Information sent by post
4. Television
5. Radio
6. Newspaper
7. Through local schools
8. Other, specify \_\_\_\_\_

5. Think about everything you may have heard about future floods in the Central Otago region. How consistent was this information? **(Tick one)**

1. I have not heard anything
2. Consistent
3. Fairly consistent
4. Unsure
5. Fairly inconsistent
6. Inconsistent

6. Do you recall ever receiving any of the following recommendations about what to do for a major flood? **(Tick all that apply)**

1. I don't recall any of the following recommendations about what to do
2. To find out about emergency plans at school
3. To look into the specifics about flood insurance
4. To find out if you live or work in an area particularly vulnerable to flood damage

7. Have you ever received any of the following information about how to prepare? **(Tick all that apply)**

1. I don't recall information about any of the following activities
2. Store water and food for three days
3. Store emergency equipment (for example, torches, fire extinguisher, first-aid kit)
4. Put spanner or wrench by gas turn-off valve
5. Develop a flood plan
6. Pick an emergency contact person outside the area
7. Learn how to assist elderly or immobile people
8. Learn how to rescue trapped people
9. Learn how to put out fires
10. Buy insurance
11. Learn to provide first aid
12. Other: \_\_\_\_\_

The next set of questions asks about flood experiences you may have had.

8. How severe was the damage caused by the largest flood you have experienced?  
(Tick the most severe experience)

	Neighbourhood	Your Home
Have not experienced a flood	1	2
No damage	1	2
Slight damage (damage to walls, damage to household items)	1	2
Moderate damage (structural damage)	1	2
Severe damage (unable to live in home after flood)	1	2

Injuries to yourself or other household members (Tick the most severe experienced)

- 1. Have not experienced a flood
- 2. No injuries
- 3. Slight injuries (for example, cuts or sprains)
- 4. Moderate injuries (for example, broken bones)
- 5. Severe injuries (for example, injuries requiring hospitalisation)

9. Answer the next question even if you have never experienced a flood. Which of the following, best describes the severity of the largest flood experienced by people you know personally but who do not live in your household? (Tick the most severe experienced)

- 1. No damage or injuries
- 2. Slight damage or injuries (e.g. damage to household items, or cuts or sprains)
- 3. Moderate damage or injuries (e.g. structural damage, or broken bones)
- 4. Severe damage or injuries (e.g. can't live in their home, or required hospitalisation)

Next, is a set of questions about flood related activities you may have done more than a year ago, or within the last year.

10. The following items are things people can do to prepare for floods. Please circle those things you have done more than a year ago and in the past year. (Tick all that apply in both columns)

	Did more than a year ago	Did in the past year
Store water and enough food for 3 days	1	2
Stored emergency equipment (for example, torch, fire extinguisher, first-aid kit)	1	2
Put a spanner or wrench by gas turn-off valve or had a lever fitted	1	2
Developed a flood plan	1	2
Picked an emergency contact person outside the area	1	2

**Question 10 continued.**

	<b>Did more than a year ago</b>	<b>Did in the past year</b>
Learned first-aid	1	2
Learned how to help elderly or immobile people	1	2
Learned how to rescue trapped people	1	2
Learned how to put out fires	1	2
Bought insurance	1	2
Obtained an emergency light	1	2
I've done none of these things	1	2

11. Have you tried to get flood information in any of the following ways? Please tick those things you have done more than a year ago and in the past year. (Tick all that apply in both columns)

	<b>Did more than a year ago</b>	<b>Did in the past year</b>
Sought information from the local government (for example district or city council)	1	2
Sort information from Regional Council	1	2
Sought information from central government (for example Ministry for emergency management)	1	2
Talked with friends, relatives and neighbours	1	2
I've done none of the following activities	1	2
Sought information from private organisations (for example, Red Cross, utilities, phone companies)	1	2
Sought information from the institute of Geological and Nuclear Sciences	1	2
Sought information from police or fire service	1	2
Found out about emergency plans at schools	1	2
Sought information about flood insurance	1	2
Sought information about if I work or live in an area particularly vulnerable to floods	1	2
Sought information from my insurance company	1	2

The next few questions are general questions about getting ready for floods.

12. Have you ever hired someone else to do work on your current home to make it safer in future floods?  
(Tick one)  
  
Yes 1  
Don't know 2  
No 3
13. About how much total money have you spent to make your current home safer in a flood?  
(Please fill in)  
  
\_\_\_\_\_ total dollars
14. About how much money have you spent to hire others to make your current home safer in a flood?  
(Please fill in)  
  
\_\_\_\_\_ total dollars
15. If you experienced \$30,000 worth of damage in a flood, who do you think would pay for the repairs?  
(Please fill in)  
  
\_\_\_\_\_
16. In addition to any of these things you may have already done to get ready for a flood, do you plan on doing anything else? (Tick all that apply)  
  
I don't plan on doing anything else 1  
Get more information about things to do 2  
Make my residence safer 3  
Buy additional insurance 4  
Learn more about flood preparedness and safety responses 5
17. Which of the following describes why you may not have done more to get ready for a large-scale flood? (Tick all that apply)  
  
1. Can't afford it  
2. Don't have the time  
3. I don't think it would help  
4. I'm as ready as I can get  
5. I won't happen in my area  
6. It is someone else's responsibility (e.g. local or central government)  
7. Other (please specify): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



18. Have you seen or heard of any of the following people, groups or organisations doing anything to get ready for a flood? **(Tick all that apply)**

1. No, I haven't seen or heard of anyone getting ready
2. Friends
3. Neighbours
4. Relatives
5. Central government agencies
6. Regional government
7. Local government
8. Business establishments
9. My workplace
10. My child's school
11. Other (please specify) \_\_\_\_\_

**The next set of questions concerns information about you and your household. Please remember, we will only generalise what is reported (information is anonymous).**

19. Do you or someone in your household, own or rent the home you live in? **(Tick one)**

- a. Rent
- b. Own or buying

20. Do you or someone in your household, own or lease any other buildings? **(Tick one)**

1. Yes
2. No

21. How long have you lived at your current home? **(Please fill in)**

\_\_\_\_\_ Years

22. How long have you lived in the Central Otago region? **(Please fill in)**

\_\_\_\_\_ Years

23. How many floods have you experienced while living in the Central Otago Region? **(Please fill in)**

\_\_\_\_\_

24. How likely is it that you will move away from the region in the next couple of years? **(Tick one)**

1. Very likely
2. Likely
3. Not very likely
4. Not likely at all

25. Do any of your relatives (who do not live in your household) live in your area? **(Tick one)**

1. Yes
2. No

26. Are you? **(Tick one)**

1. Male
2. Female

27. Which best describes the situation you are living in now? **(Tick one)**

1. Family with children
2. Family without children
3. Alone
4. With non-family
5. Other (please specify)

28. What ethnic group (s) do you belong to?

1. Asian
2. Maori
3. Pacific Islander
4. Pakeha/European
5. Other (please specify)

29. How old were you on your last birthday? (Please fill in) \_\_\_\_\_ Years

30. What kind of work do you do? **(Tick one: If retired or unemployed tick what kind of work you did)**

1. Managerial or professional speciality occupation (e.g. executive, administrative, managerial)
2. Technical, sales or administrative support occupation (e.g. technician, salesperson, clerical)
3. Service occupation (e.g. private household worker, food handler)
4. Farming ,industry or fishing occupation
5. Precision production, craft, or repair occupation
6. Operator, fabricator, or labourer (e.g. machine operator, assembler, inspector, transportation equipment, cleaner, helper)

What is your current employment status? **(Tick only one)**

1. Employed full-time
2. Employed part-time
3. Not in paid employment
4. Casually employed

Does your job involve you in an emergency management role and how long have you been in this role?

1. No
2. Yes - full time, number of years in this role
3. Yes – part-time (e.g. in an emergency), number of years in this role

Are you a Civil Defence volunteer?

1. Yes, number if years in this role
2. No

31. What was your household's gross 1999 income (**Tick one**)

1. Under \$5000
2. \$5,000 to \$15,000
3. \$15,001 to \$20,000
4. \$20,001 to \$30,000
5. \$30,001 to \$40,000
6. \$40,001 to \$50,000
7. \$50,001 to \$60,000
8. Over \$60,000

32. What is your highest educational qualification? (**Tick one**)

1. No school qualifications
2. School certificate passes
3. School qualifications, University Entrance and above
4. Trade certificate, or professional certificate or diploma
5. University undergraduate degree (e.g. diploma or bachelor's degree)
6. University postgraduate degree (e.g. Master's, Ph.D.)

**Different people respond to natural disasters in different ways. The next few questions are designed to help us better understand how the community may respond to future hazardous events. Remember all information given will remain confidential.**

33. Following, is a list of statements. Please use the scale below to show how much each statement applies to you, or doesn't apply to you.

	Not at all	A bit	To some extent	Quite a bit	Very much
I feel at home in this community	1	2	3	4	5
I am satisfied living in this community	1	2	3	4	5
I am a useful member of this community	1	2	3	4	5
I have the same values and beliefs as my neighbours	1	2	3	4	5
I feel I don't belong in this community	1	2	3	4	5
I am interested in knowing what goes on in this community	1	2	3	4	5
I would be happy to leave this community	1	2	3	4	5
I know my neighbours/and or other community members	1	2	3	4	5
I have no active involvement in this community	1	2	3	4	5

34. Please think about your life in the community at present. Choose a number from the scale below that shows how much you agree or disagree with each of the following statements.

Disagree strongly	Neither agree nor disagree			Agree strongly	
<div><div></div><div></div><div></div><div></div><div></div></div>					
1	2	3	4	5	
I feel I have control over the things that happen in my life and in the community					<input type="text"/>
There us no way I can solve some of the problems I have by myself					<input type="text"/>
I can't do much to change what happens in my life or in the community					<input type="text"/>
Somehow problems in my life usually solve themselves					<input type="text"/>

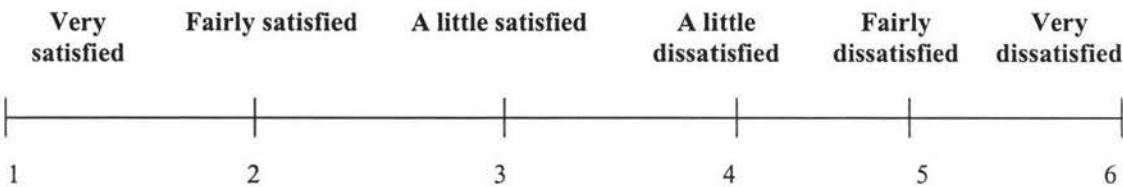
35. Below is a list of statements that describe ways different people deal with problems. Would you please think of how you have dealt with problems you have had over time, and note which statements describe *what you have done* and *what you have done in part*, and *what you have not done*. Please use the following scale, and tick the appropriate answer.

	Have done	Have done in part	Have not done
	1	2	3
Didn't think about it at all			
Feel that only time will tell, and I will just have to wait	1	2	3
Talked to someone to find out more about the situation	1	2	3
Went on as if nothing had happened	1	2	3
Kept my worries to myself	1	2	3
Tried to look on the bright side of things	1	2	3
Made a plan of action and followed it	1	2	3
Talked to someone you knew had useful suggestions	1	2	3
Tried to forget the whole thing	1	2	3
Felt you knew what was best for yourself and your family	1	2	3
Refused to let it worry you too much	1	2	3
Discussed the problem with others in the community	1	2	3
Drew on your past experiences of trauma and stress	1	2	3
Wished that the situation could be over with	1	2	3
Discussed the problem with your family	1	2	3

36. The following questions ask about people in your life who give you help or support. **Each question has two parts.**

**Part 1.**  
Count all the people you know (excluding yourself) who you can rely on for help and support in the way described and write the number in the box beside each question (maximum of 9) If you have no support enter 0.

**Part 2.**  
For each question please choose the number that best corresponds to how satisfied you are with the overall support that you have. Use the scale below. Enter the number in the box beside each question.

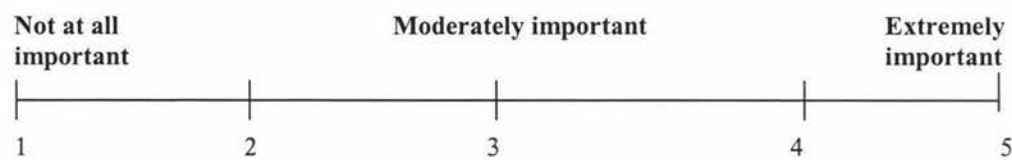


	Number of people	How satisfied are you with this support?
Who can you <b>really</b> count on to take your mind off your worries when you feel under stress?		
Who can you really count on to help you feel more relaxed when you are under pressure or tense?		
Who accepts you totally including your worst and best points?		
Who can you really count on to care about you, regardless of what is happening to you?		
Who can you really count on to help you feel better when you are feeling 'down in the dumps'?		
Who can you count on to help you feel better when you are very upset?		

37. The following questions relate to the normal feelings that people can experience in dealing with stress of everyday life. Have you experienced any of the following symptoms WITHIN THE PAST SEVEN DAYS. Please use the following scale to record your responses. If they did not occur during this time, please mark the not at all column' (remember all information is confidential and will be used only for the purposes of this study).

	Not at all	A little bit	Quite a bit	Extreme
Difficulty in speaking in times of excitement	1	2	3	4
Trouble in remembering things	1	2	3	4
Concerns about sloppiness or carelessness	1	2	3	4
Blaming yourself for things	1	2	3	4
Pain in the lower part of your back	1	2	3	4
Feeling lonely	1	2	3	4
Feeling 'blue'	1	2	3	4
Your feelings being easily hurt	1	2	3	4
Feeling that others do not understand you, or are unsympathetic	1	2	3	4
Feeling that others are unfriendly, or dislike you	1	2	3	4
Having to do things slowly, to ensure that you're doing them properly	1	2	3	4
Feeling inferior to others	1	2	3	4
Muscle soreness	1	2	3	4
Having to check and double-check what you do	1	2	3	4
Occasional hot or cold spells	1	2	3	4
Your mind occasionally blank	1	2	3	4
Either a numbness or tingling in your body	1	2	3	4
A lump in your throat	1	2	3	4
Trouble concentrating	1	2	3	4
Feeling a weakness in parts of your body	1	2	3	4
Occasional 'heavy' feelings in your arms and legs	1	2	3	4

38. Finally, please choose a number from the scale below that shows how important each of the following statements is to you personally in your life



Having a physical/spiritual relationship with the lake

11

Having a physical/spiritual relationship with the mountains

11

### Living in a small township

11

Queenstown being a visitor destination

11

## **Appendix C**

### **Flood Hazards Research Project Information Sheet**

The flood hazards research project will look at the strengths within communities that help them deal with hazards such as flooding.

This research is a joint project between the Institute of Geological and Nuclear Sciences (IGNS) and the School of Psychology, Massey University. It is being funded by IGNS. The enclosed questionnaire forms part of the research, which is being conducted by Vivien Richardson, a Masters student under the supervision of Professor Douglas Paton.

The information gathered from this research is expected to be published in a report prepared by IGNS, and will also form part of Vivien's Masters thesis. It may also be used to prepare articles for professional journals, in order to share out findings with colleagues and the public.

Feedback to the community on the results of this questionnaire will be provided later this year. Please remember that the questionnaire is anonymous, so that feedback will represent a summary of our findings and will not be linked to individuals.

Thank you for your time and assistance in taking part in this research.



**Appendix D**

**Consent Form**

I have read the information sheet for this study and have had the details explained to me. Any questions about the research have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I also understand that I am free to withdraw from the study at any time, and refuse to answer any particular questions.

I agree to provide information to the researcher on the understanding that it is completely confidential and will not be used for any purpose other than for this research.

I agree to the researcher audiotaping the interview and know that I have the right to ask for it to be turned off at any time during the interview.

I understand that she may use brief direct quotations from the interview in her reports of the study provided these do not identify me in any way.

Signed: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Appendix E

### Progress Report, February 2000

1. A flood bank wall in Queenstown from Horne Creek to Lake esplanade for flood and wave protection.
2. Barrier built across the entrance to Queenstown Bay with locks to provide boat access.
3.
  - a. Modification of the Kawarau Falls Bridge to stop the flow of water down the river being restricted.
  - b. Replacement of the Kawarau Falls Bridge.
4. Modify the Shotover River by removing material from the Shotover Delta or installing groynes in an attempt to increase outflow from the lake.
5. Lower lake levels.
6. Widen Smith Falls to provide increased flows at higher river levels to decrease the backing up of the river.
7. Reduce Rastusburn Delta.
8. Entrap sediment in the Shotover, i.e. trap the silt near its main source.
9. Flood retention in the Shotover by providing a holding dam on the upper Shotover River to moderate peak flows, reduce water velocity and restrict sediment being carried down the river.
10. Limiting sedimentation at source by using erosion control within the Shotover River catchment.
11. Remove willow trees in the Kawarau River.
12. Implement building standards for lower level buildings that will lead to a reduction in damage and ease of cleaning.
13. Upgrade infrastructure so that it works/ or no damage done during flooding.
14. Improve emergency event management (e.g. early warning event monitoring).
15. 16. & 17.
 

Consideration of flooding, its effects and flood mitigation measures on Glenorchy, Kingston and rural areas.
18. Consideration of alternative lake outlets.

(Adams, 2000)